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**Economic and Social Commission for Asia and the Pacific**  
Committee on Disaster Risk Reduction**Fourth session**

Bangkok, 27-29 October 2015  
Item 6 of the provisional agenda\*  
**Risk-sensitive development**

**Risk-sensitive development in Asia and the Pacific****Note by the secretariat***Summary*

The Third United Nations World Conference on Disaster Risk Reduction calls for risk-sensitive development. The upcoming post-2015 development agenda and sustainable development goals are expected to highlight the need to build resilience and reduce exposure and vulnerability to natural disasters as part of the effort towards achieving sustainable development in Asia and the Pacific, the world's most disaster-prone region.

In the present document,<sup>1</sup> the importance of risk-sensitive investment and development that may reduce underlying risk factors, prevent creating new risks and build resilience are discussed. Integrating disaster risk reduction into national development implies incorporating disaster risk reduction measures in the development planning of multiple socioeconomic sectors. It calls for multisectoral policy planning aimed at mainstreaming disaster risk reduction into development planning and budgeting. It also calls for enhanced cooperation to integrate the critical elements of resilience at the regional and subregional levels to tackle transboundary hazards and risks.

The Economic and Social Commission for Asia and the Pacific provides member States with the regional platform to collectively identify challenges, share experiences and strengthen regional cooperation in building resilience to natural disasters. Building regional resilience also entails having the capacity to shape regional actions, using the Committee on Disaster Risk Reduction as a regional platform to advance regionally the implementation of the part of the post-2015 development agenda pertaining to risk-sensitive development.

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\* E/ESCAP/CDR(4)/L.1.

<sup>1</sup> Detailed analyses on integrating disaster risk reduction into development are discussed in the chapter 2 of the forthcoming *Asia Pacific Disaster Report 2015*.

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### **I. Introduction**

1. Asia and the Pacific is the most disaster-prone region in the world. Since the adoption of the Hyogo Framework for Action in 2005, the region has been affected by more than 1,600 disaster events — 40 per cent of all disasters that occurred globally. The catastrophic events caused almost 500,000 fatalities and affected the lives of more than 1.6 billion people. Earthquakes and tsunamis have brought the largest devastation to the region causing 200,000 deaths. Some 321 million people have been adversely affected by tropical storms and floods and 191 million have been affected by drought.

2. During the period 2005-2015, disasters inflicted an estimated \$705 billion in damages in the region, accounting for 50 per cent of the global damage during that period. Tsunamis, floods, earthquakes and storms were the costliest hazards, causing an estimated \$684 billion in damages, or 97 per cent of the total damage from natural disasters in the region. The 2011 Great East Japan Earthquake was the costliest natural disaster event in the world since 2005. The earthquake and subsequent devastating tsunami caused \$165 billion in damage, representing 3.8 per cent of the gross domestic product (GDP) of Japan. Damage from disasters is on the rise in line with development in Asia and the Pacific, particularly in urban areas, which has resulted in increased exposure of infrastructure and assets in hazardous areas.

3. Disasters erode development gains. Developing countries, in particular smaller economies, are more vulnerable to disasters and other shocks. Countries with special needs have recorded significantly higher damage attributed to disasters and other shocks as a percentage of their respective GDP. Least developed countries and landlocked developing countries have respectively lost an average of almost 1 per cent and more than 0.5 per cent of their GDP per year since 1970 because of damage from natural disasters.<sup>2</sup>

4. In 2015, Tropical Cyclone Pam, one the more powerful storms to make landfall in the Pacific, wreaked havoc in Vanuatu, causing damages equal to one quarter of the country's GDP of \$1.23 billion.<sup>3</sup> It destroyed up to 15,000 homes and 96 per cent of the crops, leaving people with no alternative

<sup>2</sup> Economic and Social Commission for Asia and the Pacific, *Overview of Natural Disasters and their Impacts in Asia and the Pacific, 1970-2014* (Bangkok, 2015).

<sup>3</sup> Vanuatu, *Vanuatu: Post-Disaster Needs Assessment - Tropical Cyclone Pam, March 2015*. Available from [www.gfdr.org/sites/default/files/publication/Vanuatu\\_PDNA\\_Web.pdf](http://www.gfdr.org/sites/default/files/publication/Vanuatu_PDNA_Web.pdf).

food stocks. Extensive damage was inflicted on critical infrastructure, such as buildings, schools and health facilities.

5. The 2015 earthquake with a magnitude of 7.8 in Nepal caused \$7.1 billion in damages, which was equivalent to 39 per cent of the country's GDP in 2013.<sup>4</sup> Losses in the productive sectors, including tourism, agriculture and commerce, amounted to more than \$1.7 billion. GDP growth in 2015 is expected to drop from the previously projected 4.6 per cent rate to 3 per cent. The disaster will likely erase recent development gains in Nepal and impede attempts to change the country's status as a least developed country by 2022.

6. The impacts of disasters are aggravated by extreme events. On average, 86 tropical cyclones are formed annually around the world, with 50 to 60 of them occurring in the Asia-Pacific region.<sup>5</sup> Cyclone Komen, which occurred in July 2015, brought heavy rains, resulting in extensive floods and landslides in Myanmar. As of 10 August, reports from the Government of Myanmar indicate that more than one million people have been severely affected and at least 99 people have died as a result of monsoonal floods across 12 of the country's 14 states and regions.<sup>6</sup>

7. Additionally, in Kazakhstan, a sudden rise of temperature in April 2015 resulted in the rapid melting of snow, causing floods that destroyed several villages, transportation infrastructure and bridges, and disrupted electricity and water supplies.<sup>7</sup> Rising temperatures, snowmelt and glacial lake outburst can also be attributed to similar floods that resulted in mudflows and landslides which affected hundreds of thousands of people in Pakistan and Tajikistan.

