SECONDARY SCHOOLS' UNITED NATIONS SYMPOSIUM 2015

World Conference on Disaster Risk Reduction 2015

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NOVEMBER 12-15, 2015 | MONTRÉAL, QUÉBEC

Esteemed Delegates,

Welcome to the World Conference on Disaster Risk Reduction! My name is Marta Canneri and I have the immense privilege of being your Chair for the weekend. Before all else, let me introduce our fantastic dais.

Anuradha Mallik is a second year Computer Science major at McGill. She has been involved in Model UN for the past six years, serving on Dais and Secretariat teams for the last three years. She has numerous experiences with General Assemblies and can't seem to get away from them! Her passion for Gender Studies and Natural Disaster Rehabilitation coupled with her love for Model UN inspired her to pursue WDRRC at SSUNS.

Winnie Zhao is in her third year at McGill, studying Kinesiology with the hopes of becoming an occupational therapist with a focus on pediatric rehabilitation. She has participated in Model UN for 6 years, even being a delegate at SSUNS! She loves volunteering at the McGill Childcare Centre and playing volleyball in her free time. She is excited to discuss the impact of disaster risk reduction in light of the abundance of disastrous weather events that have recently occurred around the world.

Gemma Bateman is a fourth-year student at McGill who is working towards a Bachelor of Arts in Political Science, with a double minor in Economics and Management. Gemma has been involved with MUN since her second year of university, and has loved every second of it! When she's not studying or working on MUN, Gemma enjoys yoga, cooking, and swimming. She has worked hard with the rest of the dais to put the background guide and the committee together, and cannot wait to see the results!

As for me – I'm a fourth-year student at McGill studying History and Political Science with a minor in Classical Languages. I hail from Milan, Italy by way of Toronto, Ontario. To put it lightly, Model UN is a big part of my life: I have competed in and staffed conferences for the past seven years, taught at Best Delegate summer programs for the summers of 2013 and 2014, and consider MUN one of the biggest factors shaping who I am today. I was even a delegate at SSUNS, way back in 2011! At McGill, I compete on our travel team and serve as the Secretary-General for SSUNS' collegiate sister conference, McMUN. I am passionate about international affairs and global governance: this past summer, I interned at the Council on Foreign Relations in New York and conducted research as a Junior Research Fellow for the NATO Council of Canada. In my free time, I enjoy reading, listening to podcasts, and binge-watching TV shows. I am excited

to meet you all and hear the high-level debate I've come to expect from SSUNS delegates!

I challenge you to approach your committee experience at SSUNS with an open mind, a full research binder, and a flair for the creative. Model UN is more than role-play: it is the opportunity to solve a problem, develop skills that will help you for years to come, and make lifelong friends. In a large committee like this one, it is also the opportunity to showcase your negotiation and public speaking ability.

Our team has been preparing for months to bring you a committee that will push you to the limits of your knowledge and creativity. I urge you to prepare as much as possible; your research will be your strongest asset in addressing the pressing problems of our time, and this Background Guide should be merely a starting point for your own investigations into the issues at hand. Finally, I urge you to come to SSUNS with an enthusiastic attitude and a mind full of ideas: you'll need both to excel in this committee.

Best regards,

Marta Canneri

Introduction

Disaster risk reduction (DRR), as defined by the United Nations Office for Disaster Risk Reduction (UNISDR), is a proactive strategy that "aims to reduce the damage caused by natural hazards […] through an ethic of prevention".[1] Natural hazards are weather-related events such as earthquakes and floods that have the potential to create disastrous situations that impact vulnerable communities. They become disasters when they cause substantial damage to the livelihoods of a specific populace and leave the affected communities unable to function normally without outside assistance.[2] The goal of DRR is to mitigate the effects of disasters through initiatives that reduce the vulnerability of those at risk. DRR strategies focus on holistic preventative measures to increase the resilience of potentially vulnerable regions, rather than post-disaster relief and emergency aid.

The Third UN World Conference on Disaster Risk Reduction, unlike specific UN bodies, will be convened with the two specific intended outcomes of **first**, assessing past efforts in disaster risk management and **second**, adopting a post-2015 framework for disaster risk reduction.[3] One of the fundamental visions of the United Nations Office for Disaster Risk Reduction is to enable all communities to become resilient to the effects of natural, technological and environmental hazards.[4] As such, disaster risk reduction is one of the areas of UN activity that perfectly encapsulates the related concepts of a global community and of egalitarianism in global governance. Every country, regardless of its size or economic preponderance, is asked to contribute in some way to building a more disaster-ready world. In the words of UN Secretary-General Ban Ki Moon: "let us not forget that disaster prevention is a moral imperative, no less than reducing the risks of war."[5] Indeed, the United Nations system itself has had a crucial leadership role in global risk and disaster reduction, particularly in fostering international cooperation and information sharing among interested parties.

In past resolutions, the UN General Assembly has recognized the need to recognize the importance of "stronger interlinkages among disaster risk reduction, recovery and long-term development planning", as well as the need to integrate a variety of perspectives (including a gendered one) into the design and implementation of disaster risk management.[6] This committee will attempt to meet this call to action by addressing three diverse, yet irrevocably intertwined, issues in disaster risk reduction: gender, poverty, and technology. These three issues are some of the most relevant and poignant today, particularly with respect to the cause of sustainable development. Indeed, the WCDRR is important precisely because of its position as one of the first major conferences of the post-2015 sustainable development agenda. As such, these topics must be treated with the weight and respect they deserve, and the only way to do that is by researching them thoroughly and critically. It all starts, of course, right here in the background guide.

[1] "What Is Disaster Risk Reduction?"
[2] "Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organizations."
[3] UN World Conference on Disaster Risk Reduction, "Conference Handbook".
[4] United Nations Office for Disaster Risk Reduction, "What is the International Strategy?"
[5] Ibid.
[6] United Nations General Assembly, A/RES/67/209.

Past Treaties and Resolutions Governing the Issue

The realm of disaster risk reduction and, more broadly, sustainable development is governed and framed by a number of international documents, including conventions, treaties, and outcome documents. Below you will find some of the most important of these treaties and frameworks.

- The Yokohama Strategy and Plan of Action for a Safer World: guidelines for natural disaster prevention, preparedness and mitigation (1994)
- "Future We Want": the Outcome Document of the United Nations Conference on Sustainable Development, particularly the decisions related to disaster risk reduction
- The Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, together with the framework's midterm review
- The Global Platform for Disaster Risk Reduction
- The Special Report of the Intergovernmental Panel on Climate Change on managing the risks of extreme events and disasters to advance climate change adaptation, issued in Geneva in March 2012

Any research on Disaster Risk Reduction will start with these documents, may of which you will see referenced throughout the rest of your research and in committee during debate.

Topic 1: Gender and Disaster Risk Reduction

"Disasters don't discriminate, but people do."[7] Disasters across the globe, whether manmade or natural, are inevitable, and can result in enormous loss of livelihoods, health, assets, resources and lives - disaster risk. A number of factors influence who is affected by disasters – socioeconomic status and development, proximity to zones where natural disasters are more likely and vulnerability of the population. Gender discrimination exists in multiple spectrums, including that of disaster risk reduction – subsequently, women and children are one of the most neglected and affected groups. Multiple organizations, including the World Conference on Disaster Risk Reduction, have compiled the issues of gender discrimination in risk reduction, benefits of gender-specific risk reduction and methods to reduce the gap created by gender discrimination in disaster risk reduction.[8] Along with these issues' awareness, the production of solutions and gender-encompassing risk management plans have been created, some of which will be discussed and detailed in this section.

