

Letter of Agreement

No. 2012-0018

between

the United Nations Economic and Social Commission for Asia and the Pacific

and

Typhoon Committee

This Agreement is made between the United Nations Economic and Social Commission for Asia and Pacific, having its headquarters in Bangkok, Thailand (hereinafter referred to as "ESCAP") and the Typhoon Committee (TC). The Typhoon Committee is an intergovernmental body established in 1968 under the joint auspices of the United Nations Economic Commission for Asia and the Far East-UNECAP and the World Meteorological Organization (WMO) with later this Commission was re-designated as ESCAP (hereinafter referred to as the "Partner Institution"). The ESCAP and the Partner Institution are individually and collectively hereinafter referred to as the "Party" and the "Parties".

Whereas ESCAP is responsible for promoting economic and social development in the Asian and Pacific region,

Whereas ESCAP has been entrusted by its donors with certain resources that can be allocated for programmes and projects, and is accountable to its donors for the proper management of these funds and can, in accordance with the Financial Regulations and Rules of the United Nations, make available such resources for cooperation in the form of a project, and

Whereas the Partner Institution has a mandate to promote and coordinate the planning and implementation of measures required for minimizing the loss of life and material damage caused by typhoons in ECAFE region, and has agreed to implement the activities set forth in this Agreement to support the implementation of the project entitled "Synergized Standard Operating Procedures for coastal multi-hazards Early Warning System." (hereinafter referred to as the "Project") as described in the Terms of Reference attached hereto, without discrimination, direct or indirect, because of race, ethnicity, religion or creed, nationality or political belief, gender, disability or any circumstances,

Now therefore, on the basis of mutual trust and in a spirit of cooperation, ESCAP and the Partner Institution have entered into this Agreement.

Article I

Objective and scope of the Agreement

1. This document, the Terms of Reference of the Project activities (the "TOR") attached hereto as Annex I, including the budget for the Project activities therein and the Standard Terms and Conditions for Partner Institutions attached hereto as Annex II and all other document(s) agreed to between the Parties (collectively referred to as the "Agreement") set forth the terms and conditions of the cooperation between the Parties in all aspects of achieving the objectives of the Project activities described in the TOR.



2. This Agreement constitutes the entire agreement between the Parties on this subject matter. Any previous agreement, understanding, negotiation, representation or warranty on this subject matter ceases to have any effect.

Article II

Duration of the Agreement

1. The term of this Agreement shall commence upon signature of this Agreement and terminate on 31 July 2014 (the "Expiration Date"), unless otherwise agreed under Article II, paragraph 2 below or the Agreement is terminated in accordance with the terms hereunder. The Partner Institution shall implement the Project activities in accordance with the time-frame in the TOR. The time-frame to implement the Project activities shall in no circumstances go beyond the Expiration Date.
2. Should it become evident to the Partner Institution or ESCAP during the implementation of the Project activities described in the TOR that an extension beyond the Expiration Date will be necessary to achieve the objectives of the Project activities described in the TOR, that Party shall, without delay, so inform the other Party. Any extension shall be agreed to in writing by both Parties. Upon agreement by the Parties of a new Expiration Date, the Parties shall conclude an amendment to this effect.

Article III

Financial and Operational Arrangements

1. In accordance with the budget as detailed in the TOR, ESCAP has allocated and shall make available to the Partner Institution funds in United States Dollars up to the maximum of US\$457,000 (Four hundred and fifty seven thousand United States dollars) (hereinafter referred to as the "Funds").
2. ESCAP shall make payments upon satisfactory performance of the Project activities described in the TOR and submission by the Partner Institution and acceptance by ESCAP of agreed upon documentation showing satisfactory management and use of the Funds.
3. The Funds will be paid by bank transfer as follows:

Bank Account Title:	ESCAP/WMO Typhoon Committee Secretariat/TCS-ESCAP EWS Project
Bank Account Number:	A/C No. 9010575678
Bank Name:	Banco Nacional Ultramarino, S.A.
Bank Address:	Avenida Almeida Ribeiro, No. 22/P. O. Box 465, Macao, China
Currency of Account:	US dollars
Swift code:	BNULMOMX

Article IV Notices

1. Any notices required to be given by either Party under the Agreement shall be given in writing, shall be deemed given when actually received by the other Party and shall be conveyed via first class mail, postage prepaid, or via private courier, facsimile or electronic mail as instructed in this Agreement.
2. Any notice required to be given by either Party under this Agreement shall be given as follows:

To ESCAP:

Director, Division of Administration
ESCAP
United Nations Building
Rajadamnern Nok Avenue
Bangkok 10200 Thailand
Fax: (662) 288 3029

With copies to:

Director, Information and Communications
Technology and Disaster Risk Reduction
Division
ESCAP
United Nations Building
Rajadamnern Nok Avenue
Bangkok 10200 Thailand
Fax: (+662) 288 3012

If to the partner institution:

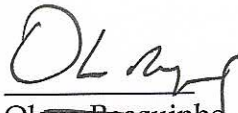
Secretary
Typhoon Committee
Typhoon Committee Secretariat
Avenida de 5 de Outubro,
Coloane-Macau, China
Fax: +853 8801 0530

IN WITNESS WHEREOF, the undersigned duly authorized representatives of the Partner Institution and ESCAP have signed this Agreement in two original copies, each in the English language at the place and on the day below written:

For ESCAP
United Nations Economic and Social
Commission for Asia and the Pacific

Signature: _____
Name: Peter Van Laere
Title: Director
Division of Administration

For Typhoon Committee

Signature: 
Name: Olavo Rasquinha
Title: Secretary of Typhoon Committee

Place: Bangkok, Thailand

Place: Macau, China

Date: 1 AUG 2012

Date: 1 AUG 2012

Annex I
Terms of Reference / Work Plan and Budget



ESCAP Trust Fund for Tsunami, Disaster and
Climate Preparedness in Indian Ocean and
Southeast Asian Countries

A. Overview

1	ORGANIZATION SUBMITTING PROPOSAL	ESCAP/WMO Typhoon Committee (TC) Secretariat
2	FOCAL POINT AT ORGANIZATION AND RELEVANT CONTACT INFORMATION	<p>Mr. Olavo Rasquinho Secretary of Typhoon Committee Avenida de 5 de Outubro, Coloane-Macau, China Tel: +853 88010531; Fax: +853 8801 0530 Email: Olavo@typhooncommittee.org info@Typhooncommittee.org</p> <p>Mr. Qamar UzZaman Chaudhry PR of Pakistan with WMO and Secretary of PTC Sector H8/2, Islamabad, PAKISTAN Tel: +925 1925 0367(c) +923 3351 41337 Fax: +925 1925 0368 Email: PTC.sectt@yahoo.com advisorclimate@gmail.com dgmetpak@hotmail.com</p>
3	PROJECT TITLE	Synergized Standard Operating Procedures for Coastal Multi-Hazards Early Warning System
4	BENEFICIARY COUNTRIES	Countries in TC and PTC region: Bangladesh; Cambodia; China; India; Lao PDR*; Malaysia; Maldives; Myanmar; Pakistan; Philippines; Sri Lanka; Thailand and Viet Nam.
5	TARGET GROUP(S)	<ul style="list-style-type: none"> • National Meteorological and Hydrological Services (NMHSs) / National Tsunami Warning Centres (NTWCs) • National Disaster Management Offices (NDMOs) • Government sectoral agencies
6	TIME FRAME	24 months
7	TOTAL BUDGET (US\$) AND BREAKDOWN OF FUNDING SOURCES	ESCAP Trust Fund: US\$ 457,000

** In spite of the fact that Lao PDR is land-locked country, it belongs to Typhoon Committee and it is prone to typhoon-related hazards. It can benefit from this project.*

Executive Summary

Many of the countries surrounding the Indian Ocean as well as Southeast Asian countries have developed standard Operating Procedures (SOP) for tsunami early warning systems. However, most of them do not have operational experience in handling a combination of tsunami and other coastal hazard early warning systems (EWS). The challenge faced by warning providers, media, disaster managers, and coastal communities is in understanding the similarities and differences among different coastal hazards and the characteristics of the early warnings that are issued.

ESCAP/WMO Typhoon Committee (TC) and WMO/ESCAP Panel on Tropical Cyclones (PTC) in cooperation with Asian Disaster Reduction Center (ADRC) and Intergovernmental Oceanographic Commission (IOC) of UNESCO recognized that there is a strong need to create synergies among different types of coastal hazard early warnings, including for tsunami, storm surge, high tide, high wave, strong wind, flood and sediment disasters by reviewing the relevant existing SOPs. These synergies can be achieved through identifying specific gaps and needs for making the existing EWSs fully operational for the use in multi-hazards context.

The project will be conducted by collecting information on the performance status of coastal multi-hazard EWS from the Members of TC and PTC, and by studying good practices of more advanced countries in this regard. Based on the analysis and synergizing of the existing SOPs for coastal multi-hazard EWS, the project will develop a Manual/Handbook of Synergized Standard Operating Procedures for Coastal Multi-hazard Early Warning Systems.

The proposal will be mainly focused on the meteorological and hydrological services for affected areas which become more vulnerable to natural disasters after tsunami and other coastal disasters. The synergized SOPs should be easier understandable and interpretable for decision makers, forecasters and dwellers, like fishermen. The project will also conduct a workshop and training courses for strengthening the capacity on performance of coastal multi-hazard early warning, and send expert missions to the countries in need to provide future assistance. This project will emphasize South-South cooperation.

