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the Development of Disaster Information Management

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Strategic plan and programme direction of the Asian and Pacific Centre for the Development of Disaster Information Management

Note by the secretariat*

Contents

* The present document is being issued without formal editing.

I. Introduction

1. The Commission, through the adoption of its resolution 71/11 in May 2015, decided to establish the Asian and Pacific centre for the development of disaster information management (APDIM) as a regional institution of the Commission (annex I).

2. The present document outlines the strategic plan and programme direction of APDIM, aligned closely with the statute of APDIM and the strategic framework of the Economic and Social Commission for Asia and the Pacific (ESCAP). It also presents the organizational structure, staffing and financial resources of APDIM. In accordance with paragraph 35 of the statute of APDIM, the Governing Council shall review and endorse the strategic plan and programme direction of the Centre, as presented in this document.

II. Situation analysis

1. Asia and the Pacific is the most disaster-prone region in the world. The *Asia-Pacific Disaster Report* 2015 highlights that over the last ten years, there have been 1,625 reported disasters, approximately 500,000 people have lost their lives and more than 1.6 billion people were affected by disasters. The most frequent disasters were floods and storms, followed by earthquakes and tsunamis. In the period 2004- 2015, the Asia-Pacific region accounted for 50 per cent of the global disaster-related losses in the world, amounting to total losses of $700 billion.[1]

2. The economic cost of disasters is rising in Asia and the Pacific. Damage has been increasing as a proportion of gross domestic product (GDP); from 0.16 per cent in the 1970s, to 0.37 per cent in the decade from 2004 to 2013.[2] The economic losses will be even higher if lost income, increased costs of production, and other financial losses to businesses as a result of damage to assets, are taken into account. The least developed countries of the region are hit the hardest by disasters.

3. Often, natural disasters wipe out hard-earned gains made in sustainable development. Disaster risks are being exacerbated by the region's rapid economic growth, rising population, and burgeoning cities, coupled with the increased intensity of extreme weather events caused by climate change. Disaster risk reduction and resilience (D3R) is, therefore, prominently recognized in the 2030 Agenda for Sustainable Development. Operationalizing D3R, however, is information- and knowledge-intensive. In this regard, the applications of science, technology and innovation (STI), as well as harnessing the methods and tools of big data analysis for better understanding of complex disaster risks assume considerable significance. Also regional and South-South cooperation play an important enabling role in integrating D3R in the efforts aimed at achieving the Sustainable Development Goals.

A. Shared disaster risk and vulnerability

4. The *Asia-Pacific Disaster Report 2015* clearly points out that the major disasters of the region are of transboundary origins. There are pockets of multi-hazard risk hotspots that transcend boundaries, highlighting the incidence of shared disaster risk and vulnerabilities.

[1] *Asia-Pacific Disaster Report 2015 – Disasters Without Borders* (United Nations publication, Sales No. E.15.II.F.13).

[2] Ibid.

5. Earthquakes are a major form of transboundary disasters. The Pacific "Ring of Fire"' is at the highest risk; in which tectonic plate movements create high intensity and frequent earthquakes, with the potential for associated tsunamis to occur. The region's second most seismically active zone is the Alpine-Himalayan orogenic belt. Another active seismic belt covers the Islamic Republic of Iran, Pakistan and Afghanistan. The Afghanistan-Pakistan earthquake in October 2015 affected both those countries, while the November 2015 earthquake in Central Asia affected Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

6. The Asia-Pacific region is at risk of catastrophic flooding. Some large-scale floods strike across countries that share river basins; such as the Amu Darya, Amur, Brahmaputra, Ganges, Indus, Mekong, Salween and Yenisey. In 2014, transboundary floods in the Chenab, Indus, Jhelum, and Ravi river basins resulted in $18 billion worth of damage in India and Pakistan.[3] Tropical cyclones also have transboundary origins, causing destruction across the countries in their path.

7. Slow-onset disasters, such as drought, can adversely affect neighbouring countries experiencing the same climatic variations over long periods of time. Seasonal variations prolong the impacts of extreme weather events, such as El Niño, which has influenced weather patterns in different parts of the world in diverse ways; predominantly interpreted as wet (flood) or dry (drought) conditions.

8. Dust and sand storms have transboundary implications. ESCAP subregions, namely North East Asia, South and South-West Asia, are part of the "dust belt". In South and South West Asia, the "dust belt" extends from western Sahara (long dust intrusions over the Atlantic Ocean to the west) to central and eastern Asia (long dust intrusions over the Pacific Ocean to the east).[4] Sand and dust storms frequently affect areas in Afghanistan, China, India, the Islamic Republic of Iran and Pakistan.