## II. Disaster risk reduction and the sustainable development nexus

8. Damage from natural disasters increased exponentially from \$52 billion in the 1970s to more than \$540 billion over the decade 2004-2013. In line with the economic gains made in the region, exposure of regional assets to natural disasters has increased accordingly. Damage from natural disasters has increased as a percentage of regional GDP from 0.16 per cent to 0.45 per cent between 1970 and 2013, raising a serious concern for achieving sustainable development in the region.<sup>8</sup>

9. The estimated yearly disaster losses weighted against the likelihood of disaster occurrence and impacts or annual average loss (AAL) are expected to be as high as \$415 billion (in 2012 U.S. dollars) globally by 2030. About 40 per cent of the losses are expected from the combined total losses of 50 countries in the Asia-Pacific region. Seven out of the top 10 countries with the highest expected disaster losses are from the region. Large economies, such as China, Japan, India and the Republic of Korea, have faced the highest

<sup>4</sup> Nepal, National Planning Commission, *Nepal Earthquake 2015: Post Disaster Needs Assessment* (Kathmandu, 2015).

<sup>5</sup> See <http://www.aoml.noaa.gov/hrd/Landsea/climvari/table.html>.

<sup>6</sup> Available from <http://reliefweb.int/report/china/asia-and-pacific-weekly-regional-humanitarian-snapshot-4-10-august-2015>.

<sup>7</sup> Available from <http://reliefweb.int/disaster/fl-2015-000039-kaz>.

<sup>8</sup> Economic and Social Commission for Asia and the Pacific, *Overview of Natural Disasters and their Impacts in Asia and the Pacific, 1970-2014* (Bangkok, 2015).

AAL in the region. Total AAL from multi-hazard risk reached \$160 billion (in 2012 U.S. dollars), among which floods, geo-hazards and storms represented about 37 per cent, 31 per cent and 22 per cent of the total, respectively.<sup>9</sup>

10. Integration of disaster risk reduction, including with regard to climate change adaptation, in sustainable development is expected to be part of the post-2015 development agenda. In the Sendai Framework on Disaster Risk Reduction 2015-2030 (the Sendai Framework) and the emerging post-2015 development agenda and proposed sustainable development goals as set by the Open Working Group on Sustainable Development Goals, the importance of mainstreaming disaster risk reduction in sustainable development is highlighted. Mainstreaming disaster risk reduction is critical because disasters have a close nexus with development. This nexus of disasters with sustainable development has three separate but interrelated dimensions: disasters erode development gains; deficits in development create vulnerabilities and risks of disasters; and development creates new risks of disasters, which compound the already existing layers of risks.

### **Disasters erode development gains**

11. Natural disasters affecting Asia-Pacific countries vary by types and intensity, including those with low frequency with high impact and those with high frequency with low impact. Major disasters cause extensive damage to key productive sectors, such as agriculture and livestock, destroy houses and educational and health facilities, disrupt basic infrastructure, such as water supply and sanitation, and impair costly transport infrastructure, further detracting from the attainment of the development goals. When a portion of the GDP is lost because of a disaster, the attainment of the development targets is set back as the activities that should have been devoted to achieving progress must be directed towards recovery and reconstruction (box 1).

12. A series of natural disasters and other severe shocks have the potential to knock economies off their growth trajectories and lead to permanent losses. Fiji and Maldives, which suffered from cyclones in 2003 and the 2004 Indian Ocean Tsunami respectively and were affected by the 2008 financial crisis, have not returned to their pre-disaster GDP levels.<sup>10</sup> The extensive cumulative effects of an earthquake in 2005, Cyclone Yemyin in 2007 and massive floods in 2010 and 2011, have prevented the economy of Pakistan from returning to pre-disaster levels.

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<sup>9</sup> Ibid.

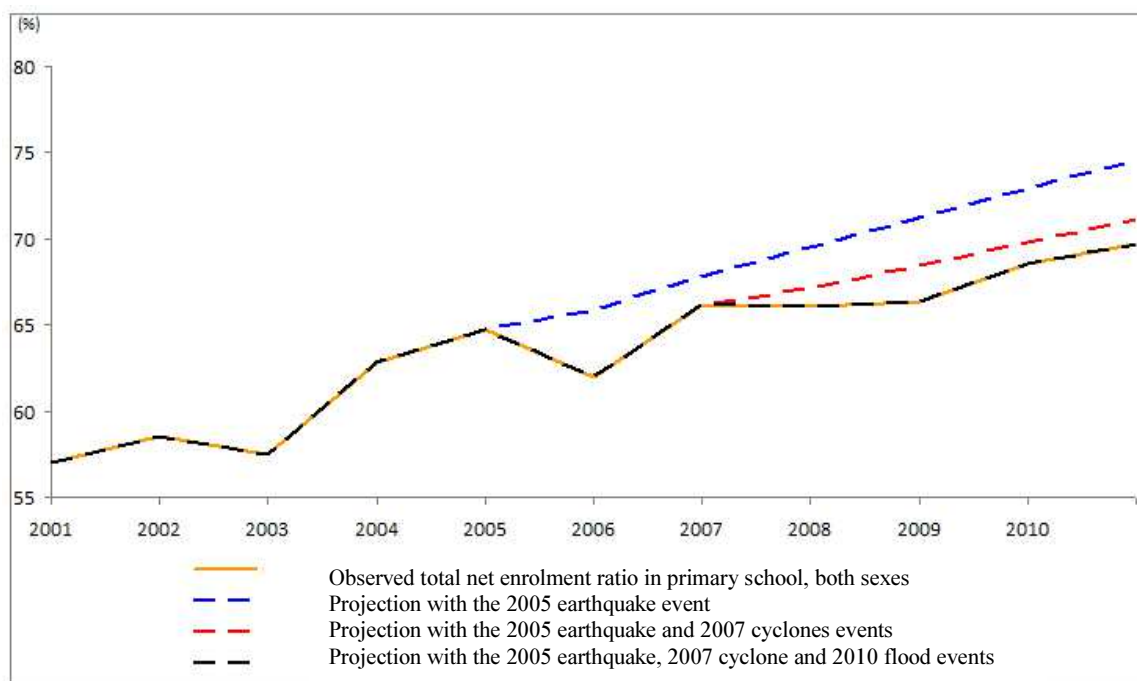
<sup>10</sup> Economic and Social Commission for Asia and the Pacific, *Building Resilience to Natural Disasters and Major Economic Crises* (ST/ESCAP/2655).

