Target Analysis of Sendai Framework for Disaster Risk Reduction 2015-2030: Kerala Flood, 2018

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Abstract

The UN World Conference in Sendai, Japan, endorsed the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030, recognizing the necessity for an all-hazards approach to disaster risk management. The framework prioritizes improved disaster risk governance, accountability, preparedness, stakeholder recognition, risk-sensitive investment mobilization, health infrastructure resilience, global collaboration, and donor policies and programs. The 2018 Kerala flood was terrible, killing 433 people, displacing 5.4 million people, and uprooting 1.4 million. The flood also wreaked havoc on physical and social infrastructure, such as roads, bridges, electrical lines, communication networks, and educational institutions. Kerala's Post Disaster Need Assessment was a participatory strategy that included discussions with impacted communities and stakeholders. The State Government and international organizations undertook post-disaster needs assessments, prioritizing social sectors. Early warning systems and disaster risk information are critical for preparing for and recovering from hazard events. The media is critical in disseminating catastrophe risk information. Response and recovery are critical steps in reducing disaster-related injuries, fatalities, property loss, and environmental impact. The National Disaster Response Force, Indian Army, state-led volunteers, fishermen, women volunteers, non-state actors, and technical advancements all responded well to the Kerala floods. The Kerala government initiated the 'Rebuild Kerala Initiative' (RKI) to address the root causes of the floods and prepare for future catastrophes.

Keywords: *Disaster risk, Rebuild Kerala Initiative, Response, Sendai Framework, Volunteers*

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1. Introduction

Among the most destructive natural catastrophes, floods affect millions of people all over the world. Many factors can contribute to flooding, such as sudden flooding, which is frequently associated with hydrologically small regions. Although it doesn't last long, the condition can cause serious harm. The frequency of floods has increased recently. Policies for sustainable development may be determined by using certain geographical parallels and differences found in flood-prone areas. (Sharma D.D, 2006).

The Third UN World Conference in Sendai, Japan, approved the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015–2030 as the outcome of stakeholder discussions and intergovernmental negotiations aided by the UN Office for Disaster Risk Reduction. The Hyogo Framework for Action (HFA) 2005-2015, which was designed to further the work being done around the world in accordance with the International Framework for Action and the Yokohama Strategy, is being replaced by the Sendai Framework (UN, SFDRR, 2015-2030). It also aimed to promote a more coordinated approach to risk reduction and resilience building (UN. IOM, 2018). The Sendai Framework acknowledges the need for an all-hazards approach to managing disaster risk, including enhanced disaster risk governance, accountability, preparedness, recognition of stakeholders, mobilization of risk-sensitive investment, the resilience of health infrastructure, global cooperation, and donor policies and programs (Rishma Maini, 2017).

The 17 Sustainable Development Goals (SDGs) are the worldwide objectives for 2030 that were created by the UN; in fact, every SDG incorporates elements of the Sendai framework. Risk is starting to take on a more systemic meaning. In order to lower risk, it is also need to integrate our methods more fully: working together across and within institutions, cooperating across sectors, and making sure that policies and actions are in line. The first widely recognised policy agenda in history to support the idea that development that takes risks can be sustained was the Sendai Framework. Direct economic losses from catastrophes have grown by almost 150% over the past 20 years, with vulnerable developing nations bearing a disproportionate share of the costs. The accomplishment of the Sustainable Development Goals (SDGs) and the Sendai Framework are both products of interrelated social and economic processes.

As a result, there is a great deal of overlap between the two policy instruments (Sendai Framework for Disaster Risk Reduction 2015-2030, United Nations, 2015).

The Great Flood of '99 in 1924 caused a significant flood in Kerala, with over 3,368 mm of rain recorded. This was the heaviest recorded rainfall to date and 64% greater than the average. In 2018, Kerala faced the worst floods in its history, with 42% more rainfall than usual. The floods led to over 400 deaths and devastated seven districts. Rapid urbanization changed the drainage pattern, causing landslides in hilly areas. Kerala was unprepared for major disasters due to insufficient policies, inadequate institutional frameworks, urban sprawl, poorly managed construction, exclusion of disaster risk preparedness in socioeconomic sectors, weak institutional capacity to foresee and respond to extreme events, and constrained financial resources.

