

South Sudan*

The recent flooding in South Sudan is the worst in over 60 years. South Sudan is highly vulnerable to the effects of climate change, including droughts and flooding. Both long-term climate change, such as the gradual increase in temperatures, and short-term extreme climate events, like increased flooding, have indirect and interlinked implications for peace and security in South Sudan.

- Unpredictable annual variations in extreme weather events, like flooding and droughts, affect agriculture-dependent communities and influence pastoralist mobility patterns and routes. Such changes may intensify the risk of tensions between herders and farmers, often in connection with land, grazing, water and communal affairs.
- Transhumance, including cross-border migration from Sudan through the Greater Upper Nile in particular, exacerbates the spread of veterinary diseases and fuels environmental degradation and competition over scarce resources.
- Women and girls continue to bear the brunt of the effects of climate change; female-headed households are especially vulnerable.
- Climate-related livestock losses compounded by pre-existing rivalries increase the risk of cattle raiding, which can trigger retaliation, communal conflict, displacement, deepening intercommunal rivalry and the formation of armed groups.

Ongoing conflict, governance deficits, insufficient resources, knowledge gaps and low technical expertise and capacity have weakened the ability of the Revitalised Transitional Government of National Unity of South Sudan (R-TGoNU) to integrate climate-related security risks into its efforts to manage communal and natural resource conflicts, as well as conflicts over land ownership and rights. The Intergovernmental Authority on Development (IGAD), the African Union (AU) and the United Nations (UN) should continue to invest in knowledge and expertise in the areas of climate, peace and security, and strengthen the R-TGoNU's capacity to adapt to climate change and integrate climate-related security risks into its early warning, prevention, mitigation and preparedness efforts.

RECOMMENDED ACTIONS:

- ▶ The R-TGoNU should strengthen its analytical capacity by bringing together relevant stakeholders and partners to produce regular reviews of climate-related security risks. These reviews should integrate and analyse data on climate, conflict, migration (including transhumance patterns and routes) and food security. Reviews should pay special attention to the needs of women, girls and female-headed households. Assessments could feed into the annual South Sudan State of the Environment Report and future National Adaption Plans for Climate Change.
- ▶ To enhance the ability of the R-TGoNU to prevent and manage climate-related security risks, the United Nations (UN) should support South Sudan's Ministry of Environment and Forestry to maintain, upgrade and establish new weather stations throughout the country, and build capacity for storing and analysing weather data in collaboration with the University of Juba or other research and knowledge institutions.
- ▶ When appointed, the new UN Mission in South Sudan (UNMISS) Climate Security Advisor should lead a process to assess and map climate-related security risks in South Sudan as a basis for strengthening UN support to the R-TGoNU and civil society. UNMISS and the UN system should coordinate closely with relevant ministries and other institutions in South Sudan, and draw on local expertise to inform their work.
- ▶ The UN Secretary-General should ensure that all UN personnel in South Sudan have adequate training for assessing and responding to climate-related security risks, especially in joint assessments, integrated analysis and planning, supporting analysis of and responses to the gendered effects of climate change, and preventing and resolving communal transhumance-related conflicts.

* This is an updated version of the fact sheet on South Sudan released in March 2021.

