CLIMATE RISK ASSESSMENT AND MANAGEMENT PLAN FOR TRANSFORMING HOUSEHOLD RESILIENCE THROUGH INCLUSIVE DEVELOPMENT (THRIVE) PROGRAM IN SOUTH SUDAN

SUMMARY REPORT

APRIL 2025

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ACRONYMS

CAFOD	Catholic Agency for Oversees Development
CERTs	Community Emergency Response Teams
CRA	Climate Risk Assessment
CRMP	Climate Risk Management Plan
CSA	Climate Smart Agriculture
EWS	Early Warning System
FGD	Focus Group Discussion
GIS	Geographic Information Systems
GUN	Greater Upper Nile
HHS	Household Survey
IDPs	Internally displaced persons
KIIs	Key Informant Interviews
NGO	Non-Governmental Organisation
SSHARP	South Sudan Humanitarian & Resilience Programme
THRIVE	Transforming Household Resilience Through Inclusive Economic Development in South Sudan

ACKNOWLEDGMENT

This Climate Risk Assessment for the FCDO-funded THRIVE Programme in the Greater Upper Nile (GUN) region stands as a testament to collaborative expertise and unwavering commitment. THRIVE, a four-year program aims to bolster the resilience of communities navigating the complexities of conflict and climate change across eight priority counties in Upper Nile, Unity, and Jonglei States. This four-year initiative, targeting approximately 120,000 households, integrates gender-responsive and inclusive strategies encompassing livelihoods development, market system strengthening, financial inclusion, women's economic empowerment, disaster risk reduction, climate adaptation, and social cohesion.

This comprehensive Climate Risk Assessment was meticulously prepared by DUBELIG Development Consulting, an experienced international consulting firm commissioned by CAFOD, the lead consortium agency for THRIVE Output 2, with the generous funding support of FCDO. Conducted between March 1st and 25th, 2025, the assessment embraced an inclusive methodology, actively engaging key stakeholders from the THRIVE consortium, local actors, government agencies, and, crucially, beneficiary communities.

We extend our profound gratitude to the diverse array of individuals, organizations, and stakeholders whose invaluable contributions were pivotal to the successful completion of this report. Their collective wisdom and dedication to understanding and addressing the critical challenges posed by climate change in this region have been paramount.

We acknowledge the strategic leadership and dedicated coordination of CAFOD team, whose oversight was instrumental throughout the entire climate risk assessment process. Furthermore, we deeply appreciate the exceptional professionalism, technical rigor, and meticulous analysis provided by DUBELIG Development Consulting. The expertise and diligence of their team were crucial in delivering a high-quality and comprehensive assessment report.

The active engagement of the THRIVE Consortium members – GOAL, Mercy Corps, and VSF Suisse – alongside their local partners significantly enriched the depth and relevance of this assessment. We also extend our sincere appreciation to the government agencies at the national, state, and county levels for their crucial participation and provision of essential insights, data and policy perspectives.

Crucially, we recognize the invaluable contributions of community leaders, local organizations, and the residents of the eight counties. Their firsthand experiences, traditional knowledge shared through HH surveys, KIIs, and FGDs, provided critical ground-level insights that have shaped the core findings of this report, ensuring its relevance to the lived realities of climate risk in GUN.

Finally, we express our sincere gratitude to FCDO for the generosity of vital funding support of the THRIVE Programme. This Climate Risk Assessment Report stands as a product of shared knowledge and collective action. We are deeply grateful to all who have contributed and trust that its findings will serve as a vital resource for the THRIVE Project and broader efforts aimed at fostering climate resilience across the Greater Upper Nile Region.

EXECUTIVE SUMMARY

1. INTRODUCTION

South Sudan, the world's youngest nation, with a total population of over 12 million, covers a total area of approximately 644,329 square kilometres and is characterized by its humid equatorial climate. The country experiences significant variability in annual rainfall, which ranges from as low as 200 mm in the Southeast to between 1,200 mm and 2,200 mm in the forest zones of Western and the Eastern Equatoria highlands[1]. The northern states receive rainfall between 700 mm and 1,300 mm. The rainy season, typically from April to December, often causes seasonal river flooding, disrupting local communities and agriculture. Since the 1970s, rainfall patterns have exhibited substantial year-to-year variability, leading to cycles of extreme floods and droughts. Notably, droughts have become more frequent and widespread in recent decades, particularly in the Greater Upper Nile region.

South Sudan is one of the countries that are most vulnerable to climate change impacts, facing increased temperatures, increased rainfall variability. The climate-related challenges of South Sudan are compounded by its political instability and ongoing conflicts. The country is highly susceptible to extreme weather events, including both floods and droughts. Recent years have seen increasing incidences of flooding, which have overwhelmed traditional management capacities and submerged areas previously deemed safe. These climatic extremes coupled with the impacts of natural disasters like flooding and drought, have exacerbated the country's deep levels of multidimensional poverty. These factors contribute to low human and land productivity, spiralling inflation, high household dependency rates, and limited social service delivery, creating a situation of significant fragility, including displacement, loss of property and increased demand for humanitarian aid.

The THRIVE programme designed to enhance the resilience of communities facing conflict and climate challenges in the Greater Upper Nile (GUN) region. Over a four-year span, this initiative will focus on eight key counties: Ulang, Renk, Fashoda, and Panyikang in Upper Nile State; Rubkona and Panyijiar in Unity State; and Akobo in Jonglei State. The programme is being implemented by GOAL, in collaboration with Mercy Corps, CAFOD, and VSF Swiss, along with local partners. THRIVE will implement strategies that encompass livelihood development, market system enhancement, financial inclusion, the economic empowerment of women, climate change adaptation and social cohesion initiatives.

This report presents the results of a Climate Risk Assessment (CRA) study and a Climate Risk Management Plan carried out by DUBELIG Development Consulting, contracted by CAFOD. The CRA study examines climate risks in terms of project exposure, potential climate impacts and risk mitigation capacity in the THRIVE project locations, and based on these findings a climate risk management plan (CRMP) drawn up, and will be used to monitor risk mitigating actions during the implementation of the THRIVE programme.

EXISTING RISKS AND FUTURE CLIMATE RISKS

Average temperatures across South Sudan have increased by 1 – 1.5°C over the past decades
The average annual temperature across South Sudan is expected to increase by about 1- 1.5°C by 2060, which will likely result in more extreme heat days and longer heatwaves, including in the Greater Upper Nile region.

[1] *African Security Sector Network, (2024). Communities of South Sudan. https://www.africansecuritynetwork.org/HSGO/ss_communities.html*
[2] Source: Climate risk profile: South Sudan | PreventionWeb

Precipitation is characterised by large year-to-year variability, resulting in cycles of extreme floods and droughts. Droughts have become more frequent and widespread over the past decades, particularly in the Great Upper Nile region.

Projections for precipitation vary across various models, with some projecting a slight increase in total annual precipitation, while others project decreasing rainy season length and total annual precipitation, likely resulting in increased drought occurrence, including in the Greater Upper Nile region.

Limitation of the Assessment

The study faced several challenges including limited time, security concerns, exclusion of Nasir County due to conflict, and language barriers. Despite these constraints, the team employed mitigation strategies such as prioritizing key stakeholders, using remote interviews, reallocating sample sizes, leveraging secondary data, and engaging local translators that ensured relevant data was collected and that the findings provide a solid foundation for a comprehensive climate risk assessment report in the Greater Upper Nile region.

2. STUDY METHODOLOGY

A mixed-methods approach was applied to the THRIVE Project Climate Risk Assessment, combining qualitative and quantitative tools for a well-rounded understanding of climate risks. The process began with a comprehensive document review, examining existing climate risk materials, hazard data, and operational guidelines to identify information gaps and guide the assessment. A comprehensive inception report and meeting between the consultant and the THRIVE team established the methodology, data collection tools, timeline, and implementation framework, ensuring alignment and clarity on the assessment's objectives and execution.

Field data collection involved 43 trained enumerators using KoBo Collect to conduct household surveys in local languages. The sampling strategy used a combination of random, stratified, and cluster sampling to ensure statistical validity and geographic representation. Out of a planned sample of 870 households from a population of 105,000, a total of 880 (100% plus) surveys were completed. To complement the survey data, 44 (78.6%) out of 56 planned focus group discussions (FGDs) were conducted, exploring local knowledge and climate-related experiences. Additionally, 63 (82.9%) of 76 targeted key informant interviews (KIIs) were held at national, state, and community levels. Together, these approaches provided robust, context-specific insights, supporting the development of a relevant and actionable climate risk assessment for the THRIVE program. The ultimate sample distribution of different data collection tools for each target county is summarised in Table 1.

Table 1: Sample size targets and achievements by County

State	County	Household Survey			FGD		KII	
		Sample Target	Achieved	Variance	Sample Target	Achieved	Sample Target	Achieved
Upper Nile	Ulang	90	97	7	8	6	8	6
	Renk	70	71	1	8	5	8	7
	Fashoda	80	81	1	8	5	8	7
	Panyikang	60	60	0	8	7	8	5
	Nasir	0	0	0	0	0		
Unity	Rubkona	320	330	10	8	8	8	10
	Panyijiar	150	136	-14	8	5	8	8
Jonglei	Akobo	100	105	5	8	8	8	8
State Level	Upper Nile; Jonglei; Unity						15	6
Juba							5	6
TOTAL		**870**	**880**	**10**	**56**	**44**	**76**	**63**

It is important to note that, due to ongoing conflict in Nasir County, all planned data collection activities—including household surveys, focus group discussions (FGDs), and key informant interviews (KIIs)—were not conducted in that location. To maintain the integrity of the sample size and state-level representation, the originally planned samples for Nasir were reallocated to the other four counties within Upper Nile State. This adjustment ensured that the assessment maintained its statistical robustness while adapting to the on-ground realities and access limitations

3. FINDINGS

The report presents findings and recommendations on: climate risks that exists in the 7 priority counties for the THRIVE programme, the climate risk assessment and vulnerability and adaptive capacity, and climate risk management plan.

3.1. Socio-economic characteristics of the households in the priority counties for THRIVE programme

The majority of survey respondents are residents who have not at any time moved out of their locations, but the communities also comprise of significant numbers of returnees, IDPs and refugees from neighbouring countries. There is a great variability across the counties on the relative proportions of long-term residents, returnees, internally displaced persons and foreign refugees. For example, while returnees constitute 40% of the households in Panyikang, only and 4% of households Panyijiar are returnees. The communities' high diversity of "residence types", is driven by the socio-economic dynamics of the region. Civil conflict, intercommunal violence and climate related hazards often cause displacement of people in search of safety areas. The diversity of residents and increase in population pauses challenges for social cohesion, which when combined with scarcity of resources sometimes leads to conflict and violence. There is need to prioritise conflict resolution and peacebuilding help communities to coexist peaceful and focus on building resilience and to minimise the negative impacts of climate risks. The gender distribution of the sample is notably skewed, with females comprising a substantial 70.7% of the total population, while males account for only 29.3% (see Table 6).

