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Disaster management: Proactive approach in reducing vulnerability to natural disasters by managing disaster risks

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Abstract

The frequency and intensity of Natural disasters have increased continuously over recent decades across the world, affecting both developed and developing countries. While natural hazards affect all countries, developing countries are most vulnerable to disasters due to the geographical situation, poor infrastructure, people's unawareness and lack of preparedness. Meanwhile, the response and reaction to disasters have been more reactive than proactive in almost all disaster prone countries, particularly in the developing countries. This calls for a change in approach from reactive disaster management to a proactive disaster risk reduction one based on prevention, preparedness, response and recovery. This paper gives an overview of disaster management, disaster risk management and several proactive approaches to disaster management.

Keywords: Disaster, hazard, risk, vulnerability, proactive

Introduction

Globally, efforts are being made to ensure a shift in emphasis in disaster management from a purely reactive approach – providing food, water, medical attention and shelter to victims during and immediately after a disaster- to a proactive approach to hazards based on mitigation, preparedness, response and recovery.

Climate change is ravaging. No country is immune to climate change but some countries are vulnerable to its effects. A global assessment report (GAR) given by united nations office for disaster risk reduction(UNDRR) warns of larger threats due to extreme climate changes to economies particularly of the Asia pacific, with the greatest impact in the largest economies of Japan, china, Korea and India. The global average temperature has increased to 1.1 degree centigrade, primarily due to anthropogenic greenhouse gas emissions. This is affecting our climate. Climate change has always happened on earth. It is the rapid rate of climate change now that is of great concern worldwide. Due to climate change, there is increase in some forms of extreme weather events like droughts, floods, landslides, wildfires, growing frequency of heat waves, heavy precipitation, increased intensity of storms and cyclones.

Many countries have suffered economic losses due to natural disasters. These economic losses have crippling consequences on the future development and undermine country's efforts to achieve the 17 sustainable development goals. The response and reaction to disasters have been more reactive than proactive. The overall current disaster management may lead to more recurrent events and cause severe impacts. Thus, there is a need in changing the approach from a reactive to proactive one.

Hazard, Disaster, Risk and Vulnerability

A *hazard* is a potential threat to life, property, health and environment. Hazards are broadly classified into natural hazards and man- made hazards. *Hazards are termed as disasters* when they cause widespread destruction of life and property. The impact of a disaster is determined by the extent of a community's *vulnerability* to the hazard. While natural hazards affect all countries, poor and marginalized Population are most vulnerable to disasters due to high susceptibilities and weak coping capacities, especially in resource-limited countries.

Natural disaster = natural hazard x vulnerability

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Risk is the probability of any hazard to become a disaster. Risk is the probability that negative consequences may arise when hazard interact with vulnerable areas, people, property, environment. Hazards are the source of risks.

Risk = probability of hazard x degree of vulnerability and exposure

Hazard and risk are often used interchangeably. The risk that a community faces is mitigated by its level of preparedness, response and recovery or readiness. Natural hazards do not become disasters until or unless people are affected by it and in most cases these are the poor people who live in the most vulnerable settings with no preparedness.

Disaster Management

Disaster management is the organization and management of resources and responsibilities in order to save lives and property against disasters. Disaster management cycle includes-

1. Disaster prevention- reducing the risk of disasters.
2. Mitigation- mitigating the severity or consequences of disaster.
3. Disaster preparedness.
4. Response- rapid and effective response to disasters.
5. Recovery- post disaster recovery and rehabilitation.

Thus we see that disaster management includes both pre-disaster reduction phase (1-2-3) and post- disaster recovery phase (4-5). One significant problem with disaster management cycle was that it still has a disaster- oriented focus. The focus has been more on response and recovery than on prevention. This means that all resources and activities are geared towards the disastrous events. The underlying causes of these disasters (eg- risk, hazards and vulnerability) are still not considered in most cases or it is the product of bureaucratic ignorance. Thus, there is a need to create a culture of prevention and not just a culture of reaction.

