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Strategies in disaster risk reduction, including those related to climate change adaptation, for sustainable development

Strengthening early warning for coastal hazards through the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries

Note by the secretariat

Summary

The present document discusses the concept of end-to-end early warning, including its cost-effectiveness. It contains a brief overview of the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries and the impact achieved by the Trust Fund since its creation in 2005. The Trust Fund's strategy for 2013-2016 is also outlined in the document. Finally, a number of issues that the Committee may wish to consider are presented in the document.

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I. Introduction

A. Background

1. The strengthening of early warning systems is an essential part of strategies to build resilience and reduce disaster risk, as recognized in the Hyogo Framework for Action 2005-2015.¹ It has been estimated that the Indian Ocean Tsunami Warning and Mitigation System (IOTWS), which became operational in 2011, will, on average, save at least 1,000 lives per year over the next 100 years.² Meanwhile, research shows that investments in early warning in developing countries have a cost-benefit ratio of between 4 and 36, making such investments also sound from an economic standpoint.³

2. Regional cooperation on early warning can be highly effective, as natural hazards often affect multiple countries simultaneously. One study concluded that, if individual countries each developed their own early warning systems for tsunamis in the Indian Ocean, this would cost around \$50 million to set up, in addition to between \$5 million and \$10 million per year for operating such multiple systems.⁴ A collective system, on the other hand, would require no more than \$1.5 million in annual operating expenditure.

3. Consequently, early warning is an area requiring long-term investments based on a regional approach. Responding precisely to this need, the ESCAP Multi-Donor Voluntary Trust Fund on Tsunami Early Warning Arrangements in the Indian Ocean and Southeast Asian Countries (the “Trust Fund”) was established in 2005, following the devastation wrought by the Indian Ocean Tsunami in December 2004.

4. The Trust Fund’s original mission was to support tsunami early warning systems through a multi-hazard approach. It received contributions from the respective Governments of Thailand (\$10 million), Sweden (\$2.9 million), Turkey, the Philippines, Bangladesh and Nepal.

5. In 2010, following an evaluative review,⁵ the scope of the Trust Fund was expanded to include overall disaster and climate preparedness among the core areas of support, while retaining a focus on end-to-end early warning for coastal hazards. At the same time, it was renamed the “ESCAP Multi-Donor

¹ United Nations, Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, 22 January 2005, A/CONF.206/6 and Corr.1, chap. I, resolution 2. Early warning is discussed particularly under priority action 2, “Identify, assess and monitor disaster risks and enhance early warning”.

² F. Yasemin Aysan, “Evaluative review of the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in the Indian Ocean and Southeast Asian Countries” (2011). Available from www.unescap.org/disaster-preparedness-fund/TsunamiTrustFund-EvaluativeReview2011.pdf.

³ Stéphane Hallegatte, “A cost effective solution to reduce disaster losses in developing countries: hydro-meteorological services, early warning, and evacuation”, Policy Research Working Paper, No. 6058 (Washington, D.C., World Bank, 2012). Available from <http://elibrary.worldbank.org/docserver/download/6058.pdf?expires=1382411581&id=id&acname=guest&checksum=0C20B2EC0411DE3836548BA0E5E81F38>.

⁴ A.R. Subbiah, Lolita Bildan and Ramraj Narasimhan, “Socio-economic benefits of early warning systems”, paper submitted to ESCAP by the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (2010).

⁵ Philip Hall, “Evaluative review 2008: final report” (Bangkok, ESCAP, 2008). Available from www.unescap.org/disaster-preparedness-fund/monitoring-evaluation.asp.

Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries”. This adjustment was made against a backdrop of the increasing impact of extreme weather events in the region⁶ and growing recognition of the benefits of early warning systems covering multiple hazards.