Table 2: Sample distribution of survey respondents by gender

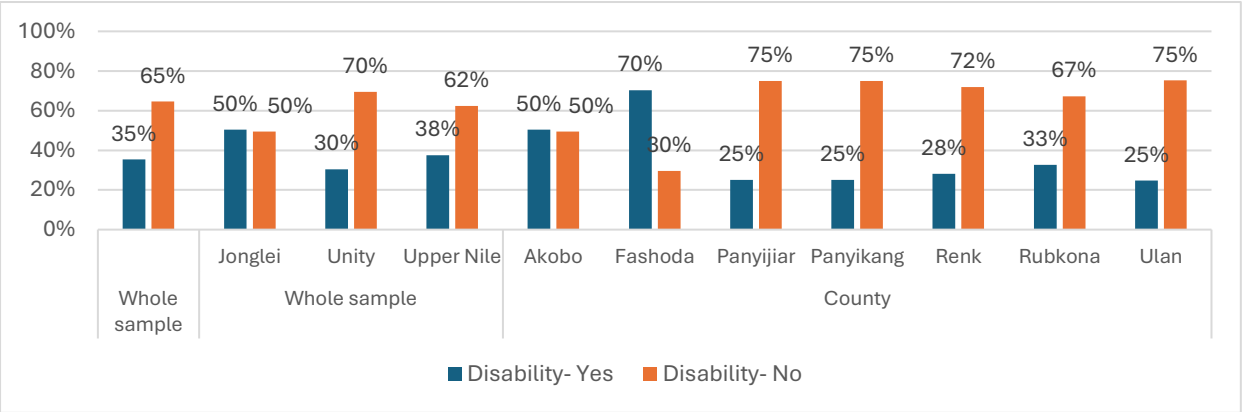
Gender	Whole sample	Akobo	Fashoda	Panyijiar	Panyikang	Renk	Rubkona	Ulang
Female	70.7%	61.0%	66.7%	86.0%	60.0%	78.9%	72.4%	57.7%
Male	29.3%	39.0%	33.3%	14.0%	40.0%	21.1%	27.6%	42.3%

The majority of the population is comprised of individuals in age groups 18-35 years (46%), 36-65 years (51%). The youth make up a large proportion of the population. The majority of the people in all counties do not have formal education, except in Fashoda and Panyikang where 78% and 58%, respectively, have some formal education. High levels of illiteracy observed in most communities have implications project implementation, for example, the choice of approaches for capacity building and strategies for dissemination of weather and climate information, and climate adaptation measures.

A significant proportion (35%) of the people have some form of disability, as classified using the Washington Group questions. There is high variability in the incidence of disability across the counties, for example, ranging from a high of 70% in Fashoda and 25% in Ulang. The selection of

climate adaptation strategies recommended for different counties and communities will need to consider the disability situation of beneficiaries.

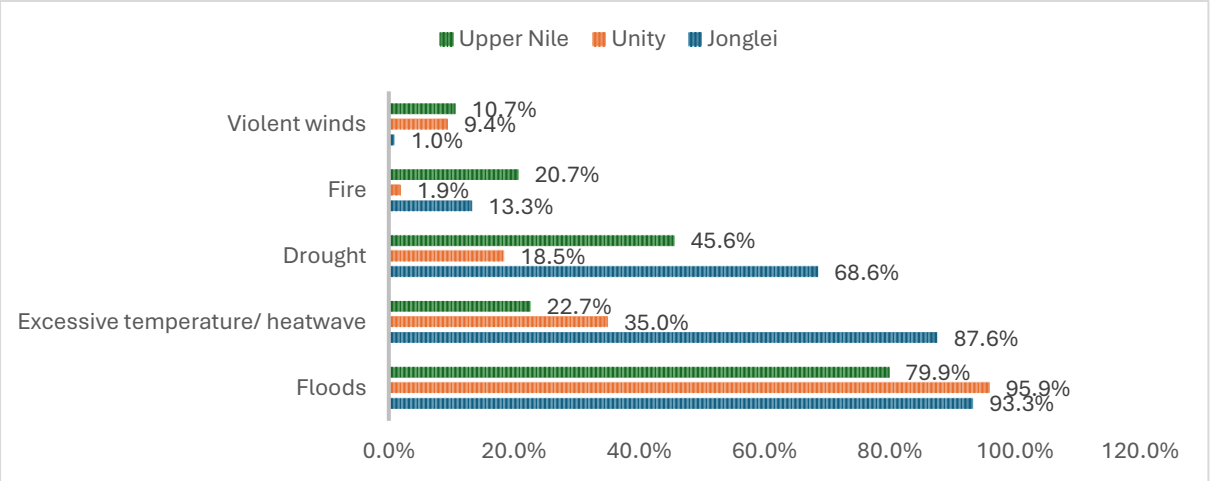
Figure 1: Disability prevalence among the respondents



3.2. CLIMATE RELATED HAZARDS EXISTING IN THE THRIVE PROGRAMME PRIORITY COUNTIES

The results of the household survey, together with information gathered from focus group discussions held with men, women, and youths in the study communities, and from interviews with key informants representing government officials at national, state, county and payam levels, as well as traditional leaders indicate that floods, extreme temperatures, drought, wildfires and violent/ strong winds are the major climate related hazards existing in Akobo (Jonglei state), Fashoda, Panyikang, Renk and Uland (Upper Nile state), and Panyijiar and Rubkona (Unity state). The status of the major climate related hazards is presented in the figure below.

Figure 2: Climate Risks experience of respondents over the previous 12 months by State



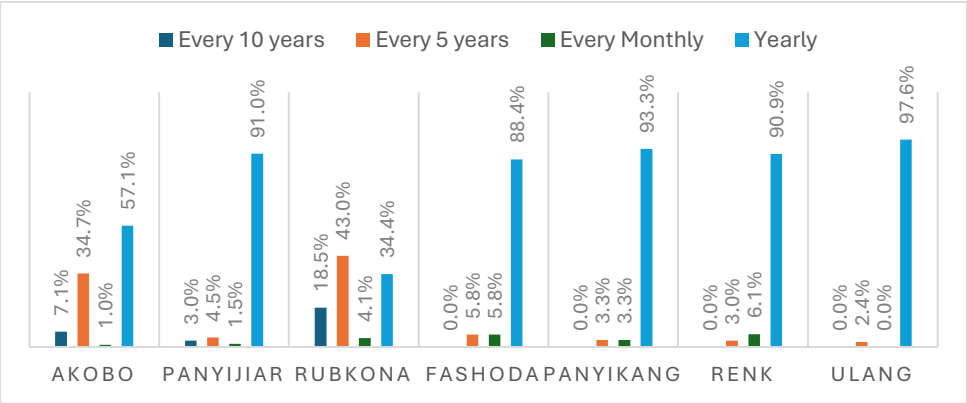
3.2.1. Analysis of Flood hazard

Averaged across all counties, 90% of respondents experienced floods in the past 12 months. There is variability in the number of households impacted by floods across the 7 counties floods: 85% to 100% in Fashoda, Ulang, Akobo, Rubkona, Panyijiar, and Panyikang; and 47% in Renk. Participants in focus group discussions in all counties also indicated that their communities experienced floods in the past 12 months, causing many negative effects including loss of life, shortage of food, damage to property, displacement, and disrupt of access to services.

i. ***Frequency of floods***

The frequency of floods is reported to have increased in the past decade and in many places flood waters not receding between flood events. The majority of those impacted by floods experienced them every year. The study shows that, a significant majority of respondents (65%), indicated that flood ocuur yearly, while 23.2% of respondents reported that flood occurs every five years. While only 3% of the respondents reported experiencing flood monthly, the remaining 8.7% responded that flood occurs every ten years. The state level response shows that, 93.1% of respondents reported flood occur yearly, followed by Jonglei and Unity where 57.1% and 51.2% of respondents, respectively, indicated annual occurrence of flood.

Figure 3: Frequency of food occurrence by County

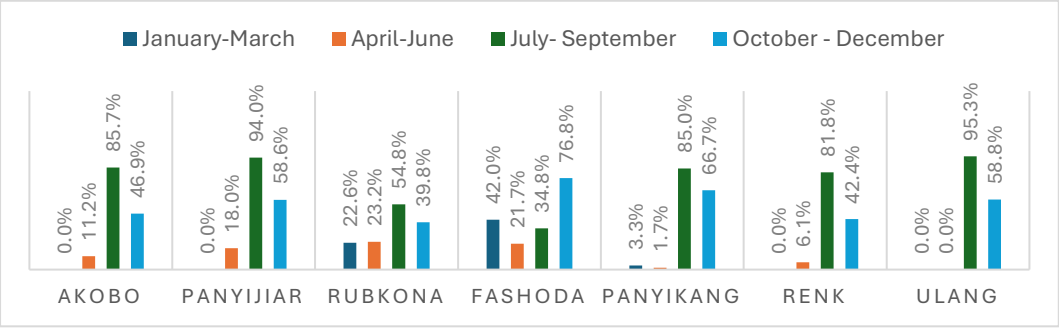


ii. ***Severity*** *of flooding*

The impacts of floods were rated as severe to extremely severe (on a 4 point scale ranging from: not at all severe, moderate, severe and extremely severe) by the majority of the affected households. 74.1% of the total respondents reported the severity of flood, while 10.6% of the respondents characterized the floods as extremely sever. The county specific response shows that, 79% in Akobo, 80% in Ulang, 80% in Panyijiar, 81% in Panyikang, 93% in Rubkona, and 94% in Fashoda, reported floods impacts as severe to extremely severe (on a scale of - not at all severe, moderate, severe, extremely severe). In Renk county, comparatively fewer people (42%) impacted by floods reported the impacts as being severe to extremely severe.

The survey finding regarding the periods of the year when floods occurred across the GUN region, 71.2% of respondents reported that floods occur between July and September, highlighting this as a peak period for flooding events. Moreover, 51.3% of respondents reported that flooding also occurred in the October to December period, indicating that the latter part of the year is also susceptible to flooding, though to a lesser extent than the mid-year months.

Figure 4: Period of the year that the floods occurred by County

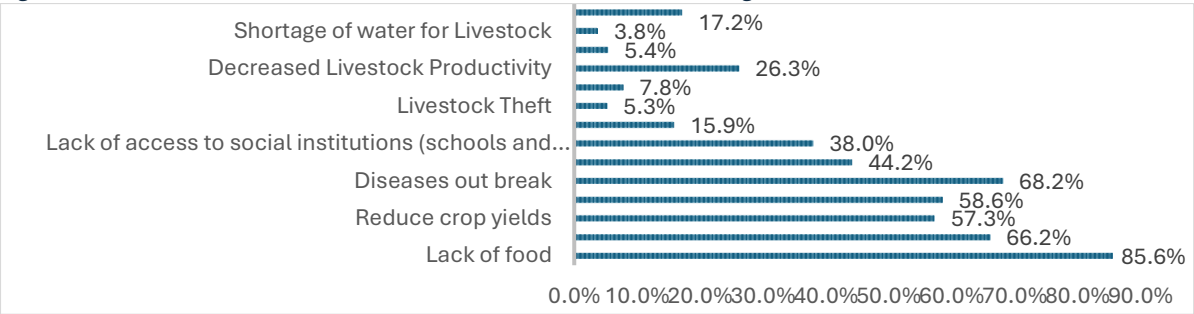


iii. Impacts of flood

The study reveals that 74.1% of respondents indicate floods impact everyone, highlighting the widespread nature of the flooding crises, but key vulnerable groups face greater risks. Women (31.8%), children (31.1%), and especially persons with disabilities (32.4%) are disproportionately impacted. These findings highlight the urgent need for inclusive, targeted disaster response strategies that address the unique challenges faced by these groups during flood events, ensuring no one is left behind in preparedness and recovery efforts.

Floods affected agriculture and livestock production, fisheries, disrupted livelihoods and caused food shortages resulting in food insecurity. Floods also caused the loss of human life in some counties, polluted water sources, resulting outbreaks of diseases such as cholera. Displacement of people and loss of land, as land stayed under water over long periods was raised as a major challenge in focus group discussions in most counties, for example the men's group in Panyijiar county and the groups in Akobo and Ulang counties.

Figure 5: The effects of the flood on the communities across the entire region



iv. *Coping strategies*

A notable 64.3% of respondents reported relying on donor aid as a primary coping strategy, indicating a heavy dependence on external assistance in the face of flooding challenges. This is followed by 30.2% utilizing government support, which underscores the importance of institutional aid in disaster recovery. Support from humanitarian organisations is the coping strategy most widely by households to cope with the effects of disasters (for example, 78% of respondents in Akobo, 70% in Panyijiar and 74% in Fashoda), including support from the different levels of government (75% in Fashoda) are the major means by which the majority of households in all counties ~~to~~ cope with the impacts of climate risks.