B. Needs Assessment

It has been pointed out in the *2011 Report on Regional Unmet Needs for Early Warning Systems in the Indian Ocean and Southeast Asia* that, coupled with the predicted effects of climate change, the Asia-Pacific region is already the most disaster prone region in the world which is seriously affected by many types of natural disasters. Also the report indicated that, an end-to-end disaster early warning system (EWS) should be a fundamental component of all nations' disaster risk reduction (DRR) strategies, enabling governments from the national to the local levels, as well as communities themselves, to take appropriate actions to reduce both the loss of lives and livelihoods in anticipation of a disaster.

It is known that, two of the five priorities of Hyogo Framework for Action (HFA) 2005-2015 emphasized the importance of EWS and public awareness. Accordingly, the second priority for action is to identify, assess and monitor disaster risks and enhance early warning. Under this, there are four key components that should be addressed:

- strengthening national and local risk assessments;
- establishing institutional and community capacities for effective early warning;
- developing and sustaining technical infrastructure and information management capacities for effective data collection and hazard analysis; and
- building cooperation mechanisms for analysing regional and emerging risks.

The third priority for action is to use knowledge, innovation and education to build a culture of safety and resilience at all levels. Under this, there are four key components which should be addressed:

- strengthening networks and mechanisms for information management and exchange;
- promoting inclusion of risk reduction in school and community education and training;
- furthering research into risk and hazard analysis and cost-benefit analysis for risk reduction actions; and
- promoting public awareness to engage media and community interest.

Since the December 2004 Indian Ocean Tsunami, many countries in Asia, which most of them are located in the region covered by ESCAP/WMO Typhoon Committee (TC) and WMO/ESCAP Panel on Tropical Cyclones (PTC), especially southern countries, developed national tsunami warning systems supported by regional tsunami warning information services provided by Japan and the United States (Pacific Ocean) and Australia, India and Indonesia (Indian Ocean) under the coordination of the Intergovernmental Oceanographic Commission (IOC) of UNESCO.

Due to low frequency of tsunami, however, there have been concerns over the continuity of such national level tsunami warning systems by themselves in less developed countries. In fact, no country except Indonesia and Japan in the region has been significantly affected by tsunami since the 2004 Sumatra Tsunami, and many countries might have been less interested in maintaining the tsunami warning system in operation. Thus, the debate was funnelled down to develop a coastal multi-hazard warning system which would be more sustainable in operation for a long time.

A more frequent coastal inundation is storm surge mainly caused by tropical cyclones. There are similarities and differences in these two hazards, and a multi-hazard early warning system must capture those for operational purposes as standard Operating Procedures (SOPs).

Storm surges caused by tropical cyclones have a longer lead time in general than tsunamis, but the duration of inundation is longer, especially for slow moving tropical cyclones. Forecasting storm surges are much easier and dependable than tsunamis because there is no earthquake early warning system. Such differences in the issuance of warning by providers such as meteorological agencies will need to be understood at the operational level. Any confusion or misunderstanding in this regard would be fatal. SOPs will need to be well developed as a bible for the warning providers as well as media and disaster managers so that general public could take an appropriate action during the warning.

There are a few significant challenges. First, early warning providers for tsunami could be different from storm surge in some countries. The challenge is to develop a good communication system between the two. A comprehensive review on multi-hazard early warning system SOPs needs to be taken. It is important to analyze whether such SOPs are realistic in terms of human and financial resources. Second, media needs to be well informed and educated when disseminating warning based on its own SOPs. Third, NDMOs and local communities need to have SOPs for taking action depending on hazard types (preparedness and evacuation components).

The current baseline is that the operational preparedness for tsunami event response is adequate in only some countries, and not all. Toward these ends, the Project proposes to take advantage of country expertise to share its knowledge, experience, and good practice with other countries. At the regional level, IOC and WMO supported by ESCAP would need to enhance coordination too.

The gaps and needs in the countries in TC and PTC regions can be summarized as follows:

- need of multi-hazard early warning system, including tsunami and other coastal hazards such as tropical cyclones, storm surge, flood, inundation, sediment disasters, etc.
- lack of operational experience with Standard Operating Procedures (SOPs) in handling a multi-hazard EWS.

- gaps in understanding of the similarities and differences among different coastal hazards' SOPs of early warning. It is very important for decision makers, forecasters and dwellers in the region to take right measures for disaster risk reduction.
- a strong need to create synergies in the different phases in early warning system, including dissemination and response to warning, so that the potential affected people can have more time to consider taking necessary self-measures to save their lives and properties, especially fishermen in the coastal area.

