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Engaging Indigenous Peoples in Disaster Risk Reduction

A White Paper Prepared for

The United Nations Permanent Forum on Indigenous Issues

by

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Executive Summary

For millennia, indigenous peoples around the world have used their traditional knowledge to prepare for, cope with and survive disasters. Their methods and practices have originated within their communities and have been maintained and passed down over generations. Until recently, policy makers have largely ignored this vast body of knowledge, in favor of "Western" science and technology-based methods of disaster risk reduction and response. Today, however, many of these traditional practices are considered important and necessary contributions to the conservation of biodiversity and environmental sustainability. At the same time, this knowledge is under constant threat of being eroded, lost or misappropriated, factors contributing to greater community vulnerability as demonstrated by the increasing levels of loss stemming from natural disasters in recent decades.

In order to successfully incorporate indigenous knowledge into DRR policies a positive relationship between indigenous practice and modern scientific method must be acknowledged and better understood.

Policy makers and academics acknowledge that poor planning, poverty and a range of other underlying factors create vulnerability, resulting in insufficient capacity to reduce the negative consequences of risk. Yet many policy makers and academics are not indigenous themselves, and their lack of knowledge about the cultural make up of indigenous communities may also contribute to these risk factors. Economic and societal vulnerabilities may be as responsible for the disproportionately adverse effects of disaster events on indigenous communities as the natural hazards themselves.

This paper is intended to stimulate discussion and act as a catalyst to create opportunities for sharing experience and knowledge about disaster risk reduction[iv] between and among indigenous and non-indigenous peoples throughout the world. It should also serve to generate debate, raise questions and look for answers that will result in reduction of loss of life and property. In addition, it will highlight efforts underway that, although not necessarily designed with indigenous peoples in mind, may be useful to indigenous community leaders as they look for opportunities to reduce risk and plan response strategies.

Two more immediate objectives of this paper are to encourage and inform discussions and recommendations on the issue of disaster risk reduction (DRR) at the 12th session of the UN Permanent Forum on Indigenous Issues (UNPFII) and to ensure that issues, articulated by indigenous people themselves, are considered in the planning and outcomes of the Global Platform for Disaster Risk

Reduction in 2013 and the World Conference on Disaster Reduction in 2015.

The Challenge

All communities are subjected to the physical conditions of their particular geographical location and the natural hazards they face. The very attributes of a community's location - on a seacoast, river or fertile valley, near valued natural resources, or at the crossroads of commerce - all hold the threat of potential risks to the well being of its citizens. While it is common to see leaders plan and anticipate ways to take advantage of the opportunities made possible by the assets and the dynamic energy of a community; less often do they seriously consider potential risks.

Through various forums, among them the United Nations Permanent Forum on Indigenous Issues, indigenous leaders worldwide in communities of varying size must step up to the challenge, making the commitment to understand and promote effective disaster risk reduction as a way to save lives and reduce loss and damage to communities in a way that respects traditional knowledge and is defined with full and effective participation of indigenous peoples.

I. Introduction

1. Recently, two urban Indian focus groups in Seattle, Washington, USA, were asked to offer feedback on public health practices surrounding the H1N1 crisis. Responders expressed confusion with regard to different public health messages about the severity of the problem and the safety of the vaccine being offered. The lack of a clear and authoritative message reinforced an already historical distrust of public officials, causing those involved to question whether the advice being offered was valid. The sheer number of messages from different sources, each asking that their views be seen as correct, exacerbated the confusion and paralyzed some from seeking the vaccine[v].

This limited assessment raises question about the importance of early warning messaging and its value to indigenous peoples and communities, which must not be overlooked in times of real crisis such as disasters and public health emergencies.

Indigenous peoples, an estimated 370 million present in some 90 countries throughout the world[vi], face systematic discrimination and exclusion from political and economic power and continue to be over-represented among the poorest, illiterate. Indigenous peoples are often dispossessed of their ancestral lands and deprived of their resources for survival, both physical and cultural, further weakening their capacity to deal with hazards, both natural and manmade.

2. Literacy and language, however important, are only one piece of the risk reduction equation when working in indigenous environments. With respect to disaster preparedness, mitigation, prevention, and longer-term risk reduction objectives, community leaders and disaster managers may have an opportunity to take advantage of local time-tested practices, which have arisen from a close relationship with the environment, cultural beliefs or the common sense of the community, by including these biases in their planning. Ideally, this bridge building would take place in collaboration with respected community leaders through participatory capacity assessment and horizontal planning. Rather than impose top-down processes, communities must be involved in the outlining of their own disaster risk reduction (DRR) strategies. It is important to respect the culture of the community affected, for effective means of successful disaster risk reduction planning cannot be built without engaging the people themselves and ensuring that the strategies agreed upon remain their own.