The progress of the SFDRR target is analyzed in the study with the data collected from secondary means. For the same purpose, the 7 targets of the framework are being analysed and how it is framed in the study area of Kerala state, especially addressing the 2018 Kerala floods.

2. Study Area

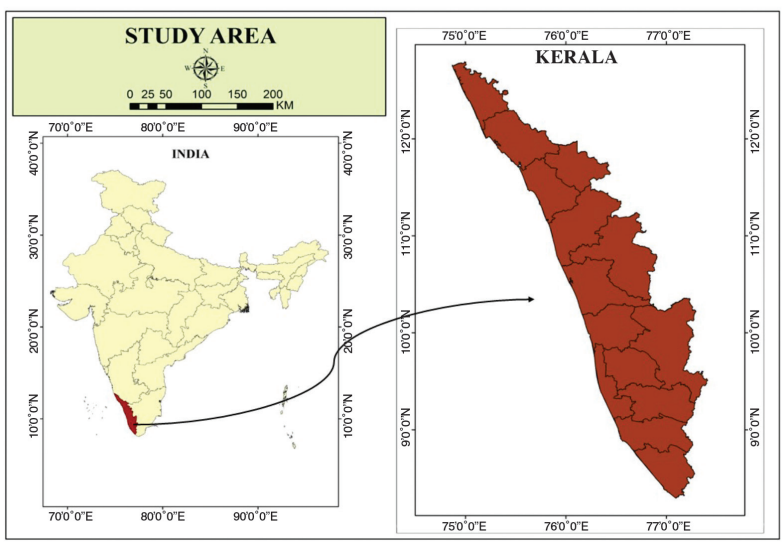

Figure 1 : Location Map

3. Methodology

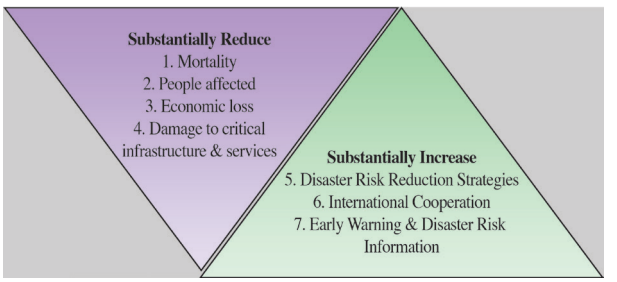

Figure 2 : Methodology

Analysing the Target Action of SFDRR by United Nations in the context of 2018 Kerala flood.The concept of risk is becoming more systemic. Here the 7 target of Sendai Framework on Disaster Risk Reduction is analysed based on the context of Kerala flood 2018. There are 4 targets which is needed to substantially reduce the impact from the past events to achieve the goal while 3 targets needed to improve or substantially increase to reduce the after effect and for a proper mitigation. The existing state of these targets is analysed based on the 2018 Kerala flood event.

4. Sendai Framework Target Analysis (7 Targets)

Global aims and indicators that are successful must be motivating, easily understood, limited in number, ambitious but doable, and measurable. It's important for metrics and targets to be consistent with other worldwide programmes. Indicators created by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators, which are closely integrated with the Sendai Framework, have recently been confirmed by the UN Statistics Division. By gathering data on these factors, UN Member States can gauge their success in reducing catastrophe risk by 2030 (Rishma Maini, 2017). The designation of seven global targets, the expectation that disaster risk will decrease, a goal centered on preventing new risk, decreasing current risk, and enhancing resilience, along with a set of guiding principles, represent the most fundamental changes in disaster risk management (UN, SFDRR, 2015-2030).

The 7 global targets are being analyzedin state level as wells in local level to get an idea of the functioning of the achieving capacity of the targets in the Kerala State.

Basically, the targets are classified into two different groups. One as the targets need to be substantially reduced and the other is to increase the substantial potentiality. The first four targets come in the category of the reducing group and the final three comes in the increasing group.