In this context, a need of conducting comprehensive review on SOPs for a multi-hazard early warning system was identified in the following areas:

- (1) Hazard risk assessment;
- (2) Monitoring and detection of hazards;
- (3) Dissemination of warning;
- (4) Action and preparedness; and
- (5) Coordination between them at the national level and regional level.

In view of the above-mentioned necessity, gaps and challenges, the objective of the proposed project is supposed to empower:

- capacity building for warning providers as the first priority of the proposed project, mainly focusing on the aspect of hydro-meteorological service for multi-coastal hazards early warning, including the methodology and skills, data and experience sharing, etc.;
- government officials who would be handling various coastal hazard forecasts and warnings and disaster managers at the national level;
- media who would be disseminating such information to the public;
- local disaster managers who would issue evacuation orders; and
- community leaders and dwellers, including fishermen, in coastal areas of southern Asia, specifically for those countries belonging to the Panel on Tropical Cyclones and Typhoon Committee.

This project is proposed to be conducted by inter-government organizations ESCAP/WMO Typhoon Committee (TC) and WMO/ESCAP Panel on Tropical Cyclones (PTC) in cooperation with Asian Disaster Reduction Center (ADRC) and Intergovernmental Oceanographic Commission (IOC) of UNESCO. Considering the missions and advantages of TC and PTC on their functions, networks of the Membership and experiences and results on tropical cyclone achieved in the past years, the approach to the objective might be mainly considered on improving the Standard Operating Procedures (SOPs) of related multi-hazard early warning, mainly focusing on the meteorological and hydrological services for affected areas which become more vulnerable to natural disasters after tsunami and other coastal hazards.

The TC and PTC region is the most vulnerable and prone area to the risk of tsunami, storm surge and other coastal hazards. In fact, the most Members of TC and PTC are developing and/or less developed countries located in this region. The main objective of the proposed project is supposed to promote the capacity building and to enhance the cooperation among the Member countries of TC and PTC. The advantage technologies and existing capacity are expected to be transferred from north countries to south countries under the network and platform of TC and PTC. Thailand, as the common Member of two regional bodies, will play very important role in the implementation of the project.

C. Problem Analysis

TC and PTC have their integrated workshop, working group meetings, training courses and annual session every year, separately. The participants normally consist of representatives from National Meteorological and Hydrological Services (NMHSs) and National Disaster Management Offices

(NDMOs) of the TC/PCT Members; the Economic and Social Commission for Asia and the Pacific (ESCAP); the World Meteorological Organization (WMO); and observers from Russia–Institute of Experimental Meteorology Scientific & Production Association “Typhoon”; Asian Disaster Reduction Center (ADRC); Asian Disaster Preparedness Center (ADPC); Thailand–Regional Integrated Multi-Hazard Early Warning System and Indonesian Agency for Meteorology Climatology and Geophysics (BMKG).

These meetings usually involve in-depth discussions on how to generate warning information and technical cooperation for typhoon-related hazards, such as large waves, storm surges, high tide, strong wind, flood, and other natural hazards experienced in coastal areas to meet the diverse needs from different customers, and how to deliver and disseminate warning information to decision-makers and communities at-risk to assist during emergencies. One of the key recommendations of these meetings is to review early warning system performance, receive user feedback, and identify problems and actions needed among Members of TC and PTC.

The expert from Hong Kong Observatory (HKO), one of TC Members, joined the Mission of World Bank in 2009 for EWS assessment in Vietnam and perceived the following observations as weaknesses or gaps, some of which probably exist in other TC and PTC Members, that require attention in the implementation of EWS-related initiatives:

- (1) poor awareness of warnings and alerts by users and recipients;
- (2) inadequate observational networks and outdated systems;
- (3) lack of usage of satellite/radar data for rainfall estimates;
- (4) under-usage of global NWP data;
- (5) extensive human resources and training needs, especially for forecasting and other technical support staff and at the regional/provincial levels;
- (6) lack of hydrological modelling capacity;
- (7) power supply susceptibility during inclement weather situation;
- (8) un-coordinated reservoir management for flood control;
- (9) lack of scenario information for risk management purpose;
- (10) communication gaps between provinces and communes; and
- (11) lack of or insufficient collaboration with academic institutes in leveraging resources for training and research support.