Section 1: Key Concepts

Disaster: an occurrence that disrupts the day-to-day working of a society, often having disastrous effects in terms of losses that results in a society's inability to efficiently maintain resilience with a lack of aid. The United Nations International Strategy for Disaster Reduction has stated that disasters are more than simply a result of a hazard; they also consist of vulnerability and lack of resilience. This provides an explanation for why women and children, as a discriminated and vulnerable population, can be heavily affected.

Disaster Risk: the disaster losses as mentioned above that can be defined as the disaster that is a response to omnipresent risk factors. These can be surveyed and predicted based on hazards as well as socioeconomic development and infrastructural resilience.

Mitigation: a response to attempted cures to the issue; mitigation can also be discussed as a reduction in negative effects of disasters. While negative effects can never be completely eliminated, they can be reduced through methods discussed later in this guide.

Gender Mainstreaming: a strategy for making women's and men's voices heard in the realm of political, societal and economic policies. This ensures gender equality between men and women. [9]

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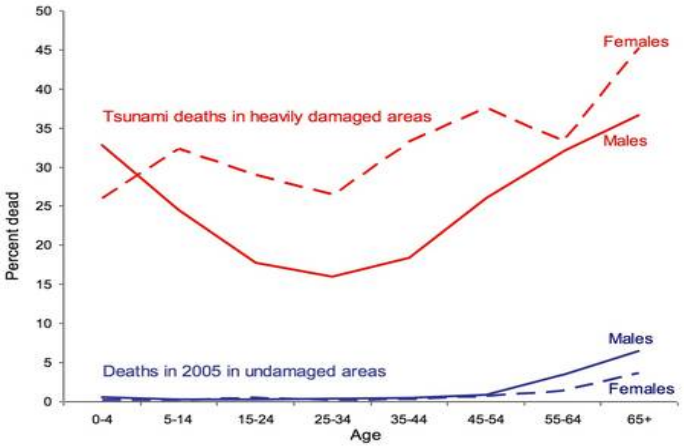
[7] United Nations. "Making Disaster Risk Reduction Gender-Sensitive."

[8] Ciampi, Maria C., Fiona Gell, Lou Lasap, and Edward Turvill. Gender and Disaster Risk Reduction A Training Pack.



[8] The effects of the 2004 Tsunamis in terms of demographics

Section 2: Defining the Problem

Poverty is an issue that is so great and pertinent that it pervades a portion of every society, and its resolution is a main aim of the UN Millennium Development Goals. Poverty is affected by a number of factors – including the marginalization of certain groups by the existence of inequalities such as lack of resources, education and opportunities. A specific marginalization that is omnipresent is that of gender inequality and neglect against women and children. The poverty rate for these groups is the highest, with that of children under the age of 18 being approximately 20%. Traditionally, women have held the burden of reproducing, as well as in many developing societies less power, opportunity and legal freedom, which decrees them more helpless against the effects of disasters. As a subsequent result, women have a higher mortality rate than men in the face of disasters: for instance, following the 2004 Tsunami, in places such as Aceh, Indonesia, it was found by Oxfam that of those affected, 70% were women and in the 1991 Bangladesh cyclone out of the 140,000 approximately 90% were female.[9] A study conducted based on 141 countries told us that more women are killed during disasters than men. Furthermore, intersectionality must be taken into consideration, and it was deduced that there are aspects within gender that heavily affect the effect of DRR; for instance, age, abilities, competency, ethnicity, caste and social class have an effect on the way women are treated in light of natural disasters.[10]

As a result of this observation and further research, it was deduced that gender inequality provides a magnifier for the effects of a disaster. This has a huge effect on disaster results, particularly because the majority of poverty-stricken individuals are female.

There are multiple examples of why this may be the case. For instance, women rely primarily on natural resources for their roles in society. Subsequently, if this is affected; a woman's role is similarly affected. This can result in violence against women, which has been seen to rise in light of disasters, potentially as a result of lack of privacy in shelters, pressuring into prostitution for services, or anger in response to women taking on leadership roles. Furthermore, women's traditional economic or social role in a household heavily affects their livelihood even after a disaster. Women have fewer assets in terms of economic endowment to provide, making them more vulnerable prior to a disaster, and making it more difficult for them to make an even recovery from a disaster.

[9] Briceño, Sálvano. Gender Perspectives: Integrating Disaster Risk Reduction into Climate Change Adaptation.

[10] Neumayer, E., & Plümper, T. The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2002.

It is evident that vulnerability to risks is heavily affected by one's assets and position in society, which suggests that attention needs to be paid to women's ability to build resilience and handle disasters.

In addition to this, it is now noted that women play an active role in recovery from a disaster, and so when they are supported in their preparation and response efforts, they can produce an enormous positive effect.[11] Women have previously spearheaded a number of initiatives to act as a catalyst for change in disaster risk reduction.[12] Often, while a woman's role in society may affect their vulnerability to risks, it can often also play a role in recovery, a fact that is often overlooked. For example, women's level of integration into their communities and risk awareness provides them with innate abilities surrounding risk assessment, early warning, disaster response and recovery.[13]

Subsequently, as statistics show, women are more heavily affected by disasters, consequently affecting recovery – accordingly a number of disaster risk reduction techniques that take into account women's roles have been under development and adopted by a number of organizations.

Section 3: Current Efforts and Potential Solutions

A number of organizations are currently making an effort to resolve the issue, including the United Nations itself. UN Women has worked with a number of nations' governments to find a solution.

Examples of Efforts by UN Women

- In Vietnam, women were trained in disaster management, and after national lobbying; the government passed a decree in September 2013, providing the Women's Union a chair in decision-making meetings of the Committee for Flood and Storm Control.
- After certain disasters – for example the 2014 Bosnia and Herzegovina floods, during which 25 people died, UN Women vigorously ensured that women played a role in recovery planning and disaster risk reduction.
- In Pakistan there were a number of floods in 2010 and 2011, during which nearly 1800 people died, UN Women helped in inaugurating the Gender and Child Cell (GCC). A women's desk was provided in Federally Administered Tribal Areas, which helped counter the stereotypical negative effect in rural areas. Provincial branches of the GCC were set up in a number of states in Pakistan, such as Sindh, Baluchistan and the Pakistani area of Punjab, as well as in the State Disaster Management Authority (DMA) of Pakistan-Administered areas of Kashmir. To this day, the GCC is supported by UN Women and regulates the inclusion of vulnerable groups such as women and children in disaster risk reduction.

[11] Aguilar, L., et al., Training Manual on Gender and Climate Change.
[12] A. Araujo et al., 'Gender Equality and Adaptation'.
[13] Aguilar, Ibid.

- In Kenya, political moves were made to draft a bill on Disaster Risk, which was subsequently approved and resulted in UN Women providing technical support to Kenyan women in governmental and parliamentary positions to push for including clauses on gender equality within the bill. The bill is still under discussion and includes the analysis of current policies, the inclusion of technology and information and communication tools like technical policy briefs, facts and information and further technical support to the government.

Worldwide movements have also been made by UN Women:

- It provided input into the Third World Conference on Disaster Risk Reduction, assisting in the development of the Post-2015 Framework for Disaster Risk Reduction.
- UN Women is working with civil society organizations and other NGOs and UN organs to provide technical support to member states as well as the secretariat of the conference.
- UN Women has heavily encouraged female leadership in disaster risk reduction.
- UN Women has focused specifically on strengthened data collection, language use and technical aspects in Gender and Disaster Risk Reduction.
- There has also been contribution into a High level Multi-Stakeholder Partnership Dialogue on Mobilizing Women's Leadership in Disaster Risk Reduction.

