LOSS AND DAMAGE YOUTH COALITION

LOSS AND DAMAGE FRAMEWORK MODEL

STORIES

APRIL 2025

REVIEW AND ANALYSIS OF FRONTLINE STORIES

This report is part of a series of four reports developed by the Loss and Damage Youth Coalition (LDYC) to provide a comprehensive understanding of loss and damage within the UNFCCC. The four reports complement each other, offering a structured approach to understanding and engaging with loss and damage discussions.

A. Background
B. Decisions Review
C. Review and Analysis of Frontline Stories
D. Analysis and Recommendations

The target audience for this report includes but is not limited to negotiators, youth, decision-makers, board members, and stakeholders interested in loss and damage. Its main purpose is to provide young people, civil society and LDYC members with necessary knowledge and evidence to engage meaningfully in discussions and roundtables. By building on various levels of expertise, this document aims to ensure that readers are prepared to contribute effectively to high-level discussions and are able to connect on-ground stories to the UNFCCC Loss and Damage Structure.

A key strength of this framework lies in its collaborative and inclusive preparation process. Developed by young people from diverse backgrounds and levels of expertise across different countries, the content is designed to be accessible yet thought-provoking. It starts from a clear, foundational level and progressively connects readers to deeper analysis and recommendations. This document encourages independent thought and deeper engagement with loss and damage discussions.

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INTRODUCTION

This document provides a series of real-life stories from communities on the frontlines of the climate crisis. It aims to complement existing research and policy analysis by grounding them in lived experiences. These stories were developed to spotlight direct narratives from affected communities and regions.

By reviewing the stories and connecting them to the UNFCCC's gaps, this compilation seeks to amplify the voices of those too often left out of decision-making spaces. It offers a more profound, human-centred understanding of how loss and damage is grounded in the lived experiences of these vulnerable communities. It offers policy reviewers, decision-makers, and negotiators a different perspective, connecting stories to the existing gaps that everyone is trying to address.

These stories are not just for sharing a narrative or an experience; they serve as evidence-based considerations that back up policy demands, pointing out and highlighting gaps, challenges, and urgent needs. They also provide practical insights into community resilience and into the urgent support needed to address irreversible loss.

DISCLAIMER

The following stories were collected from individuals and communities with their informed consent. They have been only minimally edited for clarity, grammar, and coherence, without altering the core message or tone. These stories reflect lived realities and are intended to support policy development, not to cover formal assessments.

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When an Environmental Crisis Becomes a Socio-Economic Challenge

By Nyama Mutondo - Zambia

The climate story I'll be telling will come from a country in the heart of sub-Saharan Africa, Zambia.

For the longest time, Zambia has relied on renewable energy, specifically hydropower. This was a good thing, given the nature of the rainfall cycle that the country would experience. It was predictable, and enough until recent years. That is no longer the case, given the situation with climate change.

As of 2024, the country has been severely impacted by a drought, which has led to power shortages, negatively affecting various sectors because energy is a key resource. People had to close their businesses and lay-off employees as the resources that they once had were damaged and wasted and some could not even afford to store what could help to run a business.

Since productivity relies on energy, there has been a rise in prices because the cost of production has been equally affected. In addition, water sources have been reduced, and people in rural areas are struggling to find proper water sources that they can use for their daily lives as well as growing crops they need as food.

In summary, the reality of climate change has been felt like never before in 2024 by Zambians. We have seen the importance of stable weather patterns and the availability of natural resources. To help cushion the effect of the crisis, the government has released funds to support the most vulnerable people in local communities.

Different cooperating partners have come on board by implementing projects that support the efforts to supply power via alternative sources such as solar energy and the setting up of mini-grids. Initially, one utility company was both a distributor and generator of electricity, but now decentralization is of major interest to the government as a solution to the energy crisis.

The financial support isn't enough to solve the problem overnight, and the assistance from cooperating partners can only go so far, but not all hope is lost. To address the challenge, members of local communities and the private sector are adopting off-grid technologies as well as creating a space for innovations that are needed to either provide the vulnerable members of the country with a means of earning income, weaning off peri-urban and urban area members from the grid.

This proves that even amid a crisis of this magnitude, people can rise up and not be completely at a loss. However, the country has limited financial resources and emphasises the importance of facilities like the Loss and Damage Fund in helping mitigate and adapt to climate change.

Story Review

The author tells a powerful story of Zambia's experience with climate change, marked by drought and hydropower vulnerability. This strains food security, worsens poverty, and lowers quality of life, especially in rural communities. Erratic rainfall worsens power shortages, generating economic ripple effects that hit small-scale farmers and small business owners the hardest, aggravating the wealth divide and exacerbating socio-economic difficulties.