## Box 1

**Effects of disasters on development efforts to attain the targets of the Millennium Development Goals**

The Economic and Social Commission for Asia and the Pacific (ESCAP) conducted a time series analysis for assessing the cumulative effects of the earthquake, cyclone and floods on Millennium Development Goal 2 on achieving universal primary education in Pakistan.<sup>a</sup> The education subsector accounted for 14 per cent, or \$405 million, of the total damage and losses resulting from the 2005 earthquake. A total of 7,669 government- and privately owned schools were affected, out of which 5,690 were primary and middle schools. The recovery needs were estimated at \$472 million to resume classes at all levels in the short term and build or repair the damaged schools over the medium to long term.<sup>b</sup> During the 2010 floods, the education subsector suffered 3 per cent of the total damage and losses, or an estimated \$311.3 million, affecting 10,407 educational institutions, with 3,741 of them being fully destroyed and 6,666 partially damaged. The recovery and reconstruction needs were estimated at \$504.8 million.<sup>c</sup>

Figure 1

**Observed and projected Millennium Development Goal 2 progress on educational enrolment in Pakistan**

Source: ESCAP, *Asia-Pacific Disaster Report 2012: Reducing Vulnerability and Exposure to Disasters* (ST/ESCAP/2639).

A comparison of the observed net enrollment ratio with the projected net enrollment ratio was conducted under the assumption of a no disaster event scenario. The above graph shows the observed total net enrolment ratio in primary schools and projections with the occurrence of successive disasters and their cumulative impacts on the Millennium Development Goals. The projection that reflects both the 2005 earthquake and the 2007 cyclone results in lower values than the one representing only the earthquake effect. The projection that also includes the 2010 floods shows even lower values.

<sup>a</sup> United Nations Office for Disaster Risk Reduction and the Economic and Social Commission for Asia and the Pacific, *Asia-Pacific Disaster Report 2012: Reducing Vulnerability and Exposure to Disasters* (ST/ESCAP/2639).

<sup>b</sup> Asian Development Bank and World Bank, *Pakistan 2005: Earthquake Preliminary Damage and Needs Assessment* (Islamabad, 2005).

<sup>c</sup> Pakistan, Asian Development Bank and World Bank, *Pakistan Floods 2010: Preliminary Damage and Needs Assessment* (Islamabad, 2010).

### **Ill-planned development creates vulnerabilities and new risks**

13. Development has often created new risks of disasters. The disproportionate share of economic losses in the region is strong evidence that risks of disasters are created by deficits in ensuring risk reduction measures in development. For example, unplanned urbanization has led to growth of settlements with unstable living conditions. Unsafe building practices of housing and infrastructure with poor standards and specifications of construction in seismic zones have exposed houses and infrastructure to the risks of earthquakes. Rapid industrialization and location of industrial complexes in low-lying flood plains has made them susceptible to flooding.

14. The three dimensional nexus of disaster and development makes it imperative that disaster risk reduction no longer remains as a stand-alone initiative. Instead, it must be an integral part of sustainable development and integrated in every sector of development. Development that has integrated disaster risk reduction will reduce vulnerabilities and build resilience from the risks of disasters.

### **III. Gaps in reducing underlying risk factors**

15. In the Hyogo Framework of Action, “more effective integration of disaster risk considerations into sustainable development policies, planning and programmes at all levels” is recognized as a strategic goal. Addressing the underlying risk factors across all sectors of development is one of the priorities of action. This priority of action outlined the basic approaches for mainstreaming disaster risk reduction in development in three key areas, namely environmental and natural resource management, social and economic development practices, and land-use planning and other technical measures. Eighteen activities were prescribed for reducing the risks of disasters in all these areas.<sup>11</sup>

16. A review of implementation of the Hyogo Framework of Action by governments and international organizations have pointed out that achievements made on addressing the underlying risk factors remained the most difficult, slow and challenging among all the priorities of action of the Framework, particularly in developing and least developed countries.<sup>12</sup> One of the reasons behind this lack of progress was that disaster risk management in most of those countries continued to be focused on disaster response and preparedness with limited effort being directed towards integrating disaster risk reduction across different sectors of development, leading to inadequate public investments for disaster reduction.

17. An evaluation of the region’s progress under the Hyogo Framework for Action indicated that weak translation of policies and legislation into action had been a major impediment. While countries developed legal and institutional mechanisms for disaster risk reduction, the majority of them had fallen short of integrating disaster risk reduction in development policies, planning, programmes and projects. Budgetary allocations for disaster risk

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<sup>11</sup> United Nations Office for Disaster Risk Reduction, *Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters* (2005).