B. Objective and scope

6. The Trust Fund aims to ensure a comprehensive and coordinated approach to resource mobilization for efforts to build capacities in tsunami, disaster and climate preparedness, in accordance with the needs of Indian Ocean and South-East Asian countries. The Trust Fund primarily focuses on early warning for coastal hazards, such as tsunamis, coastal zone flooding, storm surges and tropical cyclones, while applying a multi-hazard approach. It seeks to contribute to the narrowing of capacity gaps through South-South cooperation, sharing of resources and the development of an integrated regional warning system comprising a network of collaborative centres. The geographical scope of the Trust Fund includes Indian Ocean and South-East Asian countries extending from the Islamic Republic of Iran to Timor-Leste.⁷

C. How the Trust Fund operates

7. The following are the main principles and policies that guide the operation of the Trust Fund:

(a) *Needs-driven programming.* The Trust Fund addresses unmet needs and gaps in early warning, and supports innovative, potentially high-impact initiatives. Governments and other organizations develop proposals that are submitted to ESCAP for competitive rounds of funding;

(b) *Regional focus.* As the only United Nations fund operating in this area of work in the ESCAP region, the Trust Fund gives priority to strategic initiatives at the regional level, including resource-sharing arrangements and South-South cooperation, which complement national efforts. Support for national and subnational initiatives is considered for countries with high levels of disaster risk and vulnerability or significant capacity gaps;

(c) *Partnerships.* United Nations partners contribute to the Trust Fund’s strategy and the technical appraisal of projects. The Trust Fund also works with a broad range of other partners such as government agencies, regional organizations, NGOs and the media;

(d) *Quality control.* Programming and policy decisions are made by the Advisory Council, which consists of the Trust Fund’s key donors and the ESCAP secretariat.⁸ United Nations partners⁹ attend Council meetings as

⁶ United Nations, Economic and Social Commission for Asia and the Pacific, and Office for Disaster Risk Reduction, *The Asia-Pacific Disaster Report 2012: Reducing Vulnerability and Exposure to Disasters* (ST/ESCAP/2639).

⁷ The countries covered by the Trust Fund are: Australia; Bangladesh; Brunei Darussalam; Cambodia; China; India; Indonesia; Iran (Islamic Republic of); Lao People’s Democratic Republic; Malaysia; Maldives; Myanmar; Pakistan; Philippines; Singapore; Sri Lanka; Thailand; Timor-Leste; and Viet Nam.

⁸ Any donor with a 20 per cent share in the unspent balance of the Trust Fund is represented on the Advisory Council.

⁹ The Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization, the United Nations Office for Disaster Risk Reduction, the United Nations Office for the Coordination of Humanitarian Affairs, the United Nations Development Programme, the United Nations Environment Programme and the World Meteorological Organization.

observers and participate in an inter-agency task force, which undertakes technical appraisals of proposals according to relevance, efficiency, effectiveness, sustainability and impact. The ESCAP Grants Committee oversees financial and administrative procedures;

(e) *Managing for results.* The Trust Fund is guided by a monitoring and evaluation framework. The secretariat monitors individual projects and conducts progress reviews every six months. Implementing partners are required to commission an external evaluation at the end of the project to assess whether the objectives have been achieved. Independent evaluative reviews of the Trust Fund as a whole are carried out every two or three years;

(f) *Strategic linkages.* ESCAP promotes disaster risk reduction as an integral part of ensuring inclusive and sustainable development for the people of the Asia-Pacific region. The Trust Fund's location in ESCAP allows it to build on the Commission's role as a convenor of regional cooperation and a catalyst for knowledge sharing and advocacy;

(g) *Transparency.* Implementing organizations submit proposals to ESCAP through open, competitive rounds of funding. Technical appraisals are provided to organizations submitting proposals. All important documents relating to the Trust Fund are posted on the ESCAP website.¹⁰

II. Impact of Trust Fund projects

8. End-to-end early warning systems require investments in four interrelated areas: risk knowledge; monitoring and warning services; dissemination and communication; and response capability. The Trust Fund has supported priority activities across all four areas, recognizing that failure in one area would make the entire early warning system ineffective. As of 31 December 2012, the Trust Fund had approved 22 projects with a total budget of approximately \$12.3 million, directly benefitting 19 countries (see detailed table in annex).