Solar power and decentralised distribution of energy show progress, but high costs and limited financial resources hinder scale. The author suggests investing in renewable energy beyond hydropower, including mini-grids and off-grid solar, supported by public-private partnerships. Financial and technical help is needed for resilience, with the Fund for Responding to Loss and Damage offering investment for infrastructure. Skills training in sustainable energy, water management, and climate-resilient farming could empower communities.

The WIM's mandate encompasses enhancing knowledge and understanding of comprehensive risk management, strengthening dialogue, coordination, coherence, and synergies, as well as enhancing action and support including finance, technology, and capacity building, its role in this aspect is crucial.[1] Made up of expert and technical groups, the Santiago Network on Loss & Damage is key to implementation and is also important in catalyzing this technical assistance at the local, national, and regional levels.

Traditionally, reliable funding has been a challenge for the operations of the WIM.[2] With a fully operational FRLD, anticipatory action projects such as the one carried out in Zambia in 2023 can multiply.[3] There are challenges faced by least-developed countries in direct access to the Green Climate Fund. Though accredited, two of Zambia's financial institutions failed to access funding this year. The UNFCCC Least Developed Countries Expert Group has recommended that the COP invite the GCF board to enhance funding through a simplified approach.[4]

Structural ambiguity in the UNFCCC limits productivity. A clear fund disbursement mechanism is lacking, and misalignment among SNLD, WIM ExCom, and UNFCCC processes causes functional gaps.[5]

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[1] UNFCCC, 'Warsaw International Mechanism' https://unfccc.int/topics/adaptation-and-resilience/workstreams/loss-and-damage/warsaw-international-mechanism

[2] Emma Shumway, 'Observations from COP28 on the Loss and Damage Fund' (Sabin Center for Climate Change Law at Columbia Law School, 20 December 2023) https://blogs.law.columbia.edu/climatechange/2023/12/20/observations-from-cop28-on-the-loss-and-damage-fund/

[3] UNFCCC Subsidiary Body for Scientific and Technological Advice, 'International Mechanism for Loss and Damage associated with Climate Change Impacts' (Fifty-ninth session, FCCC/SB/2023/4/Add.1, 17 November 2023).

[4] UNFCCC Subsidiary Body for Implementation, 'The 46th Meeting of the Least Developed Countries Expert Group Report by the Secretariat' (1 October 2024) FCCC/SBI/2024/22.

[5] Linda Siegele and Heidi White with contributions from Edgar Fernandez and Colin McQuistan, 'Unpacking the COP27 Decision on the Santiago Network' (Loss and Damage Collaboration, 2022) https://cdn.prod.website-files.com/605869242b205050a0579e87/63e0cbabd5cae5fff9cd4635_L%26DC_UNPACKING_THE_SNLD_DECISION_2023.pdf

History of Women Farmers in the Settlement Areas of Northeast Brazil

By Osvaldo Gomes de Albuquerque-Brazil

In the northeast region of Brazil, approximately 850 km away from the state capital, São Luís, in the municipalities of Açailândia and Imperatriz, municipalities in the state of Maranhão, are located the agrarian reform settlements inhabited by the families of female farmers. The region is currently facing various episodes of climate change, but throughout time, it has always faced the problem of drought.

There are two very well-defined seasons: six months of heavy rain (too much water) from October to March and six months of drought (total drought) from April to September each year. During the six rainy months, women farmers in the settlement areas produce some food, but on a very small scale, because most crops cannot withstand the intensity of heavy rains. This happens mainly with most vegetables. During the dry season, when it is time to speed up cultivation, there is a lack of water for most human activities, making any possibility of irrigation difficult. With the energy system generated by fossil fuels, this activity is unfeasible due to the very high energy costs.

We are already facing different climate events, such as excessive rain, unseasonal rain, extended (longer) dry periods, and others. However, what most directly impacts the communities in the settlement areas is the fact that there are two well-defined seasons: six months of heavy rain (excessive water) and six months of dryness (total drought). These two aspects are extremely decisive for the difficulties faced by women farmers throughout their production process and contribute to the increase in their state of vulnerability.

During a period of heavy rain, the community is mainly affected by these factors: roads are compromised, making it difficult for women's families to travel. A decrease in the quantity of crops grown and a consequent reduction in planting areas. Production losses when planting is carried out during the off-season and there is no rain, resulting in the total loss of some crops. Low-quality production that does not fetch satisfactory prices on the consumer market. And, of course, all the consequences from then on. In a few words, these are not just losses but total suffering for these women who work in the settlement areas in this region of Brazil.