3. Understanding various cultural beliefs or ways of life within certain communities, and in particular for aboriginal populations where the historical context within which people filter mainstream messages, is a key factor to success for community leaders and disaster professionals in reducing the impact of natural hazards.

4. On the other hand, assessments of indigenous communities must not be limited to attempts to understand how outside messages and practices are perceived and responded to, but also to adequately appraise and capitalize on local capacity, resources and knowledge. During the Indian Ocean Tsunami of 2004, for example, the inhabitants of the Indonesian Simeulue Island community managed to survive the catastrophe in spite of being only 40 kilometers from the epicenter of the earthquake. While the Tsunami killed well over 200,000 people in the rest of Indonesia, seven of the 78,000 members of the community died during the disaster.[vii]

5. Barely ten minutes after the earthquake, ten-meter high waves hit the island. In this scenario, a high-tech early warning system with a 15-minute response time would have been useless. [viii] Yet a story of how buffaloes run to the hills when a tsunami is coming, passed on by oral tradition for generations, was far more effective.[ix] In another case, inhabitants of the Damodar River in West Bengal, India, used markers inscribed on trees and the observation of ants moving their eggs to higher ground as warning systems against floods.[x] These types of systems are not only easily disseminated but also highly cost-effective.

6. Local capacity, practice, knowledge and tradition have helped communities that have developed a close relation to their natural environment cope with hazards and thrive for millennia in highly at-risk areas. However, in many cases, these practices, otherwise highly sustainable, have been lost due to social, political or economical change, leading to increased vulnerability. Taking into account the advantages and challenges of this process, which will be discussed later, there is a need to adequately research and document traditional risk reduction and mitigation practices in order to understand how they may be incorporated into mainstream local community and national planning. Through participative assessments (of both capacities and vulnerabilities) and policy-making processes aimed at combining local knowledge with scientific methods, communities must be empowered to take advantage of their own traditional knowledge to develop integrated strategies that are institutionalized and perhaps even transferred to similar contexts elsewhere.

II. Background

7. Disasters affect populations and ecosystems differently, depending on many factors such as unsustainable development practices, ecosystem degradation, poverty as well as climate variability and extremes, which have led to an increase in both natural and manmade disaster risk at a rate that poses a threat to lives and development efforts. Disaster risk reduction involves the process of identifying, assessing and reducing the risks of these events.

8. Indigenous peoples around the world have used their traditional knowledge to prepare for, cope with and survive disasters for millennia. Their methods and practices originate within the community and are maintained and disseminated through non-formal means developed over several generations. They are subject to adaptation and become imbedded in a community's way of life as a means of survival.

9. On the other hand, formalized DRR information, such as plans, vulnerability maps, and even legislation and law, are typically prepared by national or sub-national organizational structures, many of which are dominated by non-indigenous decision-makers. Indigenous peoples often do not have adequate

opportunities to participate in their design, implementation, monitoring and evaluation.

10. In recent years, humanitarian efforts in the area of natural disasters have progressively focused on preparedness rather than relief. This has occurred in the context of understanding and appreciating the increasing vulnerability of disaster-prone developing countries and the ever-growing impact of natural hazards on livelihoods.[xi] Admittedly, in spite of advances in technology and increased investment in disaster management, the toll disasters take continues to rise.[xii] The cause of this is not only the obvious divergence between policy and practice, but also the changes in people's social, economic, cultural, political and environmental contexts.[xiii] The imposition of western models in societies that have lived, adapted to and coped with a constant and wide range of natural hazards for several millennia, and nevertheless prospered, can result in a loss of indigenous knowledge.[xiv] This may be one of the most important factors contributing to the increase in vulnerability of these societies.

11. Until recently, the vast body of indigenous knowledge had been largely ignored or discarded by non-indigenous policy makers, whose orientation and focus tends to be on 'Western' science and technology-based methods of disaster risk reduction and emergency response.

International Context

12. The Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters (HFA), [xv] was endorsed by the member states of the United Nations in 2005, and has since guided national policy and international organizations in their efforts to substantially reduce losses stemming from natural hazards. This Framework is comprehensive and addresses the roles of states, regional and international organizations, calling on civil society, academia, volunteer organizations and the private sector to join efforts. It promotes the decentralization of authority and resources to promote local-level disaster risk reduction.