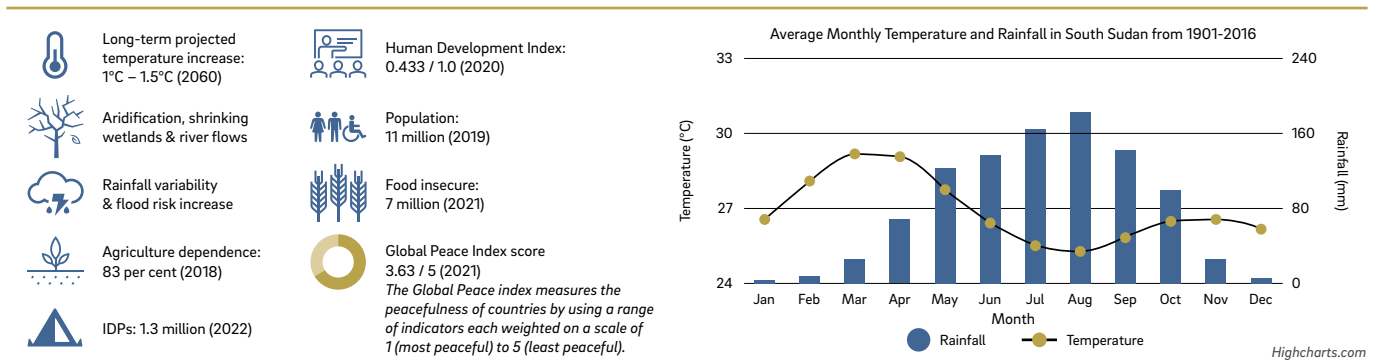


Figure 1. Data sources: UNDP (2020) Human Development Report; UNHCR (2022). [South Sudan: Populations](#). USAID (2019) South Sudan Climate Vulnerability Profile: [Sector- and location-specific climate risks and resilience recommendations](#); Vision of Humanity (2021) [Global Peace Index](#); WFP (2021). [South Sudan Emergency](#); World Bank (2019) South Sudan: [Linking the Agriculture and Food Sector to the Job Creation Agenda](#); World Bank (n.d.) South Sudan. [Climate Change Knowledge Portal](#).

Climate Exposure: Trends and Projections

South Sudan is experiencing the effects of long-term climate change, such as increased temperatures and precipitation change, as well as short-term changes, like more frequent droughts and floods.

Temperature: Mean annual temperatures across South Sudan have varied between 26.8°C and 28.9°C over the past 30 years, with an increase of 0.05°C every decade.¹ There is substantial variation in temperature trends within the country and across the calendar year, with the largest increases between December and March, coinciding with the dry season. Average temperature is projected to increase between 1°C and 1.5°C by 2060, leading to a warmer and drier climate.²

Precipitation: In the last 20 years, rainfall in South Sudan has been erratic.³ Summer rainfall has decreased by 15–20 per cent, particularly in the northeast.⁴ Recent floods have affected more than 835 000 people across eight states in South Sudan; livelihoods, food production and drinking-water supply have all been severely impacted.⁵ Consensus is lacking on long-term precipitation trends for the country: recent data indicate reductions in rainfall, but heavy rains are expected more often and with greater intensity, increasing the risk of flooding.⁶

Socio-ecological Vulnerabilities

South Sudan is highly vulnerable to climate change.⁷ Approximately 90 per cent of the land in South Sudan is arable, but only around 5 per cent is currently cultivated for crops. Some 95 per cent of the population is dependent on climate-sensitive livelihoods like traditional rainfed agriculture, crop farming, pastoralism and animal husbandry. Soil and water conditions are relatively favourable for agriculture and related activities.⁸ However, even in good harvest years, 7 million people – 60 per cent of the population – suffer from food insecurity, mainly because of the ongoing conflict.⁹ With few alternative sources of energy, more than 95 per cent of the population must depend on charcoal, firewood and grass for cooking, further spurring rapid deforestation – between 1.5–2 per cent each year.¹⁰ With a temperature increase of 2°C, water levels could fall by 50 per cent, disrupting the flow of the Bahr el Ghazal and Sobat rivers and negatively affecting local communities and natural resources.¹¹

Climate-related Peace and Security Risks

Research has identified multiple pathways through which climate change interacts with political, social and environmental stresses to compound existing vulnerabilities and tensions.¹² This can undermine development and peace gains, impacting the dynamics of ongoing violence or disrupting fragile peace processes. In turn, violent conflict and political instability undermine the resilience of communities and governments to cope with the effects of climate change.