The Seventh TCP/JCOMM Workshop on Storm Surge and Wave Forecasting was co-organized in Macao, China from 10 to 14 October 2011 by WMO and ESCAP/WMO TC. The Workshop was attended by 29 participants mainly from the countries in TC and PTC including China; Malaysia; Thailand; Philippines; Timor Leste and Socialist Republic of Viet Nam. At the workshop, it had a session on the future cooperation/collaboration of the Storm Surge Warning Service (SSWS) with the UFRM to discuss how to improve the SSWS to meet the needs of various users and how to enhance the cooperation/collaboration of SSWS with UFRM. The outcome of the discussion indicated that the countries in TC and PTC region have great needs on coastal multi-hazard early warning, including:

- (1) to improve the operational SSW products to be understandable, reliable, deliverable;
- (2) to promote the capacity building on SSW technique in Members;
- (3) to enhance the cooperation among different agencies: meteorology, hydrology and DRR;
- (4) to have better understanding among decision maker, researcher, operational and public;
- (5) to enhance the public education and awareness on SSW for action in emergency cases; and
- (6) to link UFRM with the project on Inundation Mapping launched by WMO.

D. Target Group

TC and PTC comprise of focal points from three relevant agencies (meteorology, hydrology and disaster risk reduction) namely the National Meteorological and Hydrological Services (NMHSs) and National Disaster Management Offices (NDMOs). NMHSs are the institutions in the countries which issue the warning information, and NDMOs are the institutions in the countries which make decisions for preparedness and risk reduction measures, disseminating warning information and emergency response. NMHSs/NDMOs have close relations with National Tsunami Warning Centres (NTWCs) in charge of the tsunami and other coastal disasters prevention and reduction. For example, the scientific lecture of Japan Meteorology Administration (JMA) could be good resource to know how NMHSs should provide their services for higher risks of typhoons, storm surges and heavy rainfalls in the damaged areas in the context of "multi hazard" risk management.

The National Tsunami Warning Centres (NTWCs) represent the Tsunami Warning Focal Points in each country and some of these are also NMHS. In general, the NTWCs are responsible for issuing warnings to the NDMO and the NDMOs coordinate emergency response, although there are some exceptions to this.

The proposed project would influence the following capacity building in the southern counties of TC and PTC (target group):

- human resources capacity-building by technical transfer and training;
- the policy on emergency response to coastal hazard early warning;
- the policy on collaboration among multi-agencies related to the hazard-reduction;
- the policy on data/information sharing;
- the cooperation mechanism on multi-coastal hazard EW and risk reduction between TC and PTC.

The project will be implemented based on the cooperation of NMHSs, NDMOs and NTWCs. These organizations will be closely linked together for better performance of SOP for coastal multi-hazard EWS. The Manual/Handbook of Synergized Standard Operating Procedures for Coastal Multi-Hazards Early Warning System will be distributed to these institutions. Therefore, the capacity on coastal multi-hazard EWS is targeted for the following countries: Bangladesh; Cambodia; China; India; Malaysia; Maldives; Myanmar; Pakistan; Philippines; Sri Lanka; Thailand and Viet Nam. Lao PDR, despite being a landlocked country can also benefit from this project.

E. Project Strategy

An EWS is not just about accurate and timely forecasts and warnings. A comprehensive well-structured EWS should contain the following three key components:

- **Issuance of warnings** -- adequate and reliable observational data in real time, with timely updated forecasts and warnings based on sound scientific analyses (often, for weather-related disasters in particular, the responsibility rests with the national meteorological services);
- **Interpretation of warnings** -- good understanding of the risk and vulnerability over a certain target region under different natural disaster scenarios (requiring scientific expertise in specialized fields with substantial LOCAL knowledge, e.g. hydrological assessment for flood forecasting given the varying intensity and distribution of rainfall over a river basin or catchment area); and
- **Communication of warnings** -- efficient information flow, an operation increasingly automated through the use of computers and information technology, between forecasters and key decision-makers, among stakeholders and operational units, as well as to user communities at risk (in most cases coordinated by a body comprising government departments, emergency response agencies and NGOs).

Underpinning all three key components is the human resources and capacity required in developing, operating and maintaining the EWS.

The Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) and ESCAP/WMO Typhoon Committee have been defining the standards for SOPs and instrumentation for their respective areas of jurisdiction, and have been implemented in many of the countries. However the coordination for a multi-hazard warning system as intended in the proposal needs further streamlining among these groups and at the respective national levels.

A further finding of the IOC exercises was that more and regular practice at all levels and including all stakeholders and including real-time dissemination methods and protocols, is required if we are to achieve successful early tsunami warning.

Stated thus, in addressing the problem referred to in Section B, the proposed project is expected to take the overall strategy as:

- to be coordinated and conducted under the network and cooperation platform under Typhoon Committee (TC) and Panel on Tropical Cyclones (PTC) in cooperation with their Members so that the project will build a cooperation mechanism on coastal multi-hazard EWS for target countries as a communication platform.
- to mainly focus on the meteorological and hydrological services for affected areas which become more vulnerable to natural disasters after tsunami and other coastal disasters.
- to demonstrate the performance of standard Operating Procedures (SOP) for coastal multi-hazard early warning system for target countries.
- to take the manual/handbook of synergized SOP as integrated hydro-meteorological approach to coastal multi-hazard early warning in target countries, mainly focusing on the hydro-meteorological aspect to meet the needs of diverse users, like decision makers, early warning issuers, media, researchers, operational, public, including fishermen at community-level, and accordingly assist in improving their early warning techniques.
- to train the users for target countries on the interpretation of warning information and the performance of SOPs .