13. The expected outcome of the Hyogo Framework is to substantively reduce disaster losses in terms of lives and the social, economic and environmental assets of communities and countries. The five HFA priorities for action are:

a. **Build institutional capacity**: Ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation.
b. **Know your risks**: Identify, assess and monitor disaster risks and enhance early warning.
c. **Build understanding and awareness**: Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
d. **Reduce risk**: Reduce the underlying risk factors through land-use planning, environmental, social and economic measures.
e. **Be prepared and ready to act**: Strengthen disaster preparedness for effective response at all levels.

14. The United Nations Office for Disaster Risk Reduction (UNISDR), which was formerly known as the U.N. International Strategy for Disaster Reduction, serves as the focal point in the United Nations system for the coordination of disaster risk reduction and to ensure synergies among disaster risk

reduction activities. UNISDR leads inter-agency country-specific and thematic discussions and contributes to the development of UN programming tools, such as guidelines on risk reduction.

15. The first Global Platform took place in 2007, and since then, the UNISDR has held the event every two years. The Global Platform is a forum for information exchange, discussion of the latest developments and knowledge and partnership building across sectors, with the goal of improving implementation of disaster risk reduction through better communication and coordination among stakeholders. It offers the opportunity for government representatives, NGOs, scientists, practitioners, and UN organizations to share experiences and formulate strategic guidance and advice for the implementation of the HFA. As the end date for implementation of the Hyogo Framework for Action approaches in 2015, the fourth Global Platform (scheduled for May 2013) provides a unique opportunity to focus on issues related to indigenous communities and disaster risk reduction. Currently a series of online dialogues[xvi] is underway, involving a wider range of stakeholders in the consultative process toward a post-2015 framework for disaster risk reduction.

16. The global focus on indigenous peoples' concerns, including efforts within the framework of HFA, has been limited until recently. It is important to take advantage of this movement and ensure that indigenous peoples, communities and nations have access to best practices and lessons learned through the work of UNISDR and others, and that the experience and valuable knowledge residing in indigenous peoples' communities be shared with and recognized by the international community.

III. Understanding Disaster Risk – an ever-present reality

17. All segments of the population in most parts of the world face the threat of disasters on a daily basis. Disaster risk varies by geographical region and the natural hazards to which an area or a population is exposed. Physical hazards such as earthquakes; floods; cyclones, typhoons and hurricanes; volcanoes; drought; frost; hail and heavy snow have long been a concern of countries worldwide.

18. Many factors play a definitive role in disaster risk. Some of these factors are well known to local authorities and the target of selected risk reduction measures. Knowledge of others is still emerging and is increasingly the subject of research and advocacy efforts.

19. The U.N. Office for Disaster Risk Reduction cites three major factors that, individually and in combination, drive disaster risk, especially in impoverished communities.[xvii]

a. Vulnerable livelihoods

20. Many rural people's livelihoods still depend heavily on agriculture and other natural resources, where access to the range of subsistence necessities, including land, labor, fertilizers, irrigation facilities, infrastructure and financial services, is heavily constrained.

21. Disaster losses affect huge numbers of people in poor rural areas. Historical patterns of land distribution and tenure tend to discriminate against the impoverished, which may only have access to marginal and unproductive land, prone to flooding, or with erratic or minimal rainfall. Development has, at times, precipitated the relocation of indigenous communities to these areas.

22. Rural livelihoods that depend on agriculture and other natural resources are vulnerable to even slight variations in weather and are thus particularly sensitive to climate change, which may lead to even lower agricultural productivity; more widespread disease vectors may further diminish resilience.

Inadequate infrastructure, including housing, schools and other public buildings, is too often a fact of rural life and is exacerbated by disaster: the collapse of heavy earth walls led to the destruction of 329,579 houses in the 2005 Kashmir earthquake, while the lack of protection offered by wattle and daub and thatch houses contributed to the deaths of 140,000 people in the 2008 cyclone in Myanmar.

b. Ecosystem decline

23. The preservation of ecosystems and the resources they provide is essential for the survival of the planet. Worryingly, the exploitation of ecosystem resources is increasing at the same time as their finite supply is diminishing. People have modified ecosystems to increase the output of certain commodities but such exploitation has led to unregulated behavior – for example, deforestation for agricultural purposes and the destruction of mangroves to create shrimp ponds. While such changes in the distribution of ecosystem commodities benefit specific commercial interests, the costs are often borne by poor urban and rural households and indigenous communities that have little input into decision-making and derive little benefit from the exploitation.

24. In Peru for example, the opening of new roads down the eastern slopes of the Andes and into the to extend the agricultural frontier has led to a notable increase in the number of reported landslides in that region since the 1980s.