This fact sheet uses four pathways to navigate the complex relationships between climate, peace and security: (1) livelihood deterioration, (2) migration and mobility, (3) military and armed actors, and (4) political and economic exploitation.¹³

Livelihood Deterioration

Climate change exacerbates existing vulnerabilities and grievances in South Sudan, increasing the risk of cattle raiding, looting and communal conflict. Droughts and floods have affected food security and livelihoods by contributing to resource scarcity. This can increase competition between communities – for example, pastoralists and farmers who compete for grazing land and water resources.¹⁴ Climate variability can also affect the availability and distribution of local resources. Studies of land cover in the Sudd wetland find that regions with high seasonal variability of grazing and water resources are situated adjacent to or between areas with high conflict density, close to boundaries between conflicting ethnic groups. There is evidence that these areas have a higher incidence of communal conflict and cattle raiding, placing additional pressure on communities, particularly between the states of Warrap and Unity.¹⁵

South Sudan's vulnerability to climate change is linked to food insecurity, which is driven by long-standing conflict, droughts and floods; all of which weaken community resilience.¹⁶ The UNMISS Independent Strategic Review noted that civilians had been driven away from agriculture due to environmental and conflict factors, with significant effects on livelihood and food security.¹⁷ Conflict, displacement and economic collapse have made farmers less likely to invest in building climate-resilient livelihoods, leaving them more exposed to environmental shocks.¹⁸

Both long- and short-term climate change affects transhumance mobility patterns. Traditional gender roles mean that men and boys move with livestock, explore migratory adaptation options or join armed groups or raiding parties. Female-led households, as well as women and girls, are particularly exposed to climate impacts because of land tenure insecurity that limits their capacities to respond to climate change.¹⁹ Women depend on farming to sustain their families. They are also responsible for collecting natural resources like firewood and water, which exposes them to risks like sexual violence.²⁰ Additionally, women face structural disadvantages, including child marriage and low social status, leaving them with fewer resources and adaptation possibilities.²¹

There is a substantive need for capacity development in expanding and implementing the community-based adaptation plans identified in South Sudan's Second Nationally Determined Contribution.²² The R-TGoNU and partners should build the capacity of government authorities, local leaders and national agencies to anticipate and adapt to climate change and seasonal shocks, and ensure livelihood and food security by strengthening early warning, joint planning and rapid response mechanisms. International partners should increase their support to integrated, climate-sensitive disaster risk reduction efforts by improving R-TGoNU capacities in hydro-meteorological observatory networks, flood and drought mapping capability (forecasting and post-event damage assessment), early warning messaging, and supporting community adaptation measures.

¹ World Bank (2022). [Republic of South Sudan's Climate Change Knowledge Portal](#).

² Quinn, C. et al (2019). [South Sudan Climate Vulnerability Profile: Sector- and location-specific climate risks and resilience recommendations](#). USAID

³ See online graphic: [South Sudan rainfall anomalies 2000–2020](#). Red indicates lower-than-average rainfall, blue shows above-average rainfall. Source: FEWS NET, NASA Land Data Assimilation System (FLDAS). Credit: Stefan Döring.

⁴ South Sudan Ministry of Environment and Forestry (2016) [Republic of South Sudan National Adaptation Programmes of Action \(NAPA\) to Climate Change](#).

⁵ OCHA (2021, December 16). [Daily Noon Briefing Highlights: South Sudan](#).

⁶ Ministry of Environment, 2016; Quinn et al., 2019; African Development Bank (2018). [National Climate Change Profile: South Sudan](#).

⁷ Stalon, J.L. & Choudhary, P. (2017, June 29). [Confronting Climate Change in South Sudan](#), Africa Renewal; See online graphic: [South Sudan rainfall anomalies 2000–2020](#).

⁸ USAID (2019). [South Sudan Climate Vulnerability Profile](#).

⁹ WFP (2021). [South Sudan Emergency](#).

¹⁰ UNEP (2018). [South Sudan: First State of Environment and Outlook Report 2018](#).

¹¹ South Sudan Ministry of Environment and Forestry (2021). [First National Adaptation Plan for Climate Change Republic of South Sudan](#).

¹² Van Baalen, S. & Mobjörk, M. (2017). [Climate change and violent conflict in East Africa: Integrating qualitative and quantitative research to probe the mechanisms](#), International Studies Review 20(4), pp. 547–575.

¹³ Mobjörk, M. et al (2020). [Pathways of Climate Insecurity: Guidance for Policymakers](#), SIPRI.

