
Climate Change Documentary Film Analysis: *Before the Flood*

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Abstract

This paper analyzes *Before the Flood* (2016) in relation to climate change, population health, and health equity. The documentary film analysis focuses on two interconnected climate-related issues: extreme rainfall and food insecurity in South Asia, and sea-level rise and displacement in Kiribati. Using climate justice, environmental justice, planetary health, and United Nations Sustainable Development Goal frameworks, the paper argues that climate change is not only an environmental crisis but also a public health issue shaped by structural inequities. Drawing on peer-reviewed literature, the analysis demonstrates how climate-driven disruptions threaten agricultural livelihoods in India and Bangladesh, contribute to food insecurity and mental health stress, and pose existential risks to Pacific Island nations through freshwater insecurity, displacement, and cultural loss. The paper concludes with three evidence-informed, equity-centred recommendations: integrated early warning systems combined with climate-smart agriculture and weather-indexed crop insurance for South Asian farming communities; a dignity-centred planned relocation framework for Pacific Island nations; and mangrove ecosystem restoration as a cross-cutting, nature-based solution. Overall, the findings underscore that effective climate action must address ecological, social, and structural determinants of health together, and that health equity cannot be achieved without confronting the systemic inequities that leave vulnerable populations least able to adapt to a changing climate.

Keywords: climate change, health equity, food insecurity, planned relocation, mangrove restoration, climate justice, planetary health

Climate change is making weather patterns worldwide more extreme and less predictable, resulting in heavier rainfall and severe flooding. As illustrated in the documentary, *Before the Flood*, these environmental changes are compromising the health, safety, and livelihoods of Pacific Island communities while also threatening the agricultural stability and food security of countries in South Asia that depend on seasonal monsoons. The documentary emphasizes the urgent need for equitable, globally coordinated, and sustainable responses to climate change.

Analysis: Extreme Rainfall and Food Insecurity in South Asia

Changes in precipitation patterns have led to greater rainfall variability, including longer dry periods and unpredictable, intense rainfall events. Normally, solar heat causes water to evaporate from bodies of water and soil, forming vapour that is then held in the atmosphere. The vapour cools and condenses into clouds, then finally falls as rain, replenishing the Earth and completing the cycle. Global warming increases evaporation and atmospheric water vapour, as warmer air holds more moisture, disrupting the natural water cycle (Roxy et al., 2017).

Consequently, storms release more rainfall over shorter periods, increasing the likelihood of extreme precipitation and flooding. Large-scale studies show this rising trend in India's monsoon belt over the past few decades, increasing the risk of destructive flooding during critical agricultural periods (Roxy et al., 2017). Many crops in India and Bangladesh rely on rainfall rather than irrigation, making them highly susceptible to rainfall fluctuations (Roxy et al., 2017). Dense populations in flood-prone river basins and low-lying coastal areas, particularly in Bangladesh, increase the human impact of these events. Alternatively, flooding can be intensified by upstream rainfall and river overflows close to towns and villages, increasing the impact on those communities. Research on the 2017 Bangladesh floods shows that human-caused climate change increases the likelihood and intensity of flooding disasters (Philip et al., 2019).

Film Evidence

The documentary illustrates these consequences of extreme, sudden rainfall, showing flooded farmland and destroyed crops across agricultural communities worldwide. These scenes demonstrate that damage is not only determined by precipitation amount, but also by its timing and intensity. The farmers describe receiving “half the year’s rainfall in just five hours,” demonstrating how the intensity and timing of extreme rainfall can devastate agriculture (Stevens & DiCaprio, 2016). These conditions, especially during the critical stages of crop production, create significant economic instability and make it difficult for farming communities in India and Bangladesh to absorb environmental shocks while remaining resilient.

Population Health Impacts

Extreme rainfall and flooding have significant consequences for population health. Crop losses reduce food availability and raise prices, contributing to malnutrition. This especially affects children and pregnant individuals in farming households who already have limited access to nutrition. Repeated climate shocks, crop loss, and financial instability can contribute to stress, anxiety, and depression among farmers and rural communities. Furthermore, unreliable agricultural livelihoods can lead to displacement and migration, disrupting social networks, access to healthcare, and stable housing. These factors collectively demonstrate that climate-driven disruptions to food systems pose direct threats to population health in vulnerable regions (Abebaw et al., 2025; Roxy et al., 2017).