Other NGOs such as Oxfam and the United Nations Development Program have, and plan to, make an active effort into resolving this issue. Currently, the primary aim by many of these NGOs is to raise awareness for the issue. For example, Oxfam published a ‘learning companion’ which contained information on how to learn how to resolve the issue and how to empower women in disaster-affected areas. Below is an example of some of the “suggested activities” to use while running a workshop of women in these areas published by Oxfam. This is an example of *gender mainstreaming.*

Change	Impact	Gendered programme activity examples
Temperature increase on land and water	Heat stress on crops	Ensure that women farmers as well as men have access to heat-tolerant crops and varieties, and that their cultivation and/or processing does not place an additional burden on women
	Increased water demand for crops	As above, for drought-tolerant and fast-maturing crops and varieties
		Include women in training sessions on how to increase soil's organic content
		Include women in training sessions on water-conserving crop-management practices and ensure that the practices promoted do not place an extra physical burden on women
		Promote water capture and storage, ensuring that women are consulted on appropriate systems
	Heat stress on livestock	Tree planting (for shade and fodder) done in consultation with women and men so that it is done in appropriate areas, and women are included and treated equally in planting activities
Sea-level rise	Saline intrusion	Provision of water for households and productive use, ensuring that women are involved in designing systems that meet their requirements
Changed seasonality	Farmers uncertain about when to cultivate, sow and harvest	Ensure that both men and women farmers have access to appropriate, accessible and reliable weather forecasts and know how to use this information
		Promote crop diversification and crop mixing, ensuring that their cultivation and/or processing does not place an additional burden on women
	Crops damaged by dry spells within growing season	Ensure that both men and women farmers have access to appropriate, accessible and reliable weather forecasts and know how to use this information
		Promote crop diversification and crop mixing, ensuring that their cultivation and/or processing does not place an additional burden on women
		Water capture and storage; access to fast maturing/drought tolerant varieties; soil and crop management to conserve water
		Ensure that women farmers as well as men have access to flood-tolerant crops and varieties, and that their cultivation and/or processing does not place an additional burden on women
		Promote crop diversification and crop mixing, ensuring that their cultivation and/or processing does not place an additional burden on women

Conclusion

There are a number of organizations and NGOs that are currently attempting to resolve the issue. Because in the past gender issues have arisen on many fronts, it is a battle that is ongoing. One of the primary methods of resolution as of now is collaboration between governments regarding disaster risk reduction focusing on women, as is being followed by a number of organizations. With raised awareness, we can look towards a brighter future with empowered, confident women who will have the capability and opportunity to assist in disaster risk reduction.

Potential questions to think about

1. What are the most pertinent issues regarding disaster risk reduction that arise from gender inequality?
2. How can these issues be resolved?
3. How does gender inequality affect disaster preparation and resilience?
4. How does it affect risk reduction after a disaster?
5. Is there a bidirectional relationship? Does the effect of disasters on women have an effect on gender inequality?
6. What methods exist for mitigation?
7. What methods exist for gender mainstreaming?
8. Which other organizations could play a role in this issue?

Topic 2: Reducing Disaster Risk to Alleviate Poverty

The extent of vulnerability experienced by a community or individual is dependent on several physical, environmental, social, economic, political, cultural and institutional factors. Impoverished individuals are the most vulnerable and have the greatest potential to suffer extensive harm and loss from disasters due to the exacerbation of their already dire socioeconomic and environmental conditions. The poor are not adequately equipped to anticipate, cope, resist and recover from the impact of a natural hazard, pushing them further below the poverty line and creating a vicious cycle of disaster and poverty.[14]

The UNISDR is in charge of creating a disaster risk reduction plan that effectively addresses the driving factors of vulnerability and poverty, thereby reducing the risk of a country or community. Poverty eradication and disaster risk reduction should both be considered when creating development policies and institutional frameworks to be implemented at local and national levels. Low and middle-income countries should especially be targeted, as their economies are the most susceptible to the impacts of natural hazards.

Section 1: The Link Between Vulnerability and Poverty

Poverty is one of several dimensions that can contribute to an individual or community's vulnerability to disaster. A greater degree of poverty correlates with higher vulnerability, which consequently implies a graver outcome in hazard events. In Mexico between 1980 and 2006, only 8% of housing in regions with low levels of poverty were affected by natural hazards, while 20% of regions with high levels of poverty experienced more than 50% of their housing stock being damaged or destroyed.[15] This is due to the lack of funds and resources available for poorer households to protect themselves against disasters. They are unable to safeguard their homes and livelihoods and are rarely covered by insurance or other means of social protection. Once disaster strikes, they are also unable to protect against any economic losses due to their lack of assets.

Conversely, an individual or community's vulnerability to disaster also affects their level of poverty. When disaster strikes, a plethora of social, economic and environmental factors that contribute to the livelihoods of the impoverished are affected. The most apparent consequences have a direct and negative effect on the financial status of the individual or community and include the loss of lives, homes and assets, the destruction of livelihood opportunities and the disruption of schooling and social services. Further problems stem from these outcomes that also contribute to pushing those affected further below the poverty line. Food and water availability is decreased, health problems become more abundant, and poverty eradication efforts are disrupted to divert funds towards relief and rehabilitation efforts.

[14] "Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organizations."
[15] "Risk and Poverty in a Changing Climate."

Poverty and vulnerability to disaster exert negative effects on each other and decrease the chances of an individual or community to escape from the poverty trap - the poor will become poorer and more vulnerable as each disaster strikes. In order to effectively combat the vicious cycle of vulnerability and poverty, the focus of disaster mitigation must be shifted from emergency relief efforts to holistic prevention methods. By implementing disaster risk reduction strategies, the poor environmental and socioeconomic conditions experienced by marginalized individuals will become less exacerbated when disasters occur. Introducing disaster risk measures will reduce the vulnerability and poverty of individuals in the present and ensure the safe and sustainable development of communities in the future.

Section 2: Disaster Risk and Low-Income Countries

In 2003, 600 million people worldwide were adversely affected by more than 700 natural hazards, with over 75,000 deaths reported.[16] While the severity and exposure of a hazard is a major contributing factor to the impact of a disaster, it is not the only determinant of disaster risk. The quality of underlying risk drivers such as economic strength, quality of governance, and accountability of institutions are also major contributors to a country's overall risk.

These disaster risk drivers concentrate a disproportionate amount of disaster risk on developing countries with low resilience. Wealthier countries tend to possess greater control over their risk drivers and have implemented more effective early warning systems and risk reduction strategies to dampen the impact of disasters. In comparing Japan and the Philippines, both countries that are exposed to frequent tropical cyclones, the estimated death toll in the Philippines is 17 times greater than in Japan.[17] Overall, the mortality risk due to disaster is 200 times higher for individuals in low-income countries compared to those in middle and high-income countries[18]. Mortality of these individuals is not only affected by the disaster itself, but also amplified by the economic, environmental and social repercussions of the disaster. The higher vulnerability of low-income countries causes greater mortality rates and economic losses, and sets them back in their progress towards poverty eradication.

The majority of affected individuals live in countries with small and vulnerable economies. These include Small Island Developing States (SIDS), Land-Locked Developing Countries (LLDCs), and other lesser-developed countries, notably those in Africa. Such countries have far higher levels of disaster risk with respect to the size of their populations and economies compared to countries with strong economies. The vulnerability of these countries is further exacerbated by extreme trade limitations; poor governance, lack of sustainable infrastructure, and other underlying risk drivers. Some of these low-income countries also experience rapid economic and population growth, which is increasing at a much faster rate than risk reduction measures can be

[16] "Linking Poverty Reduction and Disaster Risk Management."
[17] "Risk and Poverty in a Changing Climate."
[18] "Disaster Risk Reduction: An Instrument for Achieving the Millennium Development Goals."

implemented. This results in greater exposure of people and economic assets to potential disasters and increases the country's overall disaster risk.