9. Significant results have been achieved under Trust Fund-supported projects, at the regional, national and local levels. In particular, the Trust Fund has made important contributions to the establishment of a regional warning system for tsunamis, and the provision of cost-effective warning products and services particularly to low-capacity countries. Further, national and regional ownership of projects has grown over time, including through government funding commitments and other steps taken towards making project outcomes sustainable.

10. At the regional level, a milestone was reached in October 2011 when the IOTWS went into operation, with Australia, India and Indonesia as the service providers tasked with issuing regional tsunami warnings. In March 2013, these regional service providers assumed full responsibility for issuing such warnings for the Indian Ocean. The Trust Fund was one of the many contributors to this new collective system, in particular through support for the adaptation of standard operating procedures for tsunami warning procedures and emergency response, at the regional, national and local levels (for example, via projects TTF-04 and TTF-13).

11. The Trust Fund also made a major contribution to the establishment of the Regional Integrated Multi-Hazard Early Warning System for Africa and

¹⁰ www.unescap.org/disaster-preparedness-fund.

Asia (RIMES) (for example, via projects TTF-01, TTF-02, TTF-07 and TTF-08), which provides tsunami watch services and assists countries in applying hydro-meteorological risk information for decision-making at national and local levels. RIMES products and services, which have proven particularly useful for countries with limited domestic capacity, include daily numerical weather predictions, monitoring and forecasting of severe weather systems, and seasonal outlooks for climate risk management and preparedness.

12. RIMES has evolved from a Trust Fund project into an intergovernmental organization with its own Governing Council, 14 member States and 17 collaborating States. These countries have committed to contributing their own resources to maintain and operate the early warning centre and other components of RIMES. In this way, the initial investments made by the Trust Fund have been taken forward and augmented by the countries in the region, with positive implications for long-term sustainability.

13. At the national level, some of the most valuable and sustainable results of Trust Fund projects involve the strengthening of monitoring and warning services. Project TTF-01 established four near real-time sea-level stations in the Philippines (two) and Viet Nam (two), while project TTF-02 established four real-time seismic stations in Myanmar (one), the Philippines (one) and Viet Nam (two), filling key gaps and significantly strengthening early warning systems at national and regional levels. Today, data generated from these stations are not only used nationally and regionally, but also globally via the World Meteorological Organization's Global Telecommunication System and the Incorporated Research Institutions for Seismology (IRIS) through RIMES, respectively.

14. Following the completion of the two above-mentioned projects, which also included training and technical support, the respective Governments of Myanmar, the Philippines and Viet Nam have taken over the ownership, management and maintenance of the sea-level and seismic stations that were established with Trust Fund support, thus making the projects' achievements sustainable over time.

15. Between 2009 and 2011, the Trust Fund supported the United Nations Development Programme and the Government of Indonesia in developing new approaches and capabilities for disaster management by focusing more on risk reduction and not just response (TTF-09). An independent evaluation found that the project had been highly effective in supporting the disaster risk reduction agenda in Indonesia, especially at the national level, where it made critical contributions to new policy, legal and regulatory frameworks for disaster management.¹¹ The project also helped establish "disaster risk reduction forums" at the national and provincial levels. Further, the evaluation team found that the Trust Fund-supported project was the first systematic programme to support a "paradigm shift" in the disaster management agenda in Indonesia towards a strong focus on risk reduction and the systematic integration of disaster risk reduction into development processes and plans.

¹¹ Ben Hillman and Saut Sagala, *Safer Communities through Disaster Risk Reduction (SC-DRR) in Development: Evaluation Report* (Jakarta, United Nations Development Programme, 2012). Available from www.undp.org/content/dam/undp/library/crisis%20prevention/disaster/asia_pacific/SC-DRR%20Project%20Evaluation%20Final%20Report.pdf.