Analysis: Sea-Level Rise and Displacement in Kiribati

Climate change disproportionately impacts vulnerable populations, with those who contribute least to emissions bearing the greatest harm. This inequity is exemplified in the documentary when Kiribati, a low-lying Pacific island nation, faces rising sea levels that threaten to submerge the land, contaminate the freshwater, and displace entire communities (Stevens & DiCaprio, 2016). The documentary illustrates how these changes are already affecting the health of Pacific Island nations' populations. Thermal expansion and the melting of land-based ice sheets gradually raise sea levels and put low-lying island nations such as Kiribati at significant risk (Intergovernmental Panel on Climate Change [IPCC], 2023). Due to this sea-level rise, increased saltwater intrusion into freshwater systems threatens water security, agriculture, and

overall health (Evjenth, 2024; Mueller et al., 2024). Evidence supports the risks depicted in the documentary. Long-term consumption of saline water is associated with hypertension and adverse health outcomes (Mueller et al., 2024), while over 83% of Pacific atoll residents report psychological distress related to climate threats (Gibson et al., 2020). Together, these findings reinforce the documentary's depiction of sea-level rise as not only an environmental threat but also a growing public health crisis for vulnerable communities.

Film Evidence

The documentary *Before the Flood* illustrates the impacts of sea-level rise in Kiribati through interviews and visual evidence of environmental changes. In one scene, an official explains that “severe flooding... [has] gone into the freshwater pond, and that is how people get drinking water,” highlighting how saltwater intrusion threatens essential freshwater resources relied upon by local communities (Stevens & DiCaprio, 2016). Another official warns that “our island will be underwater—the question is what do we do about it,” emphasizing the existential threat posed by sea-level rise to low-lying island nations (2016). The film also introduces Kiribati's policy of migration with dignity (2016), a strategy intended to prepare citizens for potential relocation while preserving cultural identity and autonomy. Visual scenes further reinforce these risks, showing areas of the island that were dry land only twelve years earlier but are now submerged, highlighting the government's land purchases in Fiji as a contingency plan. This illustrates how sea-level rise is already shaping long-term national survival strategies.

Population Health Impacts

Saltwater intrusion into freshwater systems in the Pacific Island nations presents various population health impacts. Waterborne diseases from contaminated water are a significant problem associated with drinking from intruded freshwater systems. Additionally, continued consumption of saline water can lead to adverse conditions such as high blood pressure. Furthermore, displacement of the population due to sea-level rise contributes to mental health concerns in affected communities (Gordon-Strachan et al., 2025). This leads to additional challenges, including eroded cultural identity, loss of social networks, and difficulty integrating into their new communities, where belonging, familiarity, and cultural grounding must be rebuilt from nothing. Immigration is associated with mental health decline, and climate migrants carry the added burden of anticipatory stress.

Synthesis

Climate change is increasingly recognized not only as an environmental issue but also as a complex public health issue shaped by social, economic, and political systems (Ali et al., 2025). The film highlights that even across different populations and locations, the common thread of climate disruption follows a structural pathway that highlights inequities in social determinants of health, vulnerability, and resilience. Understanding these pathways requires drawing on multiple population health frameworks for analysis.

The concept of climate justice emphasizes that climate action is only effective when equity and human rights are prioritized (Berry & Schnitter, 2022). Smaller farming communities in South Asia produce minimal emissions, yet extreme rainfall threatens their livelihoods,

increasing food insecurity and economic instability (Ali et al., 2025). Similarly, Kiribati produces negligible emissions but faces great consequences from sea-level rise and saltwater intrusion. There is also an intergenerational dimension, as the youngest people will experience the most severe future impacts despite contributing the least to the climate crisis (United Nations Development Programme, 2023).

The impact of climate change can also be analyzed through the lens of environmental justice. Where inequities of responsibility exist, limited political power often follows, deepening a community's vulnerability to climate impact (Fournier et al., 2021). Smallholder farmers often lack the resources and political influence to adapt to climate variability or recover from environmental shocks. In Kiribati, existential threats exist despite their negligible influence in global climate decision-making. This demonstrates that vulnerability is not only environmental but also shaped by structural inequalities in political power, economic constraints, and historical marginalization.