Most households do manage to evacuate from impacted areas and to save some of their property (for example, 85% in Panyikang and Ulang). Some use negative coping strategies such as selling productive assets (e.g., farming tools) 19.9%, selling livestock (19.7%), reducing the number of meals eaten in a day (18.9%), pulling children out of school (23.1%), marrying of girl children (4.4%), casual labour (11.1%) and harvesting wild fruits and/or hunting (6.7%). The use of personal or community savings, drawing on food stocks saved from previous harvests, and insurance are not widespread in the communities. In general households in the study counties are underserved by financial markets. This limits the range of coping and adaptation options available to households.

3.2.2. Extreme temperatures/ Heatwave related hazards

i. Incidence of extreme temperatures/ heatwaves

A significant majority, 80.9%, indicated that heatwaves occur yearly, suggesting that this phenomenon is a common and consistent challenge faced by the population. Additionally, **11.7% of respondents reported experiencing heatwaves monthly**, which underscores the increasing frequency of extreme heat events. Extreme temperatures or heatwaves affect large numbers of

households, in Akobo 88% of the household, 62% in Panyijiar %, 27% in Fashoda, 25% in Renk, 24% in Rubkona, 22% in Ulang and 15% in Panyikang were impacted by extreme temperatures in the past 12 months. Participants in focus group discussions in most counties also pointed out that the number of high temperature days have increased over the years.

ii. Frequency of Heatwave

The majority of the households impacted by extreme temperatures indicated that it was every year. Panyikang, an alarming 100%, followed by Panyijiar (95.2%), Ulang (95.2%), Renk (83.3%), and Rubkona (81%) and Fashoda (77.3%), reported yearly occurrences of heatwave, highlighting the pervasive nature of heatwaves in these areas.

iii. Severity

The majority of the households, 70.2% of the participants who were impacted by extreme temperatures report that the effects the hazard when it had occurred are severe to extremely severe, whereas 28% of the respondents rated the severity as moderate and only 1.5% respondents described the heatwave as extremely severe In Akobo, 78% of the impacted households indicated that the impacts were severe to extremely severe, and 79% for Fashoda, 76% for Panyijiar and 100% for Panyikang, 66% for Renk. 19% of the respondents in Ulang rated the impacts as severe while 81% said the impacts were moderate.

The survey findings reveal important insights regarding the seasonal occurrence of heatwaves as reported by the participants. At the GUN regional some 74.2% of respondents indicated that heatwaves occurred during the January to March period, making it the most prevalent time for heatwave occurrences across the sample. This suggests that early in the year is particularly critical for addressing and preparing for heatwave impacts. In the following months, 44.9% of respondents reported experiencing heatwaves between April and June, indicating a considerable drop in frequency compared to the first quarter of the year, yet still showing that heatwaves are a significant concern during this period.

Figure 6: Period of the year that the heatwaves occurred by State

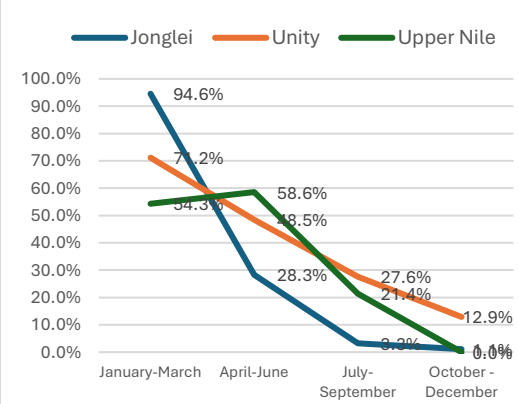
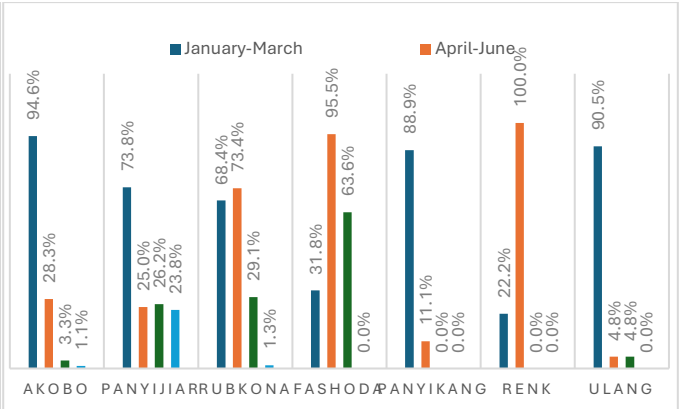


Figure 7: Period of the year that the heatwaves occurred by County



iv. Impacts

The effects of extreme temperature hazard include reduced availability and access to food, water shortages, shortages of pastures (grazing), negative effects on human health, disruption of learning due to school closures, and loss of human life, and disease outbreaks, livestock dess and decreased productivity of livestock are among the major impacts. A notable 62.8% of respondents indicated that loss of life is a critical effect of heatwaves, emphasizing the severe impact on community health and safety. Additionally, 73.2% reported outbreaks of diseases as a significant consequence, suggesting that heatwaves contribute to health crises that can further exacerbate vulnerabilities. 67.9% of respondents reported food shortages. Similarly, loss of life due to heatwaves is alarmingly high, with Panyijiar and Rubkona showing 83.3% and 81.0%

respectively. This indicates a severe impact on community health and safety. Moreover, crop yields have been adversely affected, with Panyijiar again leading at 67.9%, highlighting the agricultural challenges that these regions face. In a focus group discussion with the youth in Akobo county it was reported that school closures triggered by heatwaves affected students who were supposed to take their end of year examinations. The data further indicates that disease outbreaks are prevalent, with Ulang reporting a striking 100% of respondents affected, underscoring the public health crisis exacerbated by heatwaves.

v. Coping strategies

A big proportion of the sample, 68.9%, relies on donor aid as a primary coping strategy. This indicates a heavy dependence on external assistance to manage the impacts of heatwaves, suggesting that local resources may be insufficient to meet the community's needs. Additionally, 39.4% of respondents reported receiving government support, which highlights the role of governmental intervention in providing relief during such crises.

Specific to counties, support from humanitarian organisations (60% of respondents in Akobo, 86% in Panyijiar, and 65% in Rubkona) and the government (for example, 82% of respondents in Fashoda and 77% in Panyijiar). These are the main coping strategies used by affected households. A small proportion of households can draw of savings or insurance, in conjunction other strategies.

All in all, the findings demonstrate that age, marital status, family status, and education level all play critical roles in shaping the effectiveness of coping mechanisms against heatwaves. Each demographic group experiences unique challenges and responses, highlighting the need for targeted interventions that address these specific vulnerabilities.

3.2.3. Drought hazard

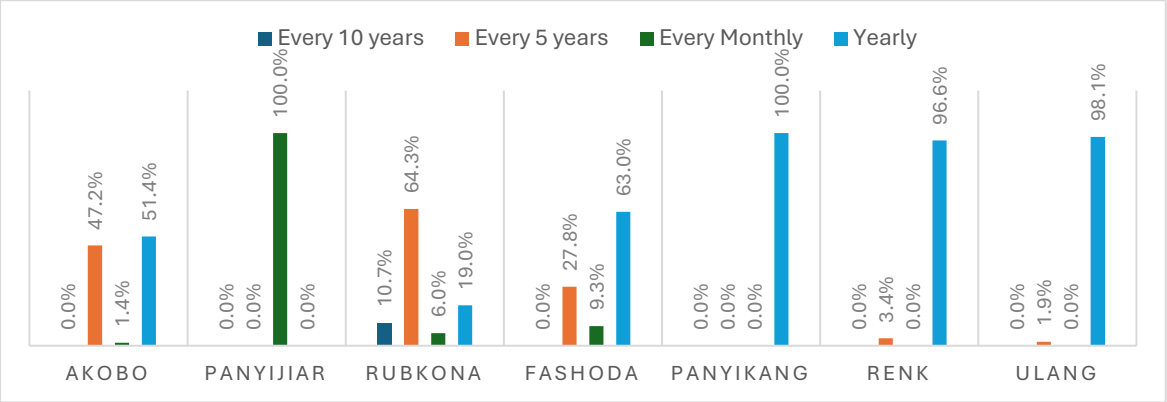
i. Incidence

Drought impacts a large proportion of households in some counties (69% in Akobo and 68% in Fashoda, 56% in Ulang and 41% in Renk) and much less so in others, for example, 26% in Rubkona, 7% in Panyikang and 2 % Panyijiar.

ii. Frequency

While respondents indicate that they have experienced drought every year, it is not clear in this case if they indeed refer to prolonged dry weather through the season and longer or seasonal or mid-season drought. The question asked if they experienced drought in the past 12 months, so the response may also refer to only the reference period mentioned, whether or not it was a drought season.

Figure 8: Frequency of occurrence of droughts by County

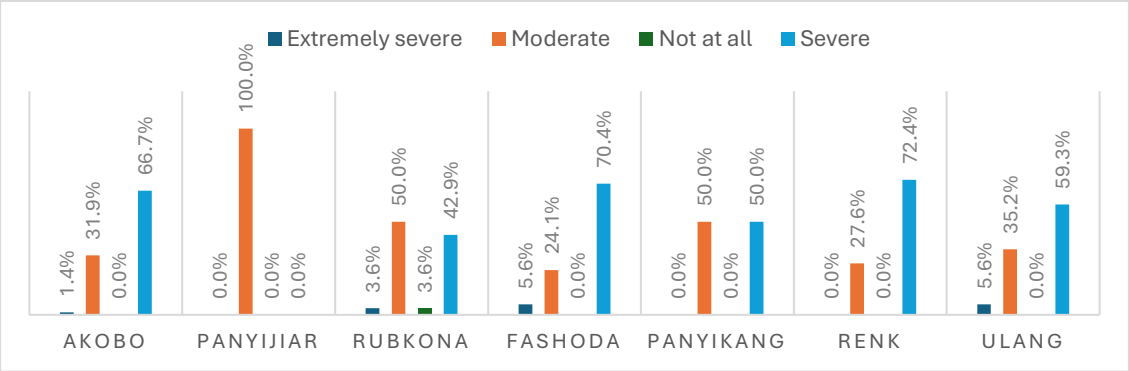


iii. ***Severity***

Analysis of the severity of drought occurrences in the GUN region shows at least 59.2% of respondents reported experiencing severe drought conditions**,** while 36.5% indicated moderate severity**.** Conversely, only 3.3% classified the drought as extremely severe**,** and a mere 1.0% reported no drought conditions at all**.** The data suggests that drought is a prevalent concern, impacting the majority of the population in varying degrees across the region.

The effects of drought were reported to be severe to extremely severe by most impacted households. For example, in Fashoda 76% of the house reported the impact on them as being severe to extremely severe, 72% in Renk, 68% in Akobo, 65%, in Ulang, 50 % in Panyikang, 47% in Rubkona.