III. The Trust Fund's strategy for 2013-2016

16. In May 2013, the Trust Fund's Advisory Council approved a new strategy covering 2013-2016. During this period, the Trust Fund will continue to support efforts to strengthen end-to-end early warning for coastal hazards such as tsunamis, tropical cyclones, flooding and storm surges, while applying a multi-hazard approach. It will contribute to building more resilient coastal communities and thus, ultimately, help save lives and reduce loss and damage from disasters.

17. To this end, the Trust Fund will focus its support on three pillars: (a) regional intergovernmental mechanisms; (b) specific country needs; and (c) civil society innovations and business sector initiatives. Under all three pillars, special consideration will be given to projects that build on the achievements made by previous projects supported by the Trust Fund.

18. As part of the support for regional intergovernmental mechanisms, priority will be given to the development and further improvement of regional products and processes, including joint tools, protocols and standards. The Trust Fund will also promote interoperability among countries, particularly leveraging regional interconnectivity. Mechanisms facilitated by ESCAP will be utilized, including the Panel on Tropical Cyclones (PTC), the Typhoon Committee (TC), the Committee on Disaster Risk Reduction, and the Regional Cooperative Mechanism on Disaster Monitoring and Early Warning, Particularly Drought. The Intergovernmental Coordination Group of the IOTWS (facilitated by the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO)) will also continue to be an important partner.

19. Under country-specific needs, requirements related to institutional strengthening and hydro-meteorological applications, which could be met with regional collective resources, will be given priority. This takes into account the fact that, despite significant progress in recent years, early warning capacities remain uneven across the region. Therefore, South-South approaches to enhance cooperation between countries covered by the Trust Fund, tapping into the capacities that have already been developed in the region, will be emphasized. Particular attention will be given to low capacity countries, but support may also be provided to projects specifically targeting poor communities in countries with more domestic capacity.

20. Under civil society innovations, the Trust Fund's focus will be on innovations related to early warning, use of hazardous weather information and empowerment at the local level. This will include projects targeting the people living in the "last mile", that is by translating and disseminating early warning messages to generate life and property-saving behaviour in local communities. The Trust Fund will also support demonstration projects for the purpose of bringing innovative ideas and lessons to the national and regional levels. Further, a component of the pillar can be support for documentation of successful local practices for policy development.

21. The Trust Fund's new strategy takes into account the growing role of the business sector in preparing for, and responding to, natural disasters, as evidenced during the 2011 floods in Thailand. Business sector initiatives eligible for Trust Fund support include efforts to scale up the role of the business sector in disaster preparedness, and to document and share best practices, in this regard. Projects that seek to strengthen the role of the business sector in the early warning chain, for example in data aggregation,

warning dissemination or as end user of information, will also be given priority.

22. The Trust Fund remains one of the few regional funding sources for regional aspects of early warning. This niche allows it to focus on its core mission and develop close partnerships with different actors, including United Nations organizations, regional organizations and national institutions. These partnerships will be a key strength in retaining and further developing the relevance and effectiveness of the Trust Fund during 2013-2016.

23. During its 69th session, held in April 2013, the Commission passed resolution 69/12 on enhancing regional cooperation for building resilience to disasters in Asia and the Pacific, asking member States to make effective use of information and communications technology for early warning across the region in order to strengthen capacities in disaster risk reduction, including those related to climate change adaptation. This raised from the deep concern at the challenges in addressing the negative impacts of multiple shocks, in particular disasters and environmental hazards, including climate-related risk, on the achievement of sustainable development.

24. The Trust Fund is a central part of the agenda that the member States have defined for the building of resilience in the Asia-Pacific region. Resolution 69/12 highlighted that the Trust Fund had strengthened regional capacity, promoted South-South cooperation, and enhanced the tsunami early warning capacity of member States. Further, the resolution invited member States to consider supporting the Trust Fund through financial contributions or technical cooperation.