<sup>12</sup> United Nations Office for Disaster Risk Reduction, *Global Assessment Report on Disaster Risk Reduction, 2011, 2013, 2015*.

reduction had increased in the region, but higher amounts were allotted in only a few countries.<sup>13</sup>

18. In the Sendai Framework, these gaps were identified and it was recommended that dedicated action needed to be focused on tackling underlying disaster risk drivers, such as the consequences of poverty and inequality, climate change and variability, unplanned and rapid urbanization, poor land management and compounding factors, such as demographic change, weak institutional arrangements, non-risk-informed policies, lack of regulation and incentives for private disaster risk reduction investment, complex supply chains, limited availability of technology, unsustainable use of natural resources, declining ecosystems, pandemics and epidemics.<sup>14</sup> Notably, Sendai Framework priority 1 reiterates the importance of understanding disaster risk, while priority 3 calls for investing in disaster risk reduction for resilience.

19. In the proposed sustainable development goals, disaster risk reduction is specifically listed for achieving specific targets of goal 1 (end poverty in all its forms everywhere), goal 11 (make cities and human settlements inclusive, safe, resilient and sustainable), and goal 13 (take urgent action to combat climate change and its impacts). Building resilience is mainstreamed in many sector-related goals, such as goal 2 (end hunger, achieve food security and improved nutrition, and promote sustainable agriculture), goal 9 (build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), and goal 15 (protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

20. The proposed key targets in which disaster risk reduction interventions have been acknowledged as being essential for the achievements of the respective sustainable development goals are:

21. Target 1.5 of goal 1, which aims to, by 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters. Approximately 933 million people are living on between \$1.25 and \$2 a day.<sup>15</sup> Disasters can push more people back into poverty. They have a disproportionate effect on the poor and vulnerable because of limited capacity to address disaster risk and inadequate financial resources to invest in proper disaster prevention mechanisms. Moreover, the poor tend to live in hazard-prone areas, increasing their vulnerability to the risk of natural hazards. In the 17 countries in the Asia-Pacific region where recent data are available, more than 500 million poor are living in medium or higher risk areas.<sup>16</sup>

<sup>13</sup> United Nations Office for Disaster Risk Reduction, *The Hyogo Framework for Action in Asia and the Pacific 2011-2013* (2013). Available from [www.unisdr.org/files/32851\\_hfaregionalsynthesisreportasiapacif.pdf](http://www.unisdr.org/files/32851_hfaregionalsynthesisreportasiapacif.pdf). *hfaregionalsynthesisreportasiapacif.pdf*.

<sup>14</sup> United Nations Office for Disaster Risk Reduction, *The Sendai Framework for Disaster Risk Reduction 2015-2030* (Geneva, 2015).

<sup>15</sup> Economic and Social Commission for Asia and the Pacific, *Statistical Yearbook for Asia and the Pacific 2014* (ST/ESCAP/2704).

<sup>16</sup> As compiled from the following sources: United Nations Statistics Division, MDG Indicators for poverty data, 2010-2012; the World Risk Index 2014 (UNU-EHS) for disaster risk; World Bank, for population 2013.

22. Target 11.5 of goal 11, which aims to, by 2030, significantly reduce the number of people affected by disasters, including deaths, and decrease the economic losses relative to gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations. Target 11b aims to, by 2020, increase the number of cities and human settlements adopting and implementing integrated policies and plans towards, among other things, resilience to disasters, develop and implement, in line with the Sendai Framework, holistic disaster risk management at all levels.

23. Sixty per cent of people living in cities in Asia and the Pacific are at “extreme” to “high” disaster risk. An assessment of the potential mortality risk from multiple hazards shows that cities of all sizes in the ESCAP region are exposed to the two highest classes of risk, “extreme” and “high”<sup>17</sup> as defined by the UNEP/GRID Global Risk Data Platform. Multiple hazards include cyclones, earthquakes, floods and landslides. Categories of risk are based on cumulated risk of cyclones, earthquakes, floods and landslides and expected annual losses. For “extreme” hazard risk, the greatest proportion of this population is concentrated in megacities (140 million), large cities (93.6 million) and medium-sized cities (107 million). In the case of “high” hazard risk, the majority lives in megacities (68.6 million), medium-sized cities (114 million) and cities with 500,000 to 1 million inhabitants (78 million). By 2030, it is estimated that 980 million people will be exposed to “high” or “extreme” multi-hazard risk.

24. Target 13.1 of goal 13, is aimed at strengthening resilience and adaptive capacity to climate-related hazards and natural disasters in all countries, while target 13.3 is to improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning. The impacts of disasters on the economy and people are aggravated by extreme events triggered by effects of climate change. Tropical cyclones hit countries in the region every year. Floods and droughts have significant implications in the developing countries of South Asia and South-East Asia where the agricultural sector plays important roles. In 2014, floods caused the highest economic losses (\$26.8 billion, in current U.S. dollars) and affected 28.6 million people.<sup>18</sup> Many large-scale floods in the last decade, such as the ones that occurred in China, India, Pakistan and Thailand, have had devastating impacts. Heavy monsoon rains combined with rapid melting of snow and outbursts from glacial lakes because of higher temperatures in 2015 have led to flash floods and flooding in various regions of Kazakhstan, Pakistan<sup>19</sup> and Tajikistan.<sup>20</sup>

25. According to the Intergovernmental Panel on Climate Change (IPCC), heat waves are likely to increase in large parts of Asia and Australia. Heavy precipitation is also expected to increase in most parts of Asia. The IPCC special report on managing the risks of extreme events and disasters to advance climate change adaptation notes the likelihood of increased disaster risk as more vulnerable people and assets are exposed to weather extremes,

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<sup>17</sup> Global estimated risk index for multiple hazards, Global Risk Data Platform. Available from <http://preview.grid.unep.ch>.