The existing capacity and experience on Tsunami and other coastal hazards EWS in Members of TC and PTC could be applied in the proposed project, such as:

- China Meteorological Administration (CMA) and Shanghai Municipal Government (SMG) jointly support the WMO demonstration project named the Shanghai Multi-Hazard Early Warning System (MHEWS) with 'Multi-agency Response' as the core. The project integrates diversified advanced technologies into a multi-hazard warning process advancing greater multi-agency coordination and cooperation through a multi-link communication platform with responsible emergency response and rescue agencies. This platform is the primary mechanism for information exchange for Shanghai's urban emergency prevention and mitigation system.
- In Thailand, Tsunami Early Warning (TEW) has been established under the National Disaster Warning Center (NDWC). NDWC acts as the center coordinating with other governmental agencies. NDWC has responsibility to make decisions, announce all warnings, and evacuate people in risk areas. The Thai Meteorological Department (TMD) is a governmental organization responsible for monitoring, analyzing, and warning all natural hazards related including earthquake information and Tsunami warning. Thailand made remarkable progresses in setting up TEW under NDWC, upgrading and expanding seismic stations, sea-level stations, and installing the warning towers in critical areas along the beaches in the Andaman coast line. All systems are reliable and compatible to the National, Regional and Global warning systems.
- Hong Kong SAR Government of China published the guidelines with the information relating to the storm surge warning and tsunami warning. And Hong Kong Observatory (HKO) also

issued precautionary announcements advising the public to stay away from shoreline in the case of rough seas and swell during tropical cyclone situations.

- India developed its National Tsunami Early Warning System built entirely using geospatial technologies to provide early warnings for tsunami and coastal hazard mitigation. The system has all the necessary computational and communication infrastructure in place that enables reception of real-time data from all the sensors, analysis of the data, generation and dissemination of warnings following a standard operating procedure using an application software developed for this procedure around GIS technology. The software solution built entirely using GIS techniques enables operations such as (i) display of geographic locations of seismic sensors, tide gauges, bottom pressure sensors, (ii) retrieve real-time data, (iii) online plotting, (iv) overlay tsunami travel times by picking up the right scenario from the database, (v) warning generation and dissemination, (vi) system monitoring, administration, back up, data retrieval and play back.
- In Pakistan, the project on Strengthening Tsunami Early Warning System was conducted on 2009. The specific areas of intervention are as: (1) establish and strengthen institutional arrangements for coastal hazards in Pakistan; (2) develop tsunami and sea-level related hazard Early Warning System; and (3) initiate pilot community and local level risk reduction arrangements.

F. Results Framework

- **Goal (positive impact)**

The longer term goal of the Project is to promote the coastal community resilience to coastal multi-hazards through having standard operating procedures for effective Multi-hazards EWS so that improving the policy and institutional arrangements at national and community levels.

- **Outcomes**

Expected Outcome 1: Integrated standard Operating Procedures (SOPs) for coastal Multi-hazard EWS for TC and PTC Members

Activity 1: *Reviewing and synergizing the existing standard Operating Procedures (SOP) for coastal multi-hazard EWS in the Members of TC and PTC and developing the Manual/Handbook of Synergized SOPs for Coastal Multi-Hazards EWS*

- 1.1 Conducting Workshop for collecting and exchanging the performance status of coastal multi-hazard EWS in the Members of TC and PTC at high risk

Indicator: needs and unmet gaps of SOPs for EWS in the selected target countries are identified

- 1.2 Piloting in selected countries, focusing on institutional capacity building and extending where applicable downstream in a Condition Based Risk Management (CBRM) approach (facilitated by regional and international experts).

Indicator: 2-3 countries with multi-visits

- 1.3 Synergizing the existing SOPs to compile a Manual/Handbook of Synergized Standard Operating Procedures for Coastal Multi-Hazards Early Warning Systems, mainly focusing on the hydro-meteorological aspect, to meet the needs of diverse users, like decision makers, early warning issuers, media, researchers, operational, public, including fishermen at community-level.

Indicator: distributed Manual/Handbook to TC/PTC Members

Expected Outcome 2: Promoted capacity on performance of SOP for coastal multi-hazard EWS in Members of TC and PTC

Activity 2: *Enhancing the capacity building on performance of SOP for coastal multi-hazard EWS in Members of TC and PTC*

2.1 Conducting Training of users in the interpretation of EWS products for decision-making, media, etc.

Indicator: about 50 decision-makers, disaster managers, media professionals and warning issuers from target countries are trained.

