

ESCAP Multi-Donor Trust Fund for Tsunami,  
Disaster and Climate Preparedness

**2018 - 2019**

**ANNUAL REPORT**

ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness

Annual Report 2018 - 2019

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**ESCAP**

Rajadamnern Nok Avenue

10200 Bangkok - Thailand

**[www.unescap.org](http://www.unescap.org)**

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## Contributions

As of 31 December 2019, the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness (hereinafter referred to as “the Fund”) had received US\$ 15.5 million in contributions from the following donors:



Bangladesh  
US\$10,000



Germany  
US\$999,380



India  
US\$1,000,000



Japan  
US\$400,000



Nepal  
US\$2,000



Philippines (the)  
US\$20,000



Sweden  
US\$2,868,139



Thailand  
US\$10,030,000



Turkey  
US\$200,000

The Netherlands provided an Associate Expert from September 2008 to April 2011. Germany has contributed with an Associate Expert since July 2016. ESCAP contributed in-kind technical expertise and administrative assistance to the Fund.

## Member countries and partners

Special thanks are extended to the ESCAP member countries in the Indian Ocean, Southeast Asia and the Pacific that are covered by the Fund, as well as the partners that work together with ESCAP to contribute to more resilient coastal communities, and ultimately to save lives and reduce loss and damage from disasters.



## Preface

26 December 2019 marked the 15th anniversary of the 2004 Indian Ocean Tsunami which resulted in more than 225,000 deaths and widespread economic losses across the Indian Ocean Rim countries. At that time, a multi-country tsunami early warning system was not in place.

Driven by the strong recognition of the need to undertake longer-term, better coordinated, and proactive steps to mitigate the impact of natural disasters through adequate preparedness and prevention measures, the ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness was created in 2005. Since then, it has been an effective vehicle for sharing data, tools and expertise to support disaster resilience in high-risk, low capacity countries of Asia-Pacific. In particular, the Fund has contributed to all aspects of people-centred early warning and has made a vital contribution towards protecting our communities and people.

But despite these developments, enhancing the region's disaster preparedness remains a high priority and sustained investments are crucial for maintaining the achievements made and deliver long-term outcomes.

Resilience is a common thread that cuts across many of the 17 SDGs, but more than that, it is increasingly clear that if disaster risks are ignored, progress towards the SDGs will be undermined. This is particularly the case in Asia-Pacific, where as the world's most disaster-impacted region, the number of global weather-related hazards has tripled since the 1980's.

Over the past years, disasters were beyond anything the region has seen in terms of the complexity of risk. Disasters posed challenges even in countries with robust disaster management systems. Notwithstanding this, the lessons that emerge from these surprises provide valuable insights into how south-south and triangular cooperative actions can scale-up the application of science and technology innovations as solution providers.

Early warning systems and early actions are essential for countries to confront a new climate reality. As shown in the 2019 edition of ESCAP's Asia Pacific Disaster Report, disaster risks are intensifying and changing in geography. Hazards are deviating from their usual tracks, creating greater complexities and deeper scientific uncertainties making it more difficult to understand and predict disasters.

For such a high-risk region as Asia-Pacific, investing in building resilience is not a choice, but a necessity. Looking forward, the Trust Fund will continue to evolve in line with changing needs within the Asia-Pacific region and continue playing a key role in the region in promoting effective and sustainable end-to-end early warning systems.

## Results Summary

Since its establishment in 2005, the ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness has contributed significantly to the progress made in building regional and national warning systems for coastal hazards. In 2011, a key milestone was reached with the operationalization of the Indian Ocean Tsunami Warning and Mitigation System (IOTWMS), which was established through the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO).

The Fund was one of the many contributors to the IOTWMS, through support for the adaptation of standard operating procedures (SOPs) for tsunami warning and emergency response, combined with training and other capacity building at regional, national and local levels. The Fund also supported the establishment of the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), which is closely linked to the IOTWMS.

RIMES is an intergovernmental institution that provides cost-effective warning products and services, particularly for tsunamis and extreme weather systems. These are especially useful for countries that are at high-risk of disasters but possess limited domestic capacity in hazard monitoring and early warning. RIMES also assists countries in applying hydro-meteorological risk information more effectively for decision making at the national and local levels. Services include the provision of daily numerical weather predictions, severe weather information forecasts and seasonal climate outlooks for risk management and preparedness, all delivered within the framework of the World Meteorological Organization (WMO).

At the national level, some of the most valuable and sustainable results of the Fund's projects involve the strengthening of monitoring and warning services. Of particular note is the more recent role of the Trust Fund in addressing the risk of slow-onset disasters, phenomena that lend themselves to early warning. However, often they do not spur early action because of a lack of understanding of the action required by the warning at the ground level as well as the absence of institutional mechanisms to consider such information on a regular basis. To help overcome these challenges, through the Trust Fund, ESCAP has supported activities aimed at building capacities for climate preparedness in highly vulnerable countries. As a result, national climate outlook forums, or monsoon forums as they are popularly known due to their convening around the onset of the monsoon season, have supported dissemination of seasonal forecast information to understand potential impacts.

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# 1 Introduction

The 2004 Indian Ocean Tsunami resulted in widespread loss of human life and livelihoods, severe damage to infrastructure and ecosystems and large economic costs. Following this disaster, there was a strong recognition across the Asia-Pacific region of the need to undertake a coordinated, long-term effort to mitigate the impact of natural disasters through effective preparedness and prevention measures, including the establishment and further strengthening of early warning systems.

The ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness was established in 2005 following a US\$ 10 million contribution from the Royal Thai Government. The Fund is part of the overall United Nations effort to strengthen resilience across the Asia-Pacific region. It contributes to the narrowing of capacity gaps and supports the development of an integrated, regional early warning system comprised of a network of collaborative centres. In 2011, the scope of the Fund was expanded to also cover disaster and climate preparedness, while retaining a focus on end-to-end early warning for coastal hazards.

ESCAP is entrusted with managing and administering the Fund and draws on its mandate as the commission for Asia and the Pacific to promote regional cooperation and integration for effective disaster risk reduction.

In accordance with the Fund's Terms and Conditions, this Annual Report provides an overview of the results of the Fund in 2018 and 2019. It also describes the financial status of the Fund and the activities carried out by the Secretariat.

## 2 Results of Fund-supported Projects

### Portfolio

As of the end of 2019, 29 projects with a combined budget of US\$ 13.75 million were approved since the Fund's inception in 2005 and 28 projects were completed.

Through the various projects, the Fund is supporting priority areas such as risk assessments, development of hazard monitoring and warning services, development and testing of SOPs, education and awareness raising, strengthening of warning dissemination and emergency drills.

### 2.1 Enhancing Weather and Climate Resilience in RIMES Member States through Capacity Building on Impact Forecasting

A key challenge to promoting risk-informed development and thus reducing disaster risk is the integration of weather and climate information into decision-making. The project "Enhancing Weather and Climate Resilience in RIMES Member States through Capacity Building on Impact Forecasting" (TTF-27), implemented jointly by RIMES and WMO, addressed this challenge in Cambodia, Myanmar, Sri Lanka, Fiji, Papua New Guinea, and Samoa, by building the capacities necessary for decision making and seasonal planning that are guided by weather and climate information. The project addressed at least 3 climate-sensitive sectors

within each beneficiary country, including agriculture, disaster management, water resources, fisheries and energy. The project fostered coherence among various development-related sectors and promoted disaster risk management as a cross-sectoral issue with a view to enhance resilience.

In the Southwest Pacific countries, this approach was implemented through several activities including the training of trainers in impact forecasting and climate applications. Convened by national warning services and supported by RIMES, these activities included trainers from a variety of NGOs and national organizations and focused on building understanding of multi-

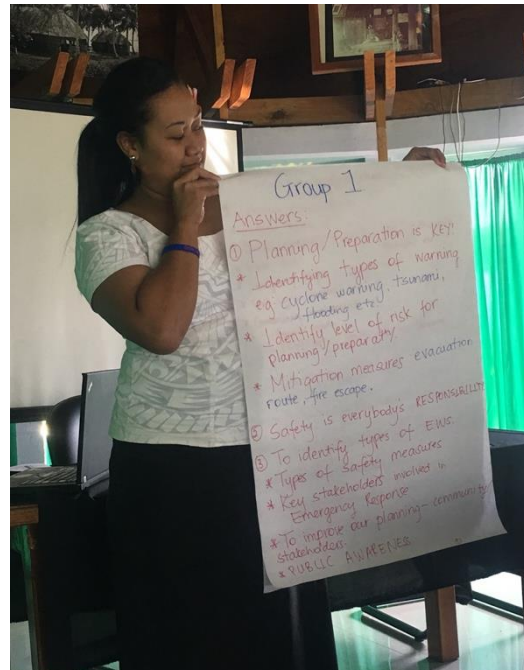


Photo: Training of trainers in Samoa, July 2018 (Source: RIMES)



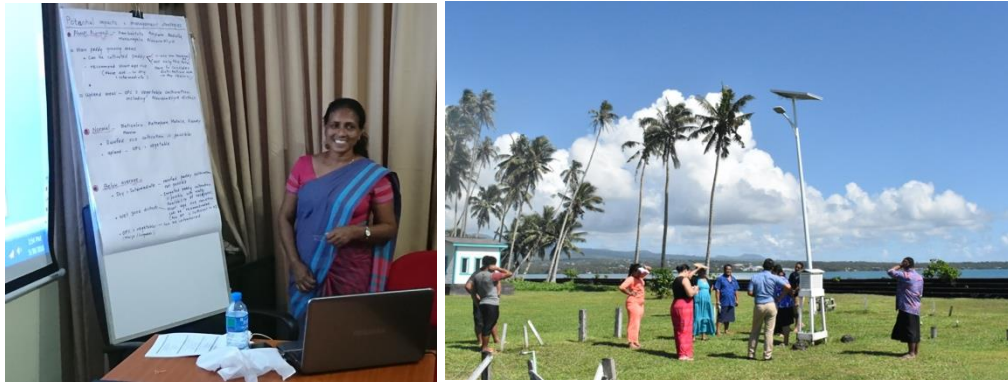


Photo: SESAME training in Sri Lanka and training of trainers in Samoa, (Source: RIMES)

hazard, multi-timescale information and how to incorporate it into planning and decision-making. The project created a pool of experts in the target countries and fostered local ownership while capitalizing on RIMES' established networks with sectoral stakeholders in Fiji and Samoa, who have years of experience in applying local climate information. Following the success of the sessions, trainers have expressed interest in leading further sessions both as a regular occurrence within their own country and in further countries in the Southwest Pacific.

In addition, multi-hazard seasonal forums have been established to facilitate the use of impact and risk assessments to inform seasonal planning in Fiji, Papua New Guinea and Samoa. Customized training data was produced by RIMES in collaboration with the national meteorology departments, which was used to sensitize stakeholders to the operational roles of preparedness, which are necessary to support a successful forum.

In Cambodia, Myanmar, Sri Lanka, and Papua New Guinea, the project enhanced decision-support systems to aid potential impact and risk analysis in the agriculture sector. Through collaboration with FAO, this was achieved by expanding RIMES' Specialized Expert System for Agro-Meteorological Early Warning for Climate-Resilient Agriculture (SESAME). Multiple approaches have been utilized according to the needs in each country, from extending the system to cover more regions, providing trainings in how to use the system, and collecting data. Here the project also offered opportunities to promote collaboration between the many national stakeholders that support SESAME within each country. This is particularly the case in Myanmar, where the system is hosted by the Department of Meteorology and Hydrology but used by the Department of Agriculture.

For Cambodia, Myanmar and Sri Lanka, RIMES additionally supported the integration of earth observations into impact forecasting and risk analysis. To this end, the monsoon forums are used as a platform for knowledge sharing between a wide variety of stakeholders including government institutions,

development organizations, media, research institutions, UN organizations and businesses.

To sustain the national Monsoon Forums in Myanmar and Sri Lanka, these were incorporated into RIMES' country programs, funded from the countries' annual financial contribution to RIMES, which are now conducted regularly.

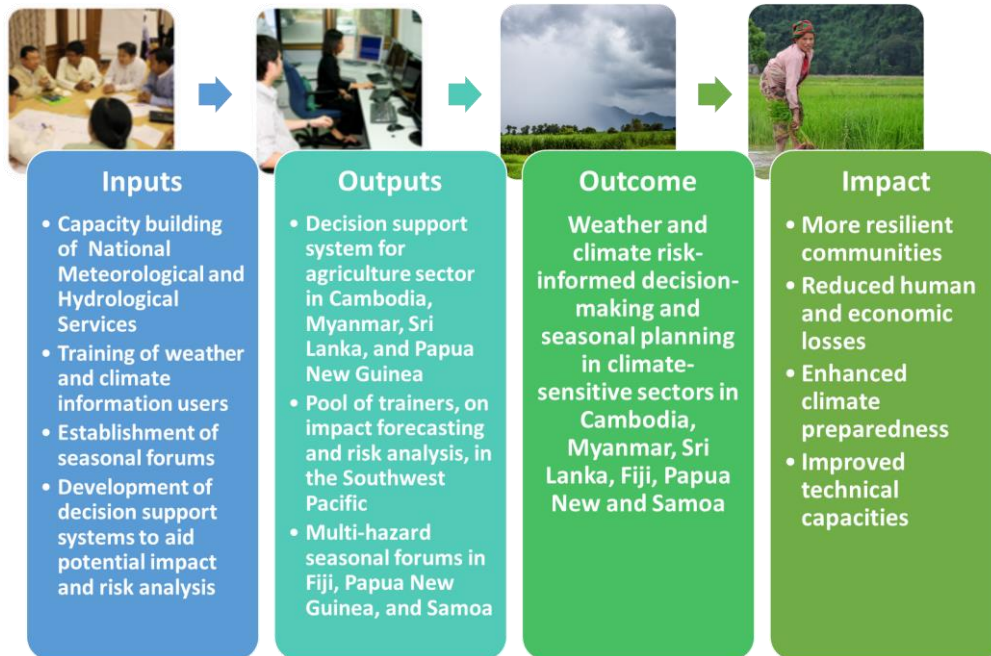


Fig 1: Logframe of project TTF-27 “Enhancing Weather and Climate Resilience in RIMES Member States through Capacity Building on Impact Forecasting”

The introduced decision support tools were designed taking operational sustainability into consideration. The SESAME system was designed to automate the process of assessing potential impacts from forecasted weather/predicted climate events. Its design allows the system to generate agro-advisories with minimal human intervention. These features make the system easy to use for operations and agreements were reached with several ministries, to integrate SESAME into regular operational and capacity building programs at national, sub-national, and community levels. Looking forward, RIMES will continue providing guidance and inputs in this process.

## 2.2 Synergized Standard Operating Procedures for Coastal Multi-Hazard Early Warning Systems

Standard Operating Procedures (SOPs) are used to promote efficiency and to facilitate communication and collaboration between multiple stakeholders. This is particularly important for coastal hazard warning systems, in which communication between stakeholders must be rapid and reliable. In an earlier project of the Trust Fund (TTF-22), the ESCAP/WMO Typhoon Committee therefore promoted SOPs through consultations with the 27 members of the ESCAP/WMO Typhoon Committee and the WMO/ESCAP Panel on Tropical

Cyclones, and further workshops in three pilot countries of Bangladesh, Pakistan and the Philippines. By reviewing existing SOPs, the committee then identified best practices, gaps and needs, and recommendations on how to further build institutional capacity and strengthen the SOPs. Ultimately the committee then combined these to produce a manual on Synergized Standard Operating Procedures (SSOPs) that was distributed to member countries.

A second phase of the project entitled SSOP Phase II: Synergized Standard Operating Procedures (SSOPs) for Coastal Multi-Hazard Early Warning Systems (TTF-28) was implemented in 2017-2019 through the Trust Fund. The SSOP-II project focused on training the mechanism of preparing and implementing synergized standard operating procedures for coastal multi-hazard early warning systems in high-risk, low capacity countries with the goal of promoting the capacity on coastal community resilience to coastal multi-hazards. Building on the results of the first phase, it focused on the current state of existing standard operating procedures in beneficiary countries and on how to synergize these through application of the Manual on Synergized Standard Operating Procedures (SSOPs) for Coastal Multi-hazards Early Warning System.

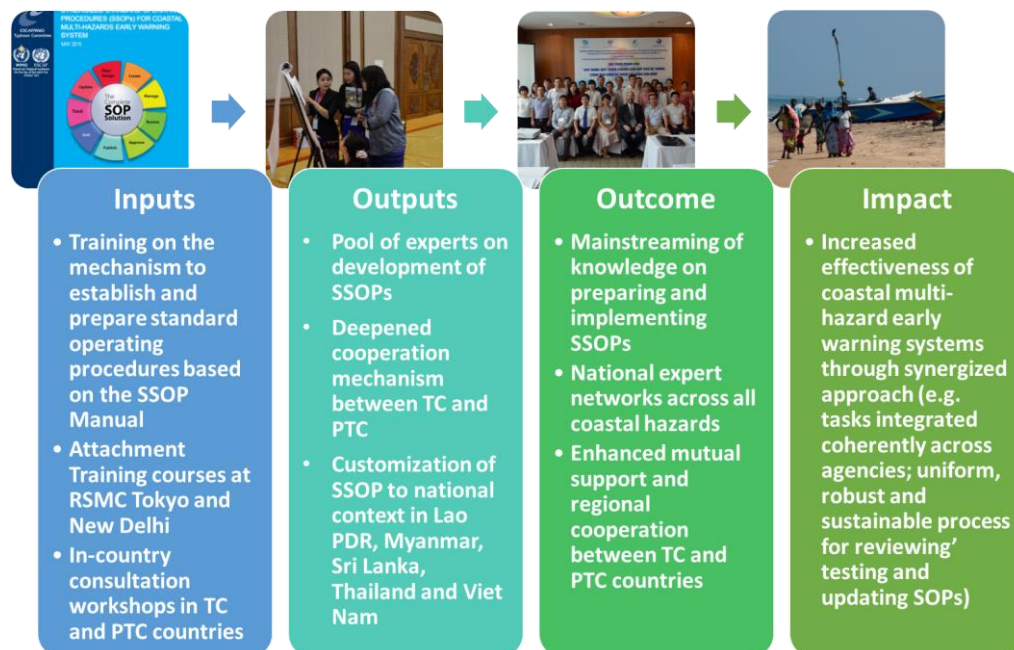


Fig 2: Logframe of project TTF-28 “SSOP Phase II: Synergized Standard Operating Procedures (SSOPs) for Coastal Multi-Hazard Early Warning Systems”

This was realized through a variety of training workshops. A course for DRR experts was held at the WMO Regional Training Centre in China and was attended by representatives from the targeted beneficiary countries. Attendees were trained in how to implement the manual through both lectures and table-top exercises focusing on practical applications. Knowledge sharing between countries was also facilitated through open discussions regarding experiences of implementing SOPs within the different country contexts.





Photo: In-country Consultation Workshop, Myanmar (Source: Tom Evans)

In-country consultation workshops were conducted in Lao PDR, Myanmar, Sri Lanka, Thailand and Viet Nam, supporting member countries in revising or establishing their own synergized SOPs in line with the recommendations set out in the manual. The implemented training activities were oriented towards trainees from National Meteorological and Hydrological Services, National Tsunami Warning Centres, National Disaster Management Offices and Government Sectoral Agencies including social scientists, decision makers, warning experts, DRR experts, warning information users and community managers.

In addition to strengthening the capacity of individual countries to implement SSOPs, this combination of multiple training workshops was designed to strengthen the relationships between member countries of the Typhoon Committee and the Panel on Tropical Cyclones, to support collaboration for disaster management and knowledge sharing. The networks created between the beneficiary countries will outlast the project itself, and knowledge sharing for SOPs can continue, increasing this initiative's long-term sustainability. Similarly, the very concept of synergy in disaster management necessitates relations between many organizations and sectors within and above the national scale. It is anticipated that this project will therefore yield additional long-term benefits, by promoting coherence between different organizations across different scales that will have broader benefits for the management of typhoons, tropical cyclones and other hazards.



Photo: Participants for the SSOP-II in-country Consultation Workshop, Colombo, Sri Lanka (Source: Tom Evans)

### **2.3 Strengthening tsunami early warning in the North West Indian Ocean region through regional cooperation**

Since 2009, the Trust Fund has been raising awareness on the tsunami risk posed by the Makran Subduction Zone (MSZ) to countries in the North Western Indian Ocean (NWIO). In order to develop a programmatic approach to the Trust Fund's engagement in the Makran region and based on the decision by the Trust Fund's Advisory Council, ESCAP commissioned an expert consultant in 2017 to elaborate recommendations on strategic areas of regional cooperation between ESCAP and IOC-UNESCO and other key stakeholders to strengthen the Tsunami early Warning Systems (TEWS) for the Makran region. The prepared recommendations outline concrete actionable measures to enhance regional cooperation in the field of TEWS in a phased approach. The recommendations are based on the results from a preceding desk study regarding the status quo and existing gaps of TEWS in the NWIO countries and the outcomes from an analytical workshop organized by ESCAP and the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System.

The programmatic approach embraces all four elements as well as crosscutting issues defined by the United Nations Office for Disaster Risk Reduction (UNDRR) **framework of people-centred early warning**, which aims to empower individuals and communities threatened by hazards to act in sufficient time and in an appropriate manner to reduce the possibility of personal injury, loss of life and damage to property and the environment. A complete and effective early warning system comprises four inter-related elements, spanning knowledge of hazards and vulnerabilities through to preparedness and capacity to respond. The inter-linkages and effective communication channels between the four elements are essential for effective warning systems.

The programmatic approach builds on **regional cooperation** to strengthen national TEWS in the four countries involved with an end to end perspective and a multi-level approach. The focus is on India, Iran, Pakistan and Oman. Oman is not an ESCAP member state, but member of the NWIO-WG and considered as a partner and provider of expertise and financial resources in the framework of the intended programmatic regional approach. For Iran, Pakistan and Oman the main threat from the MSZ are near field tsunamis, with minimum travel times of even less than 30 minutes. India is in a slightly different situation with minimum tsunami travel times from the MSZ of > 1hour. The programme explicitly addresses the challenges and requirements of TEW in the context of **near-field tsunamis**. It is worth noting that India faces near-field tsunamis threat in the eastern Indian Ocean along the Andaman Islands. To cope with near-field tsunamis, the following considerations have been addressed in the recommendations:

- Set-up of early warning systems, policies and procedures must be designed in a way to be executed realistically in the short time frame available. The required procedures and decision-making processes for near-field tsunamis most possibly will differ from already established procedures in the downstream part for other hazards with longer warning times.
- Tsunami early warning is complementary and people should never wait for an official warning. People must be able to recognize natural warning signs and act on it.
- Tsunami warning is essential, especially in cases that the earthquake wasn't felt strongly but has the potential to trigger a tsunami (slow earthquakes). EWS are required to call off an evacuation process if data shows that the previously felt earthquake does not have potential to trigger a tsunami and to issue an "all clear" message once the tsunami threat is over.
- The threat of near field tsunamis requires to set a strong focus on strengthening the capacities of the communities at risk towards self-protection. In this regard, it is considered important that communities have a high level of awareness and sufficient knowledge to react independently and properly during a tsunami threat. National and local authorities must provide all necessary services and references to enable the communities for this, especially timely warnings and evacuation plans based on solid hazard assessments.

The adopted programmatic approach comprises two phases of intervention of approx. two and a half years each and follows the logic of a structured process to build tsunami early warning and preparedness.

**Phase 1** will support the countries to establish the required preconditions to strengthen self-protection capacities at community level. This includes the

improvement of warning services at NTWC level and the organization of the national warning chains (with an end to end perspective) to assure timely warnings as well as the development of evacuation plans in line with the requirement of the threat by near-field tsunamis. Furthermore, support should be provided to enable countries to develop solid hazard and inundation maps for all tsunami prone areas in their respective territories that still lack this information. This involves initiatives by the science community to create a better understanding of the dynamics in the MSZ as well as enhancing capacities for tsunami modelling by the specialized institutions in the region.

**Phase 2** will build on the achievements of the first phase and provide support for the achievement of a clear understanding of national TEW in the countries by all stakeholders involved and the public in general as well as to addresses mechanism for scaling up and roll-out of the developed and tested approaches regarding evacuation planning and the set-up of warning mechanism at local level. Additionally, capacities for self-protection arrangements at community level shall be supported as the establishment of local 24/7 mechanism and warning dissemination technologies, the development of sub-district and institutional evacuation planning in line with the district or city plans as well as the development of strategies to strengthen tsunami awareness and knowledge at community level. Other fields of intervention relate to the development of the better understanding of the tsunami hazard in the MSZ, tsunami risk assessments and mitigation strategies. Details for the second phase still need to be discussed within the NWIO-WG.

The project “Strengthening tsunami early warning in the North West Indian Ocean region through regional cooperation”, submitted by IOC-UNESCO was selected for implementation during the Trust Fund’s 10<sup>th</sup> round of funding. In line with programmatic approach adopted through the Trust Fund’s current strategy, this project builds on previous results achieved through projects TTF-11 and TTF-21, implemented by IOC-UNESCO, as well as TTF-26, completed by Oxfam GB in 2016.

Addressing Phase I of the programmatic approach, the project foresees the following intervention strategy:

- Better understanding of the dynamics in the Makran subduction zone based on research by the science community
- Improvement of warning services at NTWC level and the organization of the national warning chains to assure timely warnings and rapid response with due emphasis on self-protection for near-source events



Completed activities include the establishment of a regional working group and working process between NWIO countries on risk knowledge. The working group first met in September 2019 in Muscat, Oman to (i) review the present scientific understanding of the tsunami hazard in the region and (ii) identify specific



Photo: Regional working group meeting in Muscat, Oman (Source: IOC-UNESCO)

fields of tsunami research and studies to address gaps in current knowledge and understanding to ensure the delivery of enhanced scientific information on the risk of the Makran subduction zone. The working group agreed that highest priority to address gaps in current knowledge and understanding of the Makran subduction zone is the collaborative development of a unified Probabilistic Tsunami Hazard Assessment (PTHA) for the North-West Indian Ocean (NWIO) Region, which can then be used to undertake informed risk assessments.

A High-Level Conference was organized in Muscat, Oman during 1 – 2 September 2019 with participants representing National Tsunami Warning Centres and Disaster Management Organisations of India, Iran, Pakistan and Oman, in addition to experts from IOC, ESCAP and project consultants. The conference served to kick off the agreed joint working process to improve national warning chains as part of the current project and advocate for the improvement of framework conditions that enable more effective national warnings and community responses.



Photo: Regional working group meeting in Muscat, Oman (Source: IOC-UNESCO)



In order to strengthen national coordination mechanism for tsunami early warning, it was agreed that the participating countries will establish or reinforce National Working Groups (NWG). Within the project framework it has also been agreed that each of the four countries shall select a number of pilot communities, which will participate in the warning chain discussion and later in the SOP workshops. These pilot communities will be encouraged to participate in the UNESCO-IOC Tsunami Ready initiative. In addition, it is expected that the pilot communities participate in the next Indian Ocean-wide tsunami exercises (IOWave). The exercise will be used to test the project outcomes and enhancements in national warning chains in practice. IOWave is a real-time and region-wide exercise organized biennially by IOC-UNESCO. It is an effective tool for evaluating the readiness of the end-to-end Indian Ocean Tsunami Warning and Mitigations System (IOTWMS) and for identifying changes that can improve its effectiveness.

## 3 Governance and Management

The Trust Fund for Tsunami, Disaster and Climate Preparedness is managed by ESCAP on behalf of the Member States in cooperation with other partners and stakeholders. Its governance structure includes the Advisory Council, the Inter-Agency Task Force and the Secretariat.

### Advisory Council

The Advisory Council makes funding and policy decisions related to the Fund. The Fund's 19<sup>th</sup> Advisory Council meeting was held on 14 November 2018 and included the Deputy Executive Secretary of ESCAP and representatives from the founding donor Thailand and key donors<sup>1</sup> India and Japan. Representatives from the other donors to the Fund, including Bangladesh, Germany, the Philippines and Turkey served as observers. The following United Nations partners also participated as observers: UNEP and UNDRR.

At this meeting, the Council approved a new allocation of US\$ 350,000 for IOC-UNESCO (TTF-29) and approved the 2019 budget for the Trust Fund Secretariat.

The 20<sup>th</sup> regular meeting of the Advisory Council was held on 3 December 2019. At the meeting, attended by the Executive Secretary of ESCAP, donors and observers came together to discuss the status of ongoing as well as the outcomes of completed projects. The Council was informed about the resource mobilization activities conducted by ESCAP in conjunction with other partners and approved the 2020 budget for the Trust Fund secretariat.

### Inter-Agency Task Force

The Inter-Agency Task Force provides technical guidance to the Fund. As such, it reviews project proposals; provides technical advice in response to Advisory Council information requests; and, reviews substantive amendments to ongoing projects supported by the Fund.

The Task Force is chaired by the Chief of the Information and Communications Technology and Disaster Risk Reduction Division (IDD) of ESCAP, with the Senior Regional Coordinator of the UNDDR acting as Alternate Chairperson. The Task Force also includes representatives from the Social Development Division and the Environment and Development Division of ESCAP; and

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<sup>1</sup> Donors that have contributed more than 20 per cent of the remaining balance of the Fund are considered key donors.

representatives from IOC-UNESCO and UNDP. The Fund's Programme Officer acts as the Secretary.

### **Secretariat**

As the administrator of the Fund, ESCAP acts as the Secretariat. One Programme Officer is financed by the Fund. Since July 2016, the Government of Germany has provided the Trust Fund secretariat with an Associate Expert with expertise in water-related hazards. ESCAP also provides administrative support staff to the Fund. In addition, professional staff of IDD provides managerial guidance and technical advice to the Secretariat.

### **General Trust Fund Management**

The ESCAP Secretariat manages agreements with implementing organizations for Trust Fund projects. The Secretariat also reviews progress reports and project evaluations, tracks financial resources, periodically updates the Fund's website with information on progress on Fund-supported projects and carries out overall reporting, including the annual report of the Fund.

### **Tenth Round of Funding**

The Fund's tenth round of funding was launched on 28 July 2015, with a closing date of 15 November 2015. A total of 124 project proposals were received. The Inter Agency Task Force reviewed the proposals and finalized recommendations to the Advisory Council for decision at its meeting in 2016. Two projects were approved in 2016, and a decision on one more was postponed and approved by the Council in 2018.

### **Monitoring and Evaluation**

In accordance with the Monitoring and Evaluation Framework, the secretariat attended project activities to monitor the progress of implementation. These included the Attachment Training at the Regional Specialized Meteorological Centre for Tropical Cyclones over the North Indian Ocean (RSMC) in New Delhi, India (5-6 July 2018) and the country-level implementation workshop co-organized with the Thai Meteorological Department (TMD) in Bangkok, Thailand, (8-9 July 2019) as part of project TTF-28.

The secretariat further showcased the Trust Fund's past and current efforts in the Makran region and monitored the progress of implementation of project TTF-29 at meetings in Hyderabad, India (9 July 2018) and Muscat, Oman (1-5 September 2019). A full list of missions conducted by the Fund in 2018 and 2019 is contained in Annex 2.

An evaluative review of the Trust Fund and Fund-supported projects was carried out in 2018 by an independent consultant. The evaluation focused on results of the

Fund to date covering relevance, effectiveness, impact and sustainability and identified the following main achievements:

- a) **Strengthened regional cooperation for hazard data and forecasting**  
As the only dedicated regional trust fund that delivers coordinated support to the development of multi-hazard early warning systems and has achieved significant results one of its major contributions has been to strengthen regional cooperation for hazard data and forecasting, in particular through supporting the establishment of IOTWMS and RIMES as well as support through the TC and PTC. In this area the Fund has taken a programmatic approach investing successively in institutions such as RIMES over a long-time period. It is the continuity as much as the volume of resources invested that has guaranteed success.
- b) **Integrated multi-hazard early warning systems in coastal areas**  
Through supporting the development of multi-hazard synergized standard operating procedures (SSOP), the Fund has contributed to strengthening coordination between the multiple stakeholders involved in early warning systems. Through support to the development of innovative approaches as SSOP and the strengthening of national capacities to use them, the Fund has made an important contribution to making multi-hazard early warning systems in coastal areas more effective.
- c) **The strengthening of early warning systems, associated with climate variability for the agriculture, water and energy sectors**  
Over the past years, the Fund has invested in the development of innovative approaches to strengthening early warning systems associated with climate variability. These innovations include climate model-based seasonal hydrologic forecasting, impact-based forecasts and monsoon forums. In the area of climate variability, the Fund has contributed to the improvement of effective end-to-end early warning systems, with substantial benefits in terms of reduced risks to end-users in the agriculture, water and energy sectors and a reduction in direct and indirect disaster losses.

In addition, the Trust Fund has undergone two separate audits in 2019. The United Nations Office of Internal Oversight Services and the United Nations Board of Auditors conducted independent audits on the management of trust funds at ESCAP. These recommended for the Fund to consider conducting a new unmet needs analysis to identify areas for technical assistance from the Fund to ensure a proportionate distribution of technical assistance among the least capacity countries.

### **Transfer of Ownership of Fund-supported Equipment**

The transfer of ownership of the Fund-supported equipment, provided as part of project TTF-27 entitled *“Enhancing Weather and Climate Resilience in RIMES Member States through Capacity Building on Impact Forecasting”*, was completed in October 2019. This included IT equipment and servers for the customization

and operation of the Specialized Expert System for Agro-Meteorological Early Warning for Climate-Resilient Agriculture (SESAME) in Cambodia, Papua New Guinea and Sri Lanka.

## 4 Advocacy and Outreach

The Secretariat represented ESCAP at the 50<sup>th</sup> Session of the ESCAP/WMO Typhoon Committee, which was held in Ha Noi, Viet Nam, on 28 February – 3 March 2018 and at its 51<sup>st</sup> Session held in Guangzhou, China from 26 February – 1 March 2019. The Trust Fund was also represented at the meeting of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) Working Group for the Northwest Indian Ocean in Hyderabad, India on 9 July 2018.

The ICG/IOTWMS, operated by IOC-UNESCO, meets regularly to review the progress made and to establish and implement working plans in the Indian Ocean region. The National and Tsunami Service Provider reports and presentations from the Working Groups, illustrated the significant achievements and valuable on-going initiatives in the field of tsunami early warning and mitigation.

At this meeting ESCAP presented updates on recent activities of the Trust Fund, including status of ongoing projects as well as advocacy and resource mobilization activities and showcased the Fund's past and current work in the Makran region. The presentation also introduced the Asian and Pacific Centre for the Development of Disaster Information Management (APDIM) and its key thematic priorities, which, as a regional hub based in Iran, will be of particular interest for the North West Indian Ocean Working Group.



Photo: Information event on Tsunami Trust Fund at Ministry of Foreign Affairs of Thailand (Source: ESCAP)

On 3 October 2019, the Government of Thailand and ESCAP co-organized a dedicated information event under the title “Building Disaster Resilience in Asia-Pacific: The ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness”, held at the Ministry of Foreign Affairs of Thailand in Bangkok. The event was well attended and featured a panel discussion including speakers

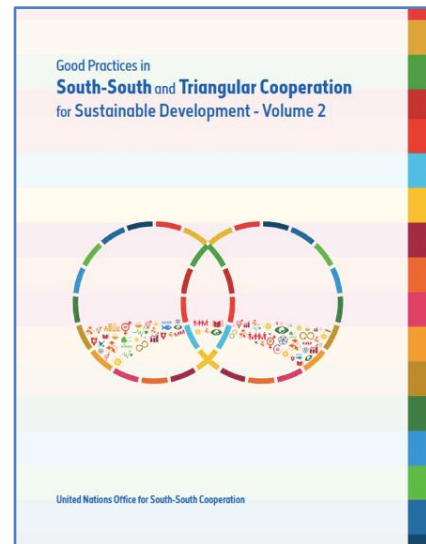
representing implementing partners (RIMES and ADPC), donors (India and Japan) as well as member States that received support from the Trust Fund (Bangladesh and Indonesia).

Panellists emphasized how the Trust Fund contributed to providing cost-effective warning products and services for tsunamis and extreme weather systems, in particular through its contributions to the establishment of the Indian Ocean Tsunami Warning and Mitigation System (IOTWMS) as well as the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES). In particular, the event highlighted how the Trust Fund has promoted innovative pilot initiatives to address the unmet needs of end-to-end early warning systems, particularly in low capacity, high risk countries.

### The Trust Fund supporting South-South Cooperation

The success and achievements of the Trust Fund were acknowledged by the United Nations Office for South-South Cooperation (UNOSSC) in its publication “Good Practices in South-South and Triangular Cooperation for Sustainable Development - Volume 2”<sup>2</sup>, which features the initiative as one of the success stories promoting South-South cooperation in the Asia-Pacific region.

The Regional Consultation on South-South Cooperation in Asia and the Pacific took place in Bangkok on 27-29 June 2018. The Trust Fund and its achievements were presented at the session on “Modalities to strengthen regional and sub-regional cooperation through South-South and triangular cooperation for sustainable development”.



The Second High-level United Nations Conference on South-South Cooperation (known as BAPA+40 Conference) was held in Buenos Aires, Argentina, from 20 to 22 March 2019, featuring a dedicated side event on the Trust Fund. By providing the opportunity for an in-depth discussion, the side event highlighted how South-South and triangular cooperation initiatives have contributed to climate and disaster resilience in the Asia-Pacific region. In particular, the event showcased how with an initial contribution of US\$ 10 million by the Government of Thailand, the Trust Fund supported the improvement of climate preparedness, multi-hazard early warning and disaster response in the region. The event also presented how the Fund leveraged on other cooperation mechanisms notably the

<sup>2</sup> <https://www.unsouthsouth.org/2018/09/12/good-practices-in-south-south-and-triangular-cooperation-for-sustainable-development-vol-2-2018/>



Regional Space Application Programme for Sustainable Development in Asia and the Pacific (RESAP).

A high-level interactive panel comprising representatives from the Governments of Lao PDR, the Philippines, Thailand and the Pacific Islands Development Forum discussed the achievements of the Trust Fund to date, presenting the perspectives of donors and beneficiaries.

In light of the recent climate-related disasters (i.e. cyclone Idai hitting Mozambique, Malawi, Zimbabwe in March 2019), representatives from Malawi and Mozambique acknowledged the importance of ESCAP's initiatives and expressed interest in enhancing national climate outlooks following the highlighted examples.

The panel concluded that the disaster-prone developing countries have much to learn from successful regional cooperative mechanisms such as the Trust Fund. Since 2005, it has been an effective vehicle for sharing data, tools and expertise, tailored to regional and country needs. But the event also stressed that addressing disaster risk requires sustainable financing and commitments from member States and other partners.



Foto: H.E Mr. François Martel, Secretary-General of Pacific Islands Development Forum, H.E. Secretary Ernesto Pernia, Director-General, National Economic Development Authority of the Philippines; Ms. Tiziana Bonapace, Director of the ICT and Disaster Risk Reduction Division, ESCAP and H.E. Thongphane Savanphet, Deputy Minister of Foreign Affairs of Lao PDR (Source: ESCAP)

### Side event at High-level Political Forum in New York

The Trust Fund and its achievements were presented at a high-level event under the title “Tackling the Perfect Storm: Empowering Societies for Disaster Resilience” which was held in New York during the High-Level Political Forum (HLPF) on 16 July 2019. ESCAP's flagship publication, the Asia-Pacific Disaster Report 2019 was launched during this event and insights from the roundtable

discussion contributed to the 2019 theme of the HLPF “Empowering people and ensuring inclusiveness and equality” from a disaster resilience perspective.



Organized by



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Speakers discussed national experiences and evidence on challenges and practical solutions and exchanged diverse Asia-Pacific perspectives on the capacities required to utilize these new opportunities for innovative policy that can reduce poverty, inequality and disaster risk, which will be essential for delivering the 2030 Agenda for Sustainable Development.

Photo: Side event at High-level Political Forum in New York (Source: ESCAP)

## Maritime Sector Strategies to Augment Tsunami Monitoring

Difficulties in our comprehension of earthquake and tsunami hazards emphasize the need for more densely spaced observing capabilities for more accurate and cost-effective tsunami preparedness. Seismic intensity parameters and sea level data from tide gauge stations are the primary basis for decisions on tsunami warning. Nevertheless, time lags of data reception and difficulties in data interpretation are major challenges for tsunami warnings. Despite the advances in tsunami monitoring and modelling technology over the last decade, there are too few rapidly available observations of tsunamis to support sufficiently accurate and timely predictions required for hazard response agencies to be able to provide the best possible response to tsunami events.

Further, current systems are expensive to build and maintain, so only a limited number are deployed. Gaps in the coverage of the network, as well as routine outages of instruments, limit the ability of current detection systems to accurately assess the hazard posed by each event. In addition to the high costs of maintaining such systems, vandalism, theft, limited budgets, and technical damage mean that a fair fraction of all tsunami buoys is not functioning.

In its current strategy 2017-2020 the Trust Fund defines “Harnessing innovation, science and technologies”, as one of its focus areas, ensuring that benefits of science, technologies and communications advances relevant to early warning systems, particularly in the fields of geo-informatics and space technology, reach high-risk and low capacity countries, particularly the ‘last mile’ i.e. communities at risk. In line with this strategic goal, the Trust Fund was represented at the



roundtable on *Advancing Maritime Sector Strategies to Augment Tsunami Monitoring*, organized by the ESCAP Sustainable Business Network on 22-23 August 2019 in Singapore. At this initial two-day roundtable made up of government, maritime and undersea telecommunications private sector stakeholders, and academia discussed the potential use of private sector infrastructure to augment tsunami monitoring in regions of greatest risk. The meeting focused on the following three areas:

- a) Use of commercial ships operating in Pacific waters around South-East Asia, leveraging on precise Global Navigation Satellite Systems (GNSS) positions from these ships that can be used to detect and report sea-surface motions.
- b) Use of stationary oil and gas platforms as “passive” markers for vertical sea-surface motions.
- c) Turn future submarine telecommunication cables into ocean-spanning observation networks by equipping them with sensors that could also provide real-time data for seismicity, sea-level movements.

In this regard, it is also important to recognize that in addition to early warning for tsunami, each of these strategies offers additional co-benefits to the private and public sectors. For example, maritime private sector hosts can benefit from enhanced operations such as e-navigation, offshore surveying, monitoring subsidence in fixed infrastructure such as oil platforms, reduced maritime accidents and groundings. Furthermore, public policy making entities can also benefit from the generation of a wealth of data that can help monitor ocean health, climate change impacts and thus help reduce environmental risks in implementation of SDG 14 - life below the sea. Individually or together therefore, these strategies can augment data sources and build redundancy to existing tsunami warning systems.

In response to the request of the Advisory Council to enhance collaboration opportunities with the private sector, the Trust Fund will continue to seek synergies in the application of science and innovation towards improvement of tsunami early warning in Asia-Pacific through initiatives as the ESNB Task Force on Disaster and Climate Risk Reduction.

## 5 Resource Management<sup>3</sup>

In 2018-2019, ESCAP has not received new funds from Governments and other institutions.

As of 31 December 2018, the Fund's total balance available for new programming and Secretariat support was US\$ 1,405,624.51

**Table 4.1: Unallocated resources as of 31 December 2018 (US\$)**

Balance on 31 Dec 2017	Allocations (2018)	Interest (2018)	Unspent balance (Projects and Secretariat costs)	Contributions (2018)	Balance at 31 Dec 2018
1,427,706.63	-227,115.00	+39,112.84	+165,920.04	0	1,405,624.51
<b>Total unspent Fund balance (US\$)</b>					<b>1,405,624.51</b>
<b>Estimated Secretariat support in 2019 (including PSC)</b>					<b>93,215.00</b>
<b>Available for programming and Secretariat support</b>					<b>1,312,409.51</b>

As of 31 December 2019, the Fund's total balance available for new programming and Secretariat support was US\$ 1,065,491.13

**Table 4.2: Unallocated resources as of 31 December 2019 (US\$)**

Balance on 31 Dec 2018	Allocations (2019)	Interest (2019)	Unspent balance (Projects and Secretariat costs)	Contributions (2019)	Balance at 31 Dec 2019
1,405,624.51	-453,311.14	+30,156.30	+83,021.46	0	1,065,491.13
<b>Total unspent Fund balance (US\$)</b>					<b>1,065,491.13</b>
<b>Estimated Secretariat support in 2020 (including PSC)</b>					<b>162,225.00</b>
<b>Available for programming and Secretariat support</b>					<b>903,266.13</b>

\* The figures in this report are interim figures only.

<sup>3</sup> Funds are "programmed" when the Advisory Council has agreed to support an activity. Funds are "allocated" when ESCAP has transferred them from the Global Tsunami Trust Fund account to a specific project account. Funds are "expended" or "committed" when ESCAP has made a formal funding commitment through a Letter of Agreement signed between ESCAP and the implementing organization.

**Table 4.3: Resources allocated but unspent as of 31 December 2019 (US\$)**

Item	Unspent resources at 31 Dec 2019	Notes
<i>Grant agreements</i>		
Grant TTF-27	11,184.00	Amendment (Reduce overall budget from USD 602,873 to USD 591,689 in 2018)
PSC on grant	322.64	PSC per 3% rate
Grant TTF-27	60,133.00	Funding recovered (unspent terminal balance) in 2019
PSC on grant	1,734.63	PSC per 3% rate
Grant TTF-28	20,013.00	Funding has not transferred to Implementing Organization (unspent) in 2019
PSC on grant	492.13	PSC per 3% rate
<b>Total grants</b>	<b>93,879.40</b>	
<i>Secretariat support</i>		
Support activities	149,915.91	Unspent funding that had been allocated for Secretariat support in 2018
PSC	4,497.49	Includes PSC 3%
Support activities	629.81	Unspent funding that had been allocated for Secretariat support in 2019
PSC	18.89	Includes PSC 3%
<b>Total Secretariat</b>	<b>155,062.10</b>	
<b>Total</b>	<b>248,941.50</b>	

\* Funds return indicative only. They are received and processed in 2019.

*As of end December 2019, the Fund had programmed grants to 29 projects for a total of US\$ 13,967,074.84. Of this amount, US\$ 13,837,529.84 had been transferred to implementing organizations, with an expenditure of US\$ 13,594,239.08 as per the latest terminal reports. An overview of the status of grants is provided in Table 4.4*

**Table: 4.4 Financial status of grants (as of 31 December 2019) (US\$)**

Project number	Implementing Organization (IO)	Funds programmed	Funds committed/ expended by ESCAP	Funds transferred to IO	Funds expended by IO <sup>4</sup>	Status
TTF-01	ADPC	247,901.00	247,901.00	247,901.00	247,901.00	completed
TTF-02	ADPC	2,358,984.75	2,358,984.75	2,358,984.75	2,358,984.75	completed
TTF-03	Asian Disaster Reduction Center	79,819.00	79,819.00	79,819.00	79,819.00	completed
TTF-04	IOC-UNESCO	339,067.55	339,067.55	339,067.55	339,067.55	completed
TTF-05	UNDP-Maldives	122,276.69	122,276.69	122,276.69	122,276.69	completed
TTF-06	Disaster Management Centre, Sri Lanka	153,282.65	153,282.65	153,282.65	153,282.65	completed
TTF-07	ADPC	774,674.00	774,674.00	774,674.00	774,674.00	completed
TTF-08	Maldives Meteorological Service	276,128.00	276,128.00	276,128.00	276,128.00	completed
TTF-09	UNDP Indonesia	1,552,779.36	1,552,779.36	1,552,779.36	1,552,779.36	completed
TTF-10	UNESCO Office Jakarta	573,003.21	573,003.21	573,003.21	573,003.21	completed
TTF-11	IOC-UNESCO	128,603.89	128,603.89	128,603.89	128,603.89	completed
TTF-12	ABU	312,275.82	312,275.82	312,275.82	312,275.82	completed
TTF-13	UNDP APCR	344,385.60	344,385.60	344,385.60	344,385.60	completed
TTF-14	Raks Thai Foundation	514,162.96	514,162.96	514,162.96	514,162.96	completed
TTF-15	UNDP APCR	381,066.40	381,066.40	381,066.40	381,066.40	completed
TTF-16	RIMES	1,289,033.00	1,289,033.00	1,289,033.00	1,289,033.00	completed
TTF-17	RIMES	342,754.69	342,754.69	342,754.69	342,754.69	completed
TTF-18	ADPC	447,490.00	447,490.00	447,490.00	447,490.00	completed
TTF-19	ABU	237,692.00	237,692.00	237,692.00	237,692.00	completed
TTF-20	IOC-UNESCO	394,226.97	394,226.97	394,226.97	394,226.97	completed
TTF-21	IOC-UNESCO	101,821.15	101,821.15	101,821.15	101,821.15	completed
TTF-22	Typhoon Committee	417,283.15	417,283.15	417,283.15	417,283.15	completed
TTF-23	RIMES	606,413.00	606,413.00	606,413.00	606,413.00	completed
TTF-24	RIMES	329,115.00	329,115.00	329,115.00	329,115.00	completed
TTF-25	AIT	281,279.00	281,279.00	281,279.00	281,279.00	completed
TTF-26	Oxfam GB	230,000.00	230,000.00	230,000.00	230,000.00	completed

<sup>4</sup> As of the most recent progress report or terminal report.

<b>TTF-27</b>	RIMES	531,554.00	531,554.00	531,554.00	531,554.00	completed
<b>TTF-28</b>	TC	250,000.00	250,000.00	229,987.00	156,344.16	Ongoing <sup>3 4</sup>
<b>TTF-29</b>	IOC-UNESCO	350,000.00	350,000.00	240,468.00	70,820.08	Ongoing <sup>3</sup>
<b>Total</b>		13,967,074.84	13,967,074.84	13,837,529.84	13,594,239.08	

<sup>3</sup>As of the most recent progress report or terminal report.

<sup>4</sup> As of 31 December 2019, project activities for TTF-28 had been completed, but the project had not yet formally been closed, pending completion of reporting requirements. The unspent fund balance of TTF-28 had later been received by ESCAP in January 2020 and will be recorded in the 2020-2021 Annual Report.

## Abbreviations

<b>ABU</b>	Asia-Pacific Broadcasting Union
<b>AIT</b>	Asian Institute of Technology
<b>ADPC</b>	Asian Disaster Preparedness Centre
<b>CAP</b>	Common Alerting Protocol
<b>CREWS</b>	Climate Risk Early Warning System Initiative
<b>DMC</b>	Disaster Management Centre, Sri Lanka
<b>DMH</b>	Department of Meteorology and Hydrology, Myanmar
<b>DRR</b>	Disaster Risk Reduction
<b>ESCAP</b>	UN Economic and Social Commission for Asia and the Pacific
<b>GAATES</b>	Global Alliance on Accessible Technologies and Environments
<b>GTS</b>	Global Telecommunication System
<b>ICG/IOTWMS</b>	Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System
<b>IDD</b>	ESCAP Information and Communications Technology and Disaster Risk Reduction Division
<b>IOC-UNESCO</b>	Intergovernmental Oceanographic Commission of UNESCO
<b>IP PSC</b>	Implementing Partner - Project Support Costs
<b>IRIS</b>	Incorporated Research Institutions for Seismology
<b>ISDR</b>	United Nations Office for Disaster Risk Reduction
<b>ITU</b>	International Telecommunications Union
<b>JICA</b>	Japan International Cooperation Agency
<b>NED</b>	University of Engineering and Technology, Karachi, Pakistan
<b>NEDC</b>	DMH's National Earthquake Data Center
<b>NMHS</b>	National Meteorological and Hydrological Services
<b>OCHA</b>	UN Office for the Coordination of Humanitarian Affairs
<b>PAGASA</b>	Philippine Atmospheric, Geophysical and Astronomical Services Administration

<b>PMD</b>	Pakistan Meteorological Department
<b>PSC</b>	Project Support Costs
<b>PTC</b>	WMO/ESCAP Panel on Tropical Cyclones
<b>RCC</b>	Regional Consultative Committee on Disaster Management
<b>RIMES</b>	Regional Integrated Multi-Hazard Early Warning System for Africa and Asia
<b>SOP</b>	Standard Operating Procedure
<b>TC</b>	ESCAP/WMO Typhoon Committee
<b>TTF</b>	Tsunami Trust Fund
<b>UNEP</b>	United Nations Environment Programme
<b>UNESCO</b>	UN Educational, Scientific and Cultural Organization
<b>UNDP</b>	United Nations Development Programme
<b>UNDP APRC</b>	UN Development Programme Asia Pacific Regional Centre
<b>WMO</b>	World Meteorological Organization

## Annex 1: Status of Fund-supported Projects

(Note: Completed projects listed with shaded background.)

Project No. / Organization/ Project Dates <sup>5</sup>	Project name	Project Results
TTF-01 ADPC August 2006 - April 2010	Support to the 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	Near real-time sea level stations were established/upgraded in the Philippines (Subic, Lubang) and Viet Nam (Qui Nhon and Vung Tau). The stations are operational, with station data shared globally through the WMO's Global Telecommunication System. Technical staff members of relevant Government agencies were trained on station operation and maintenance. Ownership of the stations was transferred to national Government counterparts.
TTF-02 ADPC July 2007 - June 2010	End-to-end early warning of tsunamis and other natural hazards for disaster preparedness and mitigation in the Indian Ocean and Southeast Asia: Phase 1	Seismic stations were established in Myanmar (Sittwe), the Philippines (Santa) and Viet Nam (Dalat and Son La). The stations are operational, and ownership was transferred to national Government counterparts. The Tsunami Alert Rapid Notification System (TARNS) was prepared in Sri Lanka, the Maldives and Myanmar, detailing the warning dissemination procedure at national and local levels. The Incident Command System (ICS) was adapted for use in the Maldives and Myanmar. Concept of Operations (CONOPS) documents for the tsunami warning services in the Maldives and Myanmar were finalized. Coastal Community Resilience (CCR) frameworks were introduced in the Maldives, Myanmar, and Sri Lanka.
TTF-03 Asian Disaster Reduction Center (ADRC) July 2007 - March 2008	Trainers training programme on community-based hazard map development	Community-based hazard mapping was strengthened in India and Bangladesh. A total of 90 trainers were trained on community-based hazard map development in five Indian provinces and two Bangladeshi divisions. By involving local communities in hazard mapping, the project built tsunami awareness among community members that otherwise might run danger of neglecting the continuing tsunami threat due to the prolonged period between each tsunami.
TTF-04 IOC-UNESCO September 2007 - March 2011	Strengthening tsunami warning and emergency responses: training workshops on the development of SOPs for the Indian Ocean and Southeast Asia	<p>The project contributed to the readiness of the Indian Ocean Tsunami Warning System to enter into operation on 12 October 2011. A total of 12 workshops (two regional; ten country-specific) were delivered to 20 Indian Ocean and Pacific Ocean countries (over 370 participants) to integrate SOPs for effective end-to-end warning and response, with emphasis on robust communication networks between key agencies. At the regional workshops, participants developed their own country-specific SOPs. A draft Manual on SOP for Tsunami Warning and Emergency Response was developed.</p> <p>Regional and sub-regional cooperation between National Tsunami Warning Centres and National Disaster Management Organizations was fostered.</p> <p>Because of the training, SOPs for tsunami warning and emergency response were developed and/or improved in four target countries (Myanmar, Pakistan, the Philippines and Viet Nam).</p>

<sup>5</sup> Start Date: Date of signature of Letter of Agreement.



<p>TTF-05 UNDP Maldives January 2008 - December 2009</p>	<p>Strengthening national and community capacities for effective early warning dissemination and response</p>	<p>National and local early warning capacities were strengthened. Fourteen related sets of standard operating procedures for early warning were finalized. Relevant agencies were trained in these procedures as well as weather research and forecasting, global telecommunication systems and tsunami modelling.</p> <p>Community-based preparedness plans were developed and signed by ten islands within two Atolls of the Maldives.</p> <p>Community mobilization led to the inception of early warning task force teams. Public awareness was raised through the International Day for Disaster Reduction, a televised debate, and a public awareness campaign encompassing newspapers, a website (<a href="http://www.rakkaa.mv">http://www.rakkaa.mv</a>), television and hand-out materials.</p>
<p>TTF-06 Disaster Management Centre, Sri Lanka February 2009 - January 2011</p>	<p>Enhancing national capacity for early warning dissemination in Sri Lanka</p>	<p>A reliable and cost-effective radio communication system (hand-held radios, repeaters and VHF base station) became fully operational. The system is facilitated by the Disaster Management Centre (DMC) and can serve during emergency situations. The DMC has committed to contribute its own funding to maintain the radio communication system. The SOPs for early warning were revised, tested, documented and distributed.</p> <p>Staff of the Emergency Operation Centers and members of the District Disaster Management Committees and Divisional Disaster Management Committees of Colombo, Galle and Batticaloa were trained to form a resource pool that can support other Centers and Committees.</p> <p>In line with the Disaster Management Act, Road Map and National Disaster Management Plan, the Government of Sri Lanka is mobilizing resources to expand the communication system to other disaster-prone Districts.</p>
<p>TTF-07 ADPC March 2008 - December 2010</p>	<p>End-to-end early warning of tsunamis and other natural hazards for disaster preparedness and mitigation in the Indian Ocean and Southeast Asia: Phase 2</p>	<p>In April 2010, the regional early warning centre started experimental operations for earthquake monitoring and tsunami watch (see project TTF-02 above). The system became fully operational in 2011. Located at the RIMES regional facility in Pathumthani, Thailand, with capabilities to receive and analyse seismic, sea level, and deep ocean sensor data, the RIMES Tsunami Watch Center utilizes data generated from its own monitoring stations and from global networks to evaluate the tsunamigenic potential of an earthquake.</p> <p>RIMES incorporated tsunami early warning into existing national warning systems through its interrelated components including regional tsunami and earthquake monitoring, advisory dissemination, decision-support tool development, potential impact and risk assessments and other related research on trans-boundary hazards.</p> <p>A web-based portal for real-time tsunami forecasting (PRECISE) was completed, tested and evaluated, giving the regional early warning centre near real-time tsunami forecasting capability. A tsunami risk assessment tool (INSPIRE) was also developed.</p>

<p>TTF-08 Maldives Meteorological Service (MMS) May 2009 - June 2012</p>	<p>Towards sustaining the Indian Ocean and Southeast Asia End-to-End Multi- Hazard Early Warning System</p>	<p>The Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) was established on 30 April 2009 as a result of projects TTF-01, TTF-02 and TTF-07. The membership and demand for RIMES services grew during the project period. The RIMES Council had 13 Member States of which India, Papua New Guinea and Sri Lanka joined in 2011. India served as RIMES Council Chair.</p> <p>The draft RIMES Five-Year Master Plan (2010-2014), which documents Member States' priority needs in hazard observation, forecasting and warning, capacity building, and research and development, was adopted by the RIMES Executive Board.</p> <p>Mongolia assumed the RIMES Secretariat functions in April 2011 from the Maldives. Mongolia focused on resource mobilization for Master Plan implementation and accelerating the process of having more countries sign the RIMES Cooperation Agreement. The Maldives continued to represent RIMES in the ICG/IOTWMS.</p> <p>Bangladesh and Nepal contributed financially to RIMES through donor-funded projects, while India contributed through fixed institutional support and programme funding.</p>
<p>TTF-09 UNDP Indonesia March 2009 - December 2011</p>	<p>Making Provincial Communities Safer Through Disaster Risk Reduction in Development (SCDRR)</p>	<p>A Provincial Platform for DRR was established in West Sumatra, including an established structure, work plan and executive body. With the support of SCDRR, the West Sumatra Provincial DRR Forum is now fully operational and able to facilitate the implementation of the Forum's activities.</p> <p>The processes of community-based DRR were tested on how to facilitate the formulation of village disaster management plans, contingency plans and action plans, in more than 40 target locations covered by SCDRR.</p> <p>Draft disaster management, contingency and community action plans were developed in Jorong (sub-village). In Nagari (village) Salayo, DRR officially became the local development policy for 2011-2015.</p> <p>Padang City developed a risk map (district level), while West Sumatra Province developed a hazard map.</p>
<p>TTF-10 UNESCO Jakarta March 2009 - July 2011</p>	<p>Tsunami Awareness and Preparedness Tools and Materials Assessment</p>	<p>A regional depository for tsunami awareness and training resources was established. The project developed the structure of Jakarta Tsunami Information Centre (JTIC) website and translated the content into five different languages (English, Bahasa Indonesia, Thai, Tagalog and Tetun). The website was regularly updated by focal points of each country.</p> <p>A total of 20 education materials on tsunami awareness were produced, translated and promoted in Indonesia, Timor-Leste, Thailand and the Philippines. Activities in the Philippines were scaled up using national budgets.</p> <p>The lessons were shared to a wider number of countries through a regional lessons learned workshop at the end of the project implementation.</p>
<p>TTF-11 IOC-UNESCO November 2009 - August 2011</p>	<p>Assessment and awareness of Makran tsunami hazards</p>	<p>The project contributed to increased awareness of the Makran tsunami hazard in key national and local institutions (Baluchistan) in Pakistan. A future strategy to further the work on understanding the Makran tsunami hazards and create awareness was agreed.</p> <p>Trainings in assessment of tsunami hazard and paleo tsunami field techniques were held in Iran (Islamic Republic of), Pakistan and Indonesia.</p> <p>A network of experts from Pakistan, India, Oman and Iran (Islamic Republic of) was established. An international support network for Makran research was also established, with participation from Thailand, Indonesia, Sri Lanka, USA and Chile.</p>

<p>TTF-12 ABU November 2009 - July 2011</p>	<p>ABU Early Warning Broadcast Media Initiative</p>	<p>The project created a platform for continuous advancement of integration of broadcast media in Early Warning Systems on a national scale in six pilot countries (Cambodia, China, Malaysia, the Philippines, Thailand, and Viet Nam). It was implemented through two complementary series of workshops. The first series of workshops, dealing with early warning broadcast and disaster risk reduction messaging through traditional knowledge, targeted television and radio broadcast journalists. Four in-country content development workshops were held in Cambodia, Malaysia, Thailand and Viet Nam. The second series, the 'Early Warning Broadcast System Road Show', dealt primarily with the technology and operation of an early warning broadcasting system (EWBS). Demonstration kits for EWBS were produced and tailor-made for each pilot country.</p> <p>ABU assisted the Thai Public Broadcasting Service and Radio and TV Malaysia (workshop participants) to establish Early Warning units within their organizations. The Thai PBS team has produced several features.</p> <p>The ABU Team has continued to conduct consultations on EWBS after the termination of the project as part of national and regional EWBS development.</p>
<p>TTF-13 UNDP Asia Pacific Regional Centre Dec 2009 - August 2012</p>	<p>Building risk knowledge to enhance early warning, preparedness and mitigation in tsunami-affected countries</p>	<p>An interactive CD-ROM containing training material on tsunami risk assessment and mitigation, including the social dimensions of vulnerability was completed and applied by experts in Sri Lanka and Indonesia. Indonesia conducted a review of its SOPs and assessed gaps for further follow-up. Final National Guidelines on Tsunami Risk Assessment for Indonesian Context incorporating recommendations from two pilots in Simeulue and Majene were prepared and shared with the BNPB.</p> <p>A case study of the Port City of Galle, Sri Lanka on "Risk Assessment and Management for Tsunami Hazard" was finalized and used by the regional IOTWMS Working Group.</p> <p>A significant contribution was made to the IOTWMS capacity, including through the regional SOP Training Workshop in September 2011 in Jakarta, Indonesia. The outcomes of this workshop provided direct inputs to the IOWave 2011, which tested SOPs before the IOTWMS became fully operational in October 2011.</p>
<p>TTF-14 Raks Thai Foundation January 2010 - July 2012</p>	<p>Strengthening Community-based Disaster Risk Management in Asia: shifting from lessons observed to lessons learned.</p>	<p>A regional network for community-based disaster risk management was developed. CARE Netherlands, CARE Australia and CARE Denmark supported additional countries to take part in the regional component, beyond the ones supported through the project (India, Indonesia, Sri Lanka and Thailand). E-learning modules on Disaster Risk Management were developed and used to support capacity building in participating countries.</p> <p>A Learning Lab was developed in two pilot communities in Krabi province, Thailand, where local disaster preparedness plans were rolled out in collaboration with the provincial governor. Six other nearby communities adopted the implementation strategy after seeing the two pilot communities' progress, and received mini-grants to develop and implement local disaster management plans. An independent survey of the target communities found that awareness of climate change and natural disasters had increased significantly during the lifetime of the project.</p>

<p>TTF-15 UNDP Asia Pacific Regional Centre May 2011 - October 2014</p>	<p>Strengthening Early Warning Systems for Extreme Weather Events to Advance Climate Risk Management in the South East Asian Region (Cambodia and Timor-Leste)</p>	<p>Through this project, UNDP and RIMES worked together to develop national capacities and provide early warning services to Cambodia and Timor-Leste.</p> <p>Assessments of weather forecasting capacities and infrastructure were completed in Cambodia and Timor-Leste. Based on the findings, technical personnel from both countries were sent to RIMES for a targeted, two-month training programme on the generation and interpretation of weather forecasts. A regional SOP workshop in data sharing on extreme weather events was held with the participation of 17 officials from the two target countries. A dedicated server was procured and installed at RIMES, providing 3-day, 10-day and site-specific weather forecasts for Cambodia and Timor-Leste.</p> <p>Disaster loss databases were established / strengthened in Cambodia and Timor-Leste, following technical training and other capacity-building activities for government officials in both countries. Experts from Indonesia were mobilized to support Timor-Leste.</p> <p>National trainings on SOPs for improving climate risk information were organized in Cambodia and Timor-Leste. High-resolution weather forecasts for application in the agriculture sector were highlighted as a priority need in both countries.</p> <p>UNDP and the Government of Cambodia mobilized over US\$ 4 million in new funds to take the project outcomes, including the national disaster loss database, forward.</p>
<p>TTF-16 RIMES May 2011 - December 2015</p>	<p>Reducing Risks for Tsunami, Storm Surges, Large Waves and other Natural Hazards in Low Elevation Coastal Zones</p>	<p>Multi-stakeholder national monsoon forums were established and supported in Bangladesh, India, Maldives, Myanmar and Sri Lanka, in collaboration with the National Meteorological and Hydrological Services and WMO. Additionally, a state-level forum was established in Tamil Nadu, India. Local-level dialogues with users of warning information were held in held in the five target countries.</p> <p>An early warning system evaluation guide was drafted, covering assessment of risks, hazard observation and monitoring, hazard prediction and forecasting, forecast translation into potential impacts and response options, communicating risks and response and options, and community readiness to receive and respond to risk information. The guide was piloted during early warning audits in Bangladesh, Maldives and Myanmar, and used during field activities and dialogues in India and Sri Lanka. Cambodia, China, Lao PDR, Pakistan, the Philippines, and Viet Nam expressed interest to replicate similar activities in their countries.</p> <p>Selected communities at risk were connected to the early warning system and 24-hour warning focal points were established in ten pilot sites in Bangladesh, India, Maldives, Myanmar and Sri Lanka (two sites per country). Capacity building activities for the application of warning information products were initiated in the target countries, and 130 disaster managers in India, Myanmar and Sri Lanka were trained on preparing disaster impact outlooks and management response options.</p> <p>WMO in collaboration with the Typhoon Committee trained forecasters from the project countries in interpretation and application of advanced forecasting products from global and regional centres, with emphasis on timely delivery of improved forecasts and warnings to the public.</p>

<p>TTF-17 RIMES July 2012 - December 2014</p>	<p>Enhancing coastal hazard early warning and response: tools and institutional strengthening</p>	<p>Technical staff members from government agencies in Myanmar, the Philippines and Sri Lanka were trained on the generation of high-resolution data for tsunami risk assessment using near-shore bathymetric, topographic and exposure surveys. Selected staff also received a month-long training at RIMES in near-shore field survey data processing and development of related outputs.</p> <p>The INSPIRE system (see project TTF-07) for tsunami risk assessment was installed in the three project countries. Officers from a range of government agencies were trained on evacuation mapping using the ESCAPE platform developed by RIMES, and produced maps showing evacuation zones and routes incorporating the outputs generated from INSPIRE. Evacuation exercises using the IOC tsunami manual were held in pilot sites.</p>
<p>TTF-18 ADPC July 2012 - October 2014</p>	<p>Technical assistance for enhancing the capacity of end-to-end multi-hazard Early Warning Systems (EWS) for coastal hazards in Myanmar, Sri Lanka and the Philippines</p>	<p>National level early warning systems gap assessments were initiated during workshops held in Myanmar, Sri Lanka and the Philippines.</p> <p>A regional capacity building workshop on Weather Research and Forecasting (WRF) modelling was held, with participation from the national hydro-meteorological services of Myanmar, Sri Lanka and the Philippines. Three professionals from each target country received intensive training on WRF.</p> <p>Technical staff members from national forecasters in the three project countries were trained in storm surge modelling by experts from the Japan Meteorological Agency. Training on climate forecast downscaling held in Sri Lanka to further strengthen capacity for coastal hazard mapping.</p> <p>Hazard mapping for pilot sites and associated areas were initiated in Myanmar, the Philippines and Sri Lanka. National workshops were held to gather feedback on the risk maps and the methods used.</p> <p>Evacuation maps and SOPs for evacuation produced and tested in eight pilot sites (three in Myanmar, three in the Philippines and two in Sri Lanka). Communications equipment installed at pilot sites.</p> <p>In collaboration with GAATES and ABU, research undertaken and manual developed on disaster preparedness for persons with disabilities.</p>
<p>TTF-19 ABU July 2012 - April 2015</p>	<p>ABU Disaster Risk Reduction Broadcast Initiative</p>	<p>Country profiles were developed for India, Indonesia, Maldives, Myanmar, Pakistan, the Philippines, Sri Lanka and Thailand.</p> <p>Induction meeting focusing on the role of broadcasters in early warning and disaster risk reduction was held with 60 participants from 25 countries.</p> <p>Workshops for broadcasters and disaster managers held in the Maldives, Sri Lanka and Viet Nam. Broadcasters from India, Iran (Islamic Republic of), Malaysia and Pakistan trained at regional workshop in Malaysia. A field mission was undertaken to Myanmar to identify national focal points and agree on next steps. In the Maldives and Sri Lanka, broadcasters and disaster managers were supported in drafting SOPs for the role of broadcasters in early warning.</p> <p>The Early Warning Broadcasting Systems Handbook was updated. Work was also completed on manuals on emergency communications for people with disabilities (in close collaboration with GAATES and ADPC).</p>



<p>TTF-20 IOC-UNESCO July 2012 - June 2015</p>	<p>Enhancing Tsunami Risk Assessment and Management, Strengthening Policy Support and Developing Guidelines for Tsunami Exercises in Indian Ocean Countries</p>	<p>Multi-stakeholder process undertaken to revise and expand guidelines on tsunami risk assessment, which was completed in 2015. Detailed training modules developed on tsunami exercises, with pilots implemented in Bangladesh, Myanmar and Timor-Leste.</p> <p>Tools for stocktaking surveys of policies on disaster risk reduction including tsunami exercises were developed, with pilot surveys completed in Bangladesh, Myanmar and Timor-Leste.</p> <p>Training on tsunami risk assessment and tsunami exercises held in Bangladesh, Myanmar and Timor-Leste, using modules developed by the project. Case study on tsunami risk assessment completed for Galle City, Sri Lanka.</p>
<p>TTF-21 IOC-UNESCO July 2012 - June 2015</p>	<p>Communicating the effects of the 1945 Makran tsunami to increase awareness and preparedness of tsunami hazards in the Makran region</p>	<p>Field missions conducted to India, Iran (Islamic Republic of), Oman and Pakistan to review literature/historical documents and obtain eyewitness accounts of 1945 Makran tsunami. The missions gathered a wealth of information and received many eyewitness accounts, particularly in Pakistan.</p> <p>A website hosting the historical documents and eyewitness accounts was launched in November 2014, and will be managed by the Indian Ocean Tsunami Information Centre. The website also contains the educational booklet produced as part of the project, which was translated into local languages.</p>
<p>TTF-22 Typhoon Committee August 2012 - May 2015</p>	<p>Synergized Standard Operating Procedures (SSOPs) for Coastal Multi-Hazard Early Warning Systems</p>	<p>Kick-off workshop was held in May 2013 on the status of coastal multi-hazard early warning systems, with participation from 27 member countries in the Typhoon Committee and the Panel on Tropical Cyclones. In country-workshops held in the three pilot countries (Bangladesh, Pakistan and the Philippines) to review existing SOPs; identify best practices, gaps and needs; make recommendations on how to further build institutional capacity and strengthen SOPs. Expert missions were undertaken to six additional countries to review SOPs for early warning.</p> <p>Work completed on a manual on synergized standard operating procedures for coastal multi-hazard early warning systems (the SSOP manual). The finalized manual was published and distributed to members of the Typhoon Committee and the Panel on Tropical Cyclones.</p>
<p>TTF-23 RIMES June 2013 - December 2015</p>	<p>Strengthening of Myanmar's Multi-Hazard Early Warning System</p>	<p>This project assisted Myanmar's Department of Meteorology and Hydrology (DMH) in developing a capacity building program framework for addressing capacity gaps, as well as fill immediate capacity gaps in earthquake monitoring and tsunami warning, and decision-support tools for disaster risk management.</p> <p>RIMES assisted DMH in undertaking a self-assessment of current capacities in hazard observation and monitoring, which was incorporated into a capacity building document highlighting priority main needs and gaps.</p> <p>A high-capacity computer was delivered to DMH and installed with SeisComp3, and ShakeCast software. Software was also installed to enable access to data from the California Integrated Seismic Network. Hands-on training on SeisComp3 was provided 13 staff members at the DMH's National Earthquake and Data Center (NEDC). Two servers were installed at NEDC for acquiring near real-time sea-level information. Tide Tool software was installed, and training provided to 14 NEDC staff. DMH staff members were trained on WRF system installation, operation, and maintenance.</p> <p>Upgrading of 17 agro-meteorological stations, including sensors and telemetry, was completed in 2015.</p>

<p>TTF-24 RIMES November 2014 - September 2016</p>	<p>Capacity Building on Generation and Application of Downscaled Climate Projections</p>	<p>National forecasters in Myanmar, Pakistan and Sri Lanka were assisted in developing downscaled, customized climate projections. This involved transfers of necessary datasets, software and hardware, in addition to intensive training of NMHS staff members. Capacity for climate risk analysis and adaptation planning was enhanced within climate sensitive sectors, through training and production of technical guides for government, NGO and research organisations. A total of 81 institutions were reached across the three countries. Further, as part of the same project, the national monsoon forum model was piloted in Cambodia, Lao PDR and Pakistan. This sought to expand the access to climate risk information in resource management. A total of 9 multi-stakeholder forums were held, with widening stakeholder participation over successive forums in each country. These occurred biannually in Cambodia and Lao PDR, and annually in Pakistan. Each country has subsequently requested further financial and technical support in order to sustain the forums.</p>
<p>TTF-25 AIT November 2014 - November 2016</p>	<p>CAP on a MAP - Improving Institutional Responsiveness to Coastal Hazards through Multi- Agency Situational Awareness</p>	<p>National multi-stakeholder consultation meetings were held in the Maldives, the Philippines and Myanmar, focal points were trained and the Sahana open-source software solution was adapted to the specific requirements of each target country. The national focal points received two weeks of intensive training at the AIT Campus in Bangkok, Thailand. This utilised a 'training of trainers' approach, in order to develop in-country capacities that will persist after the project ceases. Further, the Sahana software and the accompanying servers were deployed to each country. National trainings, tests and drills were conducted in 2016, with the full activation of the common alerting protocol (CAP) in the three countries completed mid-2016. Subsequent regional workshops were held to encourage early warning related national agencies in the remaining member countries of the Tsunami Trust Fund to also adopt the CAP standards in their own respective countries, which reached attendees from Bangladesh, Cambodia, Indonesia, the Maldives, Myanmar, the Philippines and Viet Nam, as well as attendees from Australia, the Federated States of Micronesia, Italy and Germany to facilitate further knowledge sharing. Workshops were also held within the three focus countries, to share the results with relevant stakeholders.</p>

<p>TTF-26 Oxfam GB November 2014 - September 2016</p>	<p>Enhancing Tsunami Resilience in Pakistan</p>	<p>This project enhanced tsunami resilience in five districts located in the provinces of Sindh and Baluchistan in Pakistan, by strengthening the EWS and institutional state capacity needed to utilise it and building community-based disaster risk management in target districts, through a variety of activities that prooted sensitisation, awareness-raising and preparedness for tsunami related risks.</p> <p>Through cooperation with NED University in Karachi, inundation modelling and risk mapping for Gwadar and Pasni districts of Baluchistan province have been completed, using the 1945 tsunami event as a base. These maps were used by Oxfam to develop an evacuation response plan and update the disaster risk management plan for Gwadar, through a participatory process involving various stakeholders including authorities at the national and district level, NGOs, civil society groups and representatives of local livelihoods.</p> <p>The Inmarsat Satellite-based Early Warning System at the Pakistan Metrological Department (PMD) Tsunami Centre in Karachi, which utilises a siren pole for early warning information dissemination, was re-activated in Gwadar, and extended to Pasni.</p> <p>To strengthen community resilience, community organisations were established, and 12 project orientation meetings were held with the target communities. A focus on knowledge sharing was realised through encouraging elder community members to share memories of the 1945 Makran Tsunami, and the use of participatory processes for hazard mapping and scenario building. Oxfam and its partners conducted awareness-raising and training sessions with 5,598 community members and over 100 officials. Further, tsunami education sessions were implemented for over 15,302 school children and teachers.</p> <p>Awareness was also raised among a broader range of stakeholders, through a commemoration for the Makran Tsunami on the 70<sup>th</sup> anniversary in 2015, in Karachi, various workshops on preparedness for coastal hazards, and training of community volunteers and media personnel. Further, research papers were produced entitled 'Addressing knowledge gaps in Makran tsunami', and a booklet on 'The untold story of tsunami of 1945 in the Indus Delta'; and a national consultation was held on readiness for tsunami and its impact on the local economy, with 26 participants from government organisations, NGOs, academics and UN organisations.</p>
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<p style="text-align: center;">TTF-27 RIMES January 2017-31 December 2018</p>	<p style="text-align: center;">Enhancing Weather and Climate Resilience in RIMES Member States through Capacity Building on Impact Forecasting</p>	<p>This project aimed to ensure that decision making and seasonal planning in at least 3 climate-sensitive sectors in Cambodia, Myanmar, Sri Lanka, Fiji, Papua New Guinea, and Samoa are informed by weather and climate information.</p> <p>For Southwest Pacific countries, the capacities necessary to do so are being enhanced through several activities including training, seasonal forums, institutional mapping, and decision-support system development. Training of trainers in impact forecasting and climate applications was successfully realized in Papua New Guinea, with trainers from a variety of UN organizations and NGOs. Institutional mapping and user needs assessments have also been completed.</p> <p>Seasonal forums were implemented addressing ways to use impact and risk assessments to inform seasonal planning in Fiji, Papua New Guinea and Samoa, and decision support system development in Papua New Guinea. RIMES, in collaboration with SMD (Samoa Meteorology Division), produced training data to sensitive stakeholders to the operational roles of preparedness, which are necessary to support a successful forum. RIMES collaborated with FAO in order to facilitate the input of agricultural data into SESAME (Specialized Expert System for Agro-Meteorological Early Warning for Climate-Resilient Agriculture) for the development of a decision-support system in Papua New Guinea.</p> <p>For South and Southeast Asian Countries, the project supported the integration of earth observations in impact forecasting and risk analysis, and the development or expansion of decision-support systems. The use of earth observation is now being promoted regularly through national monsoon forums, which are held in Cambodia, Myanmar and Sri Lanka with attendees from government institutions, media, development organizations, etc.</p>
<p style="text-align: center;">TTF-28 ESCAP/WMO Typhoon Committee May 2017 –30 November 2019</p>	<p style="text-align: center;">SSOP Phase II: Synergized Standard Operating Procedures (SSOPs) for Coastal Multi- Hazard Early Warning Systems</p>	<p>This project is a continuation of project TTF-22 “Synergized Standard Operating Procedures (SSOPs) for Coastal Multi-Hazard Early Warning Systems”, which produced the manual on Synergized Standard Operating Procedures. Building on these, phase II of this project continued to develop SSOPs.</p> <p>The SSOP-II project provided resources and opportunities to involve social scientists, DRR experts and warning experts from National Tsunami Warning Centres (NTWCs), National Disaster Management Offices (NDMOs), and Government Sectoral Agencies including national level, local level and community level to improve the training and capacity building on social science aspects of EWS, such as risk and impact assessment, warning communication strategies, partnership/stakeholder engagement, society response capability, etc..</p> <p>SSOP-II focused on training the "mechanism" of preparing and implementing synergized standard operating procedures for coastal multi-hazards early warning systems in beneficiary countries with the goal of promoting the capacity on coastal community resilience to coastal multi-hazards through extending the achievements of SSOP-I.</p> <p>This has been achieved through training courses for DRR experts in 10 beneficiary countries, national workshops in 3 target countries from TC and PTC regions, and TC/PTC exchanges through attachment trainings delivered by the RSMCs in Tokyo and New Delhi.</p> <p>In-country consultation workshops were conducted in Lao PDR, Myanmar, Sri Lanka, Thailand and Viet Nam, supporting member countries in revising or establishing their own synergized SOPs in line with the recommendations set out in the manual.</p>

<p>TTF-29 IOC-UNESCO 1 May 2019 - 31 October 2020</p>	<p>Strengthening Tsunami Early Warning in the North West Indian Ocean Region through Regional Cooperation</p>	<p>The magnitude 8.1 earthquake and tsunami of 28 November 1945 in the eastern segment of the Makran subduction zone resulted in reported casualties of a few hundred to 4,000 in India and Pakistan, with damage also being reported in Iran and Oman, as per different sources of information. A powerful earthquake in the Makran region could generate destructive tsunami waves capable of inundating coastlines within 20 minutes, thus making it imperative for the Member States in the region to be well prepared to respond.</p> <p>Recognising that most coastal communities of the tsunami prone region are still not prepared to respond appropriately to a near-field tsunami threat, and that countries in the Northwest Indian Ocean are indeed vulnerable to such a near-field threat from the Makran subduction zone, this project aims to improve understanding of the risk knowledge based on scientific research and to improve warning services at national level and the organization of the national warning chains (with an end to end perspective) to assure timely warnings and rapid response with due emphasis on self-protection for near source events.</p>
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## Annex 2: Secretariat Monitoring and Advocacy Missions

Location	Dates	Mission/event
New Delhi, India	5-6 July 2018	<p>Represented ESCAP at the Attachment Training at the Regional Specialized Meteorological Centre for Tropical Cyclones over the North Indian Ocean (RSMC) in New Delhi.</p> <p><u>Main outcome:</u> Presented work of Trust Fund and monitored activities of TTF-28 project “SSOP Phase II Synergized Standard Operating Procedures for coastal multi-hazards Early Warning System”.</p>
Hyderabad, India	9 July 2018	<p>Attended the Intersessional Meeting of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS), Working Group for the North West Indian Ocean (WG-NWIO).</p> <p><u>Main outcome:</u> Provided member States with an update on the Tsunami Trust Fund and explanation of the programmatic approach for the Makran region, which was elaborated by an expert consultant through the Trust Fund. ICG Members discussed the pending TTF project proposal, which was revised by IOC-UNESCO to accommodate the recommendations derived from the analytical workshop organized by ESCAP and ICG/IOTWMS in 2017.</p>
Nouméa, New Caledonia	23-26 July 2018	<p>Attended the 17<sup>th</sup> Session of the RA V Tropical Cyclone Committee of the World Meteorological Organization.</p> <p><u>Main outcome:</u> Presented work of Trust Fund and discussed expansion of existing ESCAP-WMO partnership to cover the high disaster risk and under-served Pacific sub-region in line with the joint ESCAP/WMO work of the Typhoon Committee and Panel on Tropical Cyclones.</p>
Tehran, Islamic Republic of Iran	5-6 November 2018	<p>Represented ESCAP at the Expert Consultation Meeting on Regional Cooperation for Building Resilience to Slow-Onset Disasters and Information Management for Cross-border Disasters in Asia and the Pacific.</p> <p><u>Main outcome:</u> The meeting was an important opportunity to showcase the Fund’s past and current work in the Makran region as well as its ongoing efforts in the area of multi-hazard early warning for coastal hazards.</p>
Chiang Mai, Thailand	11 November 2018	<p>Represented ESCAP at the 17<sup>th</sup> Integrated Workshop “Technological innovation for typhoon related forecasting and disaster risk reduction” of the ESCAP/WMO Typhoon Committee.</p> <p><u>Main outcome:</u> Strengthened awareness of the Trust Fund among TC member States and on current Trust Fund strategy, particularly on its focus on technology innovations for multi-hazard early warning systems. Enhanced visibility of Trust Fund’s ongoing work in the implementation of synergized standard operating procedures for coastal multi-hazard early warning systems (SSOP-II project).</p>
Kish Island, Islamic Republic of Iran	9-12 March 2019 (remote participation)	<p>Represented ESCAP at the meeting of the ICG/IOTWMS North West Indian Ocean Working Group and presented past and future work of the Trust Fund in the Makran region.</p> <p><u>Main outcome:</u> Inception meeting for newly approved Trust Fund project TTF-29 “Building Knowledge and Awareness to Enhance Tsunami Preparedness in Indian Ocean Coastal Communities”.</p>
Buenos Aires, Argentina	18-22 March	<p>Represented Trust Fund at Second High-level United Nations Conference on South-South Cooperation (BAPA+40 Conference) and organized dedicated side event on contributions of Trust Fund to South-South cooperation.</p>

		<u>Main outcome:</u> The side event gave visibility to the experience of Asia and the Pacific in early warning, including the Fund. Linkages were also built with partners involved in multi-hazard early warning.
Bangkok, Thailand	8-9 July 2019	Represented ESCAP at Consultation Workshop "Preparing synergized standard operating procedures for multi-hazards early warning systems". Participation gave ESCAP the opportunity to monitor the ongoing project TTF-28. <u>Main outcome:</u> Linkages were built with partners involved in multi-hazard early warning in Thailand.
Singapore	22-23 August 2019	Represented ESCAP and promoted Trust Fund at Roundtable on "Maritime Sector Strategies to Augment Tsunami Monitoring with Economic, Safety and Environmental Co-benefits". <u>Main outcome:</u> Exploration of new field of work for the Trust Fund in line with adopted strategy through application of innovative science and technology solutions.
Muscat, Oman	1-5 September 2019	Represented ESCAP at expert meeting and high-level conference on tsunamis in the Makran region. Participation gave ESCAP the opportunity to monitor the ongoing project TTF-29. <u>Main outcome:</u> Formulation of a strategy for regional cooperation to develop a regional tsunami hazard assessment for the Makran region.
Bangkok, Thailand	3 October 2019	Co-organized an information event on Trust Fund with the Government of Thailand at the Ministry of Foreign Affairs of Thailand. Event highlighted linkages between disaster risk reduction and climate change. <u>Main outcome:</u> The event gave visibility to the experience of Asia and the Pacific in early warning, including the Fund. Linkages were also built with partners involved in multi-hazard early warning.

# ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness

The ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness was established in 2005 to support tsunami early warning through a multi-hazard, regional approach.

In 2010, the scope of the Fund was broadened to include disaster and climate preparedness. The Fund's focus remains on end-to-end early warning for coastal hazards such as tsunamis, tropical cyclones, storm surges and coastal zone flooding.

The fund covers ESCAP member States in the Indian Ocean, Southeast Asia and the Pacific.

## Purpose

To contribute to more resilient coastal communities, and ultimately to help save lives and reduce loss and damage from disasters.

## Objective

To build and enhance tsunami, disaster and climate preparedness capacities for early warning for coastal hazards.

The Fund focuses on strategic approaches that build on ESCAP's comparative advantages as a convener of **regional cooperation**. In line with the role of ESCAP, the Fund supports projects and activities that can facilitate:

- Strengthening of regional institutions dealing with early warning.
- Enhancement of regional cooperation for early warning through data sharing, joint standards, resource sharing arrangements and effective networks.
- Sharing of knowledge and good practices.

At the **national level**, the Fund focuses on policy and institutional strengthening in countries facing high-risk and low capacity. In projects targeting specific national capacities, the Fund applies South-South approaches to enhance cooperation between countries covered by the Fund and tap into the existing capacities in the region.

## ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness

United Nations Building  
Rajadamnern Nok Avenue  
Bangkok 10200, Thailand

Telephone: +66 (0)2 288 1234  
Facsimile: +66 (0)2 288 3012  
E-mail: [escap-drs@un.org](mailto:escap-drs@un.org)  
Website: [www.unescap.org/disaster-preparedness-fund](http://www.unescap.org/disaster-preparedness-fund)