¹⁴ Pendle, N. R. (2020). [The 'Nuer of Dinka money' and the demands of the dead: contesting the moral limits of monetised politics in South Sudan](#), Conflict, Security and Development, 20(5), pp. 587–605.

¹⁵ Sosnowski, A., et al. (2016) [Remote regions, remote data: A spatial investigation of precipitation, dynamic land covers, and conflict in the Sudd wetland of South Sudan](#), Applied Geography 69, pp. 51–64.

¹⁶ Quinn et al., 2019; FEWS NET (2020) [Severe flooding, conflict, and macroeconomic crisis drive Emergency \(IPC Phase 4\) and high assistance needs](#), Key Message Update.

¹⁷ UNSC. (2020). [Report on the independent strategic review of the United Nations Mission in South Sudan pursuant to Security Council resolution 2514 \(2020\) \(S/2020/1224\)](#).

¹⁸ Quinn et al., 2019; Omondi, P. & Vhurumuku, E. (2014) [Climate Risk and Food Security in South Sudan: Analysis of Climate Impacts on Food Security and Livelihoods](#), WFP/VAM Nairobi Regional Bureau.

¹⁹ South Sudan Ministry of Environment and Forestry, 2021.

²⁰ South Sudan Ministry of Environment and Forestry, 2016.

²¹ Mai, N.J.H., et al (2018, August 1). [Climate change and gender in South Sudan](#), AfricaPortal; Chamberlain, G. (2017, June 8). [South Sudan's battle for cattle is forcing schoolgirls to become teenage brides](#), The Guardian.

²² South Sudan Ministry of Environment and Forestry (2021). [South Sudan's Second Nationally Determined Contribution](#).

Migration and Mobility

Climate change can interact with migration and mobility in several ways, including displacement caused by extreme weather and altered mobility patterns due to changing seasonal weather systems. Interacting with other factors, conflict and extreme weather have been a driving force behind recent displacement. As of January 2022, over 1.3 million South Sudanese were internally displaced, straining host communities and humanitarian support to vulnerable groups.²³

South Sudan has a long history of flooding, but localised floods have become more frequent in recent years.²⁴ In 2021, more than 835 000 people across 31 counties and eight states were affected by the floods, leading the UN to characterise these as the worst floods in over 60 years.²⁵ The northern states of Jonglei, Unity, Northern Bahr el Ghazal and Upper Nile accounted for more than 75 per cent of the total number of people affected.²⁶ In Fangak county in Jonglei, two years of consecutive flooding have driven large-scale displacement and destroyed crops, eroding community resilience and governance capacities to respond.²⁷

In 2020, flooding in Jonglei, Eastern Lakes and Terekeka county forced livestock herders to migrate along new routes into Equatoria regions, impacting nomadic and host communities.²⁸ Cross-border cattle migration from Sudan into areas like Upper Nile state brings with it veterinary diseases, immigration and jurisdiction challenges, compounding and adding additional complexity to South Sudan's governance challenges.²⁹ Heavy rainfall can make the Sudd wetlands unsuitable for cattle, forcing herders to migrate out, bringing them into competition with neighbouring communities.³⁰ The impact of climate change on seasonal patterns affects transhumant pastoralists, increasing the risk of tensions with farmers over access to water and grazing. These examples show how changing seasonal patterns can affect pastoralists' mobility options and how climate-related stress can increase the risk of tensions and impact existing conflicts. Climate change is likely to increase migration and displacement, as migration becomes an adaptation strategy for many.³¹

Climate-related influences on agriculture, as well as the prolonged conflict and its economic consequences, have spurred greater rural-urban migration, especially to the national capital, Juba. Migrants look for employment, livelihood options, health services and education, but migration has led to urban overcrowding, increasing the risk that grievances among urban migrants could escalate into violence.³² South Sudan has limited national and local capacity to mitigate and adapt to climate security risks. The Ministry of Environment and the South Sudan Meteorological Department (SSMD) lack the resources, knowledge and technical expertise to generate robust early warning data and analysis.³³