B. Disasters affecting the Sustainable Development Goals

9. Disasters are likely to have a substantial impact on the achievement of the Sustainable Development Goals. Resilience has been identified as one of the key cross-cutting elements across the 2030 Agenda for Sustainable Development (annex II).

10. About 772 million people in the Asia-Pacific region live on less than $1.25 a day, typically residing in multi-hazard-prone areas.[5] Due to climate variability, the incidence of extreme weather and slow-onset disasters, many areas in the region are susceptible to cyclones, floods and droughts. Addressing the risks posed by these natural hazards to the poor and vulnerable is critical for meeting Sustainable Development Goal 1 (End poverty in all its forms everywhere) and Goal 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture).

[3] *Economic and Social Survey of Asia and the Pacific 2013: Forward-Looking Macroeconomic Policies* (United Nations publication, Sales No. E.13.ll.F2).

[4] United Nations Environment Programme and World Meteorological, *Establishing a WMO Sand and Dust Storm Warning Advisory and Assessment System Regional Node for West Asia: Current Capabilities and Needs* (Geneva: World Meteorological Organization, 2013).

[5] *Asia-Pacific Disaster Report 2015 – Disasters Without Borders* (United Nations publication, Sales No. *Asia-Pacific Disaster Report 2015 – Disasters Without Borders* (United Nations publication, Sales No. E.15.II.F.13).

11. About 740 million city dwellers in the Asia-Pacific region are residing in areas that range from "extreme" to "high" disaster risk – multi-hazard hotspots that are vulnerable to cyclones, earthquakes, floods and landslides.[6] By 2030, this number is estimated to reach 980 million persons. Many cities in the region struggle to provide basic civic amenities, leaving the poorest – especially those residing in hazard-prone zones – exposed to sudden disaster-induced shocks, with direct implications for the achievement of Goal 11 (Make cities and human settlements inclusive, safe, resilient and sustainable).

12. It is expected that climate variability and extreme weather events will heighten the scale of disasters in future. The realization of Goal 13 (Take urgent action to combat climate change and its impacts) will, therefore, be a challenging task. With the degradation of ecosystems, the severity of drought is on the rise and desertification is expanding while and dust storms contribute substantially to this process.

C. Policy responses: Disaster risk reduction and resilience

13. There is an increasing focus on integrating disaster risk reduction (DRR), including those measures related to climate change adaptation (CCA), in the efforts aimed at achieving sustainable development in Asia and the Pacific. In 2015, important international frameworks and agendas were adopted to guide sustainable development over the next two decades, including the Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework); the Addis Ababa Action Agenda; and the 2030 Agenda for Sustainable Development, along with its Sustainable Development Goals.

14. Information and knowledge holds the key for operationalizing D3R. While understanding risk is a fundamental requirement; availability, access, timeliness and quality of information will enable effective D3R. For example, to effectively realize Goal 1 (End poverty in all its forms everywhere) and Goal 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture) of the Sustainable Development Goals.

15. Effective information management supports evidence-based risk-sensitive decision-making, which is integral to the D3R process. A number of disasters have cascading effects; such as earthquakes, floods and landslides. Land-use and exposure mapping, seismic microzonation and other techniques can help to enable better planning and enforce building standards, which are essential parts of the efforts to achieve Goal 11 (Make cities and human settlements inclusive, safe, resilient and sustainable).

16. In recent years, the substantial advances in enabling technologies; particularly information and communications technologies, geospatial technologies and modelling, risk analysis, and crowdsourcing have resulted in the development of state-of-art disaster information management systems, which also enable access to information and knowledge to disasters with transboundary origins. Application of STI is a key enabler for putting in place a disaster information management system at all levels of use, and is of particular value for achieving the Sustainable Development Goals.

17. Another emerging opportunity in disaster information management is to harness methods and tools for using big data. A geospatial information system

[6] Economic *and* Social Commission for Asia and the Pacific, Disasters in Asia-Pacific: 2015 year in review. Available from www.unescap.org/sites/default/files/2015_Year%20in%20Review_final_PDF_1.pdf.

is typically built on the foundation of a relational database management system, which is optimized for datasets to support and customize multi-scale disaster risk analysis for policy planning, and monitoring the implementation and impact assessment with regard to D3R. An emerging area is the use of geospatial tools to analyse big data applications for D3R.