Impact at the Local Level

Disasters have the greatest impact in poorer communities, especially in rural areas and informal settlements. Poor individuals are living with conditions that put them to a greater disadvantage when natural disasters occur. They reside in substandard quality housing in disaster prone locations such as flood plains, steep slopes and riverbanks. They have lower levels of access to basic health, educational and other social services, especially in rural regions. Poor households are more likely to experience increased damage to property and assets, income and consumption shortfalls and increased dependency on welfare post-disaster. Earthquakes in El Salvador in 2001 alone reduced the average income per capita in poor rural households by more than about 33%.[19] Due to their limited access to financial resources, the impoverished have little incentive to manage their resources sustainably or invest in risk reduction measures, as they are more focused on surviving in the short-term.[20]

Disasters also cause an increase in damage to the environment, notably to crops and other agricultural resources, thereby destroying the limited resources by which the poor make their living. Due to the destruction of crops, there is a decreased availability of food, which can cause nutritional shortfalls that affect the growth rate of children in the region. The region also has a greater susceptibility to further environmental hazards or after shocks once an initial hazard has struck. Finally, disasters affect entire regions by increasing infrastructural damage and affecting the availability of schools, health care, drinking water and other social resources. This decreases school enrolment and attendance and increases the rate of disease within the area. Poor communities boast a plethora of underlying risk factors that increase their vulnerability to disaster and the impact of the disaster once it has occurred. These risk factors are only further exacerbated in rural neighbourhoods due to their isolation and lack of resources.

Focus: Rural Neighbourhoods

75% of people living below the international poverty line live and work in rural areas, notably in Sub-Saharan Africa, East and South Asia and the Pacific.[21] Rural communities have a greater dependence on agriculture and other natural resources for their food and income. Destruction of crops and farm animals due to disasters affects the livelihoods and economic status of those dependent on these resources. There is also a lack of economic diversity, with each household usually dependent on a single source of income. Along with weak markets and a multitude of trade barriers, poor rural households do not have the resources or surplus capacity to absorb economic losses if their income source is destroyed due to disasters.

Infrastructure in most rural areas is developed without the enforcement of hazard resistant strategies. Buildings are built with local materials, making them weak and very subject to

[19] "Risk and Poverty in a Changing Climate."
[20] "Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organizations."
[21] "Risk and Poverty in a Changing Climate."

hazards. The destruction of buildings such as health care centers and schools due to disasters is detrimental due to the isolation of rural communities. A lack of investment by local and national governments in disaster preparedness further contributes to asset and mortality risk, boosting the level of vulnerability of rural neighbourhoods to disaster.

The Effect of Small-scale Disaster Events

The international media reports on large-scale disasters that cause high levels of mortality and great economic loss. Examples of these disasters include the earthquakes in Nepal (2015) and Haiti (2010), and the earthquake and tsunami in Tōhuku, Japan (2011). Thousands of people are affected by the impact of these hazards, and the countries are left in chaos and despair, requiring extensive international aid to recover. While these high-intensity damages are usually intensively concentrated in small regions and occur infrequently, small-scale events occur frequently and are spread across a region. These usually occur at the local level and cause low-intensity damages, with less than 50 people being killed and under 500 houses being destroyed.[22]

Small-scale events such local mudslides and floods are not often reported, as they have no significant impact on the international community. However, these events still cause livelihood disruption to those affected and, over time, these losses can add up and cause a considerable amount of destruction to local development and the livelihoods of those affected. Poor individuals are also more likely to be affected by these disasters due to their disaster prone housing locations.

The impact of low-intensity disasters represent a significant portion of a country's overall loss due to disaster, with damages to housing, crops and livestock, schools, hospitals, and roads at the local level. For example, in Tamil Nadu India, more than 60% of housing damage reported between 1976 and 2007 was due to small-scale events.[23] Regions such as Tamil Nadu lack hazard resilience and a long term, sustainable redevelopment plan, both of which are essential to mitigate the effects of disasters of any scale.

Section 3: How can Disaster Risk Reduction Contribute to Alleviating Poverty?

Over the past 50 years, direct disaster damage costs have increased from 75.5 billion USD to almost 1 trillion USD.[24] Investing in and implementing disaster risk reduction strategies can diminish the extensive disaster relief costs, as well as the impact of a disaster on the impoverished. Early warning systems can decrease the effect of localized small-scale events. Adoption of disaster-resistant plants and agricultural methods can increase the success of harvests, food security, and availability and overall wealth, as well as avert financial losses due to unsuccessful or destroyed crops. Sustainable community development can dampen the impacts of future disasters by decreasing vulnerability. International development investments and national finances can be protected to allow for fiscal growth and stability, while emergency aid funds can be redirected towards investment in development and poverty eradication.

[22] "Weather-related and Low Intensity Disaster Risk on the Rise."
[23] Ibid.
[24] "Disaster Risk Reduction: An Instrument for Achieving the Millennium Development Goals."

Hyogo Framework for Action (HFA)

The Hyogo Framework for Action (HFA) was coordinated by UNISDR in collaboration with UNDP, the World Bank, UNEP, UNESCO and other ISDR partners, and endorsed by 168 UN member states at the World Conference on Disaster Reduction in Kobe, Hyogo, Japan in 2005.[25] The framework entails 5 main priorities for action[26] that focus on increasing the resilience of nations and communities to disasters in order to reduce disaster losses, in terms of lives and social, economic and environmental assets, by 2015.[27]

Progress

A Global Assessment Report on Disaster Risk Reduction in 2009[28] found varying levels of progress on the HFA and outlines issues that need to be addressed in order to achieve the outlined objectives by 2015. In general, significant progress was made in strengthening the coping capacity of regions. There was a notable increase in legislation supporting disaster-resistant development and deficiencies in disaster preparedness and response were adequately addressed. Some progress was also made in improving early warning systems, notably in some lower income countries such as Bangladesh and Cuba where such systems contributed to drastically reduced mortality risks during tropical cyclones and floods. However, there has been slow progress in implementing DRR policies into social, economic, urban, environmental and infrastructural development. Although sufficient legislation was being created, enforcement and monitoring systems were not effective in ensuring that policies were being considered and included in development planning. This indicates a lack of communication between national and local governments and poor supervision by authorities.

The report found that many high-income countries have been able to substantially reduce their vulnerability to disaster by adopting the five priorities outlined by the HFA. While middle and low-income countries have made progress towards employing DRR strategies, results have not been apparent due to unaddressed risk drivers such as poor governance, vulnerable rural livelihoods and ecosystem decline that undermine risk reduction tactics. The least developed countries are in an even worse position, lacking the basic financial, institutional and technical capacities to tackle the most basic aspects of disaster risk reduction. Although the majority of countries have reported enhanced disaster preparedness and early warning to decrease risk of mortality, infrastructural damage is not being addressed in a satisfactory manner. Buildings are not being sustainably developed and are not structurally resistant to hazards, and are thus still vulnerable to damage following a disaster. This is causing disaster risk to continue to increase, especially in higher risk poor communities.

