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CYCLONE DITWAH'S LOSS AND DAMAGE: A CASE FOR CLIMATE ACCOUNTABILITY

Introduction

This issue brief documents and analyzes the range of impacts caused by Cyclone Ditwah, situating the event within the broader context of climate change induced extreme weather events. Scientific evidence shows that rising sea surface temperatures and shifting weather patterns intensify cyclones and extreme rainfall in the region. Cyclone Ditwah reflects this trend, underscoring how climate change is no longer a future risk but a present reality for communities in Sri Lanka.

Beyond visible infrastructure and economic damage, Cyclone Ditwah resulted in significant socio-environmental Loss and Damage (L&D) that remain largely unrecognized in formal recovery and compensation mechanisms. These include loss of life, psychological trauma, disruption of education, erosion of cultural practices, and damage to ecosystems such as forests, agricultural land, and biodiversity. By incorporating community testimonies, GIS map information and documentation findings, this brief centers lived experiences and highlights both vulnerability and resilience, including the role of community leaders and local heroes in emergency response and recovery.

Ultimately, the document aims to inform policy and advocacy by providing evidence-based insights into the gaps of disaster response, recovery, and climate risk governance. It calls for stronger integration of Loss and Damage considerations into national planning, improved protection for vulnerable communities, and greater investment in climate-resilient development and ecosystem restoration. By translating community realities into actionable recommendations, the initiative seeks to contribute to a more just, inclusive, and forward-looking climate and disaster governance in Sri Lanka.

Further, it contributes to the global narrative on climate accountability by demonstrating how communities in Sri Lanka are bearing the costs of a crisis they did not create.

Cyclone Ditwah exemplifies the growing injustice at the heart of climate change, where those least responsible for greenhouse gas emissions suffer the most severe losses and damages. By documenting both economic and non-economic losses, this brief strengthens the case for the **Polluters Pay Principle,** calling on fossil fuel corporations and major emitting countries to take responsibility for the harm caused by their actions. It supports Greenpeace's demand for accountability, adequate Loss and Damage finance, and systemic change that prioritizes people, ecosystems, and justice over profit.

Overview of Ditwah's impact

Cyclone Ditwah made landfall on 28 November 2025 in Sri Lanka, bringing record-breaking rainfall, widespread flooding, and deadly landslides across the island. The system lingered over the country for several days, producing extreme precipitation that inundated entire districts, cut off infrastructures, and triggered catastrophic slope failures in central highlands and river basins. Nearly every district has experienced severe impacts, with millions affected. Cyclone Ditwah was a severe low-pressure weather system that caused widespread damage primarily through prolonged and intense rainfall rather than strong winds. Unlike typical cyclones that impact coastal areas, Ditwah's most severe effects were inland, particularly in the Central Highlands, where heavy rainfall combined with mountainous terrain triggered landslides, flash floods, and slope failures.

A key distinguishing feature of Ditwah was its slow-moving and persistent nature, which led to soil saturation and compounded risks over several days. The event demonstrated a high efficiency in triggering landslides, even in areas not previously classified as high-risk. Ditwah reflects emerging climate change-driven disaster patterns, where rainfall intensity and compound hazards outweigh wind impacts, highlighting critical gaps in early warning systems, disaster classification, and climate adaptation planning, especially for vulnerable communities.

Human Impact

- The disaster has caused one of the highest death tolls in recent history, with over 650 confirmed fatalities and 173 still missing, as recovery operations continue.
- More than 2.3 million people have been affected by flooding, displacement, loss of homes, and disruption of basic services.
- Beyond property damage, communities face psychological distress, erosion of livelihoods, loss of dignity, and uncertainty, particularly among women, children, older persons, and people with disabilities.
- Children and vulnerable populations face heightened risks of disease, trauma, and interrupted education. United Nations Children's Fund (UNICEF) reports hundreds of thousands of children urgently requiring assistance.

Food and housing insecurity:

- **12.8% of agricultural households** face moderate to severe food insecurity. Diet quality remains poor, especially for children, pregnant and breastfeeding women, with limited access to protein, fruits, and vegetables.
- Nearly 170,000 people are displaced or staying with host families, and about 7,100 people were distributed in 96 safety centres and camps, according to the United Nation (UN) situation report.

Ongoing Needs and Response

- National authorities, armed forces, and international partners were engaged in search, rescue, and relief operations. Neighboring states have provided engineering support and humanitarian aid.
- Yet, urgent needs still include shelter, clean water, healthcare, food, psychosocial support, and long-term resilience investments.
- Schools and healthcare facilities have been disrupted, exacerbating vulnerabilities in affected communities.

Economic, Infrastructure, and Livelihood Losses

- Critical infrastructure including roads, bridges, rail lines, and utilities were heavily damaged, impeding relief logistics and recovery.
- 114,000 houses were partially or fully damaged, including nearly 6,000 homes completely destroyed
- 30% of agricultural households experienced crop damage; average paddy production declined by 12%. 53% of vegetable producers, 34% of other field crop producers, 37% of cattle farmers, and 63% of poultry producers reported losses, largely due to flooding and post-disaster disease outbreaks. 28% of fishing households reported damage to boats or fisheries infrastructure.
- Global Rapid Post-Disaster Damage Estimation (GRADE) report by the World Bank Group indicates that the event caused around US$4.1 billions of damage affecting homes, agriculture, and essential infrastructure.

Government Response

A state of emergency was declared to enable national reactions and resource mobilization in districts that were badly impacted.

National Government Immediate Response & Relief Coordination, in collaboration with the country's armed forces, civil authorities, and Sri Lanka's Disaster Management Centre (DMC) mobilized across districts to coordinate search and rescue operations, relief distribution, as well as to conduct impact assessments following Cyclone Ditwah's landfall.

The government established a Humanitarian Priorities Plan (HPP) with UN partners in order to coordinate international support with domestic efforts for life-saving relief (food, shelter, sanitation, health, and protection) in particular for the most vulnerable households.

Local government units and provincial councils were instructed to help with post-disaster management, which includes sickness prevention, debris removal to mitigate secondary dangers, and the restoration of basic services (water, sanitation, healthcare).

The "**Rebuilding Sri Lanka**" initiative was launched by the government to aid in the rebuilding of homes and the restoration of livelihoods. Institutions and citizens are encouraged to donate money or land to assist in rebuild homes for displaced households. With over Rs. 3.4 billion in contributions from both domestic and foreign sources, the Rebuilding Sri Lanka Fund has already gathered significant funds for recovery and reconstruction. In order to reduce financial loss, support small business, and boost local economic activity, more extensive financial relief measures were announced for firms affected by the hurricane, including one-time awards and credit support programs.

The operation Sagar Bandhu: India initiated one of the biggest humanitarian relief operations in the region, involving search and rescue, emergency supply delivery, medical assistance, engineering support, and task forces helping with logistics and infrastructure repairs. Sri Lanka has also received humanitarian aid supplies from a number of partner states, including China and Pakistan. Besides, technical help in infrastructure assessment, recovery planning, and capacity building for future disaster response are being improved through a Memorandum of Understanding with the Montana National Guard (USA).