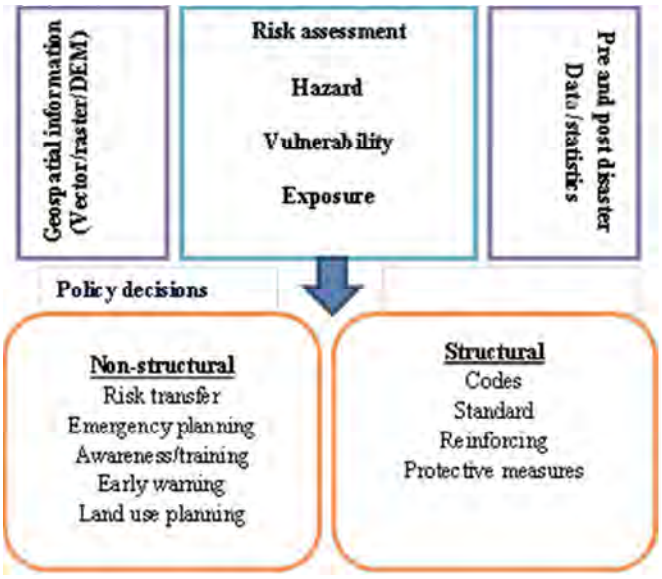
III. Information management framework for disaster risk reduction and resilience

18. A critical part of D3R is effectively managing the flow of information. Getting the right information to the right people at the right time not only saves lives and reduces losses, but it also strengthens people's resilience to disasters.

19. Some Asia-Pacific countries already have state-of-art disaster information management systems, while others have difficulty accessing data, information and knowledge. As the region is characterized by shared disaster risks and vulnerabilities, strengthening regional and South-South cooperation assumes greater significance for managing risks by sharing information and knowledge. STI plays an enabling role to bridge gaps in information and knowledge, and in facilitating the science-policy interface to deepen the understanding of the complexity of disaster risk and promote risk-sensitive development.

20. A disaster information management framework comprises subcomponents on hazard identification, exposure and vulnerability analysis for risk assessment derived from vector and raster data, digital elevation models, and deterministic and probabilistic modelling (figure 1). This framework helps facilitate the risk-sensitive decision-making process, strengthen risk governance, and offers solutions for combining structural and non-structural measures that focus on emergency preparedness, such as awareness-raising and early warning systems, inclusion of risk information in long-term planning, such as for land-use purposes, and evaluation of the most cost-effective risk reduction measures.

Figure 1
Information management framework for disaster risk reduction and resilience



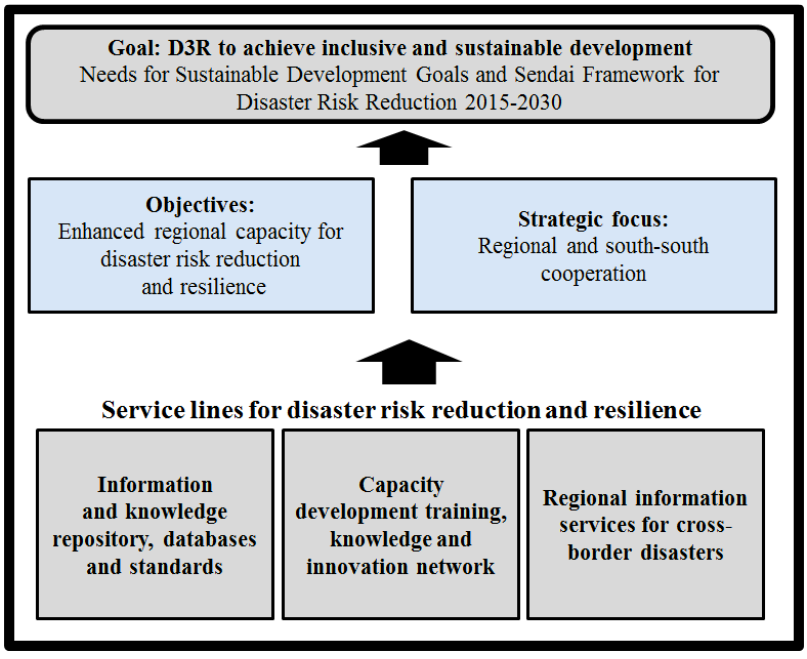
21. Understanding vulnerability and exposure is a prerequisite for reducing accumulated risk, preventing the creation of new risk, and ultimately strengthening resilience. Therefore, this is the key knowledge input to the development and implementation of appropriate cost-effective D3R measures. The framework for D3R requires institutional mechanisms that enable access to data and information on hazards, vulnerability and exposure for risk analysis and impart customized capacity development training.

22. A number of challenges impede access to, and the availability of, disaster information. Disaster information management needs are qualitatively and quantitatively diverse, serving a range of stakeholders. While a number of organizations collect disaster-related data and geospatial information, there are challenges with regard to the standardization of information and availability of related infrastructure. Though disasters frequently expose and amplify existing vulnerabilities, they also provide opportunities for countries to recalibrate their development trajectory by incorporating resilient strategies in ex-ante disaster risk reduction and post-disaster recovery and reconstruction.