The concept of planetary health further emphasizes that human health is inseparable from the stability of environmental systems. Disruptions to the water and food systems have repercussions across the planet (Antó, 2024). Crop losses in one part of the world not only affect local food security and migration pressures but also create broader economic instability elsewhere. In Kiribati, rising sea levels impact mental health through displacement and loss of cultural identity in the diaspora. These examples demonstrate that environmental degradation operates across interconnected systems, underscoring the need for a global, long-term perspective on health.

Climate justice, environmental health, planetary health, and environmental justice are interconnected frameworks that together explain the complexity of climate change as a public health issue. Climate justice explains who is harmed and why; environmental health elaborates on how; environmental justice describes the structural barriers to change; and planetary health touches on what is ultimately at stake.

United Nations Sustainable Development Goals Connections

The documentary's real-life examples demonstrate how climate change undermines multiple Sustainable Development Goals (SDGs) simultaneously. Rather than functioning as isolated environmental problems, these issues reveal interconnected systems of ecological disruption, population health risk, and structural inequity. We will analyze how climate change intersects with various SDGs and demonstrate their relationships.

SDG 13: Climate Action (Targets 13.1, 13.2)

Both climate issues are rooted in SDG 13. Target 13.1 calls for strengthening resilience to climate-related hazards, and Target 13.2 emphasizes integrating climate action into policy and planning. In South Asia, increasingly intense rainfall events are disrupting agricultural cycles and exposing smallholder farmers to repeated climate shocks, demonstrating the urgent need for resilience and adaptive strategies. Early warning systems have been shown to significantly improve preparedness, particularly among vulnerable farming populations (Pienaaah et al., 2023; Tang et al., 2024).

In contrast, in Kiribati and other Small Island Developing States (SIDS), climate adaptation must address long-term existential threats. The documentary portrays rising sea levels as an unavoidable consequence of climate change, aligning with the IPCC (2023) findings that sea-level rise is among the most severe and irreversible impacts of climate change. It is important to note that countries with lower emissions are disproportionately affected by climate change. Through these two contexts, the film demonstrates that climate action must operate equitably across both immediate disaster preparedness and long-term adaptation planning.

SDG 3: Good Health and Well-Being (Targets 3.9, 3.d)

The documentary closely aligns with SDG 3, particularly targets 3.9 and 3.d, which focus on reducing illness caused by environmental hazards and strengthening health system preparedness. In South Asia, flooding contributes to food insecurity and malnutrition, while also generating significant psychological stress linked to livelihood instability. In Kiribati, the lack of safe water and physical displacement are associated with long-term mental health challenges, negative health outcomes, and climate-related distress (Kelman et al., 2021; Mengesha & Sarnyai, 2025). The documentary's portrayal of communities living with the effects of climate change effectively highlights that it is a pressing public health issue.

SDG 2 and SDG 11 (Interconnected Social Impacts)

Extreme rainfall directly threatens SDG 2, particularly targets 2.1 and 2.4. Target 2.1 aims to end hunger, ensure sufficient access to safe, nutritious food, and protect against food insecurity. Target 2.4 calls for resilient agricultural practices that increase productivity while maintaining ecosystems under climate stress. When agricultural systems are destabilized by extreme rainfall and flooding, crop production is disrupted, and food access is limited for farming communities. SDG 11's target 11.5 focuses on reducing disaster-related impacts, and 11.b calls for inclusive planning for equitable resilience and risk reduction. Planned relocation processes are more effective when communities are involved in decision-making and when livelihoods are considered throughout the transition (Yee et al., 2024).

In summary, the SDGs that align with the documentary provide a framework for understanding the deeply interconnected health, social, and environmental consequences of climate change. Appendix A provides a visual map illustrating how climate issues and the relevant SDGs in Kiribati, India, and Bangladesh are interlinked, directly affecting one another and the world. This interconnectedness reinforces the idea that policies should never prioritize the environment, the economy, or society alone. Effective and sustainable interventions must address all three pillars simultaneously rather than in isolation.

Recommendations

The following recommendations regarding climate concerns are context-specific, evidence-informed, and centred on health equity. They aim to address food insecurity in South Asia resulting from severe rainfall, climate-induced displacement in the Pacific Island Nations, and shared ecological degradation impacting both regions.