<sup>18</sup> Economic and Social Commission for Asia and the Pacific, *Disasters in Asia and the Pacific: 2014 Year in Review* (Bangkok, 2015). Available from [www.unescap.org/sites/default/files/Year%20In%20Review\\_Final\\_FullVersion.pdf](http://www.unescap.org/sites/default/files/Year%20In%20Review_Final_FullVersion.pdf).

<sup>19</sup> Available from <http://reliefweb.int/disaster/fl-2015-000017-pak>.

<sup>20</sup> Available from <http://floodlist.com/asia/kazakhstan-floods-1000-evacuated-almaty-region-july-2015>.



even without climate change, and that climate extremes will increasingly have an effect in disaster impacts. It highlighted the need to improve disaster risk management measures.<sup>21</sup>

#### IV. Risk-sensitive development frameworks

##### **Institutional frameworks for disaster risk reduction in Asia and the Pacific**

26. Asia and the Pacific has a wealth of experience in disaster risk reduction and present diverse institutional mechanisms for disaster risk reduction. In this area, three different models have emerged with many variations. In the first model, a separate specialized national agency or authority is created by disaster management law, usually with the head of government serving as the chair, for steering the entire system and process of disaster risk management in the country. Similar authorities are also created at the provincial and local levels under the overall guidance of the national agency. This is the dominant model applied in South Asia with Bangladesh, Bhutan, India, Pakistan and Sri Lanka opting to use it.

27. In the second model, interministerial coordination mechanisms are created at the highest level for guiding the disaster management process, but the basic responsibilities of disaster risk management remain with the respective departments or agencies of the government. This model is followed by China and South-East Asian countries of Cambodia, the Lao People's Democratic Republic, Malaysia, Myanmar and the Philippines.

28. In the third model, disaster management is the exclusive responsibility of a department of the government that discharges its responsibilities in coordination with other agencies. Countries that have not enacted separate disaster management laws, such as Maldives, Nepal and Timor-Leste, and most of the Central Asian countries are following this model. This has been the dominant model in most of the countries for some time, but more and more countries are turning to the first or second model.

29. To effectively mainstream disaster risk reduction, a framework that includes a policy framework, legal-institutional framework, strategic framework and operational framework is required. While many countries have developed the policy and institutional framework, the development of the strategic and operational frameworks of mainstreaming is tenuous.

##### **Policy guidelines, mechanisms and tools for integrating disaster risk reduction into the national development process**

30. Risk-sensitive development involves integrating disaster risk reduction into development planning across all sectors of development that help to protect gains made towards achieving development goals. Managing disaster risk is a comprehensive approach that includes assessing disaster risk, reducing this risk to the extent possible within available resources, preparing for residual risks that cannot be prevented, and responding to disasters with comprehensive plans for early and longer-term recovery and reconstruction. All these activities connect disaster risk reduction with sustainable development and must, therefore, be incorporated into the development process.

<sup>21</sup> Intergovernmental Panel on Climate Change, *Special Report of the Intergovernmental Panel on Climate Change: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (New York, 2012).

31. Institutional mechanisms for mainstreaming disaster risk reduction in development cannot remain limited to the central agency responsible for disaster management. It has to encompass “whole of government” covering all sectors of development in both the public and private sectors. In this respect, governments can promote and facilitate the process of mainstreaming disaster risk reduction in the development planning process by laying down general policy guidelines, developing sector-specific tools and methodologies and creating legal and institutional frameworks for mainstreaming. While disaster risk reduction should be applied in sectors of development, governments should identify key sectors that should receive priority.

32. The “whole-of-government” cum “whole-of-society” approach to disaster risk management makes it imperative that disaster risk reduction activities do not remain centralized in the national Government but instead become the joint responsibilities of all levels of government with participation and engagement of relevant stakeholders and communities. The experience with decentralized responsibilities for disaster risk governance in Asia and the Pacific varies from deconcentration or partial dispersal of tasks and resources from the central to local government without any devolution of authority, as has been done, for example, in Cambodia, Myanmar, Pakistan and Sri Lanka, to devolution or dispersal of tasks along with partial dispersal of resources and authority, as has been done, for example, in Bangladesh, India and Viet Nam, and autonomy or dispersal of tasks, resources as well as authority, as has been done in Indonesia and the Philippines.

33. In order to be effective, vertical and formal decentralization from the national and the local authorities should be supplemented by horizontal and informal decentralization among all stakeholders across all sectors. In most countries, this mix of vertical-horizontal decentralization has yet to take root.

34. The strategic framework of mainstreaming disaster risk reduction in development can be developed at two levels, (a) a national development plan can provide an overarching framework for reducing risks of disasters and lay down a road map for disaster risk reduction during the plan period, building on the achievements and experiences of the past, and setting targets for the future or (b) based on this overarching framework, the national disaster management authorities may in consultation with development agencies develop a set of broad principles of mainstreaming across all sectors. Three separate but interconnected processes need to be integrated in order to mainstream disaster risk reduction development.

35. *Strategic framework of disaster risk management:* The overarching strategic framework of disaster risk management in a national development plan may be laid down by the national planning commission or a similar institution for a medium- to long-term planning cycle (5 to 10 years) based on the experiences gained and studies, projections and scenarios of emerging risks and their possible impacts. This framework may be developed in consultation with all relevant stakeholders, including the central ministries and departments, state governments, scientific and technical institutions and experts. Very few national planning commissions and ministries in the Asia-Pacific region have developed such an overarching framework on disaster risk management. Notably, the Planning Commission of India had developed such a framework in the Tenth Five Year Plan, but it was not continued in subsequent plans.