In its international climate policy submissions, Sri Lanka made commitments on loss and damage as well as climate adaptation. These commitments include enhancing forecasting, creating mechanisms in line with the Warsaw International Mechanism, and investigating insurance plans for losses brought on by climate change (agriculture, infrastructure, livelihoods). Recent evaluations, however, point out that budgetary frameworks lack specific, structural allocations for climate resilience and catastrophe preparedness, with emergency and reconstruction expenses being primarily funded by reallocated budget lines rather than disaster risk financing tools.

In spite of the scale of mobilization, policy debates and outside evaluations highlight a number of structural issues with government disaster management, especially at preparedness & early warning system levels: The unprecedented nature of Ditwah put a pressure on official procedures, exposing weaknesses in proactive evacuation measures and early warning distribution. The lack of a formalized budget for disaster risk underscores the necessity of stable funding sources for climate adaptation and resilience in national planning. Although there are formal commitments for loss and damage, they have not yet been translated into operational frameworks like insurance or risk-pooling programs for communities.

Climate and Accountability

The disaster in Sri Lanka reflects broader shifts in climate risk profiles: warmer oceans and a moisture-laden atmosphere not only increase rainfall intensity but also lengthen the duration of extreme events, elevating flood hazards and landslide potential. These changes undermine long-standing assumptions about storm behavior and exceed historical norms of seasonal variations.
Scientific evidence clearly shows that cyclonic storm Ditwah was amplified by human-driven climate change, with profound implications for climate risk profiles, vulnerability, and global accountability.

A recent analysis by the World Weather Attribution consortium found that the extreme five-day rainfall events in Sri Lanka associated with Cyclone Ditwah were 28 to 160 % more intense than they would have been in the absence of human-induced warming of approximately 1.3 ºC above pre-industrial levels. Higher sea surface temperatures in the North Indian Ocean, about 0.2 ºC above the 1991- 2020 average, provided additional heat and moisture that supercharged rainfall totals and flood risk.

The Clausius-Clapeyron relationship, a well-established physical law, explains that the atmosphere can hold about 7 % more moisture per degree of warming, increasing the potential for heavier and more prolonged precipitation during storms.

The Intergovernmental Panel on Climate Change (IPCC) concludes that extreme precipitation events are becoming more frequent and intense as global temperatures rise, and that many recent extremes would have been significantly less likely without human influence on the climate system.
While natural variability including La Niña and Indian Ocean Dipole conditions contributed to this year's rainfall patterns, observational trends and high-resolution climate data show clear increases in rainfall extremes over time, supporting the conclusion that climate change is a dominant driver of the unprecedented rainfall tied to Ditwah.

In the meantime, the geopolitical and ethical dimensions of responsibility are stark:

Wealthier industrialized nations have driven the accumulation of greenhouse gases in the atmosphere over the past century. Analyses show that a relatively small group of developed nations is responsible for a disproportionately large share of historical Carbon dioxide (CO2) emissions (for example, 23 developed countries account for about half of all historical emissions). Because cumulative emissions are the main driver of global warming rather than current emissions alone, industrialized economies bear a disproportionate responsibility for creating the climate conditions that intensify storms like Ditwah.

Sri Lanka and many other vulnerable nations have contributed around 0.1% from global total emissions, yet are suffering some of the most severe impacts. This reflects a fundamental inequity: countries least responsible for climate change are disproportionately affected by its worst consequences. Under the principles of climate justice and international climate agreements, those most responsible for greenhouse gas emissions have a commensurate obligation to support adaptation, resilience building, and loss and damage financing for vulnerable populations.

Given such evidences, Cyclone Ditwah should not be framed as an isolated weather event, but rather as part of a scientifically attributable pattern of climate impacts that require accountability from high-emitting nations and urgent support for climate-vulnerable countries.

Loss and Damage

Cyclone Ditwah resulted in extensive Loss and Damage (L&D) across Sri Lanka, encompassing both economic loss and non-economic loss, which one remains largely unrecognised in official assessments and recovery frameworks.

Under the United Nations Framework Convention on Climate Change (UNFCCC), Loss and Damage refers to the harms associated with climate change impacts that cannot be avoided through mitigation or adaptation. These include both economic loss, such as destroyed infrastructure and livelihoods, and non-economic loss and damages (NELD), such as loss of life, mental well-being, cultural heritage, social cohesion, and ecological integrity.

Biodiversity and Ecosystem Loss

Cyclone Ditwah caused extensive environmental damage, including forest degradation, soil erosion, riverbank collapse, and biodiversity loss. Landslides stripped hillsides of vegetation, destabilised watersheds, and altered natural drainage systems, increasing future disaster risk. Sri Lanka is one of the world's 35 biodiversity hotspots, harbouring an extraordinary concentration of species found nowhere else on Earth, with endemism rates among the highest in Asia, particularly for amphibians, reptiles, and flowering plants. The island's cloud forests, draped across the upper montane zones of the central highlands, are especially irreplaceable, functioning as critical water towers that feed major river systems while sheltering rare and endemic flora and fauna adapted to their mist-laden micro-climates. The destruction and degradation of these ecosystems does not merely represent an ecological loss, it severs the ecological foundations upon which millions of people depend for freshwater, agriculture, and climate regulation. The environmental impacts of cyclone Ditwah undermine ecosystem services that are essential for water regulation, food security, and long-term resilience. Yet, they are rarely accounted for in recovery finance.

Human and Social Loss

Cyclone Ditwah triggered one of the highest disaster-related death tolls in recent Sri Lankan history, with hundreds of confirmed fatalities and many still missing. In areas such as Mawathura and Kotmale, entire sections of hillside villages were erased by landslides. Residents report that even a specialised disaster rescue team from the United Arab Emirates, deployed to Sri Lanka with advanced equipment following Ditwah, was unable to recover the bodies of six people buried under unstable terrain.

For affected families, the inability to recover remains has meant the inability to perform final rites, leaving grief unresolved. This represents a profound form of non-economic loss: cultural and psychological harm that cannot be addressed through financial compensation, insurance, or technological intervention.

Displacement has further compounded social and mental harm. Families have spent weeks or months in camps, temples, and schools, often without clear communication about whether their homes are safe to return to. Women bear a disproportionate burden, managing children's care, education, and emotional distress under conditions of overcrowding, loss of privacy, and uncertainty. Children have experienced prolonged school disruption, trauma, and fear triggered by even light rainfall. Elders have lost ancestral land and social roles tied to place and community continuity.

Economic Losses and Livelihood Destruction

Economic loss from Cyclone Ditwah is also severe. Agriculture has been heavily affected, particularly tea smallholdings, rice fields, and spice cultivation in the central highlands. Homes, roads, bridges, and utilities were damaged or destroyed, disrupting access to markets, healthcare, and education.