Figure 9: Extent of severity of the droughts for the communities by County



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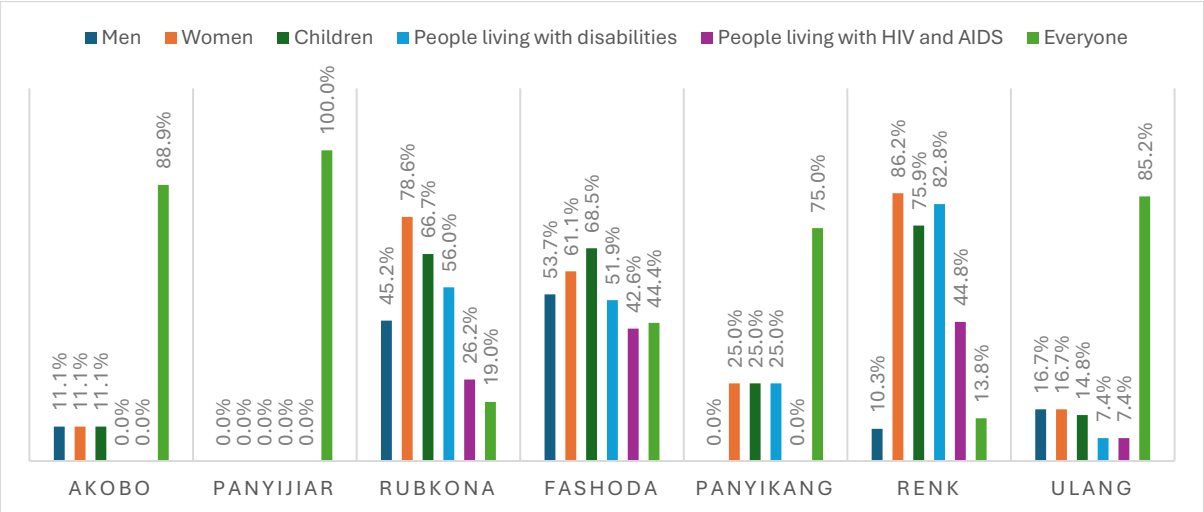
The drought hazard affects agricultural and livestock production, and fisheries resulting in reduced availability and access to food; affects water supplies, and results disease outbreaks; morbidity and mortality resulting from lack of food, lack of food; negative impact on livelihood, impact the environment and ecosystem and resulting in reduced availability of wild foods and supplies of non-timber forest products.

Figure 10: Community groups that are mostly affected by droughts at County Level

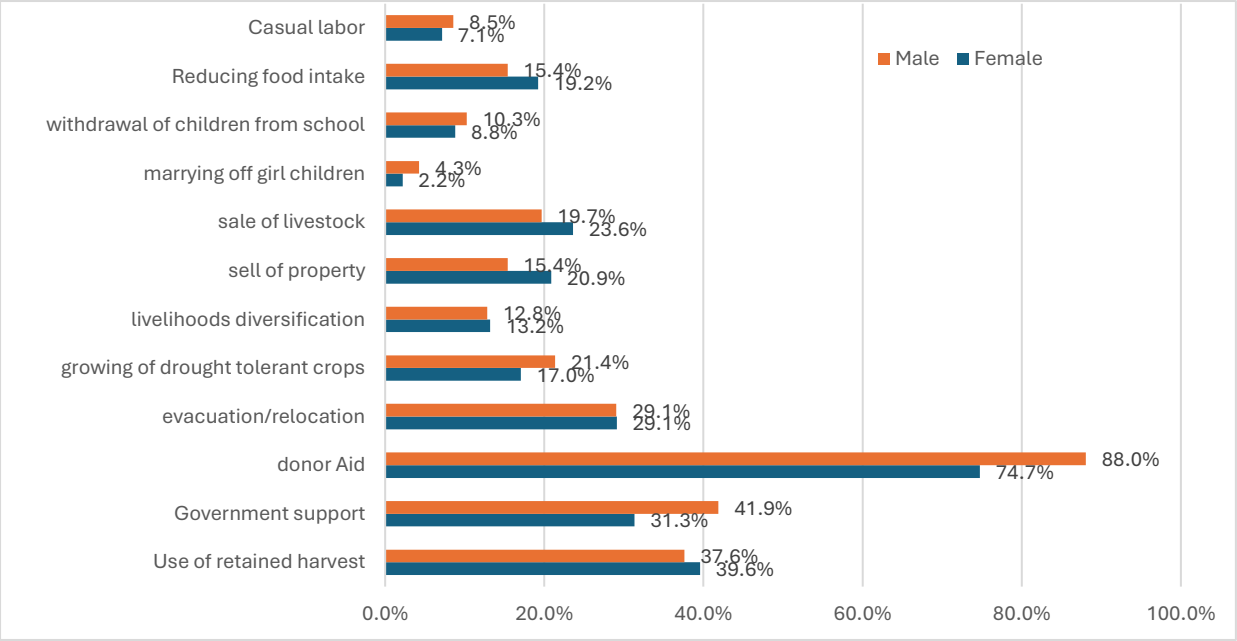


v. Coping strategies

In Panyijiar, a striking 100.0% of respondents report using retained harvests, indicating that this community heavily relies on food stored from previous seasons to cope with current food shortages. Similarly, 47.6% in Rubkona and 50.0% in Ulang also utilize retained harvests, showing that while this strategy is prevalent, its effectiveness varies among communities. Donor aid plays a critical role, with 100.0% of respondents in Panyijiar relying on this support, followed by 88.1% in Rubkona and 87.0% in Fashoda. This indicates a heavy dependence on external assistance across multiple communities, reflecting inadequate local resources to manage drought impacts effectively. Evacuation or relocation is a strategy employed by 75.0% of respondents in Panyikang, significantly higher than 16.7% in Akobo and 3.4% in Renk. This suggests that Panyikang faces particularly severe challenges, prompting many to seek better living conditions elsewhere. The other copying strategies include selling of property, marrying off girl children, withdrawal of children from school, reducing food intake, casual labour, among others.

The findings of the study highlight the fact that communities across the counties employ a diverse range of coping strategies in response to drought, with significant reliance on donor aid and retained harvests. However, the variation in strategies employed across different communities underscores the need for targeted interventions that address the specific challenges faced by each community, ensuring that support is directed to strengthening home grown coping strategies, and resilience building measures initiated by beneficiaries.

Figure 11: Coping mechanisms against the droughts by Gender of Respondent



3.2.4. Wildfires hazard analysis

i. Incidence of wildfires

Wildfires affected 32% of households in Fashoda, 23% in Renk, 22% in Ulang, 13% in Akobo, 3% in Rubkona, 2% in Panyikang. It seems wildfires are not of major concern in Panyijiar as, none of the sample household experienced the hazard.

ii. Frequency

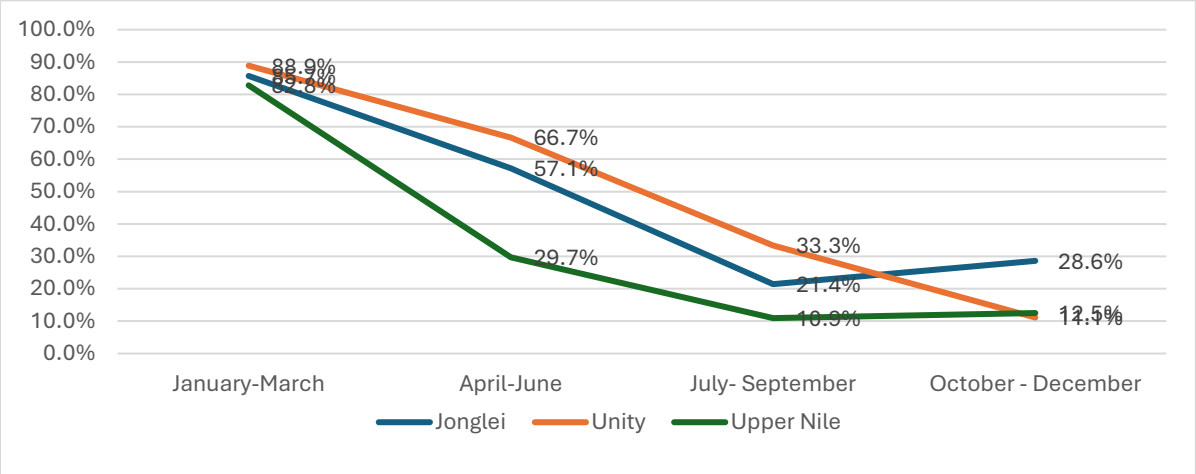
The majority of impacted households report that they experience fire hazards every year for example in Akobo 86% of respondents indicated that wildfires occur yearly, 78% for Rubkona reported, Fashoda presents a unique situation, with 70% for Fashoda%, 56% in Renk.

iii. ***Severity***

A substantial 50.6% of the whole sample classify fire as severe, indicating that many individuals perceive fire as a critical issue affecting their communities. Additionally, 46.0% of respondents describe the severity of fire as moderate, suggesting that while many recognize the risks, they may not view them as overwhelmingly critical. There is a great deal of variability in the reported severity of the impact of wildfire hazards across the counties. In Panyikang, 100% of the respondents reported the impacts of fire hazards as severe, while 91% and 65% in Ulang and Fashoda, respectively, said the impacts were severe. In Renk county 94% of the respondents indicated that the impacts of fire hazards were moderate, this was the same level of severity reported by 56% and 57% of the respondents in Rubkona and Akobo, respectively.

The study results shed light on the seasonal occurrence of fire hazards within the GUN region. A significant 83.9% of respondents indicated that fire hazards occur during the January to March period, suggesting that early in the year is the peak time for such events. In contrast, 37.9% of respondents reported that fires occur between April and June, indicating a notable but less frequent risk as the year progresses.

Figure 12: Period of the year that the fire hazards occur by State



iv. Impacts

The survey findings reveal that wildfire hazards had multiple impacts on affected household in the seven targeted counties. In Fashoda, 88.5% of respondents reported a lack of food, with 78.6% in Akobo and 81.3% in Renk also reporting the same. Loss of life is another grave consequence, with 100% of respondents in Panyikang indicating this as one of the outcomes of floods in the county, while 85.7% in Akobo and 88.9% in Rubkona also reported the same outcome. Loss of livelihoods is also reported by many people, for example, 42.9% of respondents in Akobo and 56.3% in Renk reported loss of livelihoods, while 100% in Panyikang experienced this loss, indicating how widespread the economic disruption caused by wildfire hazards can be. Property damage was acutely experienced among the affected households in Rubkona, where 100% of respondents reported damage, while 76.2% in Ulang and 37.5% in Renk also noted considerable property loss.

V. Coping strategies

Reliance on donor aid, and government support are the main coping mechanisms for households to cope with the effects of fire hazards, for example, in Rubkona, 67% of respondents utilized government support to help their recover. This highlights a strong dependence on external support in the face of fire impacts. Some households use their own strategies, for example, in Rubkona 44% reported using retained harvests, suggesting a more proactive approach to managing food resources compared to Akobo. Fashoda showed a high reliance on food stock

from past harvests, with 65% reporting using this strategy. There is a variability in the coping strategies deployed by households across counties as they try to recover from the impact of wildfires. In addition, the other common coping strategies used by the community includes: evacuation/relocation, growing of drought tolerant crops, livelihood diversification, sell of property and livestock, marrying off children, children school dropout, reduce food intake, casual labour and harvest of wild fruits/hunting.

