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Tsunami - Remembering an Unforgetteble Disaster

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ABSTRACT Tsunami is the most devastating natural disasters in the world. For most people who live in land the greatest threat is from overflowing rivers and creeks. Normally extraordinarily heavy rainfall causes rivers and other waterways to overflow. The excess water creates deadly currents and sweep away people, causing them to drown. It also does a lot of damage in the initial surge and then with standing water. A tsunami has all of these detrimental effects plus the added destructive power crashing waves.

It is obvious that tsunami is caused by a strong earthquake on the ocean bed. The vibrations travel through the water travelling sometimes thousands of kilometres. If you were on the water or deep sea diving in SCUBA gear you would not notice much probably just rough waves or a momentarily strong downward pull if you were underwater. However, a tsunami gains its true destructive power as it approaches land. The water level becomes shallower causing the waves caused by the earthquake to compress and combine. This is what creates the massive and destructive waves that cause so much destruction. The present paper is an attempt to recall the impact of Tsunami on the people who were escaped from the deadliest destruction.

U.S. Geological Survey (USGS) scientists are assessing preliminary data and beginning more detailed studies of the devastating tsunami that lashed coasts around the Indian Ocean on December 26, 2004. The large tsunami waves were generated by a magnitude 9.0 earthquake off the northwest coast of Indonesia's island of Sumatra. The earthquake occurred on the interface between the India and Burma tectonic plates where the India plate subducts beneath the overriding Burma plate. USGS scientists estimate that the sea floor in the vicinity of the earthquake was uplifted by several meters. Displacement of water above the sea floor triggered the tsunami, which caused catastrophic levels of destruction in countries around the Indian Ocean basin—even as far as the east coast of Africa—with Indonesia, Sri Lanka, India, Thailand, Somalia, Maldives, Malaysia, Myanmar, Tanzania, Bangladesh, and Kenya among the countries hardest hit. The death toll reported by the Associated Press on January 10, 2005, was more than 150,000 and expected to rise.

What will happen if lot of water either falling on men or surging towards them. The waves not only sweep the people, but also destroy even well built structures. The costs to human life can also be devastating. On December 24, 2004, a massive 9.2 earthquake occurred of the island of Sumatra. It created a deadly series of tsunamis that swept Indonesia, India, Madagascar, and Ethiopia. The death toll was estimated to be 300,000 to 350,000. This was one of the greatest losses of life due to a major natural catastrophe in modern history. The immediate destruction is only the beginning of the damage. After the waters retreated there was the elevated risk of disease created by stagnant and contaminated water. Since most tsunamis occur south of the Equator and In the Pacific this only raises the risk of disease further. There can also be more interesting effects that deal solely with scientific curiosity. The Christmas tsunami was so powerful it actually sped up the rotation of the Earth reducing the length of its sidereal day. The earthquake that spawned it also caused the Earth to vibrate all over by as much as 1 cm. Earthquakes are among the most devastating forces of nature. What we have are seven of the world's most famous earthquakes, chronologically listed below. Not all included here are necessarily the strongest (in terms of magnitude) but they made the headlines when they hit. Here they are: One of the nature's most devastating forces is earthquakes. Given below is the most famous Tsunamis occurred and caused very dangerous effect on the earth.

1. Shaanxi Earthquake of 1556

This was the deadliest quake ever recorded. It claimed the lives of about 830,000 people. At that time, most inhabitants in the affected areas were living in Yaodongs or artificial caves. They were buried alive when the huge tremors caused the cliffs in which these caves were located in, to collapse.

2. San Francisco Earthquake of 1906

Although its tremors were also felt in Southern Oregon, it is the resulting fire in San Francisco that had a more devastating impact on the economy. Is has been often compared recently to Hurricane Katrina because of its similar economic bearing.

3. The Great Chilean Earthquake of 1960

Like the one that hit Asia in 2004, this 9.5-rated quake resulted in a massive tsunami reaching up to as high as 10.7 meters. This magnitude is the highest recorded ever. Although the tsunami originated in Cañete, Chile, the waves raced north-westward to Japan and the Philippines, wreaking havoc there.