2.2 Conducting working meeting on building a cooperation mechanism between TC and PTC for coastal multi-hazard EW information sharing and technical transferring for target countries.

Indicator: about 20 participants from the target countries as focal points of cooperation mechanism joined the meeting.

- **Outputs**

Main output 1: Manual/Handbook of Synergized Standard Operating Procedures for Coastal Multi-Hazards Early Warning System, mainly focusing on the hydro-meteorological service, including SOPs related to warning providers, disaster managers, media and fishermen.

Main output 2: Regular communication and cooperation mechanism between TC and PTC on coastal multi-hazard early warning, particularly southern countries in the region

G. Contribution to Regional Coordination and Cooperation

Most of the Members of TC and PTC are located the Indian Ocean and Southeast Asian region and suffered from coastal hazards. As mentioned above, TC and PTC are comprised of focal points from NMHSs and NDMOs of the member countries in a close relationship with NTWCs. Through the mechanism and network of TC and PTC activities, the proposed project will definitely contribute to regional coordination and cooperation toward the functioning of a regional EWS for coastal hazards:

- Secretariat of TC and PTC provides the coordination and invitations to regional sharing/training events and follows this up to facilitate cooperation (and regional synergy of protocols and process) and development of common guidance.
- International, regional, and national experts provide the training. For the target group, based on experience in the subject, trainers might be from neighboring countries, the region, or international. When ideal, a trainer from a neighboring country sharing the same hazard can be teamed with a regional and/or international expert in the spirit of South-South cooperation. As more national and regional trainers team with international experts are cadre of region-based trainers is built, and would be much more sustainable (cost-wise). International experts would play the role of best practice sharing from outside-region and also encourage consistency globally or at least regionally.
- Organizations and countries in the region could be expected to build the ownership and commitment to work together so that the information and achievements of various similar Projects could be shared.
- Many of the ADRC members are located around the Indian Ocean and in Southeast Asian region. After the 3.11 Earthquake and Tsunami, ADRC, with Japanese Cabinet Office, Japan International Cooperation Agency (JICA) and ESCAP, organized two Expert Group Meetings on the Great East Japan Earthquake and Tsunami Disaster and shared their experiences among participants from the Indian Ocean and Southeast Asian region. This is a continuous effort and the third meeting will be held on July 2012. The discussion points will be provided to the implementation of this TC project. It is crucial

for ADRC and its members to enhance the project output so that the issues raised in the project will be taken up at the next Asian Conference on Disaster Reduction for further and continuous understanding and through ADRC's regular activities.

- Asian Disaster Preparedness Center (ADPC) in association with Global Alliance on Accessible Technologies for Environment (GAATES) will be undertaking a similar activities named *Technical assistance for enhancing the capacity of end-to-end multi-hazard Early Warning Systems (EWS) for coastal hazards in Myanmar, Sri Lanka and Philippines* by using ESCAP funding and ADPC will explore the possibility of organizing regional events with the participation of such country partners in order to share their experience with project target countries and to discuss the potential challenges and strategies for addressing them. The beneficiary countries of the ADPC project are members of the TC (Philippines) and PTC (Myanmar and Sri Lanka), which can facilitate the realization of joint training activities to be undertaken under both projects. Also experts from ADPC are expected to collaborate in missions and training activities related to the TC/PTC project.
- The Asia-Pacific Broadcasting Union (ABU) will conduct the project named *ABU Disaster Risk Reduction Broadcast Media initiative* aims to facilitate improvement of institutional (broadcasters and government nodal offices), national and regional coordination and information exchange for establishing and maintaining reliable SOPs, which incorporate national EWBSs. The project addresses two key aspects - how timely, reliably and accurately warnings could be delivered through EWBSs and how to improve national SOPs. The TC/PTC project, under the guidance of WMO, will contribute to the implementation of the Common Alerting Protocol, which provides a simple and general format for emergency alerting to the media, for large number of hazards. The ABU project can benefit from the progress achieved in this field, under the TC/PTC project.

H. Gender Issues

As the main outputs of the proposed project, the Manual/Handbook of Synergized SOP for Coastal Multi-Hazards EWS and the communication mechanism between TC and PTC on coastal multi-hazard early warning will benefit all population of Members of TC and PTC including women, children, elderly, disabled and other vulnerable groups.

The training to be conducted by the proposed project on how to make the coastal multi-hazard EWS better perform decision-makers, warning issuers, media and public will also incorporate gender dimensions.

TC will enhance sustainability of the gender-related project activities by integrating them into its on-going and future female training programmes in line with its annual strategic goals.