The communities, or as we call them, the settlement areas, suffer from the most basic needs, the most pressing such as:

Access conditions: most of the sections of the local roads are very difficult to drive during the six months of heavy rains, and on some days, they are even impossible for smaller cars to access, a process that ends up hindering not only the movement of the population but also the flow of produce to the markets and fairs in the nearest cities;

Transportation to support the flow of produce: neither the women farmers nor the cooperative has transportation to support the marketing of produce; the products arrive at the fairs and markets in cars, and freight is paid for, an action that also makes life difficult for the women and their families;

Health conditions: the health posts in the settlement areas do not meet the needs of the settled population which has serious consequences for the settled population as it hinders their access to essential healthcare services.

Lack of inputs: the agricultural inputs used until now constitute a major problem for women farmers and their families, based on agrochemicals, causing damage to the soil and the working population and producing unhealthy food without the slightest guarantee of food security, much less nutritional, which the population so desperately needs;

Actions with a sustainability character: very little is done to combat climate change. There is no consumption of renewable energy, there is no initiative to reuse water, much less any initiative to use rainwater, use agrochemical dosages, and even advance the process of degradation of small areas. These are the contexts that characterize these locations with a high degree of social vulnerability, allowing these families of settled female farmers to have a condition of survival and not a life worthy of those who have the land to produce and live well on it.

To say here that nothing has been done over time would be a very strong statement, but we can guarantee that what has been done so far is far from meeting the real needs faced by this population.

Government policies do not adequately meet the needs of the population, and when they do, they are deficient, slow, and out of season. Some examples are the situation of water for irrigation, which is not possible, especially during the dry season, and the legal status of the settled areas.

It has been 37 years since the families have worked there and are already owners of the land, but only now are the land titles being issued, which means that the settled women farmers cannot even seek credit policy from the institutions that develop the agricultural credit policy. In short, we are not neglecting information about what is happening, but we also cannot fail to highlight the gap that we see as possible.

In reality, we can say that there have been very few and very slow successes since what has been done is to improve some stretches of the roads that connect the municipal headquarters to the settled areas, a fact that always occurs at the beginning of the dry season (beginning of April onwards). As for the most serious part, which is coping with the drought to produce more and better, there are no measures that can serve as support for the settled families since this is undoubtedly their main climatic challenge.

Story Review

Osvaldo Gomes de Albuquerque paints a bleak picture describing the climate change-related challenges faced in Brazil's Maranhão region. The six-month cycles of heavy rains and intense drought limit viable farming periods and put the community at risk of food insecurity. The heavy rains negatively affect crop quality and the resultant soil erosion impedes road access with the effect of obstructing transportation to markets and economic hubs, as well as flooding neighbourhoods and homes.[6] Alternatively, the long dry season comes with restricted access to water for irrigation. These challenges are primarily faced by female farmers, a vulnerable group, and display the interdisciplinary problems within loss and damage analysis.

Possible solutions to these problems include the introduction of an efficient water management system. The introduction of rainwater harvesting and greywater recycling could ease the water scarcity burden during the dry months. Infrastructure development on a wide scale is needed to implement such projects through the use of reservoirs, water tanks and other water catchment systems. The Maranhão State Government has taken action to this effect in 2015 with the Water For All Program in drilling wells and installing water meters to increase water supply.[7] In addition, promoting climate-resilient crops that can tolerate extreme rain and drought would improve productivity. The introduction of training programs on agroecological farming techniques, organic fertilizers, and reducing reliance on agrochemicals could help protect soil health and produce safer, nutritionally rich food, benefiting both the environment and the community's health.

Infrastructure with regard to road maintenance and accessibility is also a necessity. Further, community-led climate action and adaptation could bolster local knowledge of the area's challenges and how best to adapt to them. Such initiatives could drive sustainable practices at the grassroots level, leveraging collective efforts to influence local government action. With climate change worsening socio-economic and demographic vulnerability within Maranhão, collective effort is needed to protect these communities.[8]

To address the present issues, funding is needed to conduct research, develop tools for utilisation, sensitize relevant stakeholders and implement development projects. Seeking assistance from a coordinated structure under the UNFCCC framework would be ideal. In recognition of the need for coherence and coordination, the Santiago Network encourages the advisory board to collaborate with the funding arrangements and the FLD in aligning technical efforts with capacity building and support programs emanating from the fund and funding arrangements.[115]

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[6] Voices for Just Climate Action, 'Women Climate Defenders' (Dossier, July 2024) https://voicesforjustclimateaction.org/wp-content/uploads/2024/08/VCA-Women-Climate-Defenders-dossier-1.pdf

[7] United Nations Department of Economic and Social Affairs Sustainable Development, 'Water For All (in Portuguese: Água Para Todos). Related SDGs: 1,2, 3, 6, 8 and 9' https://sdgs.un.org/partnerships/water-all-portuguese-agua-para-todos-related-sdgs-12-3-6-8-and-9

[8] Felipe Vommaro, Júlia Alves Menezes, and Martha Macedo de Lima Barata, 'Contributions of Municipal Vulnerability Map of the Population of the State of Maranhão (Brazil) to the Sustainable Development Goals' (2020) 706 Science of The Total Environment 134629.