3.2.5. Violent winds

i. Incidence of violent winds

Strong winds affected 19% in Ulang, 12% in Fashoda, 10% in Panyijiar, 9% in Rubkona, 7% in Renk. Strong winds are not are hazard of concern in Panyikang. Overall strong winds currently affect far fewer households compared to floods, extreme temperatures and droughts.

ii. Frequency

The majority of the affected households report that, at the GUN regional level, the highest frequency of reported violent winds is during the April to June period, with 76.9% of respondents indicating this timeframe. In contrast, 32.1% of respondents noted that violent winds occur between January and March, indicating that some wind activity begins early in the year but is less prevalent than in the following months.

iii. Severity

The severity of the impacts of strong winds was considered to be moderate, although in some counties, for example in Panyijiar the affected households report severe impacts.

iv. Impact

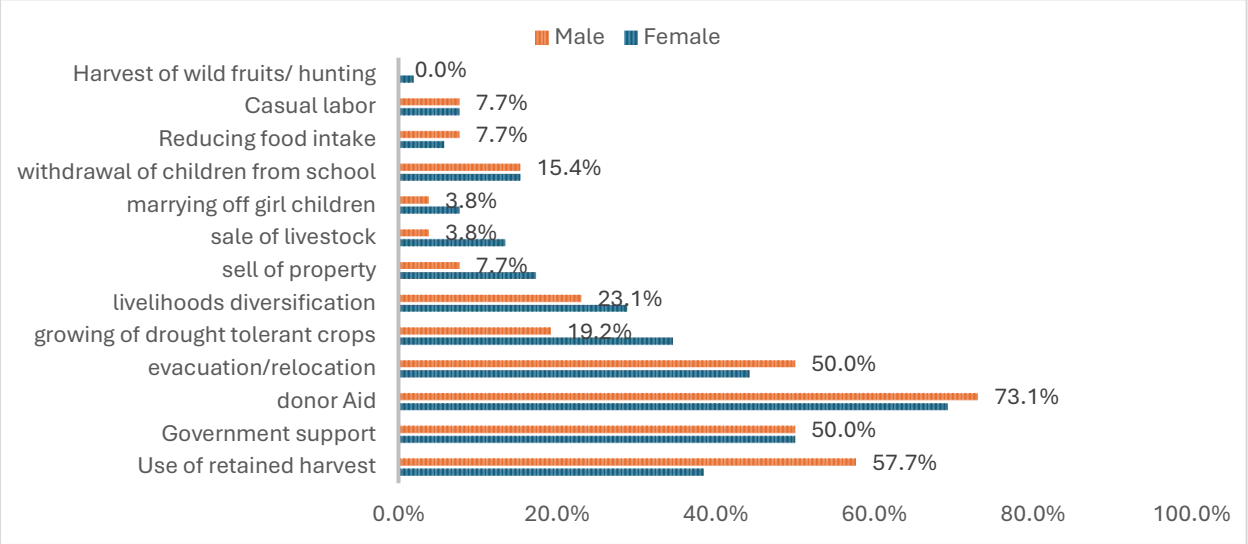
The study findings regarding the groups most impacted by violent winds reveal that the effects are widespread across various demographics. In the GUN region, 57.7% of respondents indicated that everyone in the community is affected by violent winds, highlighting the pervasive nature of this environmental hazard. This broad consensus underscores the collective vulnerability faced by all community members. Among specific demographic groups, children are reported to be the most impacted, with 48.7% of respondents acknowledging their vulnerability, while women follow closely, with 47.4% of respondents indicating that they are also significantly affected. In contrast, 30.8% of respondents indicated that people living with HIV and AIDS are impacted by violent winds.

Overall, these findings illustrate that while everyone in Jonglei is perceived to be affected by violent winds, Unity and Upper Nile show varying levels of impact across different demographics. The recognition of widespread vulnerability, particularly for women and children, is crucial, especially in the context of ongoing drought conditions in the GUN region. Some of the lists of impacts of the violent winds includes loss of livelihoods, decreased livestock productivity, destruction of property including homes, disease outbreak (both human and animal health), GBV, child marriage and livestock theft, are among others.

v. Copying strategies against violent wind hazards

A significant 70.5% of respondents reported relying on donor aid, followed by 50% of government support, highlighting the crucial role of external support in helping communities cope with the impacts of violent winds. Use of retained harvest (44.9%), growing drought-tolerant crops (29.5%), livelihood diversification (26.9%) evacuation/relocation (46.2%) reflected as the additional copying strategies next to humanitarian aid and government support. There are also negative copying strategies applied when there is limited aid, that includes, selling property and livestock, children school dropout, girl children marriage, reduce food intake, casual labour and harvest of wild fruits/hunting (1.3%).

Figure 13: Coping strategies against violent wind hazards by Gender of Respondent



3.3. EXPOSURE TO CLIMATE RISK IN THE THRIVE PROJECT PRIORITY COUNTIES

Reliance on climate dependent activities for food production and to earn income by the majority of the households in the GUN region leaves them extremely vulnerable to the effects of climate change. Lack public infrastructure such as road and transport, and their poor maintenance hampers households and communities from successfully implementing climate adaptation strategies and to build resilience

The absence and disruption of many markets due to conflict and occurrence of multiple hazards affects food supplies, opportunities for earning income and access to inputs, tools and equipment which households need for the implement climate adaptation strategies. Compounding these issues is the inadequate supply of clean water and the lack of consistent electricity provision. Without access to clean water, communities face significant health risks, particularly during and after disasters when sanitation becomes critical. The environment and ecosystems in the GUN communities are poorly managed and overexploited. There is widespread deforestation as result of firewood harvesting and charcoal production, and land clearance for agricultural expansion.

The protract conflict and intercommunal violence, and displacement exacerbates the impacts of climate risks in the THRIVE project priority.

Households in the Greater Upper Nile (GUN) region rely heavily on climate-sensitive livelihoods, making them highly vulnerable to climate change. Poor infrastructure, disrupted markets due to conflict and hazards, and limited access to clean water and electricity hinder climate adaptation efforts. Environmental degradation, such as deforestation and land overuse, further weakens resilience. Prolonged conflict and displacement compound these challenges, while exclusion from financial and insurance markets limits risk management options. Weak governance and the absence of local disaster risk structures exacerbate these issues. The THRIVE project must prioritize restoring critical infrastructure, strengthening institutions, and supporting inclusive, sustainable strategies to enhance community resilience and adaptive capacity.

3.4. PRESENT SITUATION OF ADAPTIVE CAPACITY

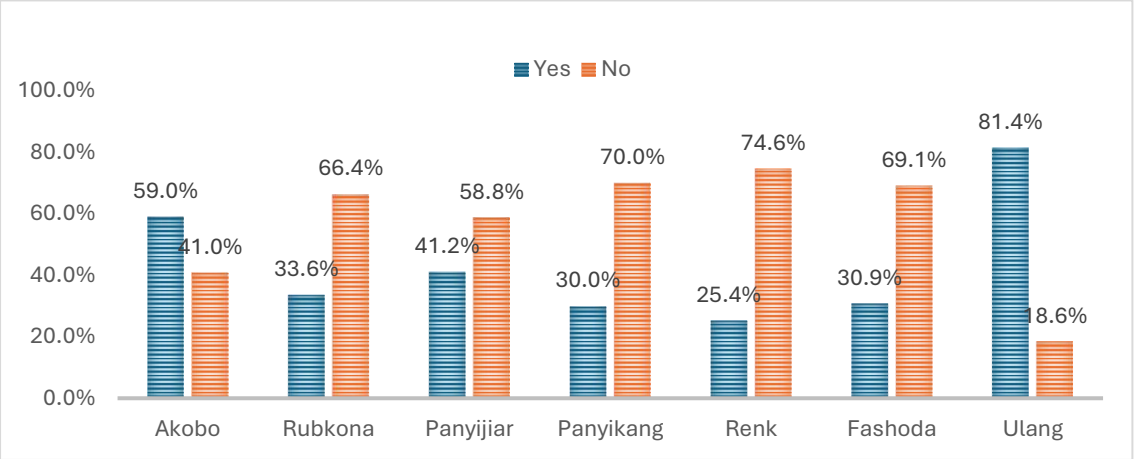
Overall there is low adaptive capacity in the priority counties for the THRIVE project. Households lack access to climate information services, and access to improved inputs for agriculture and livestock production and other livelihood activities. Governance systems are weak, lack capacity and resources to provide public services and for building and maintenance of public infrastructure. Local governments often do not with lack of or limited participation and of and engagement communities

3.4.1. *Access to climate-related information to enable adaptation and resilience*

There is a large gap regarding access to climate related information which households need to use to inform climate adaptation processes. Overall, for the entire sample, the findings indicate that a significant portion of respondents, 58.1%, do not have access to climate-related information that would enable adaptation and resilience.

In in Akobo county, 59% of respondents report having access to climate-related information, for Panyinjiar 41% have access, 34% for Rubkona, 30% in Panyikang, 31% for Fashoda, and 25% for Renk. In Ulang has a higher adaptive capacity for this indicator, with 81% of respondents able to access climate-related information. Conversely, the lack of access to climate information remains a challenge, with the highest levels of inaccessibility recorded in Renk County (74.6%) and Panyikang County (70.0%), followed by Rubkona (66.4%) and Panyijiar (58.8%). The findings emphasize the need for targeted interventions to improve climate information dissemination, particularly in counties with lower access.

Figure 14: Extent of access to climate-related information to enable adaptation and resilience by County



Source: Household Survey Data

Overall, a significant portion of the population lacks access to this vital information, with 60.3% of females and 52.7% of males indicating they do not have access. Conversely, only 39.7% of females and 47.3% of males report having access to climate-related information necessary for adaptation and resilience.

Therefore, efforts to bridge this information gap should focus on gender-sensitive climate communication strategies. These could include community-based awareness programs, the use of local languages, and leveraging radio or mobile technology to reach marginalized groups.

3.4.2. *Access to information on climate smart agriculture*

Access to information on climate-smart agriculture (CSA) remains notably limited across the THRIVE project areas. The majority of households lack adequate CSA knowledge, which constrains their ability to adopt adaptive and resilient farming practices. While Ulang shows relatively better access, with 58% of respondents reporting access to CSA information, other

counties lag significantly behind. Akobo stands at 43%, followed by Fashoda (38%), Rubkona (30%), Panyijiar (24%), Panyikang (22%), and Renk (17%). These gaps highlight a critical need for targeted CSA information dissemination efforts to support climate resilience in the region. These statistics highlight a critical challenge in promoting sustainable agricultural practices in these regions, which are vulnerable to the impacts of climate change.

Analysis by gender of respondent shows that 32.3% of females and 36.4% of males reported being familiar with climate-smart agriculture, indicating a higher awareness among males than females (Figure 90). Conversely, a substantial 67.7% of females and 63.6% of males indicated they do not have knowledge of climate-smart agriculture techniques.
The data reveals that a majority of respondents across all age groups, particularly the younger ones, are not familiar with climate-smart agriculture. Specifically, 53.8% of the 15-17 age group and a striking 70.3% of those aged 18-35 indicated they do not have knowledge of these agricultural practices.

3.4.3. *Possession of skills to enable respondents to react/ respond to EWS alerts*

There is a large gap regarding the households' ability to act on information from Early Warning Systems to facilitate climate adaptation in most of the counties. In analysing the data regarding awareness or response to an early EWS, it is evident that a significant majority of the respondents across the three states, 67.4%, indicated that they do not have knowledge or skills related to the EWS, while only 32.6% reported having such awareness. Many households in the GUN communities lack the skills to interpret and respond to information coming from the EWS so that they can make decisions related to climate change adaptation.

In Ulang, 56% of the respondents feel equipped to be able to respond to an EWS, while39% in Panyijiar, 28% in Rubkona, 23% in Panyikang, 21% in Fashoda, 17% in Renk county, report that they are well equipped to be able to understand and act on information disseminated by the EWS. This trend highlights a critical gap in disaster preparedness and risk communication strategies in the region.

3.4.4. Access to health information

The survey results indicate that 50.6% of respondents across the GUN region reported receiving information regarding the health, of their families while 49.4% stated that they did not. Analysis by county indicates that Ulang County in Upper Nile State has the highest proportion of households (93.8%) receiving family health information, indicating a strong presence of health communication efforts. In contrast, Renk County, also in Upper Nile State, has the lowest coverage, with only 23.9% of households receiving health information, highlighting potential gaps in health education dissemination.