Disaster Risk Management

Disaster risk reduction (DRR) is a new global thinking in the management of disasters and disaster risk. DRR describes the actions required to reduce the risk of disasters. It involves assessing, preventing, controlling and monitoring risks. Although often used interchangeably with Disaster risk reduction (DRR), disaster risk management (DRM) is the implementation of DRR which has the objective of reducing risks.

To strengthen DRR, international community took up the challenge at the united nation's world conference on disaster reduction (WCDR) in Japan in 2005, only some days after the 2004 Indian Ocean earthquake. HFA was formally approved at the WCDR. Hyogo framework for action (2005 – 2015) was the first internationally accepted framework for disaster risk reduction. The Sendai framework (2015-2030) is the successor instrument to the Hyogo framework for action for disaster risk reduction.

Historically, dealing with disasters focused on emergency response, but towards the end of the 20th century, it was recognized that disasters are not natural and that we can prevent losses by managing conditions of hazard, exposure and vulnerability. We cannot reduce the severity of natural

hazards but we can reduce the two components of risk that are vulnerability and exposure. We can reduce these two components by identifying and reducing the underlying drivers of risk, which are particularly related to poor economic development, degradation of the environment, poverty and inequality and climate change, which create and exacerbate conditions of hazard, exposure and vulnerability. Addressing these underlying risk drivers will reduce disaster risk, lessen the impacts of climate change and, consequently, maintain the sustainability of development. Before trying to reduce risk, we need to understand the hazards, and the exposure and vulnerability of people and assets to those hazards. Impact of a disaster depends on the vulnerability of a community. If we can manage the root cause of disasters, which is disaster risk, then disasters will not occur in the first place. Disaster risk is an indicator of poor development, so reducing disaster risk requires integrating DRR policy and DRM practice.

From disaster response to disaster prevention

Natural hazards such as tsunamis, earthquake, floods, Volcanoes will always be there but it is the actions and often lack of actions of the policymakers which convert a natural hazard into a disaster. Natural hazards do not become disasters until or unless people are affected by it. And in most cases these are the poor people who live in the most vulnerable settings with no preparedness. There is clear evidence to suggest that low –income countries with weak governance are more vulnerable and less resilient to disaster risk (UNISDR). Poverty and inequality plays a role. When an earthquake strikes a poor country, more deaths and more economic losses will likely occur than when it hits a rich country like Japan. Japan has a long history of disasters but at the same time it is one of those country most prepared to deal with disasters by enforcing strict buildings and engineering codes.

Other than developmental issues, we also live in the world of major challenges. Our population is swirling and it will reach 9 billion by 2050. 70 % of that population is going to be concentrated in urban areas which increases their vulnerability. When coupled with fast moving effects of climate change, natural hazards will not even increase in number but they will intensify. Thus, it becomes more important to manage the root cause of disasters, which is disaster risk. DRR can help in making positive change and making communities more safe and secure. We need to manage risks, not just disasters. DRR is a part of sustainable development. All the countries are striving to achieve sustainable development goals. SDG's can be achieved by reducing disaster risk.

Proactive Tools

Managing disasters requires managing risks with different tools.

Hard interventions include structural measures like land use planning, implementation of building codes and structural safety. Structural safety has two aspects:

- Design and construction of future buildings and facilities based on specific standards to prevent them from disastrous damages.
- Increasing the safety of existing weak buildings and facilities by reconstruction according to the standards.

Soft interventions include non-structural measures like awareness raising, policy making and legislation.

Awareness building can be done through education and training. Education is one of the best media for making a community prepared for disasters. This can be started from educating the young children on disasters. Various aspects and materials on health, safety and hazards should be incorporated into the formal school curriculum. The aim of all these initiatives is to increase the knowledge and understanding of children about risk to teach preparedness and also how to react in times of disasters. Children are believed to be more receptive to new ideas than adults.

These tools are part of broader initiatives to make communities more resilient by ensuring they have more capacity to cope with a range of threat. Besides these interventions, there is need to improve the level of preparedness and its maintenance. There are several tools by which communities can be made more resilient to disasters.