Improvements and Next Steps

Countries must work to increase the integration of disaster risk tactics into planning and development of local infrastructure. Institutional and legislative arrangements should be

[25] "Risk and Poverty in a Changing Climate."
[26] "Summary of the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (Hyogo Framework)."
[27] "Hyogo Framework for Action 2005-2015."
[28] "Risk and Poverty in a Changing Climate."

more effectively communicated to local development sectors in order to mainstream risk reduction policies. Any further difficulties in the implementation of risk reduction policies must be identified and addressed. Some potential next steps could include gathering more comprehensive information on region-specific disaster risks, increasing the initiative and engagement of local authorities and citizens, and ensuring greater accountability of developers in implementing disaster policies. Countries requiring external aid should also be recognized and provided with adequate financial and technical support to help them reach the level of success that higher income countries have achieved.

Section 3: Progress towards the Millennium Development Goals (MDGs)

The progress made towards the Hyogo Framework for Action and other poverty and risk reduction strategies by various international organizations, such as NEPAD (New Partnership for Africa's Development), UNDP and the World Bank, all contribute to achieving the Millennium Development Goals (MDGs), set by the Heads of State at the UN Millennium Summit in 2000.[29] The implementation of DRR policies and strategies will help achieve some of the MDGs as outlined below:

Goal 1: Eradicate extreme poverty and hunger

Disaster risk reduction is essential for the eradication of extreme poverty and hunger by working to prevent disasters from increasing poverty levels and disrupting poverty eradication efforts. It ensures that income generation and food production and availability are not threatened by disasters.

Goal 2: Achieve universal primary education

Educational facilities can be destroyed by disasters, affecting the goal to universal primary education. Through DRR, governments are encouraged to incorporate building codes into legislation and planning that decrease the risk of destruction of educational resources.

Goal 4: Reduce child mortality

Disaster can cause stress and disease by destroying water sanitation systems and health care resources, as well as increasing the risk of disease. Child mortality rates can be decreased by the implementation of DRR tactics that protect drinking water and health care systems.

Goal 7: Ensure environmental sustainability

Non-sustainable land use, mainly settlement in hazard-prone zones and overexploitation of natural resources, can trigger disasters that destroy both urban and rural environments. Educating citizens in disaster risk and outcomes as well as sustainable agricultural practices can allow for proper understanding and willingness to take action at local levels.

Goal 8: Develop a global partnership for development

In order to set up a sustainable Global Partnership, countries must integrate DRR into their overall development policies. This will ensure that vulnerability is decreased,

[29] "Linking Poverty Reduction and Disaster Risk Management."

disasters impacts are reduced and trade reforms and external investments can be effectively implemented allocated to stimulate further development.

Implementing disaster risk reduction

In order to effectively mainstream disaster risk reduction, action must be taken at local, national and international levels. Each level has its own importance and responsibilities, but inter-level cooperation and communication must occur to achieve a successful outcome.

Section 4: Local Level

Adapting a bottom-up approach, where some responsibility for disaster risk management is shifted the local political level, is more effective and beneficial as local communities understand their own behaviour. Local governments will be able to change and improve practices more efficiently and effectively than at the national level with community-based disaster management. Community-level planning allows for the direct involvement of vulnerable individuals in mitigation efforts. It also promotes the support of local businesses and government-civil society partnerships, thus decreasing costs and ensuring local acceptance.

In order for a local community to decrease its vulnerability, it must enhance its coping capacity for disaster risk reduction. The coping capacity of a community is defined as the "combination of all the strengths and social, physical and economic resources available within a community that can reduce the level of risk or the impact of a disaster"[30]. In order to increase the capacity of a region, all sectors must be targeted and improved upon.

Governance

Local governments must increase communication with intermediate, national and international resources in order to integrate DRR at the local level. Legislation and policies passed at the national level should be supported and enforced by the local authorities. Connections between development, institutional and legislative sectors should be strengthened and monitoring of building progress should be implemented to ensure that risk reduction strategies are adequately and effectively included in building development.

Education

It is essential to empower the people of each community to take control of their own livelihoods. Educating the local authorities and communities about disaster risk reduction will prepare them to effectively participate in decision-making that will directly affect their own lives. In educating the population, individuals will be more willing to participate in disaster risk management, have more equal access and control of local resources and enjoy a healthier and safer living environment, regardless of their socioeconomic status.[31]

[30] "Poverty Alleviation and Disaster Risk Reduction."
[31] "Disaster Risk Management and Vulnerability Reduction: Protecting the Poor."

Housing and public infrastructure

In order to protect the livelihoods of those affected by natural hazards, DRR measures must be taken to create disaster-resistant housing and public facilities. Integrating risk considerations into building planning and development will make houses, schools, health facilities, water and sanitation infrastructure more disaster resilient. This will in turn safeguard housing, assets, and access to education, primary health and emergency care following a disaster. Reduced destruction of such resources will in turn contribute to factors alleviating poverty such as decreased mortality rates, improved school enrolment and protection of disease eradication efforts.[32] Risk considerations at local levels could be included through implementation of land use and building codes and increased sustainable rural development. An emphasis should also be placed on reducing the rapid rate of ill-planned urban growth to deter unsustainable informal settlements from being built.

Sources of income

Local income sources must be protected by DRR to decrease the impact of disaster on the economic status of those affected, especially in rural and poor communities. Since the majority of income of the impoverished comes from agriculture, it is essential to create strategies that protect local natural resources and strengthen the economic resilience of the community. Income protection tactics could include the implementation of more sustainable food production systems and disaster-resilient agricultural practices to increase food production and security[33], diversification of income sources in each household, and coordination of trade reforms and sector development with climate change adaptation policies.

Case study: Enhancing irrigation practices to prevent urban migration and provide food security in western Peru[34]

The people in the rural community of Coyllur in western Peru depend on farming for the majority of their income and food sources. A multitude of environmental factors, including unstable and steep land, extensive soil erosion causing increased risk of landslide, and lengthening dry seasons, are negatively impacting their harvests. Farmers have to adopted unsustainable farming practices due to their lack of knowledge on steep land cultivation and proper irrigation techniques in an attempt to increase their crop yields. The high-risk housing conditions and unpredictable income is also causing more people to migrate to urban centers to seek employment.

In March 2006, Practical Action launched an initiative called Mainstreaming Livelihood-Centered Approaches into Disaster Management in the area that aimed to protect the community from frequent weather hazards such as floods, landslides and heat waves. The program sought to improve the rural population's welfare and livelihoods by providing

[32] "Disaster Risk Reduction: An Instrument for Achieving the Millennium Development Goals."
[33] "Open Working Group Proposal for Sustainable Development Goals."
[34] "Linking Disaster Risk Reduction and Poverty Reduction: Good Practices and Lessons Learned."

proper training for better land management skills, and implementing risk reduction strategies.

By employing low-cost irrigation techniques, farmers have been able to make better use of water, increase harvest, generate higher profits and reduce conflict with neighbouring communities. Other strategies introduced by the program have tackled problems such as soil erosion, landslides and flooding. The implementation of disaster resistant agricultural practices has proved to not only reduce this community's vulnerability, but also protect and improve the inhabitants' livelihoods and socioeconomic conditions.

Section 5: National Level

The main role of the national government in disaster risk reduction is to manage the overall system through legislation, support and monitoring to ensure the safety and security of its citizens. With the bottom-up approach, it is essential to increase communication and linkages between national and local governments to effectively implement policies passed at the national level. National governments should also strive to equalize private and public interests, increase control over unsafe urban growth and include disaster risk management in monetary decisions. Legislative frameworks should be developed that target underlying risk drivers and align with poverty reduction strategies.[35]

Risk identification and monitoring

The development of improved systems for hazard monitoring and risk assessment is essential to prepare a nation for potential natural hazards. Early warning systems should be implemented to increase preparedness, especially in highly vulnerable communities. Any policies regarding disaster risk management systems should be enforced and regularly monitored to improve accountability and increase the likelihood of effective disaster prevention.