Table 74: Extent to which households are provided with information regarding family health by County

	Jinglei State	Unity State		Upper Nile State			
Beneficiary response	Akobo	Rubkona	Panyijiar	Fashoda	Panyikang	Renk	Ulang
Yes	73.3%	32.7%	52.2%	66.7%	45.0%	23.9%	93.8%
No	26.7%	67.3%	47.8%	33.3%	55.0%	76.1%	6.2%

Source: Household Survey Data

3.4.5. *Access to climate-related information to enable adaptation and resilience*

Large parts of the population in the selected counties lack access to climate related information. In Akobo county, 59% of the respondents report having access to climate-related information,

while the indicator stands at 41% in Panyijiar, 34% in Rubkona, 30% in Panyikang County reported 30.0% access, 31% in Fashoda and 25% in Renk. Ulang fares much better with 81% of respondents having access to climate-related information.

3.4.6. *Extent to which health services have sufficient capacity and finances*

The health systems in the THRIVE project areas not adequately resources to provide the level of service that will facilitate effective and sustainable climate adaptation for the households. Households do perceive these inadequacies, for example, in Rubkona only 14% felt that their health services were adequately supported, while in Panyijiar 37% , 5% in Panyikang, 31% in Fashoda and 16% in Renk felt there was sufficient capacity and finance in the health services.

3.4.7. *Existence of early warning systems in communities*

In many communities EWS are absent or not every is aware of their existence, something that prevents the structure from making the level of contribution to climate adaptation as is expected. In analysing the provided data regarding the existence of an EWS in communities, it is evident that a significant portion of the respondents, specifically 42.2%, reported having an EWS in place, while the majority, 57.8%, indicated that no such system exists. In Akobo 60% of the respondents were aware of existence of EWS in the communities. Fewer people have the awareness in other counties, 45% in Panyijiar, 42% in Fashoda, 39% in Renk, 28% in Rubkona, and 20% in Ulang performs much better on this indicator with 85.6% level of awareness. the absence of an EWS in over half of the surveyed population underscores the urgent need for investment in infrastructure that supports early warning capabilities. of females and 55.4% of males do not have knowledge of an EWS in their community. Conversely, a smaller portion of the population, with 41.2% of females and 44.6% of males, affirmed the existence of an EWS.

Table 83: Existence of an EWS in the community by county

Beneficiary response	Akobo	Panyijiar	Rubkona	Fashoda	Panyikang	Renk	Ulang
Yes	59.0%	44.9%	27.6%	42.0%	20.0%	39.4%	85.6%
No	41.0%	55.1%	72.4%	58.0%	80.0%	60.6%	14.4%

Source: Household Survey Data

3.4.8. *Engagement of communities by local government/ Payam administration in DRR*

Poor governance exemplified by absence of frameworks and structures to facilitate participation of local communities in disaster risk reduction and climate adaptation planning processes is common in the THRIVE project. Analysis of the engagement of local government or Payam administration during disasters across the three states, shows that only 29.7% of respondents reported having interactions with these authorities during such events, while a significant 70.3% indicated that they did not engage with local governance structures. In Akobo 12% of the respondents report that the local government/payam administration engages them in such process, while 19% in Rubkona, 21% in Renk and Ulang report that they are consulted. Fashoda and Panyikang perform better with 57% and 42% of the households, respectively reporting engagement with local government structures.

Table 36: Whether or not local government/ Payam administration engages communities during disasters by County

Beneficiary response	Akobo	Panyijiar	Rubkona	Fashoda	Panyikang	Renk	Ulang
Yes	12.4%	56.6%	18.8%	56.8%	41.7%	21.1%	23.7%
No	87.6%	43.4%	81.2%	43.2%	58.3%	78.9%	76.3%

Source: Household Survey Data

The data highlights a critical gap in disaster response mechanisms across these states, emphasizing the need for improved communication and collaboration between local administrations and communities.

3.4.9. *Capacity and availability of finances for local government/ Payam administration effectively respond to disasters*

Local governments lack capacity and financial resources to respond effectively to emergencies, significant majority (85%) of respondents believe that the local government or Payam administration lacks the capacity and financial resources to effectively respond to disasters and only 15% perceive it as capable. This suggests a critical gap in disaster preparedness at the local level. The proportion of the respondents who believe local government/ payam administration possess sufficient capacity and finances to be able to effectively address disasters stands at 36% in Panyijiar, 30% in Fashoda, 13% in Ulang, 12% in Rubkona, 3.8% in Akobo, 3.3% in Panyikang, and 1% in Renk.

Table 89: Extent to which local government/ Payam administration has capacity and finance to respond to disasters by County

Beneficiary response	Akobo County	Panyijiar County	Rubkona County	Fashoda County	Panyikang County	Renk County	Ulang County
Yes	3.8%	36.0%	11.8%	29.6%	3.3%	1.4%	13.4%
No	96.2%	64.0%	88.2%	70.4%	96.7%	98.6%	86.6%

Source: Household Survey Data

3.4.10. *Provision of clean water by local government - provide additional water storage during disasters by County*

Local government lack capacity to provide clean water and water storage infrastructure to communities during emergencies. With only 19.7% of respondents confirming that the government offers such support, a vast majority – 80.3% – reported that no additional water storage is provided in times of crisis. In Akobo 10% respondents perceive that capacity exists, 19% in Rubkona, 34% in Panyijiar, 38 in Fashoda, 22% in Panyikang, 1% Renk, 11% in Ulang.

3.4.11. *Maintenance of public roads and transport infrastructure*

Roads and other public transport infrastructure in the THRIVE priority counties are in a state of disrepair, and local authorities do not have capacity and the resource to address this situation. Only 18.6% of the whole sample respondents across the three states believe that the roads and transport infrastructure are adequately maintained, while a significant 81.4% express dissatisfaction The majority of the respondents acknowledge this state of affairs, for example 34% of the respondents in Panyijiar and 24% in Rubkona, 7% in Akobo think local authorities are capable of maintain roads and public transportation infrastructure.

3.4.12. Capacity and availability of finances for local government to manage and maintain infrastructure

The analysis of survey responses regarding the local government capacity and financial resources to manage and maintain infrastructure in the GUN region shows a strikingly negative outlook. Among the entire sample, only 15.5% of respondents believe that the local government possesses the necessary capacity and financial means to effectively manage and maintain infrastructure. In stark contrast, a significant majority of 84.5% express scepticism, indicating that they do not believe the local government is adequately equipped to handle these critical responsibilities.

Table 4: Capacity and finance of local government to manage and maintain infrastructure by County

Beneficiary response	Akobo	Panyijiar	Rubkona	Fashoda	Panyikang	Renk	Ulang
Yes	3.8%	33.1%	14.5%	28.4%	0.0%	2.8%	14.4%
No	96.2%	66.9%	85.5%	71.6%	100.0%	97.2%	85.6%

Source: Household Survey Data

3.4.13. *Access to alternative shelter during disasters*

In most counties there is a shortage of shelters to house families during emergencies. The results indicate that only 22.4% of the respondents across the three states reported having access to alternative shelter, while a staggering 77.6% indicated that they do not have this critical resource. In Akobo, only 12% of beneficiaries report having had access to alternative shelter during disasters, while 35% in Panyijiar, 19% in Rubkona, 25% inFashoda, 12% in Panyikang and 17% in Renk accessed shelter during emergencies.

Table 101: Access to alternative shelter during disasters by County

Beneficiary response	Akobo	Panyijiar	Rubkona	Fashoda	Panyikang	Renk	Ulang
Yes	12.4%	34.6%	18.8%	24.7%	11.7%	16.9%	37.1%
No	87.6%	65.4%	81.2%	75.3%	88.3%	83.1%	62.9%

Source: Household Survey Data

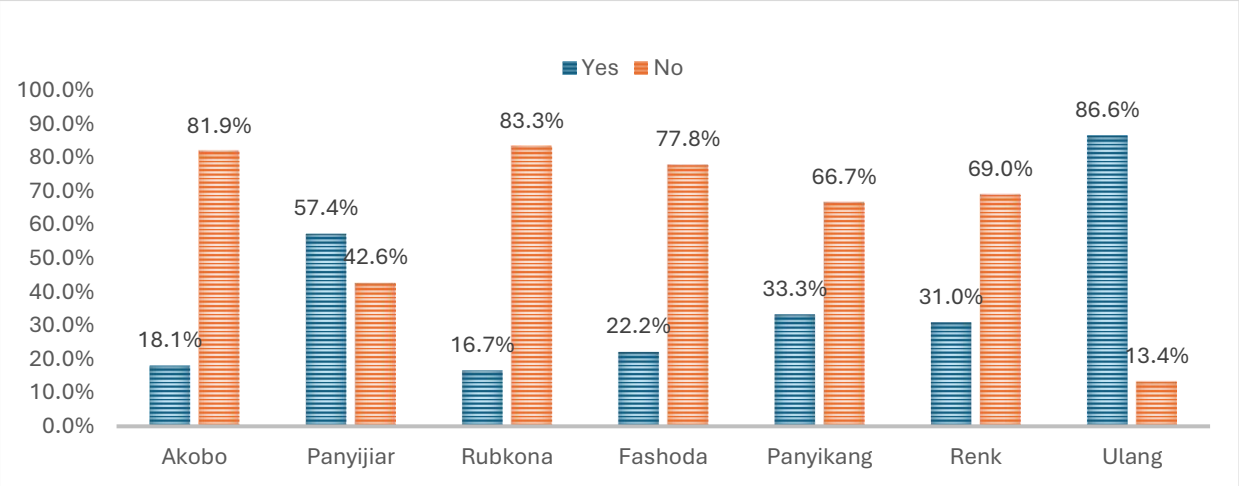
3.4.14. Access to alternative land for use in times of emergencies (such as floods)

With regards to access to alternative land for emergencies in the GUN region as a whole, it is evident that a significant majority of the respondents, specifically 61.7%, do not have access to alternative land that they could utilize in the event of emergencies. The findings shows that, Ulang (83.5%) and Panyijar (64.7%) counties got notably access to alternative land while, Panyikang (46.7%), Akobo (40%), Renk (25.4%), Fashoda (21%) and Rubkona (19.1%) have a limited access to alternative land during emergencies, This lack of alternative land poses a considerable risk to communities that may be affected by natural disasters, particularly given the region's vulnerability to flooding and other climate-related challenges.

3.4.15.Access to alternative water sources during emergencies (such as droughts)

The data regarding access to alternative water sources for emergencies in the GUN region reveals a concerning trend, with only 33.6% of the whole sample indicating that they have alternative water available for use during situations such as droughts. This means that a substantial 66.4% of the population lacks access to backup water sources, which is particularly alarming given the frequent and severe droughts that the region experiences. The findings underscore the urgent need for interventions aimed at improving water accessibility and sustainability.

Figure 1315: Extent of access to alternative water in case of emergencies such as droughts by County



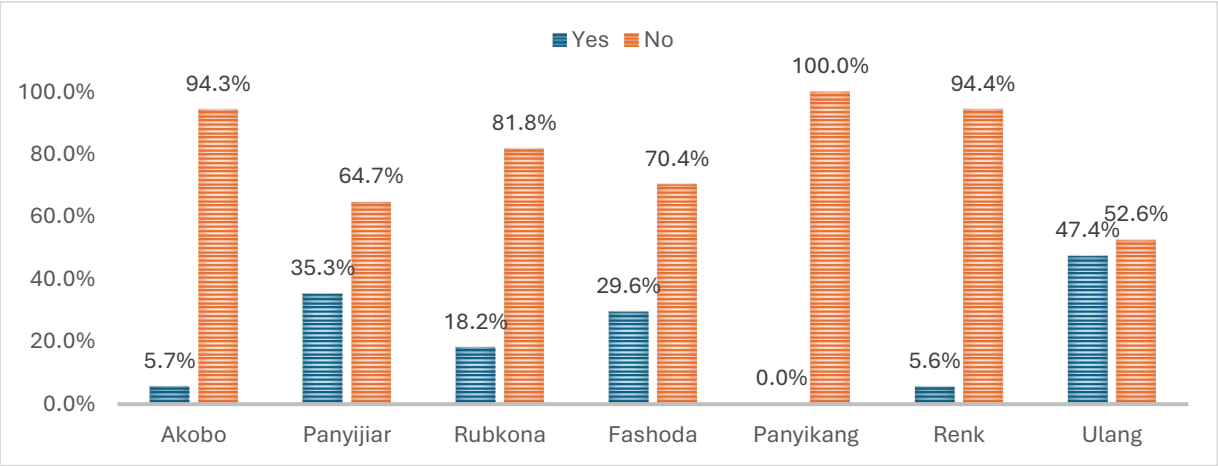
Source: Household Survey Data

3.4.16. *Management of ecosystems*

Overall, the findings indicate a pervasive sentiment of inadequacy in ecosystem management across the counties surveyed. The average high percentages of dissatisfaction (78.6%) reflect the urgent need for improved environmental policies and practices in the GUN. The environment and

ecosystems in the counties are not adequately. In Ulang 47% of the respondents believe there is adequate management. This indicator stands at 35% in Panyijiar, 30% in Fashoda, 18% in Rubkona, 6% in Akobo, 6% in Renk. Noone in Panyikang feels the environment is being managed well.

