

Disaster and Disaster Risk Reduction Strategies at Different Level

Archana Pandey Bista PhD¹, Kamala Dhakal PhD², Apsara Pandey MN¹

Authors Affiliation

¹Maharjgunj Nursing Campus, Institute of Medicine, Tribhuvan University, Kathmandu, Nepal

²Birgunj Nursing Campus, Institute of Medicine, Tribhuvan University, Birgunj, Nepal

Correspondence: Dr. Archana Pandey Bista, Associate Professor, Maharjgunj Nursing Campus, Kathmandu, Nepal
Email: archanabista67@yahoo.com

ABSTRACT

Introduction: Any form of disaster is destructive causing a large mortality, a huge environment, and economic loss with long-term adverse health consequences. Globally, Disaster Risk Reduction strategies are becoming more crucial to prepare, manage, and respond the disaster events in achieving the targets of Sustainable Developmental Goals (SDGs).

Methods: Extensive related literature been searched through different data search like google, Pubmed, Hinari by using keywords and the findings were grouped in sequential order.

Results: Disaster risk reduction plans are global effort widely used among general and health population. Effective strategic interventions like sendai framework for disaster management are in use for preventing disaster risk and managing disaster consequences.

Conclusions: Disaster Risk Reduction is the comprehensive strategies and the shared responsibility of all individuals from community level involvement to Universities level preparedness, and National level interventions.

Keywords: Disaster Risk Reduction (DRR), Sendai framework, SDGs

INTRODUCTION

Disaster is “a serious disruption to the functioning of a community or society, including widespread impacts of human, material, economic or environmental damage. Disasters can result in chaos, widespread mortality, and property losses with long-term devastating social, physical, psychological, environmental, and economic consequences that affect the health of a population¹. Disaster is a global public health concern disrupting lives of individuals, communities¹ including the nation resulting in the long-term disintegration of human life and environment health².

Global prevalence of disaster

In 2022, the Emergency Event Database EM-DAT recorded 387 natural hazards and disasters worldwide, resulting in the loss of 30,704 lives and affecting 185 million individuals. Economic losses totaled around US\$223.8 billion. Heat waves caused over 16,000 excess deaths in Europe, while droughts affected 88.9 million people in Africa. Hurricane Ian single-handedly caused damage costing US\$100 billion in the Americas. The human and economic impact of disasters was relatively

higher in Africa, e.g., with 16.4% of the share of deaths compared to 3.8% in the previous two decades. It was relatively lower in Asia despite Asia experiencing some of the most destructive disasters in 2022. These days consequences of global warming have increased the risk of disaster in Asian countries are highly disaster-prone regions accounting for 40% of all disasters².

Table 1:Top ten mortality during the year 2022

Countries	Types of Disasters	Deaths
Europe	Heat Wave	16,305
Uganda	Drought	2,465
India	Flood	2,035
Pakistan	Flood	1,739
Afghanistan	Earthquake	1,036
Nigeria	Flood	603
South Africa	Flood	544
Philippines	Storm ‘Megi’	346
Tropical		
Indonesia	Earthquake	334
Brazil	Flood	272

Table 2: Number of affected (million) by disaster type: 2022

Countries	Types of Disasters	Affected
Pakistan	Flood	33.0 million
Congo(Democratic Rep.)	Drought	26.0 million
Ethiopia	Drought	24.1million
Nigeria	Drought	19.1 million
Sudan	Drought	11.8 million
Bangladesh	Flood	7.2 million
China	Drought	6.1 million
Niger	Drought	4.4 million
Burkina Faso	Drought	3.5 million
Philippines ‘Nalgae’	Storm	3.3 million

Table 3: Top 10 economic Losses (billion US \$) by disaster type, 2022

Countries	Types of Disasters	Loss
USA	Hurricane ‘Ian’	100.0 billion
USA	Drought	22.0 billion
Pakistan	Flood	15.0 billion
Japan	Earthquake	8.8 billion
China	Drought	7.6 billion
Australia	Flood	6.6 billion
China	Flood	5.0 billion
Nigeria	Flood	4.2 billion
India	Flood	4.2 billion
Brazil	Drought	4.0 billion

The occurrence of each type of disaster was also near to the average levels in the last two decades. In 2022, the total death toll of 30,704 was three times higher than in 2021 but below the 2002-2021 average of 60,955 deaths, the latter being influenced by a few mega-disasters, such as the 2010 Haiti earthquake (222,570 deaths)³.