4. Great Alaska Earthquake of 1964

With a magnitude of 9.2, it is the second strongest earthquake to be ever recorded. It caused tsunamis, landslides, and resulted in major landscape changes. Some places near Kodiak is said to have been raised 9.1 meters high, while those near Portage were dropped by 2.4 meters. Here are more articles about Alaska earthquakes.

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5. Great Tangshan Earthquake of 1976
This is the deadliest quake of the 20th Century, with the number of deaths hitting somewhere near 250,000. Weak building structures and the time this disaster struck (4 am) contributed a lot to that sickening number.

6. Bam Earthquake of 2003
The death toll in this tremor reached over 26,000. Like the one in Tangshan, the use of poor construction materials was one of the leading culprits for the deaths. Most of the affected buildings were made of mud bricks.

7. Indian Ocean Earthquake of 2004
The resulting tsunami that killed 230,000 people was caused by a subduction between the India and Burma plate. Its 30 m-high waves destroyed virtually everything in its path, making this quake not only one of the most famous earthquakes but also one of the famous natural disasters in history.

Excluding poor building infrastructure, we can see that high death tolls in these famous earthquakes result when the tremors are accompanied by tsunamis. This happens when the quake's epicentre is found at the bottom of the ocean. The tsunami arrived in northern Sumatra approximately 1/2 hour after the earthquake, in Thailand approximately 1 1/2 to 2 hours after the earthquake, and in Sri Lanka approximately 2 to 3 hours after the earthquake. According to initial modeling and eyewitness accounts, areas east of the earthquake rupture, or "generation area," were first affected by a negative wave (drawdown of water and retreat from shore before a rise in water), whereas areas west of the generation area were first affected by a positive wave (no drawdown or retreat of water before the first tsunami wave hit). Maximum wave heights estimated from media reports are Sumatra, 10 to 15 m; Sri Lanka, 5 to 10 m; India, 5 to 6 m; Andaman Islands, 5 m; Thailand, 3 to 5 m; and Kenya, 2 to 3 m. Some energy from the tsunami "leaked" into adjoining oceans, producing sea-level fluctuations at many places around the world

Post-Tsunami Field Surveys
By December 31, 2004, six international teams (including Japanese and American teams) had been formed to document the magnitude and effects of the tsunami before the evidence is destroyed. Typically, such teams arrive in the affected areas about one to three weeks after the tsunami occurs. Because this was the largest tsunami in more than 40 years and the area affected is very large, there could be as many as a dozen international teams investigating the tsunami. USGS oceanographer **Bruce Jaffe** and USGS geologist **Bob Morton** traveled to Sri Lanka from January 7 to 16 with an international team funded by the National Science Foundation and the USGS to examine inundation areas, estimate wave heights, determine the tsunami's precise arrival time, scour the area for geologic evidence and sedimentary deposits, and examine structural damage. As of this writing, the USGS had also been invited to have scientists participate in post-tsunami surveys in India, Thailand, and Sumatra.

Ideally, post-tsunami surveys will include both a quick response focusing on ephemeral evidence and a later response (possibly in February or March) focusing on tsunami sedimentation and erosion. The quick response will include measurements of water levels, inundation distances (horizontal distance from the shoreline to the farthest inland reach of the tsunami), and indicators of the tsunami's flow direction and flow velocity. The later response will focus on the sediment deposited by the tsunami: whether it has characteristics that reflect those of the tsunami itself, such as its height, power, and extent; how much of the sediment is likely to be preserved in the geologic record; and how much is likely to be eroded away. The more we learn about sedimentary deposits from modern tsunamis, the more accurately we can identify and decipher sedimentary deposits from ancient tsunamis. Because scientists cannot yet predict when a tsunami will occur, learning to read a geologic record of past tsunamis may be one of the only ways to assess future risk.

During the past four decades, hazards events such as earthquakes, drought, floods, storms, fires and volcanic eruptions have caused major loss of human life and livelihoods; destruction of economic and social infrastructure and significant environmental damage. According to Gavidia (2000), natural disasters such as earthquakes, floods and hurricanes can wipe out years of urban development by destroying infrastructure and housing and by injury or killing thousands of people. The 2011 Tsunami in Japan is an example of a disaster characterized by an immense loss of lives and property.