25. Particular attention must be paid to climate change adaptation and its impact on increasing disaster risk. A UNISDR Briefing Note on strengthening climate change adaptation through effective disaster risk reduction points to the fact that climate change leads to gradual changes in variables such as average temperature, sea level, and the timing and amount
of precipitation. Climate change also contributes to more frequent, severe and unpredictable hazards such as cyclones, floods and heat waves—'extreme weather events.'[xviii] In this light, climate change adaptation strategy should be seen as: (a) adapting development to gradual changes in average temperature, sea level and precipitation; and (b) reducing and managing the risks associated with more frequent, severe and unpredictable extreme weather events.[xix] Isolation from mainstream research and derived "best practices" often escape indigenous communities and exacerbate the problem (for even if indigenous people are not contributors to climate change, they must certainly need to deal with their effects).

c. Unplanned development

26. The world is undergoing the largest wave of urban growth in history. In 2008, for the first time in history, more than half of the world's population is living in towns and cities. By 2030 this number will swell to almost 5 billion, with urban growth concentrated in Africa and Asia. While mega-cities have captured much public attention, most of the new growth will occur in smaller towns and cities, which have fewer resources to respond to the magnitude of the change.[xx]

27. According to the UNISDR Global Assessment Report on Disaster Risk Reduction,[xxi] poor people in urban informal settlements have higher levels of everyday risk. Cities in high-income countries typically have under-five mortality rates of less than 10 per 1,000 live births. In contrast, many developing countries have far higher rates. In Nairobi, Kenya, for example, under- five mortality rates were 61.5 per 1,000 live births for the city as a whole in 2002, but approximately 150 per 1,000 in informal settlements.

28. By the year 2050, an estimated 80% of the Earth's human population will be living in urban areas. Many indigenous people throughout the world are also following suit. In the United States for

example, nearly 67% of those self-identifying as American Indian or Alaska Native either alone or in combination with another race were living in U. S. cities in 2000. This trend toward urbanization was first recognized among this population in 1970 and the percentage of Indians living in cities has steadily grown ever since.[xxii]

29. Evidence from Africa, Asia and Latin America shows that the inhabitants of informal settlements are also increasingly at risk from weather-related hazards. Urbanization *per se* tends to increase the intensity of run-off during storms leading to heavy flooding, often due to an underinvestment in building and maintaining drains. In fact, many floods are caused as much by deficient or non-existent drainage, as by the intensity of rainfall itself. And like other individuals struggling to make ends meet, as indigenous communities undergo increased hardship individuals are migrating to cities in increasing number, looking for work and often ending up in already-vulnerable neighborhoods.

What can populations expect from engaging in disaster risk reduction?

30. Implementation of effective disaster risk reduction strategies can make communities healthier, better educated, economically stronger, a more reliable trading partner, and more resilient to the effects of climate change over time.

31. Communities that proactively seek to reduce disaster risk, as part of their sustainable development efforts, can save lives and property in case of disaster, with a dramatic reduction in fatalities and serious injuries. They may also benefit by:[xxiii]

a. Protected development gains and less diversion of resources to disaster response and recovery.
b. Active citizen participation and local democracy.
c. Increased investment in housing and other properties, in anticipation of fewer disaster losses.
d. Increased investments in infrastructure, including retrofitting, renovation and renewal.
e. Economic growth and employment.
f. Balanced ecosystems, which foster provisioning and cultural ecosystem services such as fresh water and recreation.
g. Overall better health and wellbeing.
h. Improved education in safer schools.

The Risk of Not Paying Attention to Disaster Risk Reduction

32. A single hazardous event can take a severe toll on lives and livelihoods. It can destroy social and economic infrastructure that may have taken years and fortunes to develop and upon whose vitality a community depends. A single event can also severely disrupt community lifelines—the systems that provide food distribution, water supply, health care, transportation, waste disposal, and communications locally and with the rest of the world. Disaster risks can increase or decrease over time according to a country's ability to reduce its vulnerability and strengthen risk governance capacity. Therefore, ongoing monitoring and evaluation of existing plans and policies is of paramount importance.

33. For community leaders, reducing disaster risk can be a legacy opportunity – an opportunity to improve social, cultural and economic conditions and leave the community more prosperous and secure than before.

Disaster Risk Reduction and Sustainable Development

34. Disaster risk reduction is an integral part of sustainable development and of making communities resilient to disasters. A UNISDR Handbook[xxiv] points to social and environmental factors that help achieve to resilience:

a. Social factors

i. Guarantee access to basic services for all and provide post-disaster safety nets.
ii. Allocate safe land for all strategic activities and housing.
iii. Encourage multi-stakeholder participation in all stages and strengthen social alliances and networking.

b. Environmental factors

i. Protect, restore and enhance ecosystems, watersheds, unstable slopes, and coastal areas.
ii. Engage in ecosystem-based risk management.
iii. Commit to reducing contamination, improving waste management and reducing greenhouse gas emissions.