Figure 2  
**Interconnected processes for mainstreaming disaster risk reduction into various sectors of development**



36. *National guidelines on mainstreaming disaster risk reduction into development:* The general principles and guidelines of mainstreaming disaster risk reduction into development may be developed by the central agency on disaster risk management in consultation with all sectoral ministries/departments. These generic guidelines may be based on the strategic framework and applicable for every development programme, activity and project across all development sectors.

37. *Sectoral guidelines:* The sectoral guidelines for mainstreaming disaster risk reduction into specific sectors of development may be developed by the sectoral ministries in consultation with the national authority on disaster management to cater to the specific needs of the sector. Such a setup would ensure that while the process is owned by each sector and is driven by the unique demands and requirements of the sector, it conforms to the overall national framework and guidelines and that there are no contradictions in approaches, principles and methodologies of mainstreaming between the national and sectoral plan and among the sectoral plans.

38. Specific needs of each sector vary from one country to another, but some sector-specific components for mainstreaming that are common to all the countries of the Asia-Pacific region may be highlighted. These are classified in four broad categories: social sector (health, education, housing and human settlements); productive sector (agriculture, manufacturing and business); infrastructure sector (roads and bridges, water supply, power transmission and distribution and information and communications technology (ICT)); and cross-cutting sector, such as disaster risk reduction, poverty reduction and gender issues. Multisectoral planning processes are considered for urban and rural development.

39. Public-private partnerships for disaster risk reduction: The private sector, in particular small and medium-sized enterprises, which employ more than half the labour force and contribute from 20 to 50 per cent of GDP in

most economies in the region, are particularly at risk.<sup>22</sup> These enterprises tend to be resource constrained, have limited access to insurance and coping strategies and lack the capacity to carry out ex ante risk reduction measures. Private sector business can participate in disaster risk reduction by collaborating with the public sector in various risk reduction initiatives. Various innovative business models for public-private partnerships have contributed to disaster risk reduction in many countries.

40. Integrating disaster risk reduction into development essentially means looking critically at each programme, activity and project from the perspective of not only reducing the existing disaster risks, but also minimizing its potential contribution to creating new risks of disasters. This necessitates two types of additional investments. First, elements of resilience have to be incorporated in the concept, design, management and evaluation of existing and new programmes, activities and projects; secondly, new programmes, activities and projects must be initiated in a systematic and cost effective manner to reduce the risks of disasters in areas that previously were unprotected.

41. Examples of national guidelines include, for example, a disaster impact and risk assessment that was introduced by Bangladesh for the analysis of all development projects. India developed a checklist for natural disaster impact assessment, which demands that for any new project costing more than one billion Indian rupees (\$15 million), complete information on the hazards, risks and vulnerabilities of the project, including the possible impacts of the project in creating new risks of disasters, must be provided. The National Agency for Disaster Management of Indonesia has developed the Disaster Risk Index as a tool for assessing relative vulnerabilities of districts and municipalities and prioritizing allocation of resources for planning various structural and non-structural measures for risk prevention and mitigation.<sup>23</sup>

42. Other tools for assessing future losses for policymaking include probabilistic risk assessment and climate risk assessment methodologies. ESCAP has developed a pilot probabilistic risk assessment application in the context of Nepal to produce estimated loss data in a seismic event (box 2). The probabilistic risk assessment method was also used to estimate future losses resulting from disasters for the *Global Assessment Report on Disaster Risk Reduction 2015*. The AAL captures long-term expected losses, as a yearly average, over a given period of time. This method of analysis can be extremely useful for planners and policymakers because it provides a quantifiable, comparable and more accurate assessment of the potential disaster frequency, intensity and impact the country may face. It takes into account both historical experiences and futuristic projections based on hazard modelling, exposure and vulnerabilities, and risk estimations. As disasters affect different countries in different ways, a review of AAL provides the basis for estimating expected disaster losses at the national level. Given the specific needs of different countries in terms of potential disaster impacts on the economy, the use of AAL serves as a tool to direct attention and resources to the most relevant areas.

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<sup>22</sup> Economic and Social Commission for Asia and the Pacific, *Resilient Business for Resilient Nations and Communities* (Bangkok, 2015).

<sup>23</sup> National Agency for Disaster Management (BNPB), *Disaster Risk Index of Indonesia*, 2013.

43. Climate risk assessment methodology is a tool used to inform climate change adaptation plans in relation to possible hydrometeorological hazards following a three-step modeling approach, which includes regional climate modelling, a physical impact assessment and an economic assessment. The assessment is made by downscaling climate models from a regional to a local scale for various scenarios, analysing the nature of the risks associated with climate change and the impacts on vulnerable sectors along with the associated costs. The Asian Development Bank, for example, conducted a climate risk assessment to examine the economic costs associated with climate change and adaptation in Bangladesh, Bhutan, India, Maldives and Sri Lanka. The study indicates that climate change impacts could cause countries to lose an equivalent of 1.8 per cent of their annual GDP by 2050, which could progressively increase to 8.8 per cent by 2100.<sup>24</sup>

#### Box 2

#### **Ex ante probabilistic risk assessment and ex post damage assessment in Nepal**

ESCAP carried out a pilot study on a prototype probabilistic catastrophe risk application in the context of Nepal to produce estimated damage and loss data in the event of earthquakes and enable decision makers to include risk management measures in national development plans.<sup>25</sup> A simple risk assessment model based on the Seismic Loss Estimation (SELENA) was customized to use the historical earthquake hazard data in conjunction with macrolevel data on vulnerability and exposure from the 2011 census of the Planning Commission of Nepal. The prototype model was run for various scenarios of future earthquakes with magnitudes ranging from 5 to 8. The level of exposure and seismic risk in terms of GDP loss per capita were found to have a higher value in the central hills and eastern mountains.