4.1 Mortality

The 2018 Kerala flood hits catastrophically over the region which washes out so many lives in a few days. That was such an unexpected experience for the people of Kerala who were not supposedly experienced such previous incidents. Extreme rainfall resulted in disastrous floods and landslides that killed 433 people, affected 5.4 million people, and uprooted 1.4 million people. According to information that has been made public, the tragedy had some impact on 1,259 of the 1,664 communities dispersed over the state's 14 districts. According to the information available, among the 433 people that died, 14 (3.2%) Adivasis and 44 (10%) Scheduled Castes. Alappuzha, Ernakulam, Idukki, Kottayam, Pathanamthitta, Thrissur, and Wayanad were the seven worst affected districts (CSSC, 2018). The mortality rate due to disastrous event like flooding in the study area is reduced comparatively. The Kerala State Disaster Management Authority already reported in their recent study.

4.2 People Affected

In Sendai framework, number of people affected by a hazard like flood is needed to be substantially reduced by taking actions based on the previous events. While The Economic Times stated that 33,000 people were saved, over 489 people perished, 15 are missing, and 140 are hospitalized. To house the flood victims, over 3,274 relief camps were built in various areas. A total of 1,247,496 persons are said to have taken shelter in these camps. Numerous communities were impacted, thousands of homes were damaged or destroyed, and an estimated 10,000 km (6,200 km) of highways were devastated (Kerala Flood Case Study, 2019).

The local body, disaster management authority, officials and people work together to make the situation better during the flooding time and later they help the people to build a resilience capacity. It is very important for people to overcome from the shock even if it is physical or mental. Later in 2019, 2020, 2021 and also in 2022 a continuous

hit of the flood is faced this by various regions of Kerala but not to the extent and intensity of 2018 flood situation. But the people who were affected by the very next events were comparatively very less in number and because of the preparedness and mitigation methods taken the impact in both physical, social and economic means were substantially reduced.

4.3 Economic Loss

According to research by the Associated Chambers of Commerce & Industry of India (Assocham), the severe floods in Kerala may have resulted in losses of between Rs 15,000 and 20,000 crore (India Today, 2018). With 96% more rain than normal in August 2018, Kerala had one of its worst floods since 1924, leading to significant flooding in most areas. Significant losses occurred in the areas of housing, fishing, animal husbandry, agriculture, and natural flora and wildlife. 330 landslides were recorded by the State Land Revenue Department, and the estimated economic damage topped INR 31,000 crore. Over 300 acres of coffee and tea plantations were damaged, and over 100 individuals lost their lives. This was just the after effect of the floods which is resulted in the form of top soil erosion or landslide (Chinnasamy, 2020)

The agriculture industry has suffered enormous losses as a result of the exceptionally severe rains, storms, and floods. It should be emphasized that small- and medium-sized farmers make up the majority of the population in Kerala. Only small and marginal farmers (SMF) file damage claims through NDRF/SDRF. Because of this, a damage estimate and claim are only provided for the SMF part. The relief assistance paid for land and agricultural loss by the government in total each district was 12,200/ha. The loss from the commercial sector is not clearly recorded and self-employed people also suffer from such a situation (KSDMA, 2018).

In order to evaluate damage and loss and determine recovery needs, the Government of Kerala commissioned a post disaster needs assessment (PDNA). Participants in the process, as well as the people in the impacted areas, were consulted. The Joint Rapid Damage and Needs Assessment (JRDNA), which concentrated on infrastructure sectors, served as the foundation for the PDNA. The PDNA included a recovery strategy, an examination of the impact of macroeconomic factors on human development, and

15 sectors and cross-cutting issues (Ajinder Walia, 2020). As per the target of SFDRR, the economic loss is carefully analyzed and gave relief assistance to the needful.