35. In light of this, a policy note[xxv] was produced as part of the Indigenous Knowledge workshop that took place in July 2008 at Kyoto University (Japan) to provide steps for mainstreaming indigenous knowledge into DRR. It proposes a seven-step path in this sense:

a. The establishment of a Resource Group.

b. Systematic documentation and research to establish guidelines and create a 'validated body of applicable knowledge.' A database of indigenous knowledge practices is essential.

c. Incorporation into formal and informal education.

d. Engaging in policy advocacy.

e. Enabling an environment that 'cuts across the techno-legal, socioeconomic and cultural regimes' and permeates different areas of work.

f. Identification of the right change agents (i.e. local leaders, lawmakers, administrators, etc.).

g. Creation of special focus areas such as gender, urban risk, climate change adaptation and food security.

36. Throughout the process of mainstreaming indigenous knowledge into DRR, it is important to consider cultural aspects and the role of indigenous peoples' organizations, including traditional

indigenous governments.

The Ten Essentials for Disaster Resiliency

37. The UNISDR has developed a ten-point checklist[xxvi] to help local government leaders take steps to reduce their disaster risk reduction. The ten points are in line with the five priorities of the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters. Most, if not all of the suggested steps can be modified and/or adopted by indigenous peoples to improve their disaster resilience (see suggestions in *italics* after each Essential). The ten points, as outlined by UNISDR, include:

1. Put in place organization and coordination to understand and reduce disaster risk, based on participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role in disaster risk reduction and preparedness. *Respect the institutions and organizations of indigenous peoples as when building alliances and promoting coordination.*
2. Assign a budget for disaster risk reduction and provide incentives for homeowners, low-income families, communities, businesses and the public sector to invest in reducing the risks they face. *Design culturally appropriate incentives for indigenous communities and individual and collective incentives.*
3. Maintain up-to-date data on hazards and vulnerabilities. Prepare risk assessments and use these as the basis for urban development plans and decisions. Ensure that this information and the plans for your city's resilience are readily available to the public and fully discussed with them. *Disaggregate data by sex and ethnicity. Ensure that plans are prepared in different languages and disseminated using traditional means of communication; include non-traditional and cultural concerns in risk assessments.*
4. Invest in and maintain critical infrastructure that reduces risk, such as flood drainage, adjusted where needed to cope with climate change.
5. Assess the safety of all schools and health facilities and upgrade these as necessary.
6. Apply and enforce realistic, risk compliant building regulations and land use planning principles. Identify safe land for low-income citizens and upgrade informal settlements, wherever feasible. *Take into account indigenous peoples' land use practices.*
7. Ensure that education programs and training on disaster risk reduction are in place in schools and local communities. *Take into account languages; involve indigenous leadership; make full use of local indigenous institutions,*
8. Protect ecosystems and natural buffers to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices. *Climate adaptation plans and measures should utilize sources of traditional knowledge.*
9. Install early warning systems and emergency management capacities in your city and hold regular public preparedness drills. *Warning systems should integrate traditional practices.*
10. After any disaster, ensure that the needs of the affected population are placed at the center of reconstruction, with support for them and their community organizations to design and help

implement responses, including rebuilding homes and livelihoods. *Take into account traditional spiritual healing systems, traditional medicinal practices, etc.*

38. As indigenous peoples and communities seek to build their resilience to disasters, it is important to consider the existing human resources and undertake an intercultural approach to implementing these steps, ensuring the participation of the indigenous peoples throughout the process.

IV. Using Indigenous Knowledge to Reduce Disaster Risk

What is indigenous knowledge?

39. Knowledge is not a static concept. It is created, discarded and improved upon all the time, through experience, interaction with our surroundings and through formal and informal education. Indigenous knowledge includes an understanding of society-nature relationships that have been tested by time and proven to be sustainable and successful in limiting the effects of hazards. This knowledge has usually been internalized by communities and become part of their life styles, sometimes transparent to outsiders or even to themselves.[xxvii] This fact may be part of the challenge faced by policy makers in incorporating these practices into mainstream DRR through participative processes.