The preliminary results of the scenario based on an ex ante probabilistic catastrophic seismic risk assessment model were compared with the post-disaster assessment of the 2015 Gorkha-Nepal earthquake. The damage map released by the Ministry of Home Affairs of the Government of Nepal following a post-disaster needs assessment of the earthquake highlighted that the central hills and central mountain areas were the most severely affected in terms of damage and losses. The central hills area was found to be severely exposed with extreme risk in terms of GDP per capita losses of more than 10,000 Nepalese rupees (\$95) per capita, while the central mountain area was considered to be highly exposed with high risk. The analysis highlights the correspondence between the ex ante risk assessment to ex post real life damage and losses on the ground.

*Source:* Government of Nepal, Ministry of Home Affairs, as of 21 May 2015.

<sup>24</sup> M. Ahmed and S. Suphachalasai, *Assessing the costs of climate change and adaptation in South Asia* (Mandaluyong City, Philippines, Asian Development Bank, 2014).

<sup>25</sup> Economic and Social Commission for Asia and the Pacific, “Ex Ante Tool for Risk Sensitive Development Planning: Probabilistic Catastrophic Hazard Risk Assessment”, paper presented at the ESCAP Regional Conference on Strategies and Tools for Integrating Disaster Risk Reduction into Development Planning and Financing, Bangkok, February 2015.

### **Integrating disaster risk reduction is cost effective**

44. Various studies have shown that disaster risk reduction investments are cost effective. Investments of \$3.15 billion in the sixties and seventies by China on flood control measures have reportedly averted damages of more than \$12 billion.<sup>26</sup> In addition to helping to save lives and property, the \$7.2 million Mangrove Plantation Disaster Risk Project in Viet Nam significantly reduced costs of maintenance of dykes and had a cost-benefit ratio as high as 52 during the period 1994-2001.<sup>27</sup> The marginal higher costs in earthquake-resistant buildings is 2.5 per cent for structural elements and 0.8 per cent for non-structural elements,<sup>28</sup> but the benefits are equal to or higher than the replacement costs of these structures if they were to collapse in earthquakes. One hundred sixty school buildings retrofitted in Kathmandu valley under an Asian Development Bank-supported school safety programme withstood the shock of a 7.8 magnitude earthquake.<sup>29</sup>

45. Similarly, the ESCAP-supported Regional Integrated Multi-hazard Early Warning System (RIMES) has provided evidence that a regional collective system for tsunamis and hydrometeorological hazards monitoring and early warning would cost only slightly more than 20 per cent of the cost of the systems being developed by countries individually.<sup>30</sup> Cost-benefit analysis is useful for governments seeking to compare the cost-efficient alternatives of projected development investment scenarios with the projected benefits accrued from integrating disaster risk reduction.

### **Political economy of mainstreaming**

46. Strategic principles, national frameworks and sectoral guidelines are useful for integrating disaster risk reduction into various sectors of development, however, these are not substitutes for actual investments in disaster risk reduction in different sectors. Various studies have indicated that governments may not be spending more than 1 per cent of their national budgets on exclusive programmes for disaster risk management and that most of the funds spent are being directed towards disaster response and relief. Hardly 2 per cent of international assistance from all sources is spent on disaster management, with most of it going for humanitarian assistance.

47. There is limited understanding about the risks of investments, the costs of unsafe investments and the benefits of investments in risk reduction. Governments are investing in social and economic development, but there is no effective legal, regulatory and governance mechanisms in most countries to ensure that such investments are fully protected from the risks of disasters and that these investments do not exacerbate the existing risks of disasters. Short-term gains in growth seem to be taking precedence over long-term

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<sup>26</sup> C. Benson, "The Cost of Disasters", in *Development at Risk? Natural Disasters and the Third World*, J. Twigg, ed. (Oxford, United Kingdom, 1998).

<sup>27</sup> International Federation of Red Cross and Red Crescent Societies, *World Disasters Report: Focus on Reducing Risks* (Bellegarde/Valserine, France, 2002).

<sup>28</sup> John Pereira, "Costs and benefits of disaster mitigation in the construction industry", paper presented at the Caribbean Disaster Mitigation Project Workshop, Trinidad, March 1995.

<sup>29</sup> Available from [www.adb.org/news/features/schools-earthquake-proof-technology-survive-nepali-disaster](http://www.adb.org/news/features/schools-earthquake-proof-technology-survive-nepali-disaster).

<sup>30</sup> A.R. Subbiah and others, *Socio-economic benefits of early warning systems* (forthcoming).

planning and sustainability, particularly in areas with high levels of hazard exposure.

48. A challenge of disaster risk management is how to quantify the benefits of disaster risk reduction in more explicit terms with complete cost-benefit analysis and position these benefits in the discourse on sustainable development to create demands for stepping up public investment for disaster reduction. In addition, information and analysis of most of the risks are mostly based on natural hazards. Even when risk information exists, it is not linked to cost information, which makes it difficult to promote disaster risk reduction investment. This should be addressed through practical guidance for mainstreaming disaster risk reduction in existing programmes, activities and projects in different development sectors as well as for developing new programmes for risk reduction in a cost-effective manner.

## **V. Enhancing risk-sensitive development through regional learning and cooperation**

49. In view of the upcoming post-2015 development agenda and sustainable development goals that are expected to be adopted by Member States at the seventieth session of the General Assembly in September 2015, Governments should firmly commit to integrating disaster risk reduction and critical elements of resilience into all developmental activities in multiple sectors and cooperate in developing risk reduction strategies across all sectors.