25. The Trust Fund's strategic location in ESCAP allows it to build on the Commission's role as a convenor of regional cooperation and catalyst for knowledge sharing, development of regional norms and standards, and advocacy. The Commission meets annually both at the level of senior officials and ministers, and has provided an important platform to move the agenda of the Trust Fund and its partners forward. In addition, ESCAP is the co-facilitator with the World Meteorological Organization (WMO) of two intergovernmental regional bodies, the PTC and the TC, and convenes the Committee on Disaster Risk Reduction every two years.

26. The above-mentioned platforms are used to share the lessons acquired while implementing Trust Fund projects and are supported as intergovernmental mechanisms for the development of joint standards related to end-to-end early warning. The platforms are also well suited to bridge the local, national and regional levels, demonstrating practices at local level for upstream policy development and identifying gaps and opportunities for regional cooperation.

IV. Issues for consideration by the Committee

27. Despite the progress made in strengthening early warning systems since the Indian Ocean Tsunami in 2004, some of which has been outlined above, significant gaps and unmet needs remain. For example, several countries in the region lack capacity in conducting multi-hazard risk and vulnerability assessments. Other countries require support in developing standard operating procedures for multiple hazards, and in testing them through joint drills and exercises. A common challenge is also to incorporate early warning tools and products into decision-making processes and thus promote early action. Importantly, early warning systems are never "complete", as even the most well-developed systems require regular

training, testing and adjustments. As a result, additional investments in early warning are required, as part of the overall efforts to strengthen resilience in the Asia-Pacific region.

28. In 2011, ESCAP issued a report on the unmet needs of early warning systems in the Indian Ocean and South-East Asia.¹² It was highlighted in the report that the levels of risk from mega-disasters, such as tsunamis, remained poorly understood in different parts of the region. The report also contained calls for the need to strengthen communication and dissemination of warnings, and better response capacity, at “the last mile”, which could be addressed, for example, through development of end-to-end standard operating procedures from the Government to the community levels and strengthening of partnerships (for example, between Government, non-governmental organizations and the media). Further, early warning initiatives at the country level were found to be fragmented, and there was a need to strengthen collaboration between such initiatives and incorporate them into an overall Government-led framework.

29. In this context, the Committee may wish to provide information on unmet needs at the regional, national and local levels that the Trust Fund could usefully address within its mandate. The Committee may also wish to review the 2011 report on regional unmet needs in early warning, and request ESCAP to update it during the course of 2014. Further, the Committee may want to consider recommending that a rapid survey of the state of relevant early warning systems become standard practice following major natural disasters in the region, in order to gather lessons learned and identify gaps in early warning that should be addressed in order to strengthen preparedness for future disasters.

30. Since 2004, political commitment to strengthen disaster risk reduction has increased markedly around the world and particularly in the Asia-Pacific region. However, as certain hazards, such as tsunamis, tend to occur infrequently, early warning tends to receive less attention from policymakers and decision makers, despite the major risk of a large-scale disaster. In this context, the Committee may wish to recommend that member States continue to raise early warning in the agenda of forthcoming flagship events on disaster risk reduction.

31. The increased political commitment to disaster risk reduction has not always led to additional resources for such efforts. Recent studies have found that, globally, donor resources provided for disaster prevention and preparedness remain uneven and have not increased substantially since 2003.¹³ Despite a global consensus on the cost effectiveness of investments in disaster prevention and preparedness, these only constitute 12.7 per cent of all donor support for natural disasters, as the bulk of such funding is channelled to response (65.5 per cent), and reconstruction and rehabilitation (21.8 per cent). Therefore, a key challenge remains to translate the increased political interest and commitment to disaster risk reduction into an increase in actual funding.