Integrated Early Warning Systems and Climate-Smart Agriculture

Smallholder farmers face repeated crop losses, financial strain, and food insecurity due to the increased unpredictability of extreme rainfall, limiting their ability to prepare. An integrated approach would combine community-based early warning systems (EWS), climate-smart agriculture (CSA), and weather-indexed crop insurance (WII). While EWS delivers real-time, localized weather alerts via mobile technology, CSA delivers practices adjusted to weather, such as flood-resilient crop varieties and diversified cropping. WII would provide a financial safety net by linking payouts to verified weather data rather than individual farm visits. Before extreme rainfall, EWS gives farmers time through event predictions, allowing them to take the necessary precautions, such as crop covering or early harvesting. Farmers who receive early warnings respond more effectively during the event and adjust their practices for future seasons in anticipation (Tang et al., 2024). One study found that farmers with EWS were more than two times as likely to report climate preparedness (OR = 2.24), particularly benefiting low-income communities with limited access to traditional forecasting resources (Pienaaah et al., 2023).

During and after extreme rainfall, CSA enables farmers to adapt their harvests to the climate, such as using hardier varieties or alternative planting strategies. CSA includes improved seed diversification and weather-informed farming practices, which are effective strategies for increasing resilience among smallholder farmers in South Asia (Abebaw et al., 2025). WII alleviates bureaucratic delays that contribute to the lack of support for farmers after climate shocks (Aina et al., 2024). This approach is feasible as EWS builds on existing systems such as India's national crop insurance scheme and the South Asia Hydromet Forum's regional EWS infrastructure (Pienaaah et al., 2023). Combining EWS, CSA, and WII would ensure simultaneous climate preparedness (EWS), agricultural adaptations (CSA) and safety nets for financial recovery (WII) to address climate-induced adversity in South Asia.

Dignity-Centred Planned Relocation

Many residents of Pacific Small Island Developing States, such as Kiribati, are relocating due to the threat of sea-level rise. This recommendation establishes a three-phase framework for healthier relocation with mental health support, cultural continuity, and community self-determination as its core pillars.

Phase 1 — Community-led Site Selection and a Baseline Mental Health Assessment:

Phase one is the preparation stage. Communities would be actively involved in selecting their relocation site, and a foundation would be built by establishing a mental health baseline to support the later transition. Kelman et al. (2021) found that using both social networks and governance structures for relocation yields significantly better mental health outcomes. In the Fiji relocations, better livelihood outcomes were positively correlated with community-led decision-making throughout the process (Yee et al., 2024). Gordon-Strachan et al. (2025) identified a critical policy gap: only 26% of SIDS relocation policies account for the risk of moving communities to sites also threatened by sea-level rise. This data informed our community-led site selection approach, ensuring relocated communities are not simply moved from one climate threat to another.

Phase 2 — Accompanied Transition with Continuity of Care:

The second phase is a transitional period during which nurses and mental health workers accompany the relocating communities to provide continuity of care. Through a PRISMA-compliant systematic review across Pacific Island Nations, Mengesha and Samyai (2025) documented significant psychological distress associated with sea-level rise and anticipatory displacement. This highlights the need to ensure relocated communities are accompanied, supported, and remain culturally connected, as this serves as a protective factor against psychological distress. This strengthens the community's health and addresses the concern of fragmented displacement.

Phase 3 — Cultural Preservation and Climate Passport Framework:

To ensure preservation of culture, our third phase would support Indigenous language programs and cultural organizations in the receiving nations. Internationally, this intervention advocates for a legal "climate passport" framework, as Pacific climate migrants currently hold no refugee status under international law, leaving millions unprotected (Gordon-Strachan et al., 2025). This phase aims to actively protect cultural identity through values such as language, land, and community during the transition and after migration.

Mangrove Ecosystem Restoration as a Cross-Cutting Nature-Based Solution

Mangroves are coastal trees whose dense root systems act as natural barriers against flooding and saltwater intrusion. Protecting and restoring mangroves addresses ecological degradation, which contributes to worsening floods in South Asia and increasing saltwater intrusion in Pacific regions (IPCC, 2023). In Kiribati, more mangroves would act as natural coastal barriers, slowing the flow of ocean water that would otherwise flood inland and contaminate freshwater systems with saltwater. In South Asia, mangroves already act as a buffer along river deltas and coastlines. They absorb the force of extreme rainfall runoff before it destroys farmland. However, decades of deforestation and coastal development have significantly reduced mangrove cover, making large-scale restoration essential to the effectiveness of natural protection (Ayassamy, 2025).