Economic stability

The economic status of a nation in part reflects the combined economic stability and growth of all sectors and the management of the national budget and external investments. To increase national fiscal resilience, governments must provide support to income generating activities at local levels, especially to those below the poverty line. Disaster risk reduction should also be incorporated in national development plans and budgetary decisions to ensure sustainable growth. Wise management of investments and expansion of insurance markets could also provide at risk households with greater access to financial support, risk transfer mechanisms and other tools that could further increase economic stability.

Infrastructural development

Sustainable and disaster resilient infrastructure is one of the most important targets of disaster risk reduction. In regions with inadequate planning and a lack of regulatory

[35] "Linking Poverty Reduction and Disaster Risk Management."

framework, impoverished individuals are creating informal settlements that are built without reference to risk reduction policies and occupy land that is usually deemed unsuitable for residential use. Some urban areas also lack drainage infrastructure and thus become more susceptible to floods caused by intense rainfall. National governments must monitor and control urban growth and invest in sustainable development strategies to ensure the protection of its citizens and infrastructure.

Section 6: International Level

Countries with low economic resilience often experience high economic losses due to disasters.[36] They lack the funding, strength of governance and resources required to implement risk reduction strategies and require international cooperation to effectively improve their vulnerability to disaster. Financial and technical support from multilateral development institutions, higher-income countries and NGOs is highly encouraged to increase global partnerships and alleviate the disproportionate impact of disasters on countries such as the SIDS and LLDCs. Disaster risk reduction at the international level should focus on shifting NGO resources towards disaster prevention, increasing foreign aid to decrease financial burden, and creating more trade and investment opportunities to strengthen the economies of more vulnerable countries.

The Role of Non-Governmental Organizations (NGOs) in disaster risk reduction

NGOs provide the resources necessary for low-income communities such as rural farmers to decrease disaster vulnerability through risk reduction tactics that include income diversification, more effective resource management and improved agricultural practices. The role of NGOs is the most important in disaster prone and isolated regions, where a community-based risk reduction program will have the most impact on improving the livelihoods of poor individuals.

NGOs should be encouraged to allocate more funds towards risk reduction and mitigation rather than traditional relief efforts to promote a culture of holistic disaster prevention. An example of an effective poverty reduction that incorporated DRR was the creation of food security programs by 11 local NGOs in the Gujarate State in India.[37] These programs stimulated economic activities, prevented migration to hazard prone locations and reduced vulnerability to disaster.

Foreign Aid

High-income countries can support lower-income countries by creating global foreign aid agreements. The China-Africa Cooperation Forum in 2000 is a prime example of an effective and sustainable arrangement to increase economic growth and disaster resilience in high-risk countries. China cancelled 1.2 billion dollars in African debt to help alleviate poverty and promote development. It also encouraged its companies to invest in Africa and created the African Human Resources Development Fund was also created to train

[36] Ibid.
[37] Ibid.

professionals.[38] However, simply receiving foreign aid is not an infallible tactic in implementing disaster risk reduction strategies. Corruption at donor and local government levels often occurs, where development funds are unfairly allocated.[39] An increase in government accountability and stronger economic policies must be implemented to ensure that any financial aid being received is appropriately used towards creating a sustainable and resilient environment.

Trade and investment

In order to increase economic development and productivity in low-income countries such as the SIDS and LLDCs, an emphasis must be placed on increasing global trading and improving investment climate within the country. These countries participate in less than 0.1% of global export markets and lack export diversification.[40] In order to create a more diverse and sustainable economy based on agricultural growth and industrialization, lower-income countries should be encouraged to move away from unsustainable sources of income such as natural resource extraction. Trade reforms and productive sector development must also be implemented to allow for technology and jobs to become more prevalent in impoverished communities.

Foreign investments could provide the skill development and structure required to expand local businesses to regional and international levels.[41] However, to ensure investor confidence, strategies must be implemented to improve the investment climate in low-income countries. Such tactics could include job creation through industrial expansion, improved and sustainable agricultural practices, and promotion of small businesses at the community level. Creating relations and striving towards a common goal with neighbouring communities could also help to achieve a more resilient economy for the region as a whole, thus contributing to a sustainable increase in the country's economic growth.[42]

Section 7: Conclusion

The cycle of vulnerability and poverty is an ongoing problem due to unaddressed underlying risk factors such as access to land and infrastructure for the impoverished, poor national and local governance, under-protection of ecosystems and strength and resilience of rural livelihoods.[43] Disaster risk reduction can help alleviate poverty by reducing the causal factors of disasters in a holistic and sustainable manner, which in turn will decrease the vulnerability of the poor and reduce the impact of natural hazards.

In order for disaster risk to be effectively reduced, a multilateral approach must be taken, where every part of the society, government and professional and private sectors is involved. Communication, initiative and accountability must be increased at the local, national and international levels in order to mainstream DRR into all social, economic

[38] "Poverty Alleviation and Disaster Risk Reduction."
[39] Ibid.
[40] "Risk and Poverty in a Changing Climate."
[41] "Poverty Alleviation and Disaster Risk Reduction."
[42] Ibid.
[43] "Risk and Poverty in a Changing Climate."

and environmental factors that contribute to an individual or community's overall vulnerability.

The rate at which natural disasters are occurring is increasing at a faster rate than risk-reducing capacities are being implemented and strengthened, further increasing disaster risk while eroding resilience.[44] Without DRR, the rapid growth of exposure of people and assets to natural disasters will cause increased vulnerability of the impoverished and unsustainable development. It is important for countries to invest in disaster risk reduction strategies to ensure safer living conditions and sustainable growth for the world population.

Questions to Consider:

- What are some disaster risk reduction strategies that have been implemented in your country? How have they affected the impact of natural hazards and the vulnerability of your population? How have they affected poverty rates throughout your country?
- What natural hazards have affected your country and how has your country coped with disasters in the past?
- What underlying risk factors majorly affect your country's vulnerability to disaster? How have they been addressed?
- What are possible courses of action that your national and local governments can take in order to decrease the vulnerability of marginalized groups and increase DRR at the community level?
- What can your country do to ensure to ensure sustainable livelihoods for its citizens? What types of policies should be implemented and how should risk reduction money be invested?

[44] Ibid.

Topic 3: Disaster Relief and Technology

Natural disasters occur in every area of the world in many different forms, be it floods, earthquakes, tsunamis or draughts. The United Nations has established various committees and institutions in order to deal with natural disasters and risk reduction, including the World Conference on Disaster Risk Reduction. In the past few decades, there has been an increased focus on the importance of technology in reducing the harm that natural disasters cause. It is becoming widely accepted that science and technology can hugely reduce the risk that humans face in terms of natural disasters. This topic of the background guide will be split into three main sections. First, the issue will be explained and evaluated - that is, what is the problem and how can technology help? Then, specific policies and case studies will be evaluated that show the merit of using technology to mitigate risk. Finally, the third section will explore what more can be done in the future.