40. It is sometimes difficult to draw a clear line between local and outside knowledge. However the practices adapted from contact with exterior sources, if culturally integrated and tested through time, they may also be indigenous in practice. In fact, the two most important elements of indigenous knowledge are its origin in the relation between a community and a unique natural environment, and its relation to a historic continuity in a specific location (developed over several generations). "The process of developing indigenous knowledge, whether incorporating outside knowledge or not, is accomplished solely by the community. A community holds a unique relationship with and an understanding of its environment and knows how to adapt any knowledge or experience to its specific context."[xxviii]

41. Often, mainstream disaster management institutions have systematically ignored indigenous knowledge. Additionally, many successful local practices have disappeared as a consequence of western influence. Several authors[xxix] argue that a dependency on foreign short-term humanitarian aid following disasters has resulted in the abandoning of coping practices, such as the stocking of famine foods. Also, this has led at times to a reduced ability of governments and local communities to profit from their own resources and implement (or maintain) positive DRR strategies. Furthermore, social, political, economic and cultural changes stemming from colonialism and latter globalization have led to the loss of indigenous DRR knowledge and increased vulnerability. The change from subsistence gardening to cash cropping in Small Island Developing States such as Papua New Guinea and Vanuatu have at times led to heavy land erosion, which in turn results in destruction from floods and landslides. Land has been cleared to make way for larger plantation, removing stabilizing vegetation previously protected under indigenous law[xxx]. Moreover, the wider use of formal education and the exposure to other (Western) models, standards and values can lead to a breakdown of traditional communication networks. Other possible negative bi-products include the undermining of the importance of elders within the society, allowing their knowledge to die with them.

42. Nonetheless, the value of indigenous knowledge for disaster risk reduction is being increasingly recognized in mainstream academia and research institutions, and in concrete policies through, for example, the World Intellectual Property Organization's Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore.[xxxi]

Integrating Modern Science and Indigenous Knowledge

43. It is important that a balance is made between modern science and indigenous knowledge in order to better reduce communities' risks and vulnerabilities. It is clearly useful to take advantage of the scientific and technological advances available. Yet this must be carefully articulated, recognizing the capacities and resources already available locally without undermining them, and avoiding cultural impositions.

44. The relation between indigenous knowledge and disaster risk reduction lies in the close relationship of communities with their environment. As indigenous knowledge comes from an intimate relation with the natural environment, communities have learned to read the signs in the sea, the rain, the wind, clouds, vegetation and wildlife to predict hazards. Traditional weather forecasts (used for agricultural planning, for example) include the observation of the moon, the sun, the stars and even animals and insects.

45. Direct experience with constant disasters has taught many communities the duration, location, time, frequency, intensity and predictability of these events. Likewise, the beginning and possible behavior of the hazard, such as the velocity of water flows or levels of rain, are learned from experience and transmitted from one generation to the next. These local, experiential, "early warning" systems are frequently credited with saving lives and property.

46. In order to successfully incorporate indigenous knowledge into DRR policies, the compatible nature of this set of practices with modern scientific methods must be acknowledged. This is especially true if we consider that Western science is in fact the "indigenous knowledge" of European societies, developed over generations as a survival (and expansion) mechanism, disseminated by their own Western means and now a part of everyday life (i.e., "an ounce of prevention is worth a pound of cure"). The relation between these two systems of knowledge *is* in fact complementary, with clear advantages in their intertwining. This has been the case in many traditional societies throughout the Asia-Pacific region. A limited access to radio warning systems was complemented by oral dissemination and local coping strategies during the December 2002 cyclone in the Solomon Islands, for example[xxxii].

47. Today, however, indigenous peoples' traditional knowledge and practices, which were formerly undervalued and ignored, are considered important and necessary contributions to the conservation of biodiversity and practices.[xxxiii] Yet this knowledge is under severe threat of being eroded, lost or misappropriated, a factor contributing to greater vulnerability, as demonstrated by the increasing levels of losses due stemming from natural disasters in recent decades. The UNPFII cites several reasons for this:[xxxiv]

a) Dispossession or forced removal from traditional lands and sacred sites has eroded the relationship between indigenous peoples and their environment. When forced to migrate and resettle in new environments, indigenous peoples find that their traditional knowledge and practices have to be adapted to new and often difficult circumstances.

b) Traditional knowledge may also sometimes be lost as the result of language extinction. Since the traditional knowledge accumulated by indigenous peoples is contained in languages that often have no script, this knowledge is passed on to other groups and new generations orally, making it difficult to retrieve once a language becomes extinct.

c) Poverty is another threat to traditional knowledge. It is often the case that when people are poor, conservation is not a high priority, and they will take out of the environment whatever is needed for their survival.

d) The misappropriation of indigenous knowledge in the form of biopiracy. As indigenous communities often inhabit areas with the highest biodiversity, "they are coming under increasing pressure from biodiversity prospectors and corporations interested in privatizing and commercializing aspects of their biological knowledge."[xxxv]

The concept of Transferable Indigenous Knowledge

48. The aforementioned Indigenous Knowledge Workshop Policy Note underlines the potential transferability of indigenous knowledge for DRR. In this sense, it recognizes five thematic groups in which indigenous practices could be transferred to all communities living in similar contexts. These include: mountain ecosystems, coastal zones, river basin management, water resource management and housing.[xxxvi] Each of these areas of practice contains certain key characteristics and knowledge principles that may be transferable to other locations within the same geographic and climatic setting.