Blankespoor et al. (2017) found that existing mangroves protect approximately 3.5 million people and \$400 million (USD) in GDP annually from storm surges. Without them, under the projected sea-level rise scenarios, exposed populations would increase by 103%, more than doubling the number of people at risk. Restoring mangroves is cost-effective, as the damage prevented far outweighs the cost of implementation. Mangroves not only shield people from storm surge but also support their food security and livelihoods, helping maintain economic stability. Ayassamy (2025) had two major findings through a systematic review. First, mangroves save 65 billion dollars worth of flood damage annually. Second, they generate benefits for communities such as improved water quality, enhanced fisheries, and increased community employment through restoration work.

From a health equity standpoint, job and economic opportunities directly benefit those harmed most by climate change. Therefore, this approach addresses poverty and inequity simultaneously. Implementation is supported by existing funding mechanisms, including the

Green Climate Fund (Green Climate Fund, 2018) and NDC commitments under the Paris Agreement. India has already integrated mangroves into its national adaptation strategy as "bio-shields" (Ministry of Environment, Forest and Climate Change, 2024), providing a replicable regional precedent.

The three recommendations work systematically together. Mangroves reduce the ecological impacts that drive the environmental issues, while EWS/CSA protects food security before the disaster, and planned relocation protects communities when displacement is inevitable. Our recommendations address the root causes and the consequences, rather than primarily treating the symptoms.

Reflection

The documentary allowed us to see climate change as a barrier to health equity and environmental justice, and how global systems of unequal power and responsibility shape this issue. Our literature review reinforced that climate-related harm disproportionately affects the most vulnerable populations, and why an intersectional lens is needed. Before the Flood's impact extended into our everyday lives, it changed how we process climate-related information in real time. After watching the film, we noted that when we encounter climate issues online, we can engage more critically with the content rather than passively consume it. This directly informs the way we engage with our government's response to climate issues across Canada.

The key takeaway from this project was recognizing that the root of climate change lies in capitalism and our prioritization of economic growth over sustainable development. Economic systems that emphasize profit and resource extraction continue to grow at the cost of our planet. This led us to look beyond individual roles in climate change and to consider the structural factors that influence health and environmental outcomes when seeking sustainable solutions.

Community-informed planning has been shown to lead to better health outcomes for all (Kelman et al., 2021). However, Indigenous ways of knowing that highlight reciprocity, respect, balance, and relational responsibility with the land and water are overlooked in hegemonic Western approaches to policy. Considering Indigenous insight when making decisions is essential, especially given that those most connected to the land are often the most affected by environmental disruption.

Furthermore, the film pushed us to consider how these global themes apply in our own context. Living in Alberta, a province heavily tied to resource extraction, there is an obvious tension between economic stability and environmental responsibility. This makes it essential not only to understand these issues in theory but also to apply the lessons from them to our lived realities, including advocating for sustainable practices, policy change, and better community preparedness for climate-related events. It shows that addressing climate change requires not only technological and scientific advances but also critical reflection, diversifying knowledge systems, and a willingness to challenge Western ideologies at their roots.

In conclusion, we hope to inform a system that tackles the conditions that bring patients to our care long before they even reach our doors. This system involves prioritizing equity and

structural accountability over clinical intervention by addressing the social and environmental conditions that shape health before illness occurs. As future nurses, this reinforces our roles as advocates for sustainable health, as we will inform care in a world where the environment itself is a downstream determinant of health inequity.