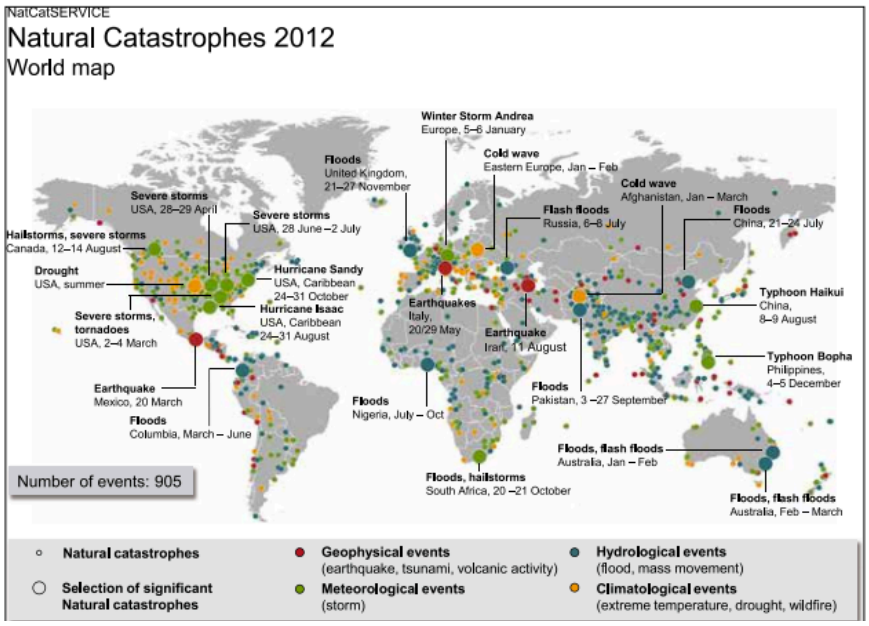
Section 1: What is the Problem?

The international community has not always recognized the merit of using science and technology to mitigate risk in terms of natural disasters. For decades, this led to many injuries, deaths, and other negative outcomes throughout the world. For example, in 1970, a cyclone in Bangladesh led to approximately 300,000 – 500,000 deaths.[45] In China, millions of people died from flooding between 1931 and 1959.[46] It is widely recognized that natural disasters pose a risk to humans around the world, both economically and physically. In fact, "between 2000 and 2012, 1.7 million people died in disasters and an estimated US$ 1.7 trillion of damage was sustained".[47] Additionally, these risks are increasing, as the "number, scale and cost of disasters are increasing".[48] This is due to a growing population, an increasing rate of urbanization, and steady global warming.[49] Other causes of increased risk are ageing populations, and unplanned settlements.[50]

It is also important to note that natural disasters can strike anywhere. That is, all countries can be affected by natural disasters. However, varying countries may feel different levels of risk, due to differences in infrastructure and preparedness. For

[45] "Using Science for Disaster Risk Reduction," *Report of the UNISDR Scientific and Technical Advisory Group – 2013*, Accessed May 24, 2015, http://www.interacademies.net/File.aspx?id=24920.
[46] Reid Basher, "Science and Technology for Disaster Risk Reduction: A review of application and coordination needs," UN International Strategy for Disaster Reduction, March 31, 2013, Accessed May 24, 2015, http://www.preventionweb.net/posthfa/documents/Science-and-Technology-for-Disaster-Risk-Reduction.pdf.
[47] "Using Science for Disaster Risk Reduction."
[48] Ibid.
[49] Jude Dineley, "Intelligent technology helps manage natural disasters," *The University of Melbourne*, Accessed May 25, 2015, https://pursuit.unimelb.edu.au/articles/intelligent-technology-helps-manage-natural-disasters/.
[50] "Using Science for Disaster Risk Reduction."

example, it is proven that "conflict and fragility increase the impact of natural disasters, and there is an expectation that disasters and conflict will collide more in the future".[51]



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Thus, it should be clear that natural disasters do pose a risk, and efforts should be taken in order to minimize those risks. Many organizations exist today that work towards this goal. For example, the International Federation of the Red Cross has a whole organizational branch dedicated to reducing risk caused by natural disasters.[52] However, the organization does not recognize the value of using science and technology in this area. In fact, there is little mention of technology on the organization's website.[53] Some call this "short-sighted design"[54] as it often does not prepare citizens well for the future. For example, earthquakes in Northern Thailand often damage buildings and infrastructure, and leading to many deaths. Earthquakes frequently occur in this area, yet government policies do not take advantage of the science and technology that is at hand. That is, these risks and negative consequences could be avoided if policies are implemented with the intent to "withstand the rising intensity of Mother Nature".[55] It should be clear that, if this issue is not addressed, many lives and livelihoods would continue to be at high risk from natural disasters.

Section 2: What is Currently Being Done?

Science and technology is increasingly being recognized as a positive force in the realm of natural disasters. As natural disasters cannot be avoided or stopped, the focus must be on building community resilience, so that they are able to withstand natural disasters.

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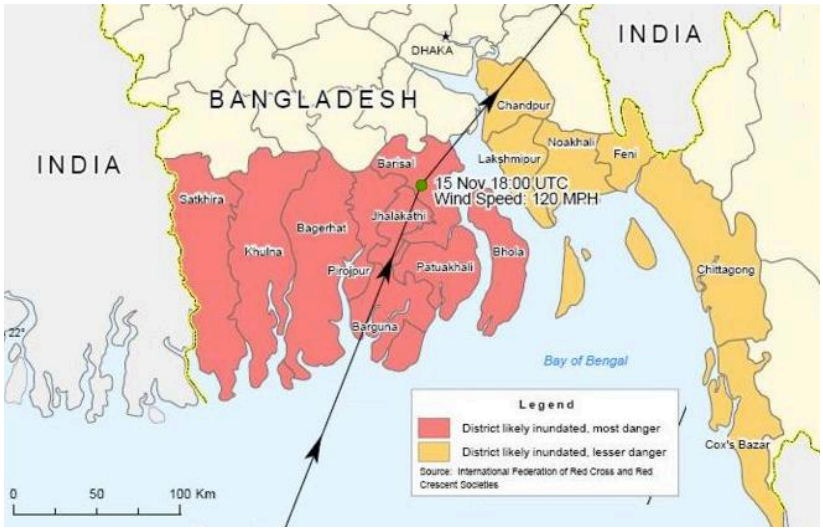
[51] Ibid.
[52] "The IFRC's approach to disaster risk reduction," *International Federation of Red Cross and Red Crescent Societies*, Accessed May 25, 2015, http://www.ifrc.org/en/what-we-do/disaster-management/preparing-for-disaster/risk-reduction/.
[53] Ibid.
[54] Gianluca Lange, "How technology can help reduce the impact of natural disasters," *The Nation*, Last modified June 10, 2014, Accessed May 25, 2015, http://www.nationmultimedia.com/technology/How-technology-can-help-reduce-the-impact-of-natur-30235813.html.
[55] Lange, "How technology can help."

However, there is also an increasing focus on data and analysis, in order to further reduce risk. Thus, rather than building infrastructure and improving on-the-ground conditions, some argue for more funding in other areas of disaster risk reduction, including satellites, and other monitoring systems.

Some progress has been made towards this goal, and the UN has actually addresses these concerns in a variety of ways. For example, a regional body has been created called the United Nations Economic and Social Commission for Asia and the Pacific (UNESACP). As this area experiences one of the highest rates of natural disasters in the world,[56] the UNESACP has a distinct arm in order to deal with disaster risk reduction. This effort includes constructing buildings and infrastructure that will be resilient to natural disasters, as well as working to improve states' "capacity to withstand, adapt to, and recover from natural disasters".[57] In addition to this focus on building resilience through technology, there is also an emphasis on data and analysis in order to further reduce risk. Many organizations highlight the importance of so-called 'big data,' as increased connectivity and information can lead to helpful analysis of various trends and outcomes.[58] As a result of these, and other, efforts, "programmes to forecast floods, detect tsunamis waves, prevent infectious disease outbreaks with vaccination and effectively communicate disaster risk and enhance community resilience"[59] have been successfully implemented.