Food Insecurity & Internal Displacement

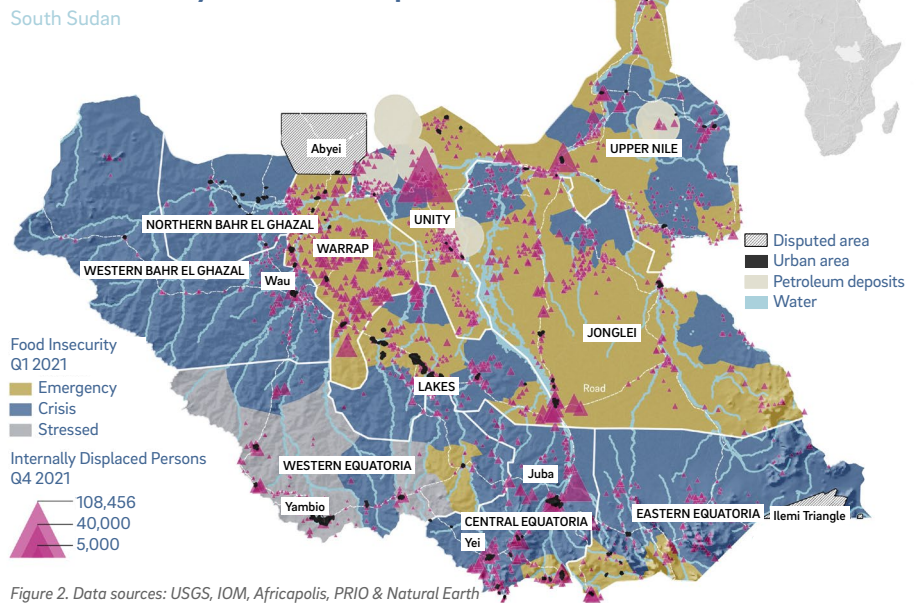


Figure 2. Data sources: USGS, IOM, Africapolis, PRIO & Natural Earth

Military and Armed Actors

The 2018 Revitalised Agreement on the Resolution of the Conflict in the Republic of South Sudan (R-ARCSS) brought relative stability to the country.³⁴ Nevertheless, delays in implementation of the remaining pre-transitional tasks, including the critical security arrangements for the establishment of unified forces and broader security sector reform, remain a serious challenge.³⁵ Local climate stress are feeding national political instability and conflicts in the PiBOR, Tonj, Wau and Upper Nile regions.³⁶ Between June and August 2021, more than 100 civilians were killed in ethnic clashes in Tambura in Western Equatoria. More than 80 000 people have reportedly been displaced by the conflict, with thousands fleeing to neighbouring Bahr el Ghazal state and Ezo county.³⁷

The involvement of civil defence groups and community-based militias in subnational and inter-communal violence reflects the growing militarisation of communal conflicts, heightening the risk that resource conflicts become more deadly and harder to resolve through local dispute resolution.³⁸ There is evidence that political and communal militias active in the civil war are linked to increasing farmer-herder violence, which weakens resilience to the adverse effects of climate change and reduces the opportunities for adaptation.³⁹ Since June 2021, in Tambura county in Western Equatoria state, repeated episodes of inter-communal violence, involving abductions and conflict-related sexual violence, have displaced an estimated 80 000 men, women and children.⁴⁰ UNMISS estimated that, between June and September 2021, at least 440 civilians were killed in fighting between rival groups in Tambura county.⁴¹ In other areas, armed groups have further fragmented, creating new groups or defecting to the Sudan People's Liberation Army (SPLA) through quick deals.⁴² This violence also