Figure 16: Whether or not ecosystems in their area are adequately managed by County

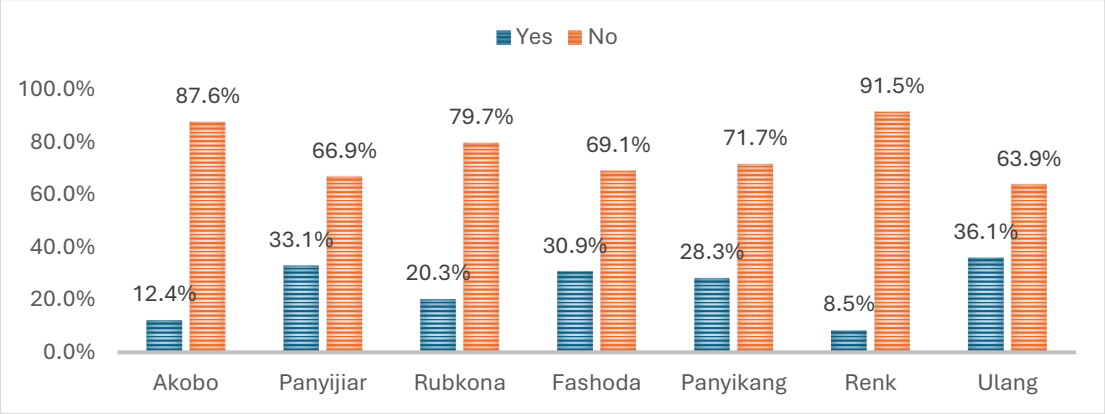


Source: Household Survey Data

3.4.17. *Access to fertilizers, crop (seed) varieties and/or alternative livestock breeds*

There widespread lack of access to improve seeds and livestock, fertilisers and other inputs that households would need to facilitate implementation of climate adaptation measures and to be able to exploit the opportunities that come with climate change. In Ulang 36%, 33% in Panyijiar, 31% in Fashoda, 28% in Panyikang, 20% in Rubkona, 12% in Akobo and 9% in Renk have access to improved inputs. Overall, the data shows that in all regions analyzed, a substantial majority of respondents – ranging from 63.9% to 91.5% – do not have access to these critical agricultural inputs.

Figure 17: Access to fertilizers, crop (seed) varieties and/or alternative livestock breeds by County

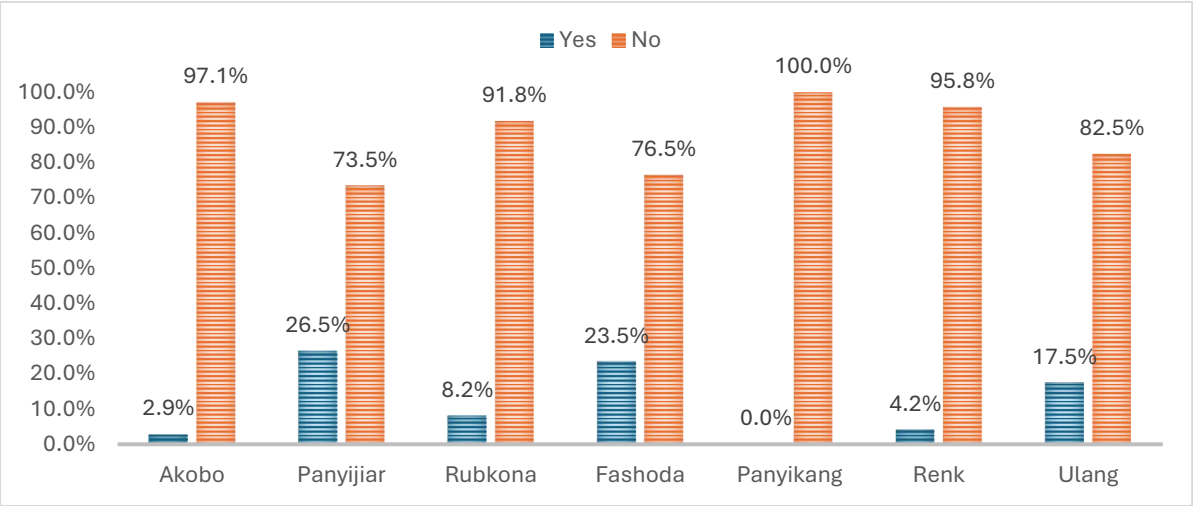


Source: Household Survey Data

3.4.18. *Access to a bank account or community fund to support your livelihood*

Most of the households (88.1%) lack access to financial service, and are able to save or obtain credit. Akobo and Renk also show very limited access, with only 2.9% and 4.2% of their populations, respectively, having In Panyijiar, 27% of the respondents have access to these financial resources, while 23% in Fashoda, 18% in Ulang, 8% in Rubkona, 4% in Renk and 3% in Akobo, have access financial services.

Figure 18: Access to a bank account or community fund to support livelihood by County



Source: Household Survey Data

3.4.19. *Access to insurance*

The majority of households in the THRIVE project areas do not have access to insurance so lack the ability to transfer some of the climate risks they face to other parties (insurance companies). Among the entire sample, only 11.9% of respondents reported having access to insurance that could assist them during emergencies. This figure indicates a severe lack of preparedness and protection for the majority of individuals, as a staggering 88.1% do not have any form of insurance coverage. In Akobo, only 8% of respondents reported having access to insurance, 28% in Panyijiar, 14% in Ulang, 7% in Rubkona, 26% in Fashoda, have insurance coverage. None of the households in Panyikang and Renk in had access to insurance. The low percentage of insured individuals underscores the urgent need for initiatives aimed at improving access to insurance products tailored to the unique challenges faced by the GUN communities.

In summary, adaptive capacity in the priority counties for the THRIVE programme is assessed as low. This result is similar to the situation across South Sudan, the results of the survey paint indicate an aggregate picture of low capacity to adapt to climate change among communities in the GUN region. Given the levels of deficiencies in the majority of the indicators of adaptive capacity examined in the study, all 7 counties are assessed as having low adaptive capacity. There is however some variability noted in some of the elements of adaptive capacity, where some counties appear to perform better than others.

Adaptive capacity within the GUN region varies significantly among different communities and sectors. While some groups possess a degree of adaptive capacity through access to resources or knowledge, many others lack the fundamental tools to respond effectively to climate hazards. For instance, communities with strong social networks may demonstrate greater resilience, as they can mobilize support and resources during crises. However, the overall adaptive capacity is undermined by systemic barriers, including inadequate education, limited access to technology, and insufficient financial resources.

The variability in adaptive capacity underscores the need for tailoring interventions to enable optimal and sustainable use of resources. Thus, to be effective, adaptation responses need to be tailored to individual counties and households, based on the kind of risk faced and vulnerabilities.

3.5. SUMMARY OF CURRENT CLIMATE RISKS IN THE COMMUNITIES

The assessment of the climate risks affecting households in the THRIVE priority counties show that floods, extreme temperatures, and drought and pause the high risk in many counties.

Table 121: Current climate risk matrix for flood, extreme temperatures, drought, wildfires, and violent winds hazards in the 7 selected counties for the THRIVE project

	Hazard/ climate risk	**Prevalence of hazard**	**Likelihood of occurrence**	**Severity of impacts**	**Risk level**
Akobo	Flood	H	H	H	H
	Heatwaves	H	H	H	H
	Drought	H	H	H	H
	Wildfires	L	H	M	M
	Violent winds	L	L	L	L
Fashoda	Flood	H	H	H	H
	Heatwaves	L	H	H	M
	Drought	H	H	H	H
	Wildfires	M	H	M	M
	Violent winds	L	M	M	L
Panyijiar	Flood	H	H	H	H
	Heatwaves	H	H	H	L
	Drought	L	L	L	H
	Wildfires	L	L	L	L
	Violent winds	L	H	M	L
Panyikang	Flood	H	H	H	H
	Heatwaves	L	L	L	L
	Drought	L	L	H	L
	Wildfires	L	L	L	L
	Violent winds	L	L	L	L
Renk	Flood	M	H	M	M
	Heatwaves	M	H	M	M
	Drought	M	H	H	H
	Wildfires	L	H	M	L
	Violent winds	L	H	M	L
Rubkona	Flood	H	M	H	H
	Heatwaves	M	H	H	H
	Drought	M	M	H	H
	Wildfires	L	H	M	M
	Violent winds	L	H	M	M
Ulang	Flood	H	H	H	H
	Heatwaves	M	H	H	H
	Drought	H	H	H	H
	Wildfires	M	H	M	M
	Violent winds	M	H	M	M

Akobo, Fashoda, Panyikang, Ulang, Panyijiar and Rubkona have a high risk for flood. Climate adaptation measures are urgently required in these counties to build household and community resilience so that gains from any development interventions can be achieved and sustained. Renk currently has medium risks for flood.

In Akobo, Fashoda, Rubkona and Ulang there are currently high risks for extreme temperature/ heatwaves. There is need to priotise adaptation measures to address the risks and reduce the impacts they may have in agro-pastoral production activities, infrastructure and property, livelihoods, and market systems, and natural environment in the identified counties. In Panyijiar and Panyikang there currently are medium risks for extreme temperatures, while in Renk currently risks for extreme temperatures are assessed as low.

The current risks for drought in Akobo, Fashoda, Panyijiar, Renk, Rubkona and Ulang are high. Climate adaptation strategies will need to be put in place urgently to prevent the potential negative impacts of the risks. Panyikang has low current risks for drought. For Akobo, Fashoda, Rubkona, and Ulang the current risks for wildfires were assessed as medium, while current risks for wildfires in Panyijiar, Panyikang and Renk are assessed as low. Wildfires are a very immediate threat in the counties.

Strong winds hazard current risks are medium in Rubkona and Ulang, but assessed as low for Akobo, Fashoda, Panyijiar, Panyikang and Renk. It's important to note that, the above listed climate risks are presented in level of priority from high risk to minimum risk.

3.6. VULNERABILITY

In the GUN region, the vulnerability of communities to climate hazards is shaped by a complex interplay of social, economic, geographic, and policy factors. Certain groups, particularly those living in low-income communities, are disproportionately affected by climate hazards due to their limited resources and capacity to adapt. These communities often reside in high-risk areas, such as floodplains, making them more susceptible to disasters. The lack of infrastructure, including roads and public services, further exacerbates their vulnerability, as it hinders access to emergency resources and support during crises.

The major drivers of vulnerability include several interrelated factors:

- Social dynamics such as poverty and inequality, play a significant role in determining which populations are most affected. Marginalized groups, including women, children, and the elderly, often face heightened risks due to their limited decision-making power and access to resources
- Economic factors, such as reliance on subsistence agriculture or informal employment, leave these populations less able to absorb shocks from climate events.
- Geographic factors also contribute to vulnerability; areas prone to flooding, drought, or extreme weather are inherently at greater risk.
- Additionally, inadequate or poorly enforced policies regarding land use, disaster management, and climate adaptation can leave communities without the necessary support to build resilience.