Case Study: Cyclones in Bangladesh

As mentioned above, Bangladesh consistently is hit with cyclones, which often cause huge damage. In 1970, 300,000 – 500,000 people died as a result.[60] States and communities learned from these experiences, and began to implement and utilize technology to reduce risk. For example, a Storm Warning Centre was created, with "the capacity to detect the formation of tropical depressions in the Bay of Bengal and send early



Source: http://unosat-maps.web.cern.ch/unosat-maps/Tsunami/DLR/DLR_maps_Sumatra/DLR_indonesia_aceh3_1-5000_medium.jpg

[56] "ICT and Disaster Risk Reduction," *United Nations Economic and Social Commission for Asia and the Pacific*, Accessed on May 28, 2015, http://www.unescap.org/our-work/ict-disaster-risk-reduction.
[57] Ibid.
[58] "Digital Inclusion," *United Nations Economic and Social Commission for Asia and the Pacific,* Accessed May 28, 2015, http://www.unescap.org/our-work/ict-disaster-risk-reduction/digital-inclusion.
[59] "Using Science for Disaster Risk Reduction."
[60] "Using Science for Disaster Risk Reduction."

warnings".[61] Additionally, technology was used to implement infrastructure to disperse warnings across communities, and to create evacuation zones and shelters.[62] As a result of this use of technology, in 1991, the number dropped to 138,000 deaths.[63] In 2007, after further implementation, the number dropped again to 4,200 deaths – a clear "reduction in mortality from previous cyclones".[64] Thus, it should be clear that technology can reduce the risk posed by natural disasters.

Case Study: Typhoons in Taiwan

Another positive example of the impact of technology on risk reduction comes from Taiwan, where typhoons can bring "record-breaking rainfalls… causing large-scale floods, landslides, and debris flows".[65] Typhoon Morakot caused $6.7 billion in damage in 2009.[66] Various NGOs worked together to find the root of this problem. Two traditional indigenous villages were studied and compared.[67] Although similar in many ways, including environment and rainfall amounts, there was a key difference between these two communities: disaster preparedness.[68] One community had implemented specific evacuation plans, had shelters, and was prepared while the other was not. Awareness was raised as a result of this small study, and the Taiwanese government began to use technology to implement disaster strategies.[69] By using technology, the government now receives "real-time monitoring data, numerical simulation of hazard events, and threshold values of debris flows or floods based on historical events,"[70] all of which helps to reduce disaster risk.

In 2010, these new measures were put to the test. The new technology detected a typhoon, and the government was able to issue an early warning.[71] This allowed for early evacuations across the country, which saved many lives.[72] Again, this example demonstrates the importance of technology in reducing the risk caused by natural disasters.

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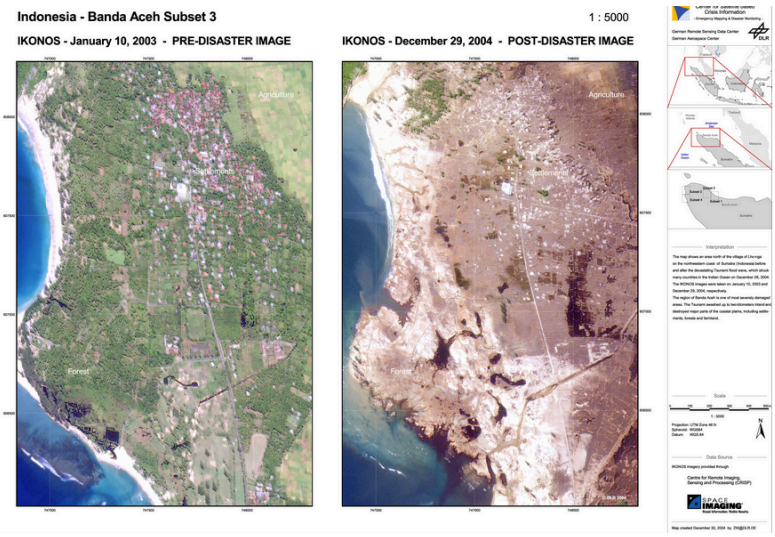
[61] Ibid.
[62] Ibid.
[63] Ibid.
[64] Ibid.
[65] "Improved Evacuation Procedures Save Lives in Taiwan from Severe Flood and Debris Flow," *UNISDR – 2015*, Accessed May 28, 2015, http://www.preventionweb.net/files/workspace/7935_liuassessmentofdisasters.pdf.
[66] Ibid.
[67] "Improved Evacuation Procedures."
[68] Ibid.
[69] Ibid.
[70] Ibid.
[71] Ibid.
[72] Ibid.

Case Study: Tsunamis in the Indian Ocean



Source: http://unosat-maps.web.cern.ch/unosat-maps/Tsunami/DLR/DLR_maps_Sumatra/DLR_indonesia_aceh3_1-5000_medium.jpg

It is important to note that technology has not been implemented in all sectors of natural disaster risk reduction. States around the Indian Ocean experience earthquakes and tsunamis that certainly put their citizens at high risk. In fact, as recently as 2004, over 230,000 people died from a tsunami wave, and many more were injured.[73] At this point in time, "tsunami science was a niche scientific field, with little translation of knowledge into practice".[74] Arguably, it was this exact lack of knowledge transfer and implementation that led to so many negative consequences as a result of this tsunami.

Section 3: What More Can Be Done?

Although a lot of work has been made towards using technology to reduce risk, there is still more that can be done. There are many calls for deeper implementation of technology, as many state that it should become "even more deeply embedded in our work".[75] That is, there is always room to go father, and to more fully integrate technology into policy.

Additionally, some scholars worry that policy makers do not make full use of the technology that is available.[76] Technology must be made "understandable, relevant to the interests of those involved, and affordable"[77] in order for policy makers to implement it. That is, there should be a transfer of knowledge from the scientific-academic community to the policy-making community. Complex scientific phrasing may prevent politicians from understanding, and thus fully utilizing, all scientific research and knowledge. Both sides should make an effort to bridge this gap. Additionally, politicians must see this knowledge as relevant and applicable to their specific countries and situations. They must understand that these technologies can help reduce the risks that natural disasters create. There is also the issue of cost – implementing technology to reduce natural disaster risk can be expensive. Indeed, these programs may be too costly to utilize, even

[73] "Using Science for Disaster Risk Reduction."
[74] "Using Science for Disaster Risk Reduction."
[75] Ibid.
[76] Basher, "Science and Technology for Disaster Risk Reduction."
[77] Ibid.

if policy makers understand and desire the technology. There are many other barriers to technology implementation, including "lack of political interest, conflicting views on priorities, inadequate institutional mechanisms, and lack of access to knowledge, technical capacity, and funding".[78]

This committee should focus on three main sub-issues. The first issue concerns the level of the response – that is, should these approaches be global, or regional? What are the pros and cons to these different levels of solutions? The second issue concerns the implementation of the responses – how should these issues be put into practice? How much should technology be tailored to each specific state or community? The final issue concerns the type of research that should be carried out – is bettering infrastructure more important, or is detecting coming natural disasters more important? Or should something else take priority?

Conclusion

It should be clear both that natural disasters pose a risk to communities and states around the world, and that technology can help to reduce this risk. This committee is aimed at achieving these goals. As you go thorough you research, pay particular attention to the questions above, as they will help guide you in your debate.

Questions to consider:

1. Of the barriers mentioned above, which is the most severe? How can this barrier be overcome?
2. How can the international community work together to develop technology that addresses and reduces natural disaster risk?
3. What role does technology play in achieving this goal?

[78] Ibid.

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