4.4 Damage to Critical Infrastructure & Services

Damages that occur to critical infrastructures during a flood is needed to be reduced to attain the target of SFDRR. During the Kerala flood in 2018, all the physical and social infrastructure was mostly damaged all over the state. Especially the road network is closed, bridges collapsed, power connection was destructed, the communication network was damaged, and educational institutions were affected and closed for many days. Many camps were set up in those schools and large auditoriums. Health institutions were affected tremendously, not because it is drowned during the flood but the need of medical facilities were huge during flood time. Emergency services were completely blocked. Especially in the state many health institutions including government hospitals and PHC were affected by the flood. Basically, they are geographically located in the flood-prone regions. The same goes for educational institutions as well.

This damage occurring to the critical infrastructure and services also needed to be substantially reduced. So those will be the helping element for people during flooding. Restoring power and water connections was most important in the critical infrastructure. The damage and recovery needs from infrastructure sectors of transport, power, water resources and irrigation were taken into more consideration after the event and the government also makes accessibility of those infrastructures to people as soon after the event.

4.5 Disaster Risk Reduction Strategies

Disaster risk reduction strategies are something which is needed to be understood importantly because it is the way to mitigate the disaster event. In SFDRR, strategies to reduce the disaster risk is needed to be improved even in the local body level. That is the only way to make the situation better. In the case of many districts in Kerala, the district disaster management plan was last prepared before the flooding event so it is needed to be updated for the improvisation of strategy making. The state disaster management authority of Kerala and the district disaster management authority is under the control of the preparation of strategies, plans, early warning and alerts.

The disaster risk reduction strategies from (Kerala Sate Disaster management Plan, 2016) includes,

- To lessen the severity of floods, the Kerala Conservation of Paddy Land and Wetland Act 2008 must be put into effect.
- Pond and open well preservation as well as rainwater collection on slopes lower than 20 should also be carried out.
- Competent organizations should also follow SOPs for varying rainfall levels.
- The Proceedings of Chairman, DDMA, Thiruvananthapuram No. H1-33275/15 (2) dated 2-05-2015, which was upheld by the High Court of Kerala, provides an example of flood mitigation.
- It is mandatory for government local bodies to put up with local-level disaster management plans.
- Before obtaining environmental clearance, make sure to study disaster management plans and hazard susceptibility maps and include suitable risk reduction measures in project proposals.
- From lower primary through professional education, make an effort to include subject-specific and general concepts of disaster risk reduction in the curriculum and syllabus.
- Help DDMAs run training sessions and spread awareness of disaster risk reduction using audio, video, and print marketing.
- Now it is mandatory for preparing masterplans to involve risk information regarding any natural and manmade hazard and plans need to be prepared.

4.6 International Cooperation

International cooperation is something which is needed to be boosted up to get better from any disastrous circumstances. A participatory approach, the Kerala PDNA included talks with affected communities and stakeholders. Following the floods, detailed damage and loss assessments of both direct and indirect losses were conducted by both the State Government and foreign organisations as part of the

post disaster needs assessment (PDNA), which placed a priority on social sectors. A renowned International NGO worked in order to offer survivors in relief camps with food, hygiene kits, toiletries, soaps, water containers, cutlery, bedsheets, blankets, clothing, water purifiers, and other necessities, Rise Against Hunger India (RAHI) and Save the Children India (SCI) worked together. Children's psycho-social well-being was also supported by Save the Children India through educational and recreational opportunities. The Central Ministry of Agriculture received a project proposal for $745 million, which included financing assistance of $500 million from the "International Fund for Agricultural Development." This assistance was received by the entire state during and after the 2018 flood and the fund allocations and support were tremendously helpful for the purpose of "Rebuild Kerala" (Ajinder Walia, 2020).