Social and economic structure of a society is a major determinant of the vulnerability of the population to the impact of disasters. This explains the variation in the impact of disasters and environmental emergencies all over the world. The Munich Re-insurance estimated that economic losses due to environmental emergencies have increased three-fold from the 1960s to the 1990s, and in the first few years of this decade, are running about US $50 billion per year. Although most of these economic losses occurred in industrially developed parts of the world developing countries in Africa and Asia suffer greater burden of the relative impact of these disasters. The effects of disasters on such human and economic sectors as employment, balance of trade, indebtedness from reconstruction and loss of capital continued to be felt for many years after disaster events.

Developing nations in particular, experience pervasive risk of devastation, human and property loss resulting from human and natural disasters, this level of risk is attributable to socio-economic stress, aging and inadequate physical infrastructure, weak education and preparedness for disaster and insufficient fiscal and economic resources to carefully implement the preparedness, response, mitigation and recovery components of integrated emergency management.

Disaster risk is a potential factor in many development projects. Environmental hazards can affect a project area, with socio-economic consequences for the project's target populations. Development projects can increase or reduce the risk of natural disaster, through their impact on social resilience and the natural environment. By understanding and anticipating future hazard events, communities, public authorities and development organisations can minimise the risk disasters pose to socio-economic development. Understanding the interactions between projects and environmental hazards is crucial in ensuring the sustainability of development gains. Sustainable development is accepted as a fundamental objective for public policy and decision making because the overall objective of any development process is to enhance the quality of life of the target population. Thus the growing acceptance of sustainable development as an over-arching policy goal has rightly stimulated interest in assessing the impact of particular intervention on sustainable development at aggregate, sec-

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toral or project levels (Centre for Good Governance, 2006). This sustainability objective is justified based on the fact that issues pertaining to the ecosystem's capacity to tolerate and respond to population growth and other human induced stresses have become essential for sustainable management of natural resources and human livelihood systems related to them.(Uito and Morgan, 1996). Thus due to increased pressure on resources accompanied by evidence of environmental deterioration, poverty inequality, and general economic decline needed to be addressed in regards to the immediate or potential environmental damage and social consequence that may be associated.

Social impact assessment can therefore play an important role in the understanding of the consequences and social outcome of projects that are meant to tackle poverty, enhance community development or designed to reduce vulnerability to disasters during environmental emergencies.. According to the Inter-organizational Committee of the U.S. Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service (1994), "social impacts" refers to the consequences to human populations of any public or private actions-that alter, or are capable of altering, the ways in which people live, work, play, relate to one another, organize to meet their needs and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society. Social Impact Assessment (SIA) is the process of analysing, monitoring and managing the social consequences of policies, programmes and projects. These consequences may be positive or negative, intended or unintended, direct or indirect; they may be short-term impacts or long-term changes. As well as helping to explain how a proposed action will change the lives of people in communities, SIA indicates how alternative actions might mitigate harmful changes or implement beneficial ones.

Conclusion

When placed in the context of sustainable development, disaster management represents an important aspect of socio-economic and national security, therefore facilitating a continuous development process. Disaster reduction policies and measures need to be implemented with a two-fold aim; to increase the resilience to natural hazard while ensuring that development efforts do not increase vulnerability to these hazards.

It is important to emphasize that disaster risk reduction is a proactive approach that needs to be integrated in regular development planning and poverty reduction program at all levels. Policymakers in the development and poverty reduction sector need to recognize that disasters are not just "setbacks" or "roadblocks" to development, but result from the paths that development is pursuing. Thus by changing our planning processes, and incorporating disaster risk assessment in the planning of all new development projects, we can make sure that the future natural hazards will encounter resilient communities that are capable of withstanding their impact and therefore remain mere emergencies rather than disasters. We need to recognize that we can mitigate the impact of disaster and make mitigation the cornerstone of disaster management interventions. We must shift the focus to the most poor and vulnerable sections of our society, and ensure that our interventions are community-based and driven. To do this the extent to which a community disaster risk space is linked with environmental management practices must be recognized and given adequate consideration.