- Increasing education, training (conducting safety drills) and public awareness as well as promoting a collective prevention and safety culture.
- Community participation: communities and local people have wealth of valuable skills and knowledge to offer.
- Early warning system: Talking about Indian Ocean tsunami (2004), it took 2 hrs for the tsunami to reach India from Indonesia. At that time there was no way to warn people. Killer here was not tsunami in itself or nature's wrath, it was lack of information, lack of early warning system to let the people know that they should not run towards the ocean but should run away from it.
- Scientific knowledge: while considering disaster risk reduction, it is important to take account of the scientific information on climate trends. Variability of climate change should also be considered while managing the risk of natural disasters. A region vulnerable to drought, may get floods in a short span of time due to climate variability. Therefore, disaster risk reduction should take account of the possibility of such surprises.
- Local knowledge and public participation: Working close with local people helps in developing skills to handle future disasters like in rebuilding homes, search and rescue. Thus, improving the knowledge base is important.
- Information sharing: The working organizations on disaster risk reduction should establish linkages with scientific institutes that can provide them necessary information.
- Use of technology: Technical and engineering aspects of any hazard includes hazard mapping, hazard modeling, GIS utilization and prediction. Instead of using technology only to respond, it is more important to use it to better prepare and to understand the risks around us.
- Quick means of communication: The information related to disaster should reach the vulnerable groups on time. It should be conveyed down by all means of communication like radio, television, internet, telephones.
- Risk identification: We must always look backward before planning forwards. Previous years data of disasters can help in future planning against disasters. Appropriate communication of robust risk information at the right time can raise awareness and trigger action.
- Improving building codes.

- Flood and storm surge protection.
- Planting trees to stabilize slopes.
- Evacuation.
- Preparing emergency supplies.
- Resource planning.
- Deployment planning.
- Land use planning
- Insurance
- Finance and contingency planning- providing financial protection for people and businesses at risk.
- Building check dams and bridges
- Better urban planning
- Contingency plans
- Sustainable development
- Relocating exposed people and assets away from a hazard area.
- Policy making and legislation- laws and policies are needed to implement strict land use and building construction codes.
- Incorporating disaster risk management into national planning and investment.
- Public and private investment- governments need to invest in the collection, management and dissemination of risk information.
- Collaboration- different organizations should work together to fight against disasters.

Conclusion

Hazards are termed as disasters when they cause widespread destruction of life and property. There's nothing natural about disasters. These are the natural hazards which convert into a disaster, most often due to lack of actions of the policymakers. The frequency and the intensity of the natural hazards have increased in the recent years due to climate change. Both developed and developing economies have suffered huge losses. While natural hazards affect all countries, poor and marginalized population are most vulnerable to disasters due to high susceptibilities and weak coping capacities especially in resource-limited countries. The impact of a disaster is determined by the extent of a community's vulnerability to the hazard. Disasters can be managed by managing disaster risk. By understanding the two components of risk- vulnerability and exposure, we can control disaster risk. Disaster risk is an indicator of poor development, so reducing disaster risk requires integrating DRR policy and DRM practice. In the post-disaster stage, the authorities and public have been quite responsive. However, prevention and preparedness are still lacking. The government and aid organizations usually act after the disaster has taken place. Thus, there is a need to act proactively rather than being only reactive in handling disasters. Man-made factors, natural causes and managerial issues, are the factors that have contributed to the problem. The coordination and the public awareness are the challenges in improving disaster management. Efforts should be made to alleviate the problems through legal framework establishment and community participation programs. We need a public policy that promote better buildings codes and enforcement mechanisms. If we build are public policies around the simple principles of DRR, we can lessen the impact of disasters. DRR is a part of sustainable development, so it must involve every part of society- government, non- government organizations and the private sector. We need to manage risks, not just

disasters. This therefore requires a people- centred approach, multi-sector approach and creating a culture of prevention and resilience.

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