4.7 Early Warning System & Disaster Risk Information

A hazard, vulnerability, and risk assessment (HVRA) is the process of quantifying the spatiotemporal return probabilities of various hazards, the expected level of damage to which a given element or set of elements-at-risk is exposed, and the expected financial losses when a given area is exposed to hazards within a given time period. It assists community members in preparing for reaction to and recovery from hazard events, addressing vulnerabilities, reducing hazards, and making risk-based decisions. To allow enough time for evacuation and the implementation of emergency plans on the eve of a disaster, early warning systems can be created and implemented in areas designated as possible danger hotspots. IMD and SOEC are the main agency that gives update about weather events and give alerts to all departments and public about disaster. Media also played a crucial role in giving disaster risk information to public. The significance of delivering early warnings and actionable alerts, the method of transmitting the alert message, and the information's content are the three key elements. The general people were unaware of the full meaning of the color-coded signals in the absence of awareness campaigns and readiness exercises during the past flood event occur. Ironically, the public and the media downplayed the coded signal, and social media posts even expressed concern about the shutters not opening in the event of a decrease in rainfall. but now the situation changed, and people are now aware of the significance of colour coded alerts and early warnings. Other than these weather

alerts now the KSDMA's official website also declares alerts regarding water level increases in dams, rainfall intensity and so on (Ajinder Walia, 2020).

5. Response & Relief

It's important to keep disaster-related injuries, fatalities, property damage, and environmental harm to a minimum. It involves evacuating people, animals, and cattle in addition to giving survivors refuge, food, clothes, and medical care. Stakeholders including the NDRF, Indian Army, state-led, community volunteers, fishers, women volunteers, non-state actors, and technological innovations efficiently responded to the Kerala floods. The National Disaster Response Force (NDRF) dispatched 57 teams, 435 boats, five paramilitary, military, and coast guard companies, 40 helicopters, 20 aircraft, two ships, ten columns, and ten Engineering Task Force teams. Red Cross and Airbus Foundation collaborated to travel farther, and 4537 fishermen deployed 669 boats to save at least 65,000 lives.

6. Community Participation In Disaster Risk Reduction

The Sendai Framework recognized the crucial role that the community plays in disaster risk reduction. Community, as well as local government, join their hands during any hazardous situation simply to reduce the impact of the situation and for resilience building. Disaster risk management uses this paradigm to determine the decrease in catastrophic risk. It offers numerical measurements for damages at the local and national levels. Our understanding of the effectiveness of disaster risk reduction strategies is improved through the compilation and evaluation of disaster damages under the Sendai Framework (Gacu, 2022). The cognitive sense of people is taken into action when a disaster hits. The community themselves become the first responders against such catastrophic events.

Kudumbashree units are self-help groups organized for empowering women. Simply during flood time the activities of this unit are said to be as women in response. In total, 1,13 lakh residential buildings, 3,100 public spaces, and 11,000 impacted individuals received psychological treatment from Kudumbashree Workers in Kerala. From the first days of the disaster, Kudumbashree employees worked hard to provide boxed meals to those in need. The work done by these groups during those times,

particularly in Pathanamthitta, was outstanding, and they are still such active volunteers today. They are the people who were living as one among the affected community and they even participated in the volunteer work.

Community Volunteers, Kerala's response to the floods was the consequence of a sense of community and a desire to help that transcended political, religious, and class boundaries. The planning of rescue and relief operations was done by mass organizations, trade unions, volunteers, students, regular farm laborers, carpenters, electricians, and plumbers from all over Kerala. Thousands of volunteers, including medical professionals, cooked food, unloaded supplies of relief items, took care of the old or sick or looked after children at the relief camps. Students, regular agricultural laborers, carpenters, electricians, and plumbers from around Kerala visited each home to clear the muck, repair the water and power connections, and replace broken doors or windows.

Fishermen, were considered as the actual rescue teams which comes in time for the local community. They single-handedly carried out the rescue mission and came forward to help based on their own will.

Role of technology, Kerala floods made clear how crucial information technology is to rescue and relief efforts. To identify victims, find camps, and sign up volunteers, Kerala Rescue.in, a web-based program, social media, and conventional information broadcast methods were used. A significant number of volunteers were recruited for one-time cleaning tasks through the use of social media.It served as a tool for connecting with those who were in need.