49. For example, the Disaster Reduction Hyperbase Initiative is a component of the "Portfolio for Disaster Reduction," proposed by the government of Japan as part of the implementation of the Hyogo Framework for Actions 2005-2015.[xxxvii] The objective of this facility, specialized in the Asian region, is the dissemination of disaster reduction technology and knowledge. In this framework, it defines the concept of transferable indigenous knowledge as "the traditional art of disaster reduction that is indigenous to specific region(s) but having potential to be applied to other regions and having time-tested reliability."[xxxviii] It establishes as well a set of criteria[xxxix] for identifying transferable indigenous knowledge:

a. Understandable to users.
b. Implementable (usable, doable).
c. Originated within communities, based on local needs, and specific to culture and context (environment and economy).
d. Provides core knowledge with flexibility for local adaptation for implementation.
e. Uses local knowledge and skills, and materials based on local ecology.
f. Has been proven to be time tested and useful in disasters.
g. Is applied or applicable in other communities or generations.

What has been done to date?

50. Since 2007, an increasing number of publications have emerged on the subject of indigenous knowledge for DRR. Several of them come from the Asia-Pacific region. Most have been focused on the documentation and dissemination of indigenous knowledge in order to illustrate its value. Among these are the Japanese government's previously mentioned Disaster Reduction Hyperbase (DRH Asia) and the Indigenous Practices and Lessons Learned for DRR in the Asia-Pacific compilation, published by UNISDR and Kyoto University and funded by EuropeAid.

51. In 2007 and 2008, meetings on Transferable Indigenous Knowledge were held in New Delhi, India for initial discussions, case sharing and the establishment of an action agenda. In 2008, workshops on the subject took place in Beijing and Kyoto to discuss thematic indigenous knowledge sectors and

other issues. Also that year, the Third Asian Ministerial Conference on Disaster Risk Reduction, held in Malaysia**,** included an Indigenous Knowledge side event to discuss the policy note cited above. Finally, at the fifth Asian Ministerial Conference on Disaster Risk Reduction in Yogyakarta (Indonesia) in 2012, DRR stakeholders participated fully in the consultations now underway worldwide to mainstream disaster risk reduction into the post-2015 Development Agenda.

52. These changes have also slowly permeated the national level and results are beginning to emerge. Although the examples are still few and recent, some national governments have finally integrated the acknowledgement and importance of indigenous knowledge for DRR into their strategies and frameworks for action. The case of Nepal, as cited in Annex 1, offers one example.

53. Several community-level projects have already been successfully undertaken with the support of the UNDP, such as the Community-Based Disaster Management Project in Nepal, completed in 2011. These actions aimed to enhance stakeholder capacities at the community and district levels. Special attention was given to the combination of modern and indigenous knowledge in disaster preparedness and mitigation to reduce vulnerability.

54. Other interesting examples of community-level initiatives (expanded upon in Annex 1) include the use of keen observation and hereditary knowledge of the Moken Sea Nomads of the Surin Islands in Thailand and NGO-partnered projects in Vietnam and Indonesia.

5. Opportunities: Action Steps

55. Many communities have sufficient resources at their disposal to take steps to minimize possible risks. Existing community structures, public knowledge and experience, and local capacities and skills often sufficient once the objectives are understood and the leadership is provided (and after all, it is the responsibility of each individual to protect himself or herself, family, friends and neighbors). Examples of communities that are taking risk seriously include Dhaka, Bangladesh, where aggressive mitigation programs are helping to reduce the risk of earthquakes, cyclones and floods in this city of 14 million people; Karlstaad, Sweden, which has operative, technical and planning measures in place to meet the threat of floods and minimize damage; and Aleppo, Syria, that has carried out risk assessments and classified by intensity those areas most at-risk. The city has prepared and continuously updates a database of institutional resources and capabilities of those involved reducing risk[xl]. Models like this may have relevance if scaled in appropriate magnitude and adapted in culturally appropriate ways to indigenous community life in its many forms.