IV. The Asian and Pacific Centre for the Development of Disaster Information Management: Objectives and key functions

23. As outlined in resolution 71/11, the main objectives of the Centre are to reduce damage and loss resulting from natural hazards by developing human and institutional capacities and capabilities of countries and organizations of the region in disaster information management to support disaster risk reduction, and strengthening regional cooperation in disaster information management for achieving internationally agreed development goals, particularly the Sustainable Development Goals and the Sendai Framework (figure 2).

Figure 2
Goals, objectives and service lines of the Asian and Pacific Centre for the Development of Disaster Information Management



24. The full functions, products and services are listed in the statute of APDIM. The key functions of the Centre include, among others:

(a) Providing disaster information management services and technical assistance to member States in the areas of disaster prevention and risk reduction, preparedness, response and recovery with a focus on disaster monitoring and early warning;

(b) Facilitating access to regional and global disaster information and data sources and developing capacities to create products, using appropriate standards and mechanisms;

(c) Acting as a regional platform for the exchange of expertise, experiences and knowledge in disaster information for risk reduction and management.

25. The key products and services of the Centre include, among others:

(a) Capacity development in disaster information management and disaster risk reduction;

(b) Information support and analytical work on disaster risk reduction and assessment at regional/subregional levels;

(c) Information and publications in disaster information management.

26. The focus of the programme and activities of the Centre are to provide capacity development in disaster information management and technical assistance and supplementary information services during major disasters. The Centre will employ a multi-hazard approach, with a focus on cross-border disasters, such as earthquakes, tsunamis, floods, cyclones/typhoons, drought, sand and dust storms, to address all phases and sectors of disaster management and risk reduction.

27. The Centre will commence its operations with a focus on South and South-West Asia and North and Central Asia, with a view to eventually cover the wider Asian and Pacific region.

V. Strategic plan

A. Linkages with the ESCAP Work Programme and Strategic Framework

28. The Centre is a subsidiary body of the Commission. The objectives and activities of the Centre contribute to subprogramme 5 on information and communications technology and disaster risk reduction and management of the ESCAP strategic framework and programme of work.

29. The objective of subprogramme 5 for the biennium 2016-2017 is to enhance the contribution of information and communications technology connectivity, space applications, and disaster risk reduction and management strategies to the achievement of inclusive, sustainable and resilient development in Asia and the Pacific. The expected accomplishment most relevant to APDIM is as put forth in (b) improved knowledge and awareness of member States of effective strategies and policies in […] disaster risk reduction and management, including their gender dimensions, for inclusive, equitable, sustainable and resilient development.[7]

[7] *Official Records of the General Assembly, Seventieth-first Session, Supplement No. 16* (A/71/6).

30. The overall strategic focus of subprogramme 5 is to improve capabilities of member States to create more disaster-resilient societies. The emphasis will be on enhancing regional knowledge and knowledge-sharing, strengthening capacities to manage risks and vulnerabilities, and reducing socioeconomic impacts of disasters. With the establishment of APDIM, these efforts will be further augmented by capacity building in disaster information management organized by the Centre.

31. The Centre will further contribute to the objective of subprogramme 5 for the biennium 2018-2019 by way of addressing the expected accomplishment of (a) strengthened regional mechanisms to effectively address shared challenges and opportunities in disaster risk reduction and management for resilient and sustainable development; (b) enhanced evidence-based policies on disaster risk reduction and management for resilient and sustainable development, including gender perspectives; and (c) strengthened capacity of member States to use disaster risk reduction and management for resilient and sustainable development.

32. As part of its strategy, the Centre will build on comparative advantages and multisectoral strengths of ESCAP in promoting cooperation among member States towards achieving inclusive and sustainable economic and social development in the Asia-Pacific region. In this regard, in line with subprogramme 5, the Centre will collaborate with other subprogrammes, including:

(a) Statistics: For disaster-related statistics and geospatial information management services, as part of the work of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) related to disaster management in Asia and the Pacific, as well as applications of big data for D3R.

(b) Environment and development: Contribute towards building resilient cities and infrastructure through seismic microzonation, retrofitting technologies, and spatial land-use planning; addressing climate-related disaster issues and water resources management and dust and sand storm-related issues.

(c) Social development: With regard to the integration of gender and disability dimensions in disaster risk reduction and disaster information management.

(d) Macroeconomic policy and financing for development: Concerning disaster risks and their impacts on socioeconomic development, the provision of comprehensive regional disaster risk reduction policy options