¹² United Nations, Economic and Social Commission for Asia and the Pacific, *Early Warning Systems in the Indian Ocean and Southeast Asia: 2011 Report on Regional Unmet Needs* (ST/ESCAP/2594).

¹³ Jan Kellett and Alice Caravani, *Financing Disaster Risk Reduction: a 20 Year Story of International Aid* (Global Facility for Disaster Reduction and Recovery, and Overseas Development Institute, 2013). Available from www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8574.pdf.

32. As of August 2013, the Trust Fund does not have resources available for new programming. Consequently, future rounds of funding are dependent on new donor contributions. Following the approval of the Trust Fund's strategy for 2013-2016, efforts will be intensified to engage potential donors through, among other things, measures to increase the visibility of the results of Trust Fund-supported projects as well as the outstanding gaps in early warning for coastal hazards across the region. In this regard, the Committee may also wish to comment on opportunities for mobilizing additional resources for the Trust Fund.

33. In summary, the Committee may wish:

(a) To discuss gaps in early warning at the regional, national and local levels, and request ESCAP to update its report on unmet needs;

(b) To recommend that reviews of early warning systems become standard practice following major natural disasters in the Asia-Pacific region;

(c) To highlight the importance of ensuring that early warning remains high on the agenda in forthcoming flagship events on disaster risk reduction;

(d) To ensure continued funding for early warning initiatives, including the Trust Fund.

Annex

Trust Fund projects and their financial status (as at 31 December 2012)

Project number	Title	Implementing organization	Main countries covered	Funds programmed (United States dollars)	Status (as at 31 December 2012)
TTF-01	Support to establishment of capacities in the region to observe and evaluate anomalous sea-level conditions for early warning of tsunamis in the Indian Ocean and Southeast Asia	Asian Disaster Preparedness Center	Myanmar, Philippines, Viet Nam	247 901	Completed
TTF-02	End-to-end early warning of tsunamis and other natural hazards for disaster preparedness and mitigation in the Indian Ocean and South-East Asia: Phase 1	Asian Disaster Preparedness Center	Bangladesh, Cambodia, Lao People's Democratic Republic, Maldives, Myanmar, Philippines, Sri Lanka, Thailand, Viet Nam	2 358 985	Completed
TTF-03	Trainers training programme on community-based hazard map development	Asian Disaster Reduction Center	Bangladesh, India	79 819	Completed
TTF-04	Strengthening tsunami warning and emergency responses: training workshops on the development of standard operating procedures for the Indian Ocean and South-East Asia	Intergovernmental Oceanographic Commission of UNESCO	Myanmar, Pakistan, Philippines, Viet Nam	339 068	Completed
TTF-05	Strengthening national and community capacities for effective early warning dissemination and response	United Nations Development Programme (UNDP) Maldives	Maldives	122 277	Completed

Project number	Title	Implementing organization	Main countries covered	Funds programmed (United States dollars)	Status (as at 31 December 2012)
TTF-06	Enhancing national capacity for early warning dissemination in Sri Lanka	Disaster Management Centre, Sri Lanka	Sri Lanka	153 283	Completed
TTF-07	End-to-end early warning of tsunamis and other natural hazards for disaster preparedness and mitigation in the Indian Ocean and South-East Asia: Phase 2	Asian Disaster Preparedness Center	Bangladesh, Cambodia, Lao People's Democratic Republic, Maldives, Myanmar, Philippines, Sri Lanka, Thailand, Viet Nam	774 674	Completed
TTF-08	Towards sustaining the Indian Ocean and South-East Asia end-to-end multi-hazard early warning system	Maldives Meteorological Service	Bangladesh, Cambodia, China, India, Lao People's Democratic Republic, Maldives, Myanmar, Philippines, Sri Lanka, Thailand, Viet Nam	276 128	Completed
TTF-09	Making provincial communities safer through disaster risk reduction in development	UNDP Indonesia	Bangladesh, Indonesia, Malaysia, Sri Lanka, Thailand	1 552 779	Completed
TTF-10	Tsunami awareness and preparedness tools and materials assessment project	UNESCO Jakarta	Indonesia, Philippines, Thailand, Timor-Leste	573 003	Completed
TTF-11	Assessment and awareness of Makran tsunami hazards	Intergovernmental Oceanographic Commission of UNESCO	Iran (Islamic Republic of), Pakistan	128 603	Completed