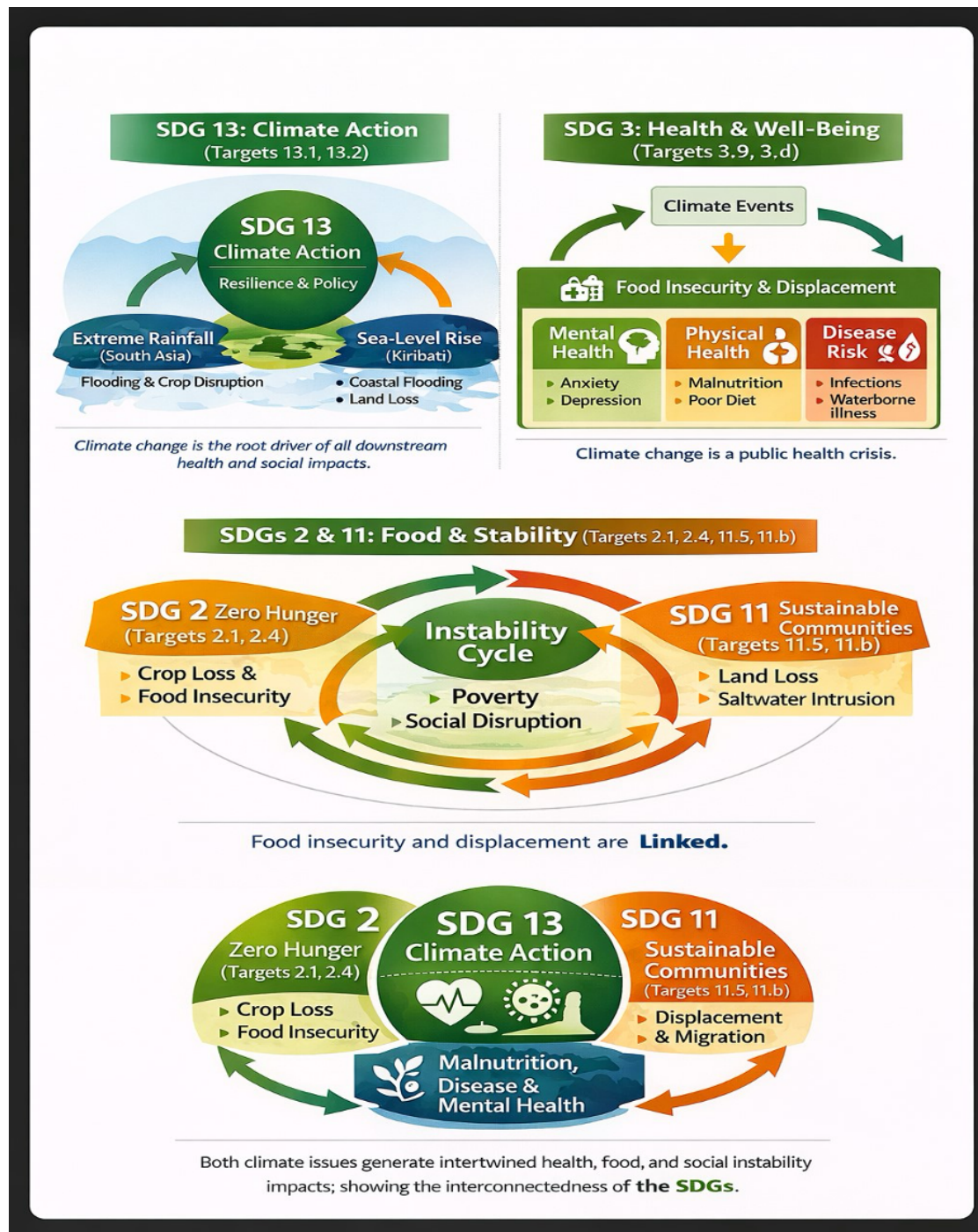
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Appendix A: SDGs and Interconnection with Climate Priorities from *Before the Flood*

Figure 1: Interconnection of SDGs in *Before the Flood*.



Note: This diagram illustrates how climate instability (SDG 13) acts as the central driver linking food insecurity (SDG 2), health outcomes (SDG 3), and displacement and community instability (SDG 11). It highlights the cascading and interconnected nature of climate change impacts, demonstrating that environmental disruptions simultaneously affect multiple systems and contribute to broader population health challenges.

Figure 2: Colour-Coded Alignment with United Nations SDGs



Note. The image above presents the 17 United Nations Sustainable Development Goals (SDGs) using standardized colour-coded icons, illustrating the breadth of global development priorities across social, economic, and environmental domains. From "The 17 Goals," by the United Nations, n.d. (<https://sdgs.un.org/goals>).

Figure 3: Comparative Illustration of a World Without SDGs vs With Integrated SDG Implementation



Note: This image contrasts a world without coordinated Sustainable Development Goal (SDG) action, characterized by environmental degradation, inequality, and poor health, with one in which SDGs are implemented in an interconnected manner. It highlights how integrated progress across climate action, health, food systems, and sustainable communities can lead to improved population health, environmental stability, and global equity.