[9] UNFCCC, 'Annual Report of the Santiago Network 2024: Addendum 2, Joint Report of the Executive Committee of the Warsaw International Mechanism for Loss and Damage Associated with Climate Change Impacts and the Santiago Network for Averting, Minimizing and Addressing Loss and Damage Associated with the Adverse Effects of Climate Change' (2024) https://santiago-network.org/resources?category=publications&year=all-years

The Hidden Costs of Climate Change: Loss and Damage in Zhombe

by Perseverance Javangwe - Zimbabwe

In the heart of Zimbabwe, the rural community of Zhombe is home to farmers who have relied on agriculture for generations. However, this once-thriving agricultural hub has become a victim of climate change. The community, mainly comprised of smallholder farms growing maize and rearing livestock, is extremely vulnerable to extreme events. Already battling poverty, Zhombe's farmers face dwindling resources, food insecurity, and many more social challenges as climate change continues to take its toll.

Zhombe has been hit hard by El Niño-induced droughts, which intensified last season. El Niño, a periodic climate event linked to the warming of ocean waters, disrupts rainfall patterns across Southern Africa, bringing longer and more intense dry spells. For Zhombe's farming community, where rain-fed agriculture is a lifeline, this has been catastrophic.

"This is the worst year that we have ever experienced. Nobody was well aware that we would have a drought. Early planting has always been witnessed in October and November, but we have noticed that climatic changes have taken effect, which has led to the severe drought we are experiencing at present. Gazing at these fields, you can easily see what is happening. We used to rely on the rains in October, November, January, then March, but this time around, it didn't go as usual," remarked Ward 9 Councilor Alderman Emmanuel Sibanda.

As droughts become more frequent, the community's crops have been severely affected. Maize, the staple food, now yields less and less, with many fields producing almost nothing in recent years. In 2023, the region recorded its lowest rainfall, a devastating blow to both crops and livestock.

"In recent years, we have observed drastic climate changes. Kwekwe district lies in regions 3, 4, and 5, so we have been having some short rain seasons. Temperatures are getting higher and higher, year by year, especially during the summer period. As a result of the change in temperature, we have witnessed food shortages in the district. This has affected the livelihoods of our communities," says Fortune Mupungu, the Kwekwe District Development Coordinator (DDC).

Duyo Ndlovu, a local farmer in Zhombe, added his voice, "We are facing a dire situation due to drought. We are surviving through purchasing mealie-meal, yet getting the funds to purchase it is difficult. Before this drought, we had better harvests because the rains came earlier, usually in October and November, and we would plant early."

"Long back, the planting season began in October and November, and in January, families would

be eating green mealies, but due to the change in weather patterns, we are now planting in January

but sadly, nothing will come out because usually, in February, and even March, there will be no rains," added MacMillan Sibanda, a local farmer in Zhombe. "So there is a huge change in the weather patterns, especially when we observe the past two to three years, no farmer has harvested anything, even if you check in the fields there is nothing, the rains only came once, our livestock are not getting enough to graze. So there is a huge change. It is hunger for people as well as our livestock," he added.

The losses in Zhombe are staggering. Crop yields have plummeted, with most farmers reporting harvests reduced by as much as 70%. This means that families that once produced enough to feed themselves and sell the surplus at local markets are now struggling to grow enough for subsistence. Maize, which once covered fields as far as the eye could see, now stands in sparse, withered patches. Livestock herds, another critical source of income, have also been decimated. As watering holes dry up, cattle die, and farmers are forced to sell their remaining animals at a fraction of their normal value.

"I had nine cattle, but now I am left with four," explained Sidaniso Sibanda, a local farmer. "The ones that survived are too weak to produce milk or to sell at a good price. We are losing everything."

"Due to drought, the majority of us are now venturing into mining,

as well as some piece work. Some have gone to South Africa, while some have traversed to town in search of better conditions. However, if there is rain, we know that we can even get more of such piecework, but due to drought, no one has harvested anything, so it becomes difficult to get the piecework. All our farms are dry, so we are just trying to run around and see what we can get to feed our families," added Sibanda.

In response to this crisis, various forms of support have been provided to help Zhombe cope with the impacts of climate change, but these efforts have had mixed results. Farmers have been trained to grow drought-resistant crops like sorghum and millet and encouraged to adopt conservation farming techniques, such as mulching and water harvesting, to retain soil moisture amongst other mitigation and adaptation mechanisms.

"We are having to change our planning to suit these circumstances. For example, we have started introducing some income-generating projects, new farming techniques, and other livelihood options for our communities. More money is going towards drought mitigation, and that has affected development in the district in a major way," said Mupungu.