56. Local citizens and populations play the first role in responding to crises and emergencies. They are responsible for providing services and maintaining infrastructure (such as health, education, transport, water, etc.), which must be resilient to disasters. Strategies must be found and developed that empower communities and their citizens to understand their risk and to take action to reduce those risks in order to save lives and property.

57. There is a need, now, to create a campaign that will engage world leaders of indigenous peoples interested in risk reduction, and their non-indigenous counterparts in a dialogue aimed at understanding risks -- those that are unique to indigenous people and those shared in common with vulnerable communities throughout the world. The hopeful outcome of this dialogue will be effective strategies to reduce risk to disasters and other events of public health consequence and ways to remove the challenges that may exist to our ability to implement them universally.

RECOMMENDATIONS

Moving Forward: Commitments and Actions[xli]

Commitments and action by the International Community (i.e., United Nations Permanent Forum on Indigenous Issues, UNISDR Global Platform for Disaster Risk Reduction 2013 and World Conference on Disaster Reduction 2015, etc.):

a. Advocate among international and national entities to make resources available through coordination with local governments as a way of strengthening autonomy and capacities (a possible objective of the Post-2015 HFA Framework)
b. Advocate with regional bodies and national governments to engage indigenous communities in the formulation of DRR policies, both to ensure cultural adaptation of mainstream strategies to better reach vulnerable communities, and to empower these communities by taking advantage of their own knowledge and practices.
c. Promote at the regional and national levels, the systematic research and documentation of indigenous knowledge and practices for DRR, studying the possibility of calibrating successful practices to similar contexts.
d. Work toward investing in disaster risk reduction in order to create resilience.

Commitments and Action by National Policy Makers:

a. Create a specialized working group for the systematic research and documentation of successful indigenous practices and knowledge to create a 'validated body of applicable knowledge.'
b. Incorporate the identification and use of successful indigenous knowledge and practices for DRR, including non-formal means of dissemination, into official national DRR policies and education plans.

Commitments and Action by Indigenous Community Leaders:

a. Take a leadership role in local level development and disaster resilience, and work with all stakeholders (locally and nationally)
b. Work with city councils, municipal governments and others to promote budget increases aimed at assessing, capitalizing on, and strengthening capacities for resilience at the local government level.
c. Ensure that, at the community level, capacity and vulnerability self-assessments are undertaken -- with community participation -- in order to identify new or recurrent hazards and the successful past / present DRR practices of local and/or external origin used to cope with them.

d. Develop, through this process, integrated strategies that take advantage of both local knowledge and mainstream strategies that are better adapted to local concerns, capacities and resources.

e. Become active participants in dialogue with national and international institutions, platforms and frameworks to share knowledge and learn from the rapidly growing body of successful evolving DRR practice.

61. Governments, institutions and organizations must actively seek to identify, incorporate and facilitate transfer of indigenous knowledge into all their DRR projects and programs. The decision-making power must, however, reside in the hands of the community. It must be recognized, also, that the danger of commercialization is always present; hence attention must be given to avoid exploitation during the transfer of indigenous knowledge.

62. The use of indigenous knowledge for DRR is important because it represents the essence of self-reliance and sustainability. The strength of societies is based upon their ability to thrive with their own capacities and resources. Natural disasters do not exist, as the ISDR affirms, only natural hazards. Disasters happen when hazards strike unprepared societies. There is no better way of confronting a disaster than to prevent it from happening. Too often, dependency has stemmed from intervention, and this has in turn provoked vulnerability. Indigenous knowledge not only has potential, but a power proven by thousands of years of survival.

In Respect to Future Generations

63. The constitution of the Iroquois Nations (of North America) is referred to as "The Great Binding Law." In it, there is a passage that calls for thinking of future generations, which might serve as a call to take action to reduce risk.

> "In all of your deliberations in the Confederate Council, in your efforts at law making, in all your official acts, self-interest shall be cast into oblivion. Cast not over your shoulder behind you the warnings of the nephews and nieces should they chide you for any error or wrong you may do, but return to the way of the Great Law, which is just and right. Look and listen for the welfare of the whole people and have always in view not only the present but also the coming generations, even those whose faces are yet beneath the surface of the ground -- the unborn of the future Nation."

64. The concept of making decisions with "Seven Generations" in mind has become a common theme of many indigenous communities. Some interpretations of Seven Generations include previous generations as well as future generations.

65. By respecting this precept we may honor our ancestors' knowledge -- applying it, together with what we have learned in our own time, to make the future safer for generations to come.

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[iv] **Disaster Risk Reduction** is the concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events. *Source: UNISDR. Terminology on Disaster Risk Reduction. 2009.*

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