However, even where economic loss is documented, existing compensation mechanisms have proven to be inadequate. One woman farmer from Nayapana, who had taken a five-lakh rupee bank loan to "develop" her land based on prevailing development narratives, lost her home and all cultivated crops to a landslide. Despite never missing a loan instalment, she received no debt relief when the disaster struck. Her experience illustrates how financial risk is transferred downward to individuals, while systemic drivers of climate vulnerability remain unaddressed.

Loss of Land, Culture, and Identity

In affected highland areas, land is not merely an economic asset but a foundation of identity, memory, and social organisation. Many villages impacted by Cyclone Ditwah have existed since the time of the kings, with generations living, farming, worshipping, and being buried on the same land.

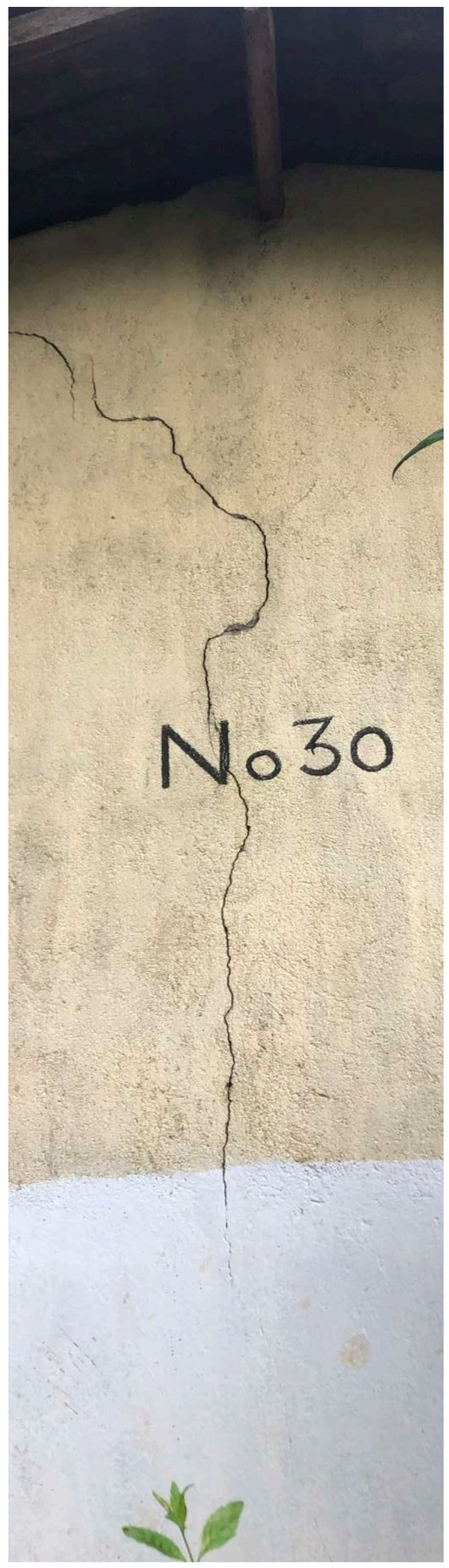
Landslides triggered by prolonged extreme rainfall have severed these ties. Residents report cracks and fractures in land surrounding culturally significant and archaeological sites such as දෙහෙදු කඩුල්ල (Dehadu Kadulla), also known as Kothmale Kadadora. Damage or loss of such sites constitutes non-economic loss through the erosion of shared history, cultural continuity, and collective memory, impacts that are irreversible and unquantifiable.

Gaps in Funding, Accountability, and Response

While the government has undertaken emergency relief, evacuation, and limited compensation measures, current responses focus primarily on short-term humanitarian assistance and infrastructure repair. Public-private partnerships and market-based mechanisms dominate climate finance planning, while Loss and Damage compensation, particularly for non-economic loss, remains marginal. There is no dedicated national mechanism to assess, document, or compensate NELD. Mental health support, education recovery, cultural preservation, and long-term community-led relocation remain underfunded and fragmented. Early warning systems relied on rainfall thresholds that communities could not measure in real time, highlighting a disconnect between policy design and lived realities.

Besides, under the Polluter Pays Principle, those most responsible for greenhouse gas emissions bear an obligation to support Loss and Damage finance. Sri Lanka, contributing less than 0.1% of global emissions, is absorbing disproportionate harm. Yet, Loss and Damage finance remains inadequate, inaccessible, and largely disconnected from the accountability of fossil fuel corporations and high-emitting countries.Cyclone Ditwah demonstrates that Loss and Damage is not an abstract policy concept. It is lived daily through unresolved grief, fractured communities, lost futures, and damaged relationships between people and their environment. Without its explicit recognition of and meaningful accountability for climate drivers, many recovery efforts risk reproducing injustice rather than addressing it.

This underscores the urgent need to integrate comprehensive Loss and Damage frameworks into national planning, secure dedicated and accessible finance, and centre affected communities as rights-holders in decision-making processes.



From Hill Country Homes to Global Boardrooms: Why Polluters Must Pay for Climate Loss and Damage in Sri Lanka

In order to comprehend and record some of the loss and devastation caused by Cyclone Ditwah, a Greenpeace South Asia team and journalists traveled to Kotmale, Ragala, and Walapane on January 7–9.

Cyclone Ditwah did not strike a high-emitting industrial economy. It devastated self-reliant, low-income rural communities in Sri Lanka's Central Highlands, communities that have contributed almost nothing to the climate crisis. Yet, they are now paying the highest price.The impacts documented across Nayaapana, Mawathura, Walapane, Ragala, and surrounding villages demonstrate that Cyclone Ditwah is not only an economic disaster, but a profound case of non-economic loss and damage.

Beyond destroyed houses, crops, and livelihoods, communities are experiencing deep disruptions: mental peace, dignity, cultural continuity, social cohesion, sense of safety, and belonging. Children live in constant fear, unable to attend school during even light rain. Students preparing for life-defining examinations are traumatised, displaced, and mentally exhausted. Parents are forced to choose between safety and education. Elderly people and persons with disabilities face life-threatening evacuation challenges due to lack of infrastructure, electricity, and communication. These impacts are not temporary - they reshape lives, futures, and identities.

Entire villages that were once self-reliant are now fragmented. Social trust is eroding as displacement leads to family strain, insecurity, theft, and prolonged dependence on camps that strip people of privacy and dignity. Cultural and spiritual life is disrupted as temples, schools, and community spaces become evacuation sites rather than places of continuity. The loss of familiar landscapes, biodiversity, and stable land has deeply affected people's psychological relationship with their environment.

These impacts are not accidental. While local mismanagement, unplanned construction, loss of vegetation, degraded soils, and blocked waterways have amplified risk, the scale and intensity of rainfall that triggered these landslides reflect a changing climate system which is overwhelmingly driven by global fossil fuel emissions. Communities in Sri Lanka - who have contributed negligibly to global greenhouse gas emissions are paying with their lives, futures, and social fabric.This is the essence of climate injustice: those least responsible bear the heaviest burdens. Short-term relief payments, temporary camps, and relocation without consent or cultural consideration fail to address this injustice. They also shift responsibility onto affected communities rather than those who caused the crisis.