²³ UNHCR (2022). [South Sudan: Populations](#).
²⁴ UNEP (2007). [Sudan Post-Conflict Environment Assessment](#); OCHA (2019). [Humanitarian Data Exchange](#). HDX.
²⁵ UNHCR (2021, 19 October). [South Sudan Floods Wreak Havoc on Vulnerable Communities](#).
²⁶ WFP (2021, 9 November). [WFP in South Sudan reaches communities battered by third year of floods; builds roads and dykes to help people recover](#).
²⁷ REACH (2021). [Fangak Shocks Verification Mission](#).
²⁸ Tiitmamer, N. (2020, November 23) [South Sudan's devastating floods: why there is a need for urgent resilience measures](#), The Sudd Institute.
²⁹ UNMISS staff (interview, 7 January 2022).
³⁰ Raleigh, C. & Kniveton, D. (2012). [Come rain or shine: An analysis of conflict and climate-related change in East Africa](#), Journal of Peace Research 49(1), pp. 51–64; Radio Tamazuj (2022, March 1) [Magwi fighting: Governor Lobong says cattle raiders clashed with pastoralists](#).
³¹ McLeman, R. (2019). [International Migration and Climate Adaptation in an Era of Hardening Borders](#). Nature Climate Change 9, pp. 911–918.
³² Moses, L.A.B., et al. (2017). [Causes and consequences of rural-urban migration: The case of Juba Metropolitan, Republic of South Sudan](#), IOP Conference Series: Earth and Environmental Science 81; Koubi, V., et al. (2021). [Environmental migrants and social-movement participation](#), Journal of Peace Research, 58(1), pp. 18–32.
³³ Tiitmamer, N. (2015). [Assessment of Policy and Institutional Responses to Climate Change and Environmental Disaster Risks in South Sudan](#). The Sudd Institute.
³⁴ IGAD (2018, September 12) [Revitalised Agreement on the Resolution of the Conflict in the Republic of South Sudan \(R-ARCSS\)](#).
³⁵ WFP (2021). [South Sudan Country Brief](#).
³⁶ WFP, 2021 Rüttinger, L., et al. (2015). [A New Climate for Peace – Taking Action on Climate and Fragility Risks](#). Climate Diplomacy.
³⁷ Amnesty International (2021, December 9). [South Sudan: Survivors describe killings, mass displacement and terror amid fighting in Western Equatoria](#).
³⁸ EPON (2021). [UNMISS 2022 Mandate Renewal: Risks and Opportunities in an Uncertain Peace Process](#).
³⁹ Gebreyes, Y.A. et al. (2016) [The Impact of Conflict on the Livestock Sector in South Sudan](#), FAO.
⁴⁰ UNHCR (2021). [UNHCR position on Return to South Sudan](#).
⁴¹ The Defence Post (2022, March 1) [UN Says 440 Civilians Killed in South Sudan Clashes](#).
⁴² Crisis Group (2022) [South Sudan's Splintered Opposition: Preventing More Conflict](#), Africa Briefing No. 179.

weakens communities' resilience to the adverse effects of climate change.

The UN Food and Agricultural Organisation (FAO) has warned that South Sudan lacks effective state institutions and local mechanisms for peaceful settlement of disputes over power, livestock and resources.⁴³ UNMISS, the UN system and international partners should work with the AU and IGAD to increase and coordinate their support to national and local authorities and civil society in South Sudan, to help to build sustainable local and national capacities for peace.

Political and Economic Exploitation

In South Sudan, communal and ethnic conflicts are closely linked to broader political dynamics, increasing the risk that local conflicts become more violent and harder to resolve. Climate change can exacerbate these tensions, with the added risk that powerful groups may use the conflicts and inter-communal violence resulting from adverse climate impacts for their own ends.⁴⁴

With more than 40 million livestock, South Sudan is one of Africa's wealthiest countries in per capita livestock wealth.⁴⁵ However, this also contributes to emissions, local environmental damage and land degradation, making land vulnerable to erosion and resource scarcity. Before and since independence, South Sudan's political leaders and elites have accumulated wealth from cattle, making many complicit in cattle-related conflicts and resource exploitation.⁴⁶ Elites have incentives to maintain, or even expand, cattle farming, but climate-related stress, raiding practices and the civil war have inflated livestock prices to the extent that they affect the livelihood opportunities of pastoralists and agro-pastoralists, and negatively impact the citizenry in general.⁴⁷

Climate impacts in South Sudan are further exacerbated by human actions like deforestation, illegal timber exportation and charcoal production. In particular, the latter is a lucrative business for armed groups, communities and affiliated political elites.⁴⁸ Unregulated charcoal production involving soldiers from the South Sudan People's Defence Forces (SSPDF) has expanded along the Juba-Bor road in the Equatoria regions. Illegal logging has been documented around the Southern National Park, Lantoto National Park, Western Equatoria and Yambio.⁴⁹