Despite these efforts, the scale of support has not matched the magnitude of the problem. Government assistance has been limited and inconsistent, with only occasional food aid and no long-term strategy to address the root causes of the losses. Without significant financial resources, many farmers have been left to fend for themselves, relying on practices that are no longer sufficient in the face of worsening climate conditions.

Village Head Jonga Changasi added: "We appreciate the help we have received from our government, but it is not enough. We need long-term solutions, not just emergency food aid. Our children's future depends on it." She also suggested going back to traditional means of rain-making ceremonies to request rains from the ancestors, "...long back, around October, we used traditional means to ask for the rains, people would gather and approach traditional leaders, and they would warn on the rain situation, and advise on what to do. However, with the proliferation of churches, things have changed, and they do not support the issue of approaching traditional leaders. Back then, we would go close to a river to ask for rain, but nowadays, people no longer believe in that. Now, each church has its own day of praying for the rains."

The successes in Zhombe's adaptation efforts are largely localized and small in scale.

"We hear about these new farming methods, but we cannot afford the equipment," said MacMillan Sibanda. "We need more support from the government, and it needs to be sustainable."

"We need a proper plan," insisted Councilor Alderman Sibanda. "Farmers need access to weather information, insurance for their crops, and better irrigation systems. Without this, we are just waiting for the next drought to wipe us out again."

The farmers of Zhombe are resilient, but they cannot face the impacts of climate change alone. The international community, too, has a role to play. Zimbabwe, like many other developing countries, is disproportionately affected by climate change despite contributing little to the global carbon footprint. Climate finance mechanisms must prioritise communities like Zhombe, where the need is urgent, and the potential for impact is significant.

The plight of Zhombe's farmers illustrates the human cost of climate change. Loss and damage are not abstract concepts, but they are lived realities for people who are losing their livelihoods, their food security, and their hope for a stable future. The time to act is now before the next drought brings even greater devastation to this vulnerable community.

Story Review

Javangwe describes the hardships faced by the rural community in Zhombe mainly comprised of low-income small-scale farmers. The area is affected by the intensity of El Niño. This is a cyclical climate event marked by unusually warm ocean temperatures in the equatorial Pacific.[10] The event, worsened by climate change, brings longer and more intense dry spells. With 57% of people in rural Zimbabwe set to be food insecure within the first quarter of 2025, this is an area of significant concern.[11]

The farmers bear the brunt of the economic losses. With the planting and harvesting seasons disrupted, their yields are beyond unsatisfactory. Sustaining livestock has also proven challenging with water sources drying up and animals dying in the heat. The farmers are then forced to make the most out of their remaining stock which, as expected is too little to get by on, perpetuating a cycle of poverty. To provide for their families, some take up mining as a new trade despite possessing little to no experience, or travel to South Africa, a neighbouring country, seeking employment.

The UNFCCC Santiago Network for Loss and Damage has collated the technical assistance needs of Zimbabwe.[12] They range from needs related to tropical cyclones and increasing temperatures. There is a strong need for temperature forecasting and modelling equipment, as well as climate change information centres and capacity building.

To address the problems resulting from the drought, innovative farming techniques have been adopted, including the increase of farming drought-resistant crops, water harvesting and mulching. However, Javangwe claims these interventions 'do not match the magnitude of the problem'. Government support is described as limited and inconsistent. With farmers seeking information, insurance for their crops, and better irrigation systems, long-term strengthening of institutional capacities is essential.

The government of Zimbabwe would need to seek funding from the FLD in order to meet these growing demands. However, one of the challenges noted is that the fund suffers from an undefined donor base and inconsistent contributors. A fair and equitable matrix for carrying out contributions is yet to be established so the fund remains operational.[13] Further, assistance from the WIM Expert Group on Action and Support, the Taskforce on Displacement to address human mobility, as well as the Technical Expert Group on Comprehensive Risk Management could step in to enhance knowledge, coordination and technical support in tackling drought.

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[10] Hillary Ugiyo et al, 'El Niño's Effects on Southern African Agriculture in 2023/24 and Anticipatory Action Strategies to Reduce the Impacts in Zimbabwe' (2023) 14(11) Atmosphere 1692 https://doi.org/10.3390/atmos14111692

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The Untold Story of Sangli Flood

By Mayuri Madhukar Jadhav from India

Sangli is a district place of Maharashtra state located in the Western Ghats of India. It is located on the banks of the river Krishna. Krishna is the main river of Sangli. The community of Sangli primarily relies on farming, with sugarcane as the main crop, and irrigation is dependent on the river Krishna. Sangli has been facing floods year by year, with the most severe ones in 2019 and 2021.