Residents in Kotmale and Walapane repeatedly stated that "We experienced 14 to 15 days of continuous rain when we were young. Nothing like this ever happened."

The difference today is climate-altered rainfall intensity, driven primarily by global greenhouse gas emissions from fossil fuel extraction, production, transport and consumption, largely by corporations and countries far removed from these villages.

In Nayapanna Village, on the night of 27th November, rain intensified and around 3:00 a.m. on 28th, landslides began tearing through upper slopes. Within 30 minutes, entire houses were destroyed:"We realised something was wrong. We had a few minutes. Then everything was gone. Our home, our belongings, everything," says Danashili Manike, Mother from Nayapana Village
Electricity failed. Phone signals disappeared. Roads collapsed. Families with elderly members and people with disabilities were left with no viable evacuation pathway.Government advisories instructed residents to evacuate if rainfall reached 75-100 mm, but villagers wondered: "How are we supposed to measure rainfall at 2 a.m. with no power, no signal, and no equipment?"
This gap between policy and reality turned early warnings into unusable instructions, placing lives at risk.

Danashili Manike's Family Pushed to Ground Zero

Behind one collapsed house lived a family of four: A father with a spinal injury, paralysed below the hip, a mother as the sole income earner, and their daughter preparing for her A/L examinations while their son serves in the army.They escaped with only a few important documents and a few schoolbooks. "We could not even take our clothes. The entire house is submerged to the ground," says Nimesha Sewandi, 19-years old.

The government provided LKR 25,000 as rental assistance, which is insufficient for long-term displacement, medical needs, and lost livelihoods. Nimesha, who had carefully prepared study timetables for her final exams, said: "After what happened, nothing feels certain anymore. I removed all my charts while crying."

This is climate loss and damage in human terms: educational futures jeopardized, mental health fractured, dignity stripped away, insecurity and loss of social life.

Community Solidarity vs Systemic Failure

While climate-driven rainfall triggered the disaster, human decisions amplified its impact. Villagers from Mawathura Nuwaraeliya highlighted that unplanned estate housing and sanitation systems have weakened slopes, removal of traditional tea cultivation as well as pesticides and weedicides degraded soil stability, roads blocked natural drainage paths, concrete infrastructure accelerated runoff, large-scale industrial farming on hilltops added pressure, while new constructions were allowed in known landslide zones. This reflects a pattern seen across climate-impacted regions: when climate extremes meet poor governance, disasters multiply.

When formal systems failed, villagers organised rescues, youth groups coordinated emergency support, temples and schools became relief centres, families shared food, clothing, and shelter. Yet even this solidarity had limits, since isolation, hunger, and fear persisted long after headlines faded."Support came only to houses that were visibly damaged. Those of us trapped at home were forgotten," says Ms. Chandrika Damayanthi

Children Carrying the Climate Burden

Kotmale Nayaapana School serves 640 students. According to Principal, Mr. K M K G Upali Hennayeke, one teacher died in the disaster, multiple schoolchildren families lost their home, and even light rain now keeps children from attending school. Fear has become the new normal. Most of the villagers able to leave have moved to cities, which affects the school and culture of the whole village. "Even with the small rain, many students do not come to school. Fear is a daily reality here now," says Mr Upali, Principal of Kotmale Nayaapana School.

A generation that did not cause the climate crisis now carryies a psychological and educational burden that could affect the country economically, culturally and socially in the long run.

Who Should Pay?

Sri Lanka contributes less than 0.1% to global CO2 emissions17, yet communities like Nayaapana are suffering irreversible, economic and non-economical losses, meanwhile major fossil fuel corporations continue to profit and high-emitting countries delay meaningful climate finance. One disaster after the other, Loss and Damage mechanisms remain underfunded and inaccessible.

Scientific analyses indicate that global warming intensifies tropical storms and extreme rainfall events, even when those storms are not classified as high-category wind events. Atmospheric moisture saturation from heated oceans means that cyclones can carry vastly more rain, increasing the probability of severe flooding and landslides.

Under international climate science frameworks, such impacts are recognised as part of loss and damage caused by climate change, which includes:

- ***Sudden-onset events: cyclones, floods, landslides.***
- ***Economic losses: destroyed infrastructure, lost livelihoods, housing losses.***
- ***Non-economic losses: psychological trauma, loss of cultural heritage, human displacement.***

The Polluters Pay Principle (PPP) states that entities responsible for pollution should bear the costs of managing it and compensate affected communities. In climate discourse, this means:

- ***Fossil fuel corporations and high-emitting countries should contribute financially to loss and damage funds.***
- ***Compensation should reflect historical responsibility for greenhouse gas emissions that have driven the warming trends underlying events like Cyclone Ditwah.***
- ***Loss and damage should be understood as compensation for irreversible harm, not charity.***

Under the United Nations Framework Convention on Climate Change (UNFCCC), loss and damage includes harm from climate events and slow-onset processes. The Polluters Pay Principle discussions have been central to long-standing negotiations on climate liability and reparations.

In this context, Sri Lanka's former President and climate advocates have argued that developing countries impacted by global emissions deserve compensation from industrialised nations and/or fossil fuel corporations – a stance consistent with the Polluters Pay Principle. Beyond moral legitimacy, a study published on Nature economic analyses suggest that the five top fossil fuel companies' Saudi Arabia, Russia, US, British historical emissions will contribute to global heat related loss, supporting arguments that polluters must help finance climate adaptation, mitigation, and loss & damage.

What Justice Requires

For communities like Kotmale, climate justice means legal accountability for corporations driving the climate crisis, polluters contributing based on historical responsibility, dedicated Loss and Damage finance reaching affected people, long-term relocation and safety planning, mental health and education recovery support, and governance reforms that mitigates risk reproduction.
From Nayapana village, a mother of two kids, said:"We are not asking for sympathy. We are asking for certainty and safety for our children."

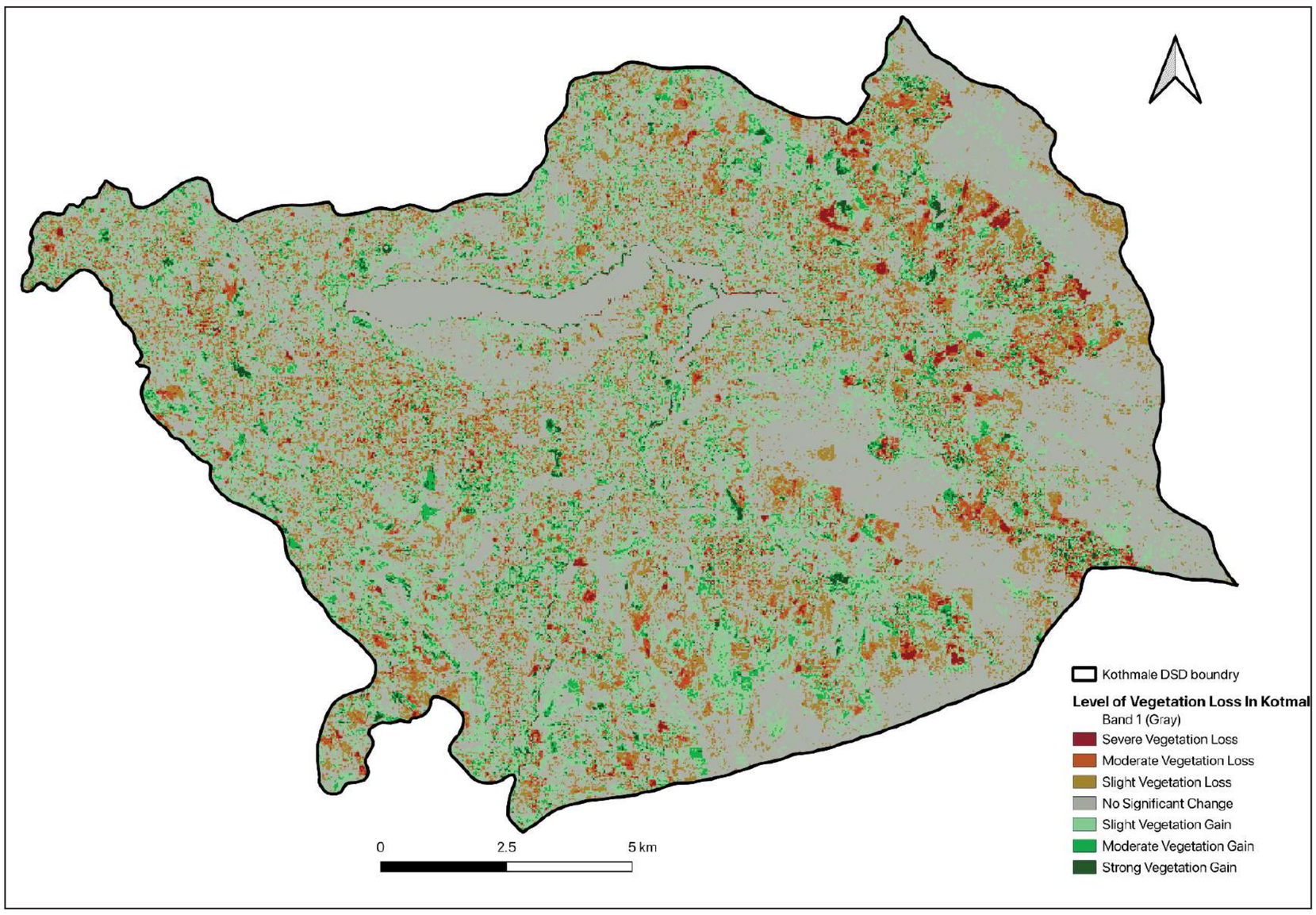
Cyclone Ditwah is not an exception. It is a preview. Without global accountability, climate-vulnerable countries will continue to absorb damages caused by reckless profit-driven policies elsewhere. Each landslide, each lost home, each traumatised child strengthens the moral and legal case for making polluters pay.

Research Findings

7.1 Loss of Vegetation and the Advent of New Water Bodies: Relevance to the Ditwah Disaster

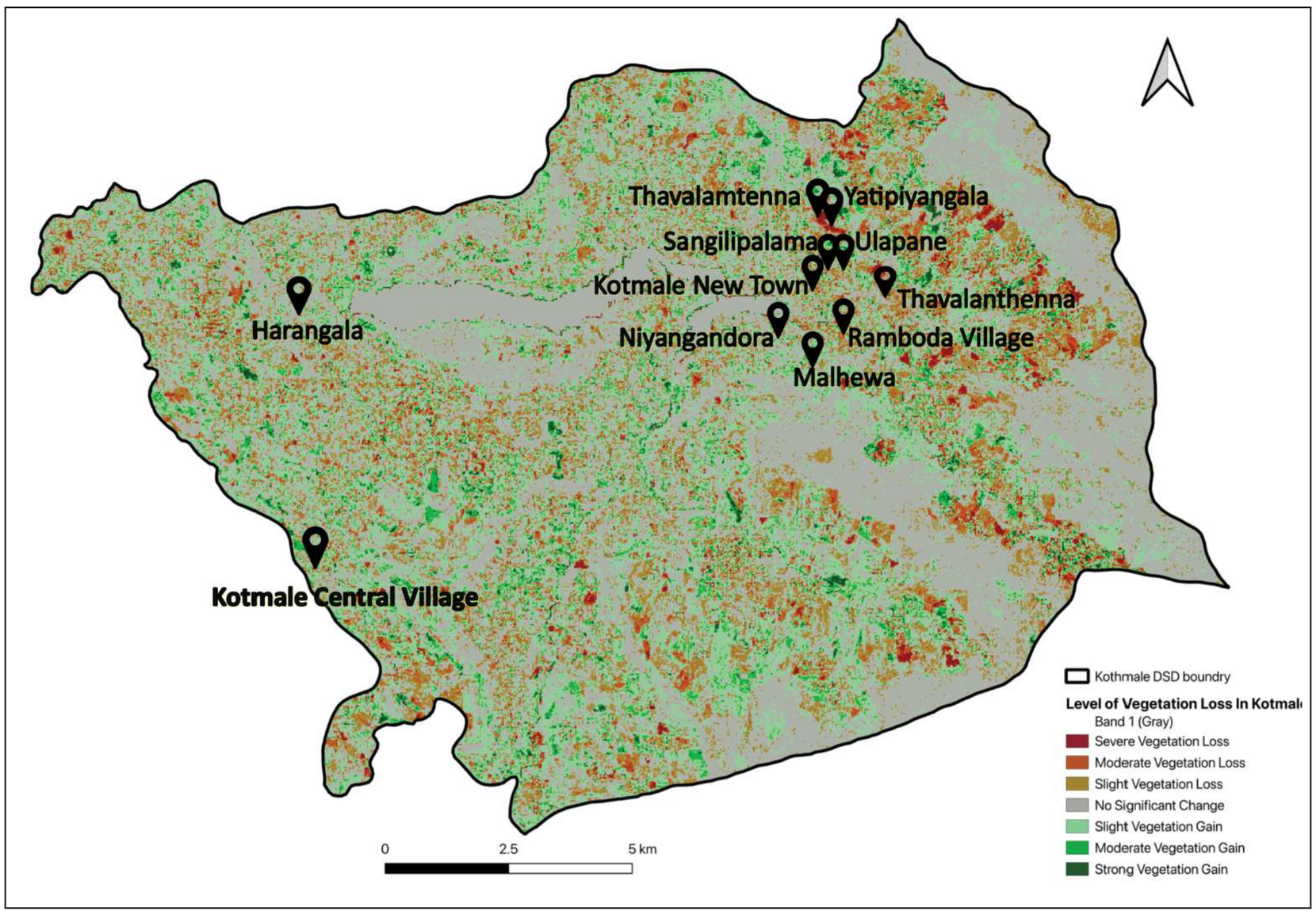
Spatial analysis based on Geographical Information Systems (GIS) indicates an obvious connection between increased loss of vegetation, surface water accumulation, and greater disaster risk in the affected areas, particularly in Kotmale. Satellite monitoring of land use changes, alteration of slopes and infrastructure construction shows an obvious decline in plant life and distribution over time.

Vegetation performs an essential function on the slopes. Deforestation decreases the binding root system and soil structure, resulting in the reduction of water infiltration and soil retention capacity. As a consequence, rainfall flows on the surface and generates uncontrolled erosion.



Map 01:- Vegetation Cover change from 2016-2025 in Kotmale, Sri Lanka (Before Ditwah)

Satellite data analyses indicate a very high spatial correlation between the loss of vegetation cover and hillside disasters. By applying high resolution Sentinel-2 L2 satellite imagery, vegetation cover conditions were measured both prior to, and after the Ditwah landslide events, using the Normalized Difference Vegetation Index (NDVI). Based on the NDVI Difference map, measuring changes in vegetation cover from 2016 to 2025, there is a high level of vegetation loss in the eastern part of the Kothmale Divisional Secretariat Division, which is also the region with the highest landslide red alerts.



Map 02:- Severely affected Grama Niladasri Divisions during Ditwah Disaster and the level of vegetation loss in particular villages

Table 01:- The locations and level of vegetation loss in a selection of severely affected villages in Kotmale Divisional Secretariat, Sri Lanka

Name of village	Latitude (°N)	Longitude (°E)	Level of Vegetation Loss (2016-2025)
Kotmale (central village)	7.0142	80.5897	Moderate Vegetation Loss
Sangilipalama (Kotmale DS office area)	7.06464	80.68456	Moderate vegetation loss
Kotmale New Town	7.061	80.681	Slight-Moderate Vegetation Loss
Thawalanthenna	7.062	80.692	Moderate Vegetation Loss
Tavalamtenne	7.076	80.684	Severe Vegetation Loss
Malhewa	7.05	80.68	Slight Vegetation Gain
Ramboda (village)	7.058	80.686	Moderate Vegetation Loss
Niyangandora / Niyamgamdora	7.055	80.675	Moderate Vegetation Loss
Harangala	7.06	80.59	Slight Vegetation Loss
Ulapane	7.065	80.685	Moderate vegetation loss
Yatipiyangala	7.075	80.685	Severe Vegetation loss

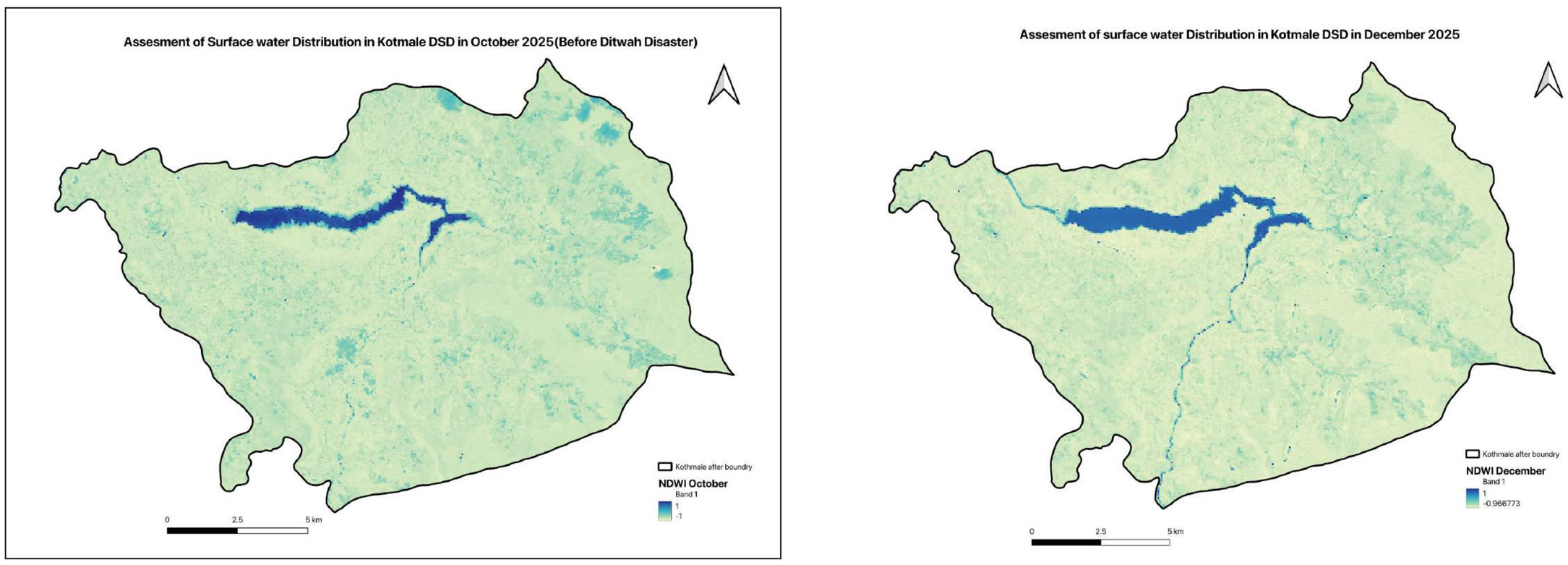
The humanitarian consequences wrought by Cyclone Ditwah are considerable. Flash updates provided by the United Nations and government authorities later confirmed hundreds of thousands displaced, homes and critical infrastructure destroyed and basic services affected by slope instability and rain.

The concentrated pattern of vegetation decline in the Kothmale Eastern hill ranges and in the river basin draws attention to the consequences of environmental changes in terms of disaster aggravation. There were much less occurences of landslides in areas of highest vegetation levels, whereas the places cleared of vegetation reported the biggest numbers of of catastrophic landslides.

These results hold significant lessons for disaster risk reduction in Sri Lanka. While some of the direct solutions may come from early warning systems, drainage and embankments, the critical benefits of healthy ecosystems and vegetation cannot be undermined. Programs such as re-vegetation and adequate, enforced land use management policies are critical to improve the resilience of the land, especially in sensitive highlands such as Kothmale. As the country recovers from Cyclone Ditwah, focussing on future disaster preparedness and the restoration of the environment could greatly mitigate the economic and human cost of the next extreme weather events.

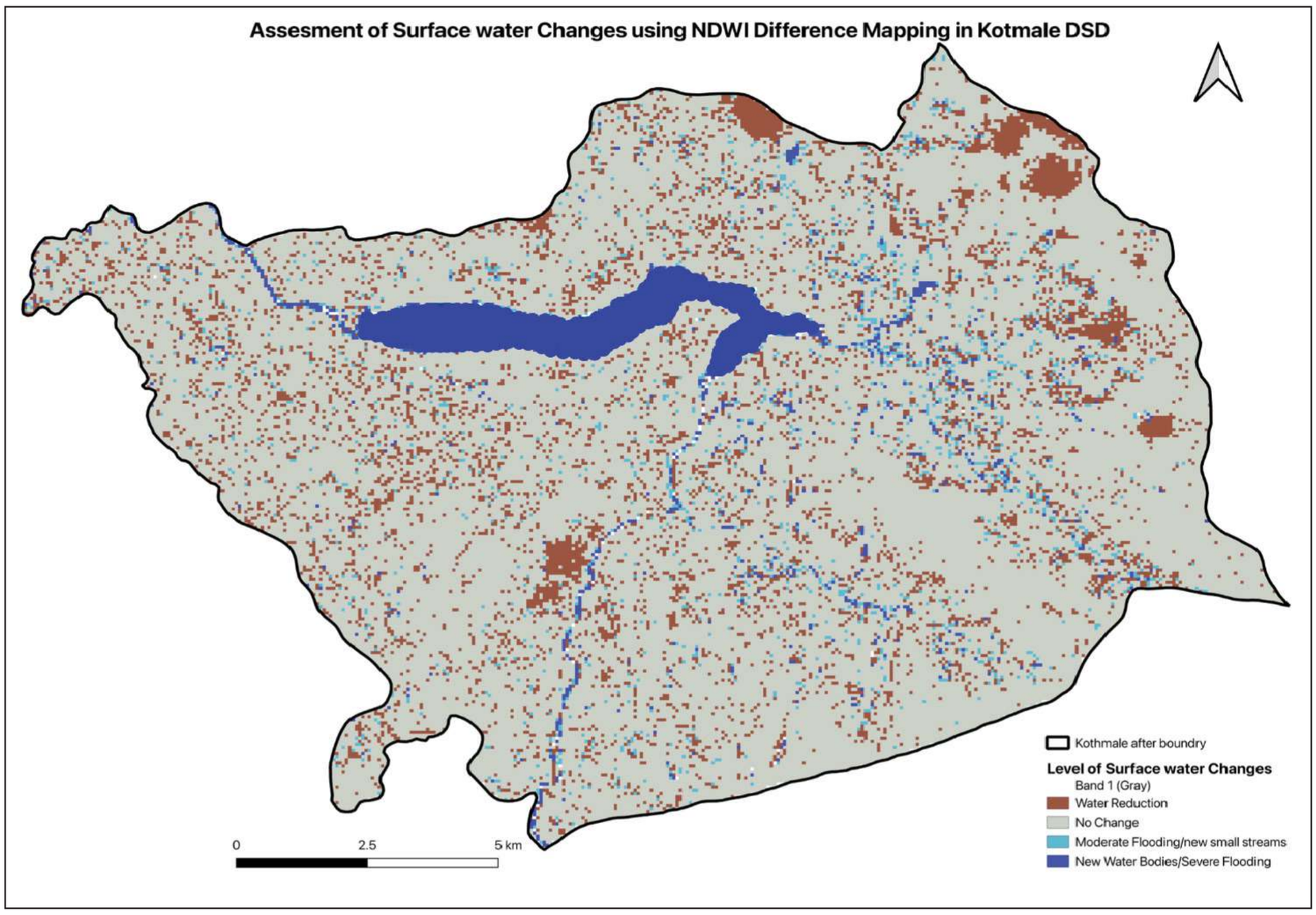
7.2 GIS-Based Water Body Maps show the creation and growth of temporary and permanent water structures within Kotmale Divisional Secretariat Division (DSD), Sri Lanka

Normalized Difference Water Index (NDWI) is a remote sensing index that enhances the identification of open water features, by comparing green and near infrared spectral bands. By subtracting pre-disaster NDWI values from post-disaster values, this analysis effectively captures hydrological changes triggered by intense rainfall, slope failures, and altered drainage pathways associated with the Ditwah event.



Map03:- Comparison of surface water distribution patterns in October(Before Ditwah) and December(After Ditwah) 2025

Areas highlighted in blue on the map below (map 04) represent new water bodies or zones of severe flooding, while lighter blue indicates moderate flooding and the formation of small streams. Brown areas reflect water reduction, possibly due to rapid drainage, sediment deposition, or channel diversion.



Map04:-Surface water distribution changes due to Ditwah in Kotmale

These water bodies that have recently formed are not natural lakes, but rather symptoms of poor drainage, soil saturation, and altered hydrology. Therefore, the retention of soil moisture over time can contribute greatly to slope instability.

Prior to the Ditwah incident, it was already observed that there were abnormally high levels of moisture in the lands before the major cyclone rainfalls. This points to a situation wherein a hydrological tipping point had been reached for water-saturated soil, which precipitated the scale of landslides and flooding events.
The spatial pattern reveals that new water bodies are predominantly concentrated along existing river channels, valley bottoms, and low lying terrain within Kotmale DSD. This indicates that the disaster intensified surface runoff and expanded stream networks, temporarily converting agricultural lands and settlements into inundated zones. From an environmental perspective, these changes can have both negative and positive effects. Prolonged flooding increases soil erosion, nutrient loss, and sedimentation, which may degrade downstream reservoirs and aquatic ecosystems. At the same time, newly formed wetlands and expanded water surfaces can enhance groundwater recharge, support biodiversity, and provide temporary habitats for aquatic species, if managed properly.

Social impacts are more immediate and visible. Newly inundated areas often overlap with farmlands, access roads, and residential zones, increasing livelihood disruption, crop loss, and health risks such as water-borne diseases. Communities located near newly formed streams or flood zones may face repeated exposure to similar hazards in future extreme rainfall events. However, the identification of stable “no change” areas also offers valuable information for safer land use planning, relocation strategies, and infrastructure development.
The accumulation of spatial data underscores that, whereas the Ditwah disaster was a resultant of substantial rainfall, the scale of its impact was also significantly caused by environmental degradation, in particular vegetation destruction. Without careful attention and care of local nature services, climate change and extreme weather events will cause increasingly severe impacts upon communities.

This analysis advocates for the need to strengthen ecosystem-based disaster risk reduction, especially in conserving the forest, restoring the slopes, practicing sensible land management, and controlling land use in sensitive environments. Failing that, such disaster may likely recur in the future and with more frequency, unless the underlying causes of vegetation loss and imbalances in the hydrological cycle are addressed as a mean of adaptation to our changing climate.

Conclusion and Recommendations

Cyclone Ditwah has exposed the devastating reality of climate injustice: communities in Sri Lanka's Central Highlands, who have contributed virtually nothing to global greenhouse gas emissions, are bearing catastrophic losses, both economic and non-economic, driven by a climate crisis they did not create. The disaster claimed over 650 lives, displaced hundreds of thousands, destroyed homes and livelihoods, and inflicted irreversible harm on mental health, cultural continuity, education, and social cohesion. These impacts extend far beyond what financial compensation alone can address.

Scientific evidence confirms that human-induced climate change made the extreme rainfall associated with Ditwah somewhere in between 28 - 160% more intense than it would have been without global warming. This is not an isolated event but part of an emerging pattern where climate vulnerable nations suffer disproportionately while major emitters and fossil fuel corporations continue operations with impunity. The principles of climate justice and the Polluter Pays Principle demand that those most responsible for the crisis take meaningful responsibility for Loss and Damage.

Yet, when Sri Lanka now considers debt restructuring, the environmental costs of the very projects that amplified Cyclone Ditwah's catastrophic impacts disappear from the equation. Debt-financed development systematically destabilized the Central Highlands, through the removal of vegetation that eliminated soil-binding root systems, construction on slopes that increased surface water accumulation and landslide risk, road building that blocked natural drainage and accelerated runoff, quarrying and extraction that disrupted watersheds and degraded soil structure, and development patterns that replaced water-absorbing forest cover with impermeable surfaces. These interventions created hydrological and ecological conditions that magnified disaster vulnerability, transforming what might have been manageable heavy rainfall into landscape-scale slope failures that buried entire villages, destroyed homes within minutes, and left families unable to recover bodies for final rites.

While local environmental degradation amplified disaster risk, the scale and intensity of rainfall that triggered landslides and flooding reflect systemic changes to the climate pattern caused overwhelmingly by global fossil fuel emissions. Addressing root causes requires both local ecosystem restoration and global accountability, including accountability for environmental destruction caused by debt-financed projects.

Recovery efforts to date, though commendable in immediate life-saving response, remain insufficient. Early warning systems have proven inadequate for real-world conditions. Relief has been short-term and fragmented. Non-economic losses remain largely invisible in policy frameworks.. And most critically, there is no functional mechanism to ensure that polluters contribute to the losses they have caused, nor to hold creditors accountable for the environmental destruction deriving from the projects they financed.
The communities affected by Cyclone Ditwah are not asking for sympathy. They are demanding justice, certainty, and the right to rebuild their lives with dignity in a climate-altered world they did not create.

Recommendations

1. Establish a National Loss and Damage Framework that Recognizes Non-Economic Loss and Damage (NELD)

The Government must urgently establish a comprehensive national Loss and Damage framework that explicitly recognizes Non-Economic Loss and Damage (NELD), including loss of life, mental health impacts, educational disruption, cultural heritage loss, ecosystem degradation, displacement, erosion of social cohesion, dignity, and psychological trauma. NELD must be formally integrated into national climate policy, disaster recovery planning, and compensation mechanisms, acknowledging unpaid care burdens, particularly on women, and ensuring responses extend beyond financial compensation to include long-term psychosocial care, trauma-informed education recovery, and culturally appropriate healing processes.

2. Create an Independent Loss and Damage Committee with Decision-Making Authority

An independent Loss and Damage Committee must be established with meaningful representation from affected communities, including women, farmers, fisherfolk, estate workers, small businesses, people with disabilities, and disaster survivors. This body must hold decision-making power (not merely advisory status) over the design, implementation, and monitoring of Loss and Damage assessments, compensation mechanisms, and recovery programs.

3. Guarantee Meaningful Community Participation and Women's Leadership

The Government must ensure genuine community participation by providing sustained capacity building, financial resources, and institutional support to enable affected populations to engage effectively. Particular attention must be given to women's leadership and the inclusion of marginalized groups, ensuring community members shape outcomes rather than being limited to symbolic consultation.

4. Provide Long-Term Psychosocial Support and Trauma-Informed Recovery

Dedicated, long-term mental health and psychosocial support services must be established for disaster-affected populations, with priority for children who have lost access to education, displaced families, elderly people who have lost ancestral land, and communities experiencing irreversible cultural loss. Recovery efforts must include grief counseling, trauma-informed education, and culturally sensitive healing processes.

5. Scale Up Community-Based Mental Health Services in Disaster-Affected Areas

The Government must deploy accessible, community-based psychosocial programs targeting women carrying disproportionate care burdens, people with disabilities who face heightened evacuation risks, children experiencing prolonged school disruption, and households navigating extended displacement, ensuring services are locally grounded and sustained over time.

6. Demand Climate accountability and the Polluter Pays Finance

Sri Lanka should actively advance international efforts to operationalize the Polluter Pays Principle, holding big oil and gas corporations and high-emitting countries legally and financially accountable for Loss and Damage. The Government should support climate liability claims grounded in attribution science and international law and advocate for binding accountability mechanisms.

7. Secure Grant-Based Loss and Damage Finance Without Creating New Debt

At negotiations under the United Nations Framework Convention on Climate Change, Sri Lanka must demand dedicated, accessible, grant-based Loss and Damage finance that explicitly includes NELD, such as mental health impacts, education disruption, cultural loss, and community disintegration. Funding must reach affected communities directly and must not deepen debt burdens.

8. Cancel Climate-Related Debt

The Government must advocate for comprehensive debt cancellation or fair restructuring for climate-vulnerable countries, recognizing that servicing debt while rebuilding from climate disasters largely caused by others constitutes a profound injustice. Debt relief must free fiscal space for recovery, adaptation, mitigation, and Loss and Damage responses, without imposing conditions that undermine sovereignty.

9. Strengthen Climate Adaptation Through Education, Rights Awareness, and Dignified Rebuilding

Authorities must deliver culturally appropriate climate education and early-warning communication through trusted community channels, simplify administrative procedures for accessing aid, and rebuild housing using climate-resilient and culturally appropriate standards with independent community oversight. Assistance must be reframed from charity to rights-based compensation, empowering communities to demand accountability.

10. Establish a Public, People-First Climate Insurance System

The Government must create a publicly backed climate risk insurance mechanism that delivers rapid, accessible payouts to disaster-affected households, farmers, fisherfolk, informal workers, and small businesses, explicitly covering Non-Economic Loss and Damage including displacement, education disruption, and psychosocial harm. This system must reject profit-driven private models and instead be funded by major polluters and high-emitting countries, with simplified claims processes and specific provisions for women-headed households, people with disabilities, and informal workers.

Make Climate Polluters Pay

Front-line communities are paying for a crisis they didn't create. It's time the biggest polluters are held accountable. Across South Asia, the climate crisis is no longer a distant threat. Floods, cyclones, landslides, and rising seas are destroying lives and livelihoods, especially in countries that contributed the least to global emissions.

Across South Asia, the economic cost of extreme weather since 2015 has run into billions of dollars, while frontline communities are left to cope with little support.

This is climate injustice.

We're demanding that the biggest fossil fuel polluters pay for the damage they have caused, through polluter-funded Loss and Damage finance that is community-led and accessible to those most impacted.

Join the call to hold the fossil fuel industry accountable. Support us by sign this petition

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