Assessing the GUN region's vulnerability highlights significant gaps in community and household-level systems and adaptation strategies. Therefore, the vulnerability of communities in the GUN region to climate hazards is shaped by a multitude of factors that must be addressed holistically. Through the recognition of the drivers of vulnerability, assessing adaptive capacity, and exploring effective response options, the THRIVE project can foster resilience and empower communities to better manage and reduce risks associated with climate-induced disasters. Strengthening existing systems,

integrating indigenous knowledge, and promoting inclusive policies will be crucial in building a more resilient future for the GUN region.

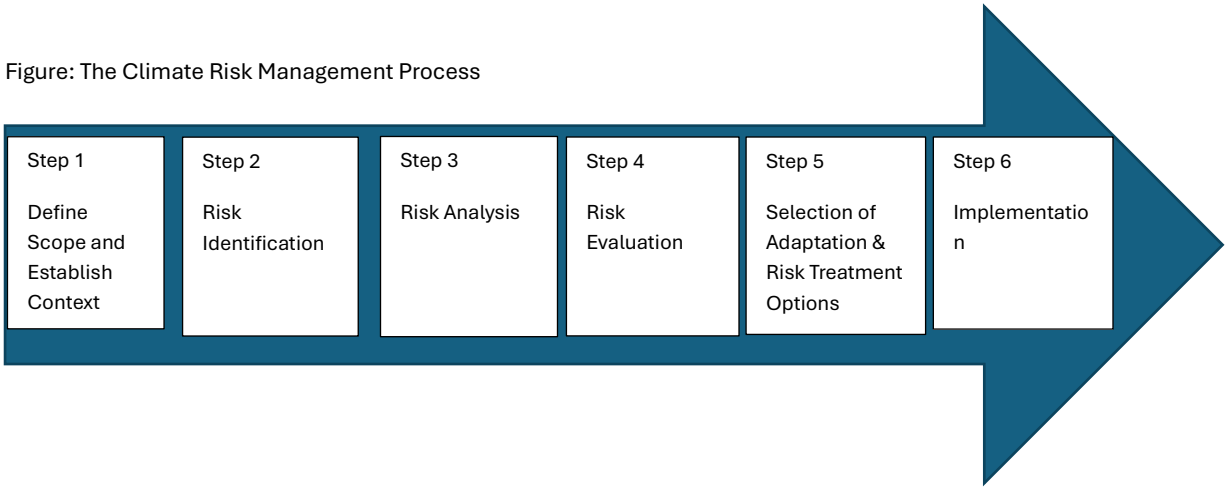
4. CLIMATE RISK MANAGEMENT PLAN

The climate risk assessment study identified the priority risks for each county. To help households and communities in the GUN region manage the climate risks, adaptation strategies were recommended for use in the THRIVE project. The adaptation strategies selected for each of the hazards, floods, extreme temperatures, drought, wildfires and violent winds, and the risks they pause for the planned livelihoods development, market system strengthening, financial inclusion, women's economic empowerment, climate change adaptation, and social cohesion activities. Also, of important consideration in selecting the climate adaptation strategies is the suitability to address observed climate risks in the project areas, effectiveness, their fit with the socio-economic and political context of the GUN region, as well as and their environmental sustainability.

The CRMP is county specific, developed based on the risk priorities existing in the county as per the climate risk matrix tool and in view of the potential components of the THRIVE project. The THRIVE project component interventions to support agricultural and livestock production, markets systems strengthening, fisheries, and forest non-timber products utilisation and commercialisation. These sectors are vulnerable to the climate risks identified in the climate risk matrix. Managing the climate risks during planning and implementation of THRIVE Project is very crucial to achieving its intended outcomes, and to minimize adverse impacts of the project implementation in exacerbating negative impacts of climate risks. The climate risk management plan is a tool that will help the THRIVE project team to be able to anticipate, avoid and prevent many of the climate risks and to exploit the opportunities that climate change may create.

The figure below summarizes the process that can be followed in developing an effective climate risk management plan. Each step of the process are fully presented in the detailed assessment report.

Figure: The Climate Risk Management Process



The recommended climate adaptation strategies addressing flood risks that may affect the THRIVEs ability to achieve its goals across all intervention areas include climate smart agriculture, diversification of livelihood activities

Flood risks for the THRIVE project components include: threats to human life, food security resulting from crop and livestock loss, livelihoods as a result of loss of assets, loss of income, disruption of market functioning due to damage to infrastructure, increase in incidences GBV due to food shortages and resource competition, conflict over resources shortage of water, arable land and grazing.

The recommended climate adaptation strategies to prevent the negative impacts of floods include; strengthening local disaster risk reduction and management structures including development of early warning systems, supporting diversification of livelihoods to less flood-prone activities, climate proofing local infrastructure and supporting its maintenance. Flood risks are highest in the counties of Akobo, Fashoda, Panyikang, Ulang, Panyijiar and Rubkona. . The THRIVE project will need to prioritise climate adaptation interventions as failure to do so will result in the project failing to meet its objectives. While there are moderate risks for floods in Renk, these risks are increasing overtime, it is prudent to be proactive and invest in measures to prevent damages from floods

Extreme temperature risks for THRIVE project components includes: threats to food security due to crop and livestock loss, threats to human health and well-being, threats to livelihood activities, water shortages, loos of flora and fauna. The counties that face high risks for extreme temperatures are Akobo, Rubkona and Ulang. There is a need to prioritise adaptation measures that will address the observed risks to prevent negative impacts of extreme temperatures. Renk and Fashoda have medium current risk for extreme temperatures, however, it is likely that these risks will increase in the medium term, where project activities can incorporate climate adaptation measures without adding significant costs, it would be prudent to do so in order to proactively address impending climate change. Panjyijiar and Panyikang face low current risks for extreme temperature, as such adaptation measures focusing on these risks may not be a priority at the moment.

The recommended climate adaptation strategies include: diversification of crops and livestock to include varieties and breeds that are more tolerant to heat stress, implement strategies to improve water management, such as improved crop irrigation systems to increase water use efficiency and reduce water consumption, introduction of water harvesting systems and development of water storage systems, and support for development and use of climate hazards early warning systems.

Identified drought risks for the THRIVE project components include: threats to food security due to loss of crops and livestock, threats to human health due water shortages and disease outbreaks, threats to livelihood activities, loss of income, and reduction in availability of forest products. Six counties face high current risks for drought – Akobo, Fashoda, Panyijiar, Renk, Rubkona and Ulang. For these counties implementing adaptation measures that address the risks is urgent. Panyikang faces low current risks for drought, and as such implementation of adaptation measures is not urgent. However, where doing so does not significantly increase the costs of implementing project activities it is best to be proactive and be ready for future climate change.

The recommended climate adaptation strategies to prevent drought impacts include: strengthening local disaster risk reduction capacity including development and use of early warning systems; promote the adoption of adoption of climate smart agriculture, support diversification of livelihoods activities, support improvement in management of water resources including introduction of water harvesting practices, development water sources (e.g., boreholes) and repair and maintenance of local water infrastructure.

Wildfires in the THRIVE project areas pause risks to project activities including damage to property and threat to human life, loss of plants and animal life, threats to food security due to damage to crops and grazing, reduced biodiversity, displacement and migration, increased completion for resources which may result in conflicts and degradation of the environment. Four counties face medium current risks for wildfires – Akobo, Fashoda, Rubkona and Uand. While implementing adaptation measures may not take a very high priority, where there is a possibility for choosing productivity or profitability enhancing measures that can also prevent negative impacts of wildfires, it would be best to consider these as it will to help households to prepare for

future climate change. Panyijiar, Panyikang and Renk have low current risk for wildfires, thus implementation of adaptation measures may not be of priority here.

Identified climate adaptation strategies to help prevent negative impacts of wildfire hazards include: support for the establishment of defensible spaces by ensuring clear spaces around houses, infrastructure, and crop fields; strengthen local disaster risk reduction capacities including establishment and use of early warning systems, support community-based natural resources management structures, and diversification of livelihoods to reduce dependence on income from fire-prone activities.

Violent winds pause the following risks for THRIVE project activities: injuries to people from falling objects and debris, damage to infrastructure, threat to food security due to reduced crop productivity and crop damage and disruption to livelihood activities. Two counties face medium current risk for violent winds – Rubkona and Ulang. While its not urgent to implement adaptation measures in this case, the likelihood of the risks increasing in the medium term exist. Proactively integrating adaptation measures in project activities is advisable. The current risk for violent winds is low in the remaining counties – Akobo, Fashoda, Panyijiar, Panyikang, and Renk.

The identified climate adaptation strategies to help prevent the negative effects of violent wind hazards include: strengthening local disaster risk reduction capacities including establishing early warning systems, diversification of livelihoods to reduce dependence on violent winds-prone activities, climate proofing infrastructure by use of materials that can withstand strong winds for construction of dwellings and shelters, and risk informed planning – identify areas with high violent wind risk and avoid setting up vulnerable activities in such areas.

- ☞ The climate risk management plan based of the risk priorities for the THRIVE priority counties and identified adaptation measures is summarised in the detailed report (Table 122)

5. RECOMMENDATIONS

Recommendations to improve climate resilience

All investment in any sector in GUN region, and in South Sudan in general must consider climate stressors and shocks, while also carefully considering the cultural, social, and political contexts as these factors can impede attainment of objectives of interventions. In the priority counties for the THRIVE project, much of the agricultural potential and for potential entrepreneurial activities is currently among small scale operators at the community level given the difficulties of movement across the country in the current situation of insecurity and conflict. Developing the capacity of smallholder farmers and small-scale business helps build their resilience and to prepare them to grow and thrive once the conflict situation is resolved and the national institutional capacity improves. The THRIVE programme's focus on

To improve climate resilience of agriculture and livestock production it is recommend:

1) Work with local communities to better understand factors that facilitate increased adoption of more climate resilient agricultural practices. Strengthen community-based adaptation strategies.
2) Promote sustainable climate smart agriculture, such as introduction of drought tolerant crop varieties, livestock improvement, soil erosion control, and avoiding deforestation
3) Support development and effective functioning of early warning systems at national, sub national, and village levels to strengthen preparedness and build resilience.
4) Support the integration of crop and livestock production with tree crops (agroforestry).
5) Support social transfer and conditional asset transfers after a disaster, including through food/cash-for-work interventions such as building or maintain local infrastructure, conservation works.

6) Improve land, fisheries and natural resources access and land tenure policy and regulations. Governments at all level and traditional authorities need to improve access to land, natural resources and fisheries for people who need them to engage in productive and livelihood activities. The rights should also be clarified and secured to create incentives for implementation of resilience building actions.

To improve resilience in livelihoods

1) Support diversification of livelihoods towards activities less prone to flood hazards. Support development of micro, small and medium enterprises. Support value addition activities for crop, livestock, fish products.
2) Support alternative income-generating activities including sustainable collection and marketing of non-timber forest products.

To improve water supplies

1) Promote of water harvesting and storage of water for different uses, including domestic use, for livestock and crop production to increase food production.
2) Develop alternative water supplies, such as boreholes to ensure availability of clean safe water during emergencies.

To build resilience of the environment

1) Promote community based natural resource management
2) Promote equitable access to natural resources. Access to natural resources provides a safety net for many poor households as a source of food and materials during crises.

To build resilience of infrastructure

1) Support building, improvement, and maintain infrastructure, such as roads, dykes/raised embankments, floodwalls and culverts to reduce flood risk, especially around markets, and social infrastructure.
2) Support selection of areas and sites that are less prone to hazards for building of storage facilities for agricultural produce and processing facilities for value addition activities