In 2019, over 600 villages on the banks of the river, including Sangli's Bhilavadi, Ankalkhop, Brahmanal, Karnal and Nandre-Vasgade villages, were completely submerged. It was the month of July 2019, and all the people were happy because it was raining but their happiness didn’t last nine days. Sangli was flooded by heavy rainfall, 758 mm within nine days, as recorded, and the river Krishna was overflowing. The villages situated on the banks of the Krishna River, including Sangli, were affected. The highest water level of the Krishna River was recorded, 57 feet and half of the Sangli was submerged.

In 2021, 11 villages were completely underwater, and 83 were partially underwater. Nearly 1.66 lakh hectares of agricultural land were affected by this flood situation, and thousands of people were also affected by the rainfall. There was a huge loss of everything, including economic loss, agricultural loss, human and animal loss, etc.

But 2019 was the worst of them all, and we Sanglikars cannot forget that flood. Everything was worse as it cut almost 50 villages' transport and communication. 50,000 people were rescued, and there was huge loss and damage to property and agricultural land. It took 2-3 months to normalize everything. The damage was in Crore. We cannot afford that loss and damage.

True, it’s the effect of climate change, but we humans are also responsible for that. Poor drainage systems and deforestation are also the reasons behind floods. In ancient days, banks were full of trees, but nowadays, because of urbanization, they cut trees on the banks of the river, and we can see the infrastructure or other things on the banks, which leads to flooding. Trees can reduce floods, but there are only a few left on the banks of rivers. The fear of floods is too dangerous, you can ask the people who are affected by the flood.

To stop this, the only solution is the application of nature-based solutions in flood-affected areas. We have to focus on the implementation of a good drainage system, river management, early warning system, relief, and rehabilitation. It contains tree plantation drives on river banks. Stop urbanization on the banks of the river. Create awareness of floods and the reasons behind floods.

The application of nature-based solutions is the only solution for this flood situation. We need to implement this solution as early as possible so that next year this won’t happen again. This is a natural calamity, but we humans are also somewhat responsible for it. Now, it’s our responsibility to do something for Mother Earth and ourselves to prevent flood situations.

Story Review

Jadhav tells the story of Sangli, a district in Maharashtra's Western Ghats, where agriculture; especially sugarcane irrigated by the Krishna River, is the main livelihood. The river floods annually, but the 2019 and 2021 floods were particularly devastating. In 2019, 600 villages were submerged, 50,000 people rescued, and 50 villages were cut off for 2 months. In 2021, 93 villages were affected. Agricultural fields, livestock, and lives were lost. Climate change has intensified monsoon rains, increasing such risks, and despite improved evacuation and relief procedures,[14] Sangli still lacks sufficient knowledge and resources for loss and damage management.[15]

Contributing factors exacerbating these disasters include poor drainage and deforestation. Nature-based solutions like reforestation and riverbank restoration (e.g., tree plantation drives along the Krishna) are suggested by the author as solutions moving forward. Infrastructure improvements such as better drainage, sustainable urban planning, and buffer zones could reduce future impacts. Early warning systems, especially in remote villages, along with disaster management upgrades and community education, are vital. Legislative action is needed to enforce adaptation measures and create district- and state-level climate plans.

India has called for funding based on historical responsibility, emphasizing the need for up-scaled,[16] resilience-focused financial tools. Though India mostly used domestic resources,[17] developed countries under the UNFCCC and Paris Agreement are committed to providing new, additional finance and technology.

While the WIM and the SNLD can support implementation, current risk management practices are neither comprehensive nor widely implemented, leaving gaps in addressing economic and non-economic losses, especially for slow-onset events and post-disaster recovery. Additionally, there is a need for transformative solutions, such as alternative livelihoods, to adapt to extreme conditions which would require funding to property effect. The loss and damage structure within the UNFCCC needs strong governance and institutional support, to broaden its capacity to coordinate resources effectively and assist countries in managing long-term and irreversible climate impacts.[18] To properly address the adverse effects of climate change loss and damage.[19]

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[14] Mayank Bhagwat, 'Maharashtra: How One City Avoided Worst of India Floods' (26 July 2021) BBC News https://www.bbc.com/news/world-asia-india-57969153

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Flooding and Water Scarcity in Indus River Basin in Pakistan: Crisis, Conflict, Cooperation

By Song Yee Ho - Pakistan

Context

With an area of 1137819 km^2, the Indus River Basin (IRB) spans across four countries: Pakistan, India, China and Afghanistan.[20] The main Indus River begins in mountain springs nested in the Tibetan Himalayas and eventually empties into the Arabian Sea near the port city of Karachi.[21] It is joined by five main tributaries: Jhelum, Chenab, Ravi, Beas, and Satluj.[22] Due to its large area and altitude change, IRB's climate exhibits great variability, ranging from arid deserts to humid Mediterranean regions that receive over 1000mm in annual rainfall.[23]

The IRB supports diverse ecosystems, agriculture, and economies, thus being a lifeline for the 237 million people who call it home.[130] Of the four riparian states, Pakistan remains the most dependent on the Indus River and its tributaries. 61% of the basin's total population are Pakistani and contains the planet's contiguous irrigation system.[24]

However, climate change has introduced greater unpredictability to the river's flow, exacerbating the crippling floods and water scarcity that already plague the region due to water mismanagement.