7. Rehabilitation & Recovery

Utilizing public funds, the Kerala government started an immediate recovery programme. The government's major departments all got to work on the restoration and recovery initiatives, which are expected to cost 4,000 crores. The majority of Keralans returned to their homes within a week of the flood waters receding, demonstrating the incredible resiliency of the local population. The 'Rebuild Kerala Initiative' (RKI) was launched by the Kerala government to address the underlying causes of floods and make plans for any future disasters. The RKI aims to enhance the lives and

livelihoods of its citizens by implementing higher standards for recovery and reconstruction infrastructure and by building ecological and technological protections so that the restructured assets may better endure floods in the future.

8. Conclusion

Floods result in extensive property, crop, and environmental damage, as well as a higher risk of diseases including cholera and dysentery. Due to their lower levels of readiness, economic resilience, and health, the poorer people are more vulnerable. Flooding can have more negative non-economic repercussions than negative economic ones. Local governments can help with disaster response since they have a personal understanding of a community's social, economic, infrastructure, and environmental needs.

The analysis based on SFDRR for Kerala is scrutinized with the help of 7 global targets which are locally achieved or the level of achievement of those global targets at a local body level. The lack of availability of recent data can be considered as a negative part of the analysis so many targets achieved only a partial level of success. The Sendai Framework introduced the notion that risk-averse development is sustainable as the first well-known policy agenda in history. Direct economic losses from catastrophes have climbed by more than 50% in the previous 20 years, with vulnerable developing nations bearing a disproportionate share of the costs. The achievement of the Sustainable Development Goals (SDGs) and the Sendai Framework are both outcomes of interconnected social and economic processes. As the matter of Kerala state the flooding incidents that ocuur after 2018 not much severe in the previous case but still progressed to achieve the global targets of SFDRR to a great extent. The reason behind this achievement is the proper strategic planning that they implemented after the face to the great floods. Not just the government is being a part of risk reduction in the state but also the community itself is being engaged in any mitigation and preparedness activities voluntarily. It proves that the human cognitive sense can change the existential reality.

By pointing out more effective mitigation measures, real-time data on flood-prone people and areas can help with emergency planning, land use, river basin management, and policy development. This work may be used to provide accessible flood effect

information for decision-makers and the general public by being integrated into virtual reality settings or transformed into a web-based geospatial analytical system. The unique economic and human ramifications of mitigation methods can augment the advantages of community and property measures.

References

1. Ajinder Walia, N. N. (2020). *Kerala Floods 2018*. NIDM, Ministry of Home Affairs.
2. Chinnasamy, P. P. (2020). Slipping away from the surface: Impact of Kerala 2018 floods on soil erosion. Retrieved from https://rnd.iitb.ac.in/research-glimpse/slipping-away-surface-impact-kerala-2018-floods-soil-erosion
3. CSSC. (2018). Retrieved from Centre for Studies in Social Sciences Calcutta: www.cssscal.org
4. Gacu, J. G. (2022). Flood Risk Assessment using GIS based Analytical Hierarchy Process in Municipality of Odiongan, Romblon, Philippines. *Applied Sciences*.
5. India Today. (2018). *Kerala floods caused damage worth Rs 20,000 crore: Assocham*. Retrieved from India Today: www.indiatoday.in
6. Kerala Flood Case Study. (2019). Retrieved from internet geography: /www.internetgeography.net/topics/kerala-flood-case-study/
7. Kerala Sate Disaster management Plan. (2016). *Disaster Mangement Plans*. Retrieved from Kerala state Disaster Mangement Authority: https://sdma.kerala.gov.in/disaster-management-plans/
8. KSDMA. (2018). Retrieved from Kerala State Disaster Management Authority: https://sdma.kerala.gov.in/2018/
9. Rishma Maini, L. C. (2017). The Sendai Framework for Disaster Risk Reduction and Its Indicators—Where Does Health Fit in? *International Journal of Disaster Risk Science*.
10. UN, SFDRR. (2015-2030). *Sendai Framework for Disaster Risk Reduction 2015-2030*. Retrieved from UNDRR: https://www.undrr.org
11. UN. IOM. (2018). Retrieved from International Organization for Migration | IOM, UN Migration: https://www.iom.int/