50. ESCAP has launched a regional programme on the integration of disaster risk reduction into development planning to support member States' efforts to create more disaster resilient economies and societies. The programme has brought together key ministries with mandates in national development planning and financing and the central agency in charge of disaster risk reduction policy to engage in dialogue with other sectoral ministries in charge of critical infrastructure, transport and environment, among others, to integrate disaster risk reduction into multiple sectors. The programme develops guidelines for integrating disaster risk reduction into multisectoral and subnational development planning. The guidelines are to take into account the Sendai Framework and the upcoming post-2015 development agenda and sustainable development goals.

51. In addition, the programme also develops tools for ex ante risk assessment for planning and integrating disaster risk reduction into national development and tools for ex-post rapid damage assessment for recovery planning, including a manual on rapid assessment of damage and loss using innovative technology and space applications. The guidelines and tools will contribute to building the capacities of countries to integrate disaster risk reduction into development planning. They will be piloted in selected vulnerable countries of Asia and the Pacific, and when finalized, will be shared with members and associate members of ESCAP. Increasing risk-sensitivity of development and investments is key to reducing underlying risk factors. The Committee may wish to support and contribute to this work of ESCAP.

52. While mainstreaming disaster risk reduction into national development strategies, policies and fiscal budgets is critical, shared risks may call for cross border cooperation. Enhancing such cooperation in terms of sharing knowledge, good practices and lessons is an essential component of building resilience as countries are increasingly connected and are faced with natural disasters that have cross-border effects and transboundary risks.

53. The forthcoming *Asia-Pacific Disaster Report 2015* systematically analyses cross-border disaster risks. It illustrates that as economies in Asia and the Pacific have become increasingly integrated into regional and global manufacturing production networks, large-scale disasters in one country can cause cascading impacts in other economies in the region. Risks are also rapidly emerging in the region's agricultural supply chains as intraregional and interregional trade rapidly expands, threatening food security. The extensive 2011 floods, for example, in rice-growing South-East Asian countries reduced the production of rice and other crops, which affected food security and contributed to rising international prices.

54. Moreover, the *Asia Pacific Disaster Report 2015* indicates that that transport networks in the region are increasingly at risk. The Asia-Pacific region is linked by a system of cross-boundary highways and railways, including the Asian Highway and the Trans-Asian Railway. Many parts of these road systems are in areas exposed to multi-hazard risk. Segments of the Asian Highway in South Asian countries, including Bangladesh, India, Nepal and Pakistan, are in areas that have particularly high multi-hazard risk. The recent earthquake in Nepal led to disruptions in cross-border transactions of goods and services with neighbouring States. Road infrastructure connecting Cambodia, Myanmar, Thailand and Viet Nam as well as large parts of the Asian Highway in China, Indonesia, Japan, the Democratic People's Republic of Korea and the Philippines are also exposed to high disaster risk. The Asian Highway connecting Kyrgyzstan, Tajikistan and Uzbekistan are also exposed to medium disaster risk. In this respect, ICT networks that are developed along the transport networks in the Asia-Pacific region are also at risk.

55. There is an urgent need to fill the gap in understanding these shared risks, analysing their cross-border impacts, building better regional/subregional level awareness, identifying weak network connections, and facilitating regional sharing of data, information, practices, and experience so that national efforts directed at disaster risk reduction would not be undermined by cross-border, shared risks. Going forward, the secretariat, using its multidisciplinary and multisectoral platform, intends to begin work in this area.

56. Asia-Pacific countries have a wealth of information and experience in integrating disaster risk reduction and resiliency aspects into development. Risk-sensitive development requires integrating disaster risk reduction into long-term development strategies at all government levels and across all relevant ministries, including the planning and finance ministries. Allocating appropriate budgets and implementing disaster risk reduction strategies on the ground are critical. It is also important to promote regional learning and cooperation for protecting lives, critical infrastructure and economic assets from disasters that cut across boundaries. Risk-sensitive development is a complex challenge, and the success very much depends on strong political will.

## **VI. Issues for consideration by the Committee**

57. The Committee may wish to invite member States to further promote integrating disaster risk reduction into development strategies by developing general policy and sector-specific guidelines and creating legal and institutional frameworks for mainstreaming. Institutional mechanisms for mainstreaming disaster risk reduction in development cannot remain limited to the nodal agency responsible for disaster management. Member States should be encouraged to extend responsibility for disaster risk reduction to the line ministries that shape development strategies, including the national planning authorities and finance ministries.



58. In support of such a process, the Committee may wish to request the secretariat to make use of its multidisciplinary approach to development and multisectoral reach within governments to facilitate knowledge- and experience sharing in integrating risk-sensitive development into national development strategies, planning and budgeting, as well as in sectoral strategies, in line with the recommendations of the Sendai Framework and the upcoming sustainable development goals. The Committee may also request the secretariat to continue to strengthen the capacity of member States, particularly those with special needs, in risk-sensitive development through technical assistance and regional advisory services.

59. The Committee may wish to request the secretariat to continue to develop regional analytical knowledge to strengthen risk-sensitive development policymaking through the publication of the subsequent *Asia Pacific Disaster Report*. The *Report* should be published regularly to inform the Committee at its subsequent sessions of the state of the region's resilience vis-à-vis the outstanding issues and key challenges that need to be highlighted for deliberations with the key stakeholders at the intergovernmental regional platform to promote knowledge-sharing and regional cooperation.

60. The Committee may also wish to request the secretariat to carry out analytical work on building resilience of regional networks to natural disasters that cut across boundaries, and identifying vulnerable network connections of strategic importance in the region, such as critical infrastructure and agricultural production systems, to ensure sustainable development in Asia and the Pacific.

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