Loss of Quality of Life

Despite historically producing just 0.3% of world's emissions,[25] Pakistan will face increasingly intense floods, water scarcity and heat stress, resulting in displacement, the loss of lives and livelihoods.

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Floods

Extreme weather conditions made increasingly likely by climate change have resulted in severe floods that are likely to recur. A case in point is the massive flooding in Pakistan's southern provinces of Balochistan, Sindh, and Khyber Pakhtunkhwa in August 2022.

The immediate causes of the flood include increased glacial melt and extreme rainfall beyond 350% the mean level of precipitation normally received in July to August in the past 20 years.[26] In addition, a prenaturally severe heat wave from March to May 2022 (breaching 51°C in May),[27] whose probability has increased by 30 times due to climate change, exacerbated monsoonal low-pressure systems.[28]

The flood killed at least 1739 people, displaced 7.9 million and could push another 9 million into poverty.[29] In addition, women were hit especially hard, as weaker access to training in survival skills like swimming and navigation, along with reduced availability of contraception and increased gender violence, rendered them more vulnerable.[30] Furthermore, 9.4 million acres of agricultural land was flooded, 1.2 million livestock was lost,[31] and 2.1 million homes sustained damage. The economic losses total over US$16 billion.[32] If global temperatures rise by 2°C above the pre-industrial average in the future, the population exposed to precipitation extremities such as this will increase by 122.7%.[33]

Water Scarcity

While climate change may temporarily increase water availability due to increased ice melt,[34] the eventual depletion of the Himalayan glaciers that feed the Indus could reduce river flows by 30 to 40% by the end of the century.[35] This will intensify Pakistan's existing water supply crisis. Water supplies are already strained due to projected population growth,[36] inefficiency in water use, and government mismanagement of the water supply,[37] causing the IRB to be rated the world's second most stressed aquifer.[38] This trend is alarming because the IRB provides 90% of Pakistan's farming industry with water, and is responsible for 70% of the country's GDP.[39]

Compounding Risk

Increased flood risk and water scarcity come at a time when the government is least able to respond due to domestic political instability. Former Prime Minister Imran Khan was ousted in 2023, triggering mass demonstrations,[40] while allegations of voter fraud have introduced further instability.[41] Moreover, water scarcity will likely further divide Pakistan along provincial lines, as downstream provinces like Sindh rebuke upstream provinces like Punjab for damming up rivers to store more water for themselves.

Additionally, decreasing water availability has already provoked geopolitical tensions with India. Under the auspices of the World

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Bank, the two riparian countries signed the Indus Water Treaty (IWT) in 1960 to share the Indus' water resources.[42] Pakistan was to control the Indus, as well as the Jhelum and Chenab tributaries, while India was given the Ravi, Beas and Sutlej Rivers.[43]However, India started damming rivers allocated to Pakistan and threatened to obstruct river flow.[44] PM Narendra Modi has also threatened to unilaterally end the IWT, which Pakistan would deem an act of war.[45] As such, water conflicts arising from climate change could further destabilise relations between the two nuclear-armed states, raising the spectre of costly armed conflict.

Coping Measures

In partnership with the World Bank, the provincial government in Sindh spent PKR 5.7 billion to repair flood control infrastructure (e.g. drains, bunds) damaged during the August 2022 deluge, which quickly drained remaining floodwaters and restored economic activity.[46]

More broadly, the government has been constructing more dams to mitigate floods and water scarcity, though many academics allege that they actually make floods worse.[47] Others have highlighted that dams deprived downstream indigenous communities of water,[48] and called for nature-based solutions (NBS) like establishing inundation zones that recognize the natural ebb and flow of the Indus, instead of trying to artificially control its flow.[49]

Support Needed

Floods: Funding and technical expertise is needed to support more nature-based solutions like Pakistan's Ten Billion Tree Tsunami tree planting program,[50] as well as inundation zones.

The International Red Cross has also recommended investments in early warning systems that alert residents in the event of a flood.[51] Third-party mediation could open the door to India and Pakistan collaborating to enhance early warning systems by sharing information.

Water Scarcity: Investments, aid and reskilling is needed for farmers to transition away from water-intensive crops like cotton, so as to reduce agriculture's astronomical demand for water, which constitutes 95% of Pakistan's water consumption.[52]

Capacity building in Pakistan's water governance is also critical to reducing water scarcity and conflict. There has been a lack of transparent and reliable data collection on river flow, resulting in the Punjab and Sindh provinces accusing each other of falsifying river flow data.[53] In addition, Pakistan's National Water Policy (NWP) 2018 called for water pricing to reduce wastage, but did not specify how it would be operationalized. In addition, it was

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found that different policy actors had conflicting narratives about the causes of water scarcity and their corresponding solution.Clearly, the government's ability to collect data, price water and inspire consensus on their approach to water governance needs to be improved.

Lessons Learned

Flood-related loss and damage poses greater dangers for the lives and safety of women.

Loss and damage do not occur in a vacuum but rather within a larger context of political economy and geopolitics. Economic reliance on water-intensive crops increases a country's vulnerability to climate change-induced water scarcity. Decreasing water availability in a transboundary basin could also inflame already tense relations between riparian countries.

Hard engineering methods like dams are not always the solution to water-related loss and damage, and can often be counterproductive. Policymakers should pay greater attention to supporting nature-based solutions.

The downsides of damming as a response to loss and damage may be disproportionately borne by indigenous communities who are neglected in the policy-making calculus.

Technical assistance and capacity building is often an integral part of any loss and damage program for developing countries.

Synopsis

The Indus River Basin (IRB) spans Pakistan, India, China, and Afghanistan, with Pakistan being highly dependent on the river for agriculture and its economy. Climate change exacerbates flooding and water scarcity in the region, causing significant loss of life, displacement, and economic damage, as seen in the devastating floods of August 2022. These environmental challenges are compounded by political instability and mismanagement, leading to internal and cross-border water conflicts, especially with India. Current coping measures include infrastructure repairs and dam construction, though experts argue that nature-based solutions and improved water governance are more sustainable. International support and investment are needed to implement these solutions and enhance cooperation among the riparian countries.

Case Study Review

The Indus River Basin (IRB), one of the world's largest contiguous irrigation systems, faces a dual crisis of severe flooding and water scarcity impacting millions of Pakistanis.[54] The challenges presented by climate change in the IRB—widespread displacement, economic loss, conflict, and strained bilateral relations with India—demand a comprehensive and collaborative approach.

The Warsaw International Mechanism (WIM), as the core structure for managing loss and damage, can mobilize its expert group on non-economic losses to promote the computing and accounting of non-economic losses in reviewing climate change impacts.[55] This would ensure that this group of losses is factored into national and global economic decision-making processes. Further, the Technical Expert Group on comprehensive risk management can provide trainings and guidelines with applications on Pakistan's climate resilience. The expert group on action and support may assist in the compilation and dissemination of resources on averting loss and damage.[56] Furthermore, as the author has pointed out, the melting of the Himalayan glaciers is a cause for great concern when considering water scarcity. The rolling plan of action of the WIM expert group on slow onset events highlights the creation of a technical guide on glacial retreat.[57] The application of such a guide in this context would benefit the entire region reliant on the river as a water source.

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[56] Irfan Ashraf and others, 'Community Perspectives to Improve Flood Management and Socio-Economic Impacts of Floods at Central Indus River, Pakistan' (2023) 92 International Journal of Disaster Risk Reduction 103718 https://doi.org/10.1016/j.ijdrr.2023.103718
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Designed to assist vulnerable countries with the technical support they need, the Santiago Network could play a central role in securing expertise and technology for sustainable water and flood management in the IRB. Through collaborations with organizations specializing in water governance, and nature-based solutions, SNLD could support Pakistan's efforts to restructure water use, improve data collection, and implement non-structural flood defences like inundation zones and reforestation programs, which as stated by the author, are seen as more beneficial than dams.

Similarly, the FLD recently introduced to provide financial support directly to vulnerable countries, may assist Pakistan in meeting immediate recovery needs while strengthening resistance. By prioritizing funding for projects in high-risk areas like the IRB, this fund could be directed toward rebuilding flood-damaged infrastructure, supporting nature-based solutions, and aiding farmers in transitioning to crops that are less water intensive. Additionally, it could assist local governments in implementing Pakistan's National Water Policy, particularly in developing the water pricing mechanism with accurate data collection done on the same.

Given the IRB's transboundary nature, international support could be extended to foster data-sharing agreements and early warning systems, which would improve regional preparedness for extreme weather events and reduce geopolitical tensions. By supporting a multilateral approach, these international mechanisms can create a safer, more resilient environment for communities in the IRB, enabling sustainable responses to loss and damage that extend beyond national borders.

In summary, by leveraging the resources availed by the UNFCCC structure. Pakistan could build a more resilient framework for coping with climate-induced loss and damage, helping to secure the future for millions dependent on the Indus River Basin.

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