Disaster occurrence in India

India has been vulnerable, in varying degrees, to a large number of natural, as well as, human-made disasters. It is highly vulnerable to floods, droughts, cyclones, earthquakes, landslides, avalanches, and forest fires. Out of 36 states and union territories in the country, 27 of them are disaster-prone. Almost 58.6 percent of the landmass is prone to earthquakes of moderate to very high intensity; over 40 million hectares (12 percent of land) are prone to floods and river erosion; of the 7,516 km long coastline, close to 5,700 km is prone to cyclones and tsunamis; 68 percent of the cultivable area is vulnerable to drought and hilly areas are at risk from landslides this also is very alarming problem toits near country like Nepal³.

Disaster occerence in Nepal

Nepal is in the top 20 of all the multi-hazard countries in the world. It experiences different hazards like floods, landslides, earthquakes, fire, and drought. According to the Global Report on Disaster Risk, Nepal ranks the 11th position in terms of earthquake risk. The entire region of Nepal is prone to earthquakes and the country has had major earthquakes in the 20th century; namely Bihar- Nepal earthquake (1934), Bajhang earthquake (1980) Udayapur earthquake (1988), and the Gorkha earthquake during the year 2015⁴. Seismological studies have shownthat Nepal is exposed to many natural and human-induced hazards due to its diverse topography, complex geology, and highly varying climate. More than 80% of the Nepali population is exposed to the risk of natural disasters which include earthquakes, droughts, floods, landslides, extreme temperatures, and glacier lake outburst floods.Limited domestic economy, geographically dispersed, unconnected population contribute to the compounding social vulnerability to disasters⁴.

Approximately 86% ofthe population lives in houses made of earthen wire, stone, and wood in rural areas. Residential houses are developed on a cluster basis and therefore are more susceptible to catching fire and spreading due to proximity, especially in the dry season⁵.

Global strategies to address disaster

In recent days, disaster management and sustainable development have gained importance in various national and international negotiations in recent times. The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by UN General Assembly in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030 with the focused titled as ‘Transforming Our World: The 2030 Agenda for Sustainable Development’ which consists of 17 goals and associated 169 targets, the most relevant targets is disaster risk reduction and recovery addressing poverty, hunger, health, education, gender equality, clear water and sanitation, sustainable cities and communities and climate actions with involvement of youth in leadership role. Below included aims have to be achieved at national, regional, and international levels involving all the stakeholders and partnerships till the end of the year 2030⁶. The strategies to address disaster are as follow:

1. Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global

mortality rates in the decade 2020–2030 compared to the period 2005–2015.

2. Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015.
3. Reduce direct disaster economic loss to global gross domestic product (GDP) by 2030.
4. Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.
5. Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.
6. Substantially enhance international cooperation with developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030.
7. Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030³.

Nepal disaster risk reduction strategies at policy level

In the Nepalese context, the Constitution of Nepal Disaster Risk Management (DRM), Schedules 7 8, and 9 describe the responsibilities of DRM as a shared priority of the federal and provincial governments; the local governments, and all levels. Also, the Disaster Risk Reduction and Management (DRM) Act 2017 (amended 2018) DRM Regulations in 2019 and the Local Government Operations (LGO) Act 2017 have identified responsibilities of managing disaster risk reduction and response at local levels to the concerned local governments. Nepal Government has formulated the Disaster Risk Reduction National Strategic Action Plan (DRRNSPA) 2018-2030. The Fifteenth Plan (2019/20-2023/24) emphasizes the mainstream of DRM in all development plans⁵. Disaster Risk Reduction (DRR) in Nepal is important for youth, women, and girls to understand disaster impacts and their inclusion and leadership in decision-making around risk reduction. In recent days, community disaster preparedness has become a global strategic intervention. Disaster Risk Reduction interventions focusing on structured frameworks like the Sendai framework are very crucial with the involvement of all health professionals,

stakeholders, and community people.¹⁷ Sustainable Development Goals, which aim to eradicate poverty, protect the planet, and assure equality and prosperity by balancing and coordinating the social, economic, and environmental components of sustainable development, place young people at the center⁷.

In disaster events, communities are the first and most affected by its negative impacts, and the most benefitted from risk reduction through preparedness so community active participation is essential to integrally manage the risks and their impacts at the community level (CBDRR). The Youth-Led Initiative for DRR is a sort of CBDRR that strives to empower young people by improving skills, establishing an environment that allows them to develop their competencies, and promoting active engagement in families and communities to decrease disaster risks and consequences⁸.