Project number	Title	Implementing organization	Main countries covered	Funds programmed (United States dollars)	Status (as at 31 December 2012)
TTF-12	Asia-Pacific Broadcasting Union early warning broadcast media initiative	Asia-Pacific Broadcasting Union	Cambodia, China, India, Malaysia, Philippines, Thailand, Viet Nam	312 276	Completed
TTF-13	Building risk knowledge to enhance early warning, preparedness and mitigation in tsunami-affected countries	UNDP Asia-Pacific Regional Centre	Indonesia, Sri Lanka	344 386	Ongoing ^a
TTF-14	Strengthening community-based disaster risk management in Asia: shifting from lessons observed to lessons learned	Raks Thai Foundation	Cambodia, India, Indonesia, Lao People's Democratic Republic, Maldives, Myanmar, Sri Lanka, Thailand, Timor-Leste, Viet Nam	600 000	Ongoing ^b
TTF-15	Strengthening early warning systems for extreme weather events to advance climate risk management in the South-East Asian region	UNDP Asia-Pacific Regional Centre	Cambodia, Timor-Leste	381 066	Ongoing
TTF-16	Reducing risks for tsunami, storm surges, large waves and other natural hazards in low elevation coastal zones	Regional Integrated Multi-Hazard Early Warning System for Africa and Asia	Bangladesh, India, Maldives, Myanmar, Sri Lanka, Thailand	1 818 274	Ongoing
TTF-17	Enhancing coastal hazard early warning and response: tools and institutional strengthening	Regional Integrated Multi-Hazard Early Warning System for Africa and Asia	Myanmar, Philippines, Sri Lanka	484 990	Ongoing

Project number	Title	Implementing organization	Main countries covered	Funds programmed (United States dollars)	Status (as at 31 December 2012)
TTF-18	Technical assistance for enhancing the capacity of end-to-end multi-hazard early warning systems (EWS) for coastal hazards in Myanmar, Sri Lanka and Philippines	Asian Disaster Preparedness Center	Myanmar, Philippines, Sri Lanka	486 304	Ongoing
TTF-19	ABU Disaster Risk Reduction Broadcast Initiative	Asia-Pacific Broadcasting Union	India, Indonesia, Maldives, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand, Viet Nam	237 692	Ongoing
TTF-20	Enhancing tsunami risk assessment and management, strengthening policy support and developing guidelines for tsunami exercises in Indian Ocean countries	Intergovernmental Oceanographic Commission of UNESCO	Bangladesh, Myanmar, Timor-Leste	480 947	Ongoing
TTF-21	Communicating the effects of the 1945 Makran tsunami to increase awareness and preparedness of tsunami hazards in the Makran region	Intergovernmental Oceanographic Commission of UNESCO	India, Iran (Islamic Republic of), Pakistan	121 662	Ongoing
TTF-22	Synergized standard operating procedures for coastal multi-hazard early warning system	ESCAP/WMO Typhoon Committee	Bangladesh, Pakistan, Sri Lanka	457 000	Ongoing
Total				12 331 117	

^a The official project completion date was 31 August 2012. On 31 December 2012, ESCAP was awaiting the final financial statement before the accounts could be finalized.

^b The official project completion date was 31 July 2012. On 31 December 2012, ESCAP was awaiting the revised terminal report before the accounts could be finalized.

Note: The table does not include one project approved by the Advisory Council on 7 May 2013, which focuses on the strengthening of early warning capacities in Myanmar. This project has a budget of \$705,291 and will be implemented by the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia.