South Sudan's Vulnerability to Floods

Research Paper

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1. Introduction

Climate change is a global phenomenon, but its negative impact mainly affects poorer countries due to their dependence on natural resources and lacking coping capacities (De Silva & Kawasaki, 2018). In 1991, Homer-Dixon proposed that developing nations are more vulnerable to climate change than rich ones. Following studies supported this claim as developing nations experience more natural hazards, such as floods or droughts than developed countries (Chinowsky et al. 2011). Originally, disasters were studied as single extreme events, but academic research changed towards favouring the perspective that societal developments are the root causes of disasters and natural hazards only trigger them. In this perspective, socio-economic developments can lead to a fragile relationship between humans and the environment they inhabit (Hewitt, 1983; Oliver-Smith, 1999).

One of the most recent examples is South Sudan, experiencing its fourth year of record-breaking rainfalls, directly affecting over 900.0000 people and flooding two-thirds of the country as of October 2022 (UNHCR, 2022). While being directly afflicted by the devastating consequences of climate change, *The World Bank* (2022) also labels South Sudan a pressing humanitarian crisis due to its political instability and poverty. Therefore, the country is not only vulnerable to floods because of climate change itself but also because of socio-economic factors.

In 2004, Wisner et al. published the so-called *Pressure and Release Model* (PAR), which combines man-made vulnerabilities and natural hazards. This model helps to identify the factors that make certain people vulnerable to hazards. Consequently, it is possible to address the issues, increasing these peoples' safety and security. The following paper uses the PAR model to answer the research question: "Why is South Sudan so vulnerable to floods?" The next section explains the PAR model, followed by the model's application to the flood vulnerability of South Sudan and a conclusion summarising the main findings and reflecting on this research.

2. Theoretical framework

In the Pressure and Release Model, Wisner et al. (2004) assume that disaster risks only exist if there is a combination of vulnerabilities and exposure to hazards. Hazards are natural events

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that affect places in varying intensity and severity, such as earthquakes, hurricanes, and droughts (Wisner et al., 2004). There needs to be a vulnerable population potentially affected by these hazards. Then there is a risk of a disaster. Humans can affect this risk by increasing or decreasing their vulnerability to hazards. Wisner et al. (2004) refer to this as pressure and release. Increasing pressure can come from more hazards or higher vulnerability. The only way to reduce pressure is by reducing vulnerability, as the existence of hazards themselves cannot be influenced or controlled.

The formation of vulnerability is what Wisner et al. (2004) call "the progression of vulnerability" (p. 51). Understanding this progression enables identifying what led to the vulnerability in the first place and how to reduce it. The progression of vulnerability consists of three interrelated causes. Firstly, *root causes* are the most remote and underlying influences and refer to economic, demographic, social, and political processes that affect the general distribution of power in society, allocation of resources, and functioning of the state (Wisner et al., 2004). Secondly, *dynamic pressures* translate these general root causes into specific unsafe conditions and vulnerabilities. Dynamic pressures are more contemporary and immediate than root causes and refer to economic, social, and political patterns that directly create vulnerability. For instance, there is rapid urbanisation, violent conflict, deforestation and so on (Wisner et al., 2004). Lastly, *unsafe conditions* are the specific expressions of vulnerability in conjunction with the hazards. They are divisible into four categories. There is the physical environment, the local economy, social relations, and public actions and institutions. The unsafe conditions cause a disaster if hazards trigger them, for instance, a population living in flood-prone areas. It is worth mentioning that the authors only refer to a disaster when a significant number of people were affected by a hazard, and their recovery is unlikely without help from non-affected communities. The specific vulnerability and hazard components are visible in Figure 1, according to Wisner et al. (2004).

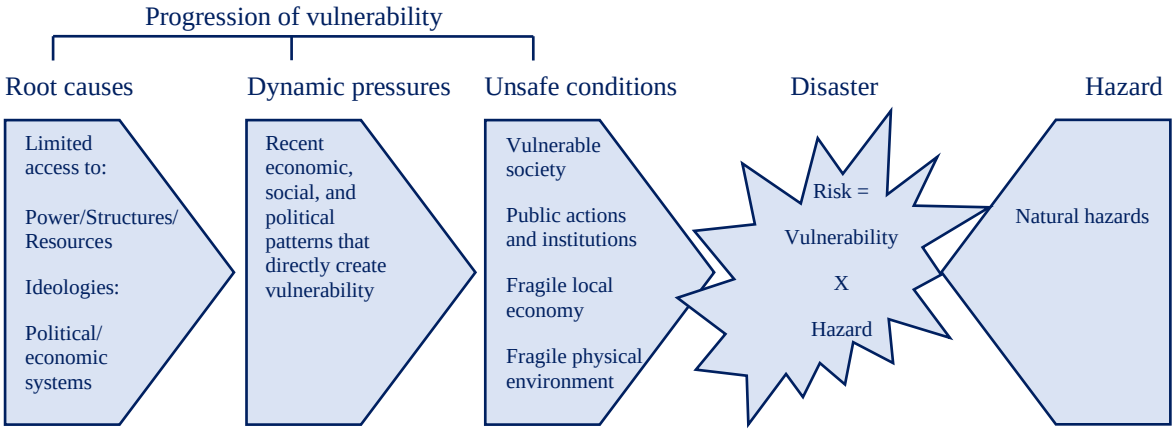

Figure 1. The Pressure and Release model (PAR), a simplified version of Wisner et al.'s (2004) PAR model

3. Analysis

a. Root causes

South Sudan's vulnerability mainly stems from the legacy of its long civil war. The country gained its independence from Sudan in 2011. But a following 6-year civil war between President Salva Kiir Mayardit and First Vice President Riek Machar devastated much of the country, and still determines its contemporary politics (Bertelsmann Stiftung, 2022). Both politicians fuelled an ethnic rivalry between the Dinka and Nuer tribes to defeat their adversary. For example, President Kiir attempted to place more Dinka people in government while excluding other ethnic groups at the expanse of compromising national unity, which is destructive since South Sudan's society is mainly organised in tribes (Mayen et al., 2022).
The political instability fuelled by social inequality has so far severely affected the economy of the new-born nation, which is still underdeveloped today. Widespread poverty forces most people to work in the agricultural sector, which is highly sensitive to climate change (Government of South Sudan, 2018). Large parts of the population live in rural areas and/or close to rivers because of the fertile land. Thus, many people rely on livestock and crops for survival. The majority has limited or non-existent market access due to poor infrastructure (Cullis, 2021).

South Sudan's remoteness increases the value and importance of local communities, especially tribes, as these are entities where most people receive help in the first place. Thus, power distribution is highly decentralised in South Sudan. The feeling of South Sudanese nationhood is relatively weak as tribal relations are seen as more important. Additionally, there is little support for the national government because it mainly consists of former military personnel fighting each other for more power. It has low legitimacy since the country's first-ever elections will just be held in 2024. Thus far, the country was only ruled by a transitional government (Angu, 2022).

b. Dynamic pressures

Since independence, the transitional government has proven to be ineffective overall. Its mismanagement over the past years has dramatically worsened South Sudan's socio-economic situation. The government revenue heavily relies on oil as its export contributes to 90% of the country's income, despite large marble/dolomite, aluminium, iron ore, and gold sources (The Borgen Project, 2022). This single-resource-driven economy makes South Sudan vulnerable to world market price fluctuations and inflation. For instance, oil exports declined due to COVID-19, and the war in Ukraine caused many aid donors to reallocate their resources and staple goods prices skyrocketed due to Russia's grain blockade (Kleinfeld & Francis, 2022).

The lack of a noteworthy economy created a high dependency on neighbouring countries for consumer goods and construction materials imports. Thus, most people are forced to work in the informal agricultural sector due to the lack of job opportunities (Irwin-Hunt & Makoni, 2022). However, the agricultural sector dramatically suffered over the past years due the violent

conflicts and extreme weather conditions. Violent conflicts for land, revenge killings, and cattle theft are common triggers for displacement (Bertelsmann Stiftung, 2022). Additionally, South Sudan experiences severe floods annually since 2019, forcing people to leave their homes while also shrinking the usable land for herding that so many people rely on (Tiitmamer, 2021). The White Nile's water level increases every year and the new occurrence of annual major floods means that the ground is already saturated when further floods occur. Thus, their devastating consequences become stronger every year. More people are internally displaced, resources shrink, and tensions rise (REACH Initiative, 2022).

Nevertheless, over the past years, the government was more preoccupied with maintaining its power, and officials acted in self-interest, which further weakened governance capabilities. South Sudan had the most corrupt public sector worldwide in 2021 (Transparency International, 2022). There is no de facto separation of powers despite the country's constitution. Thus, government officials can prevent any internal prosecution attempt. Corruption has severely weakened governance capabilities and government credibility in the population, but also in the international community, making humanitarian cooperation even more complicated and forestalling the country's development (Bertelsmann Stiftung, 2022).

Additionally, many political parties maintain links to armed groups. Thus, political tensions can easily lead to violent conflict, and local militias, as well as government forces, has been involved in severe human rights abuses (Mayai et al., 2022). Also within those groups, there is intergroup violence and communal violence for local power struggles, forestalling stability and development in the country (Funke, 2022). The government's monopoly on the use of force is contested because security forces cannot access all parts of South Sudan due to the poor infrastructure. It also means that most people cannot participate in politics as they cannot access the few governmental institutions or healthcare systems and vice versa. Due to the lack of government provision of basic services, most people must rely on their community for support and are highly vulnerable to external threats (Liaga, 2021).

c. Unsafe conditions

The recent developments, as described above, resulted in a dire situation when South Sudan experienced record-breaking rainfalls in 2022. The main issues are a lack of funding for the country's development resulting in weak governmental response capacities to floods and the fact that so many people are forced to live in areas close to the rivers. Approximately two million people are displaced within the country, putting great pressure on other communities that already struggle to survive. Nine million people require humanitarian assistance, and almost eight million face food insecurity and malnutrition, turning South Sudan into one of the worst ongoing humanitarian crises worldwide (European Commission, 2022). Only 7% of the population has access to electricity, less than 50% have access to safe drinking water, and 85% of the population works in the informal sector despite an abundance of natural resources, especially oil (Government of South Sudan, 2018; OCHA, 2022; World Bank, 2022).

Furthermore, as a consequence of corruption, it is estimated that South Sudan's elites have diverted more than $4 billion since 2012 (UN News, 2021). The missing investments in the country's development mean that South Sudan lacks knowledge and expertise in flood risk management, environmental studies, and emergency management. Consequently, South Sudan's critical infrastructure regarding drainage systems, dams, urban planning, and levees is severely underdeveloped. The mismanaged governmental system, resources, and tribalism prevent meaningful progress in disaster management mitigation. Most progress in this area is only achieved with the help of NGOs. Consequently, local communities are usually left on their own when floods occur (Mayen et al., 2022). South Sudan's overall progression of vulnerability to floods can be seen in Figure 2.

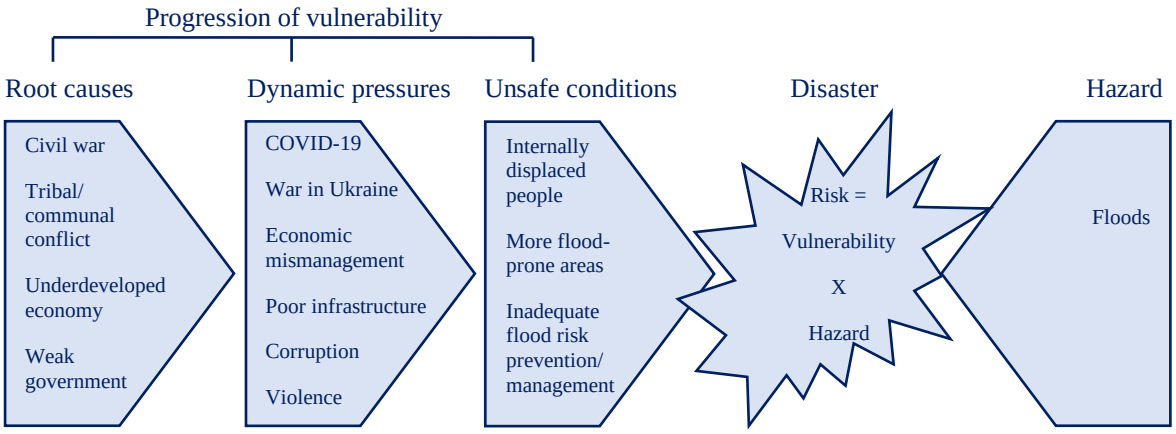

Figure 2. South Sudan's progression of vulnerability to floods

4. Conclusion

Based on the PAR model, this research indicates that South Sudan's vulnerability to floods mainly stems from man-made causes and not just the fact that floods occur more frequently. South Sudan's government is mainly responsible for this as it did not invest enough in the country's development over the past years, which means that it has inadequately prepared for flood risk. The population is the victim of this neglect because many people must flee their homes due to local violence and lack of flood prevention measures. The government wastes valuable resources because of economic mismanagement and corruption, resulting in overall weak governance capabilities and lacking provision of basic services. Consequently, vital funds are missing, and international aid often does not reach the target population. Therefore, exposure to floods in South Sudan is a highly political topic.

Knowledge of flood vulnerability is provided by actors outside South Sudan and it points to the government for responsibility. This is problematic as the government would never admit its inefficiency. It has systematically denied all corruption accusations over the past years and tried to stay in power by successfully pushing back general elections since 2015. Conceding its responsibility would mean losing legitimacy. This implies that there will be probably no improvement in South Sudan's vulnerability to floods until there is a government change, which might happen in the 2024 elections.

Another shortcoming of the data used in this research is that most information is generalised for the whole country as many parts of South Sudan are difficult to access, reducing data transparency and detailed information. This means that this research cannot explain local differences in the creation of flood vulnerability. However, the application of the PAR model makes this research easily replicable, which increases its reliability. Overall, this study conforms with the academic perspective that disasters have their root causes in socio-economic developments, as described by Hewitt (1983) or Oliver-Smith (1999) earlier, by analysing South Sudan as a case study. This paper supports the idea that human behaviour has a crucial impact on the creation of disaster risk.

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