DRR strategies at universities level

Timely and efficient healthcare interventions for preparing for disaster response are one of the top priorities so that training and developing competencies in disaster care intervention are important parts of education. WHO also has recommended that in all countries health professionals should be trained to prepare and respond to all types of disasters, with priority given to those most likely to occur in each country⁹. Educational Universities also need to plan for theoretical and practical learning components for their students in their curricular or co-curricular courses¹. Students can be valuable assets for the local community and management agencies during disaster recovery if they are trained and given the necessary tools¹⁰. Along with this, shreds of evidence have shown that training among health professionals have found very effective interventions¹¹.

DRR strategies among youth at family level

Youth participation in DRR procedures by using their knowledge, creativity, power, and teaming capability, ensures long-term investments and sustainability. Young people who participated in various risk management and risk reduction programs have demonstrated better knowledge and understanding of security issues and measures¹². They have also actively promoted better preparedness in their surroundings and home environment. Studies revealed that young people participating in various activities before, during, and after a disaster or a major incident have a better ability to handle the situation practically and mentally¹³.

CONCLUSIONS

Considering the unpredictable nature of the occurrence of disasters with serious human and environmental loss, global disaster risk reduction has been considered as efforts that include preparedness, response, and recovery to mitigate and manage the impact of disasters referring to the structural framework like Sendai framework is important. And disaster risk reduction is the comprehensive strategies and the shared responsibility of all at different level.

REFERENCES

1. Patel RK, Pamidimukkala A, Kermanshachi S, Etminani-Ghasrodashti R. Disaster Preparedness and Awareness among University Students: A Structural Equation Analysis. *Int J Environ Res Public Health*. 2023;20(5).
2. Center for Excellence in Disaster Management & Humanitarian (CFE-DM). Center for excellence. 2020;(October):2–71.
3. MINISTRY OF HOME AFFAIRS I. Country Report- INDIA. 2022;
4. Ministry of Home Affairs Government of Nepal. Crisis to Resilience : Transforming Through Disaster Risk Reduction and Management. Asia Pacific Minist Conf Disaster Risk Reduct [Internet]. 2022;2022(September). Available from: https://www.dpnet.org.np/uploads/files/Final_2022-09-16_05-13-58.pdf
5. Bhandari D, Neupane S, Hayes P, Regmi B, Marker P. Disaster risk reduction and management in Nepal : Delineation of roles and responsibilities. *Oxford Policy Manag* [Internet]. 2020;(May):29. Available from: [https://www.preventionweb.net/files/72985_delineationofresponsibilityfordisas\[1\].pdf](https://www.preventionweb.net/files/72985_delineationofresponsibilityfordisas[1].pdf)
6. Tandon U, Kumar A. Disaster Management and Sustainable Development in the Asia and Pacific Region: Engendering the Strategies of the SDGs. 2020;11–32.
7. MOHA. Mid-Term Review Implementation of the Sendai Framework for Disaster Risk Reduction. 2023;
8. INTERNATIONAL COUNCIL OF NURSES. Core Competencies in Disaster Nursing Version 2.0. 2019;1–12.
9. Koca B, Arkan G. The effect of the disaster management training program among nursing students. *Public Health Nurs*. 2020;37(5):769–77.
10. Hung MSY, Lam SKK, Chow MCM, Ng WWM, Pau OK. The Effectiveness of Disaster Education for Undergraduate Nursing Students' Knowledge, Willingness, and Perceived Ability: An Evaluation Study. *Int J Environ Res Public Health*. 2021;18(19).
11. Shi P, Ye T, Wang Y, Zhou T, Xu W, Du J, et al. Disaster Risk Science: A Geographical Perspective and a Research Framework. *Int J Disaster Risk Sci* [Internet]. 2020;11(4):426–40. Available from: <https://doi.org/10.1007/s13753-020-00296-5>
12. Khorram-Manesh A. Youth Are Our Future Assets in Emergency and Disaster Management. *Bull Emerg trauma* [Internet]. 2017;5(1):1–3. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28246615> <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC5316128>
13. Mubarak AF, Amiruddin R, Gaus S. The effectiveness of disaster prevention and mitigation training for the students in disaster prone areas. *IOP Conf Ser Earth Environ Sci*. 2019;235(1).