Livelihood Zones & Intercommunal Violence

South Sudan

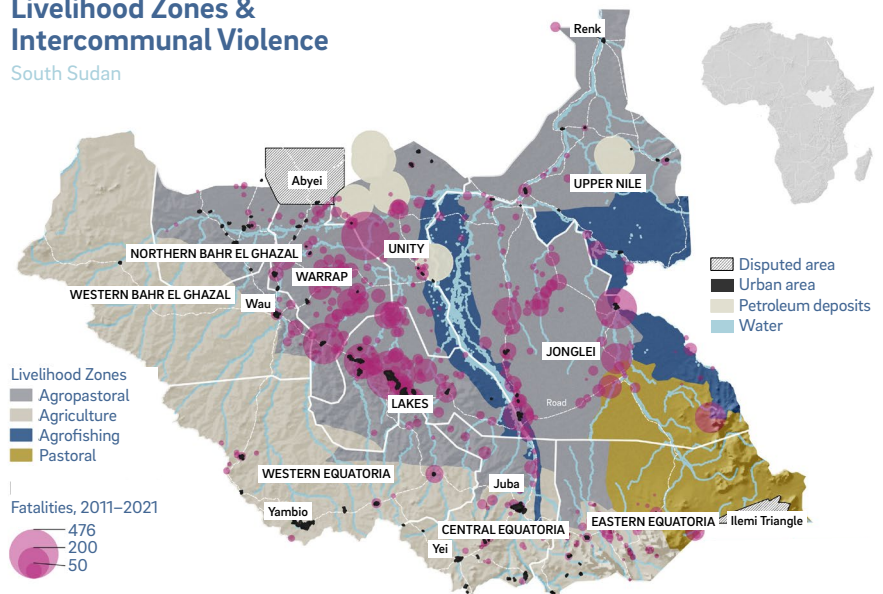


Figure 3. Data sources: USGS, ACLED, Africapolis, PRIO & Natural Earth

Research indicates that political leadership deficits and economic mismanagement have played a key role in South Sudan's water-related and other resource conflicts, highlighting the importance of climate-sensitive development.⁵⁰ Environmental peacebuilding initiatives can strengthen community resilience and sustain peace, especially among women and youth. However, low capacity, unclear roles and responsibilities for local government and customary authorities, and government absence have often impeded the design of lasting solutions for local resource conflicts. The R-TGoNU and its partners need mechanisms for systematically gathering and analysing data and assessing climate, livelihoods, food security, migration (including transhumance) and conflict trends, in order to be better positioned to generate early warning information and anticipatory preventive responses.

⁴³ FAO (2016). [South Sudan Resilience Strategy 2016–2018](#); Tchie, A.E.Y. (2019, November 17). [Why South Sudan's attempts at peace continue to fail](#). The Conversation.

⁴⁴ Van Baalen, S. & Mobjörk, M., 2017.

⁴⁵ FAO (2022). [FAO Livestock Show and Agricultural Exhibition to promote food security](#).

⁴⁶ The Sentry (2016). [War crimes shouldn't pay: Stopping the looting and destruction in South Sudan](#).

⁴⁷ Idris, I. (2018). [Livestock and Conflict in South Sudan](#). KFD4 Helpdesk Report.

⁴⁸ Mosel, I. & Henderson, E. (2015). [Market in Crisis: South Sudan case Study](#). HPG Working Paper.

⁴⁹ Radio Tamazuj (2016, March 4). [War brings devastating assault on South Sudan's wildlife](#). An official (Interview, 5 March 2021) confirmed that the SSPDF soldiers use charcoal production to supplement their income due to factors including late payment of salaries and low levels of remuneration.

⁵⁰ Selby, J. & Hoffmann, C. (2014) [Beyond scarcity: Rethinking water, climate change and conflict in the Sudans](#). Global Environmental Change 29, pp. 360–370.

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