I. Partners

The project partners, namely the UNESCAP/WMO Typhoon Committee (TC), The WMO/ESCAP Panel on Tropical Cyclones (PTC) for the Bay of Bengal and Arabian, Asian Disaster Reduction Center (ADRC) and Intergovernmental Oceanographic Commission (IOC) of UNESCO have been assisting the member countries to address the above-mentioned concerns, challenges and needs. TC, PTC, ADRC and IOC of UNESCO have been providing technical support as below.

TC and PTC country focal agencies (NMHS, NDMO) already engaged in these issues and would be central to the process. The international organization and regional agencies, such as IOC/UNESCO, WMO, ESCAP, ADRC and Regional Integrated Multi-Hazard Early Warning System (RIMES), and the national departments such as NMHSs and NDMOs of TC and PTC Members will be involved in

the implementation of the project. Expertise and existing research achievements, and information on coastal multi-hazard EWS are expected from these partners:

1) UNESCAP/WMO Typhoon Committee (TC)

The UNESCAP/WMO Typhoon Committee (TC) was founded in 1968 under the auspices of Economic and Social Commission for Asia and the Pacific (ESCAP) and the World Meteorological Organization (WMO) in order to promote and coordinate the planning and implementation of measures required for minimizing the loss of life and material damage caused by typhoons. It is currently composed of 14 Members: Cambodia; China; DPR of Korea; Hong Kong, China; Japan; Lao PDR; Macao, China; Malaysia; Philippines; Republic of Korea; Singapore; Thailand; United States of America and Vietnam.

TC has very effective and efficient structure to support its cooperative mechanisms on coastal disaster risk reduction. TC has its Secretariat with meteorologist, hydrologist and disaster risk reduction expert. TC has leaderships and focal points for each working groups in its Members. This network ensures TC cooperative mechanisms.

All TC members can share their experience and expertise on water-related disaster reduction. Each year TC provide very good platform for its members to exchange the progresses and discuss the lessons on implementation of the Annual Operation Plan (AOPs) through TC Integrated Workshop, Annual Session and working group meetings.

As one of capacity building, Typhoon Committee accepted at its 44th Annual Session, which was held in February 2012 in Hangzhou, China, the offer of WMO Regional Training Centre, Nanjing (Nanjing University of Information Science and Technology) to serve as a training center for the Committee.

The existing capacity on disaster risk reduction (DRR) in TC Members has been strengthened through enhancing the end-to-end early warning systems, including risk assessment, monitoring, forecasting and warning, and dissemination of early warnings to people at the community level:

- Risk assessment: Identification of the impacts of the social and economic damages caused by typhoon-related disasters and more accurate and reliable information on future typhoons at the national and regional levels
- Monitoring: application of advanced technology, including satellite and radar technology, to monitor hazards more accurately with longer lead times
- Forecasting and warning: Application of the multiple-model ensemble prediction system that narrows the uncertainty of forecasting and pin-point forecasting, and gives warnings longer lead times
- Dissemination: clear, understandable warning messages to the public with advanced information communications technology, preparation of an alternative communication system, and good networking with media and national and local authorities

TC has published a number of technical reports related disaster risk reduction in past years, including:

- Typhoon Committee Disaster Information System Manual
- General Guidelines for Setting-up a Community-Based Flood Forecasting and Warning System (CBFFWS)
- Report on UN ESCAP/WMO Typhoon Committee Members Early Warning System
- Report on UN ESCAP/WMO Typhoon Committee Members Disaster Management System
- WEB GIS Based Typhoon Committee Disaster Management System Manual
- Final Report on Flood Hazard Mapping Project
- Sediment-Related Disaster Forecasting Warning System Project
- Assessment Report on Impacts of Climate Change on Tropical Cyclone Frequency and Intensity in the Typhoon Committee Region

- Report on Mountainous Flash Flood Forecast System Manual

2) WMO/ESCAP Panel on Tropical Cyclones (PTC)

The WMO/ESCAP Panel on Tropical Cyclones (PTC) for the Bay of Bengal and Arabian Sea is an inter-governmental organization officially established in 1973 as a regional body of United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) and World Meteorological Organization (WMO) and associated with the Tropical Cyclone Programme of WMO. It is composed of 8 Members: Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand.

The PTC aims to improve and coordinate programmes and measures of disaster prevention in the North Indian Ocean rim countries and reduce the loss of lives and properties caused by tropical cyclones related disasters. The PTC develops activities under three substantive components: meteorology, hydrology, and disaster prevention and preparedness (DPP), as well as in areas of training and research. The PTC has been exerting its effort to mitigate the impact of tropical cyclones in this region since its inauguration in 1973. The PTC activities are fundamental contribution to improving the regional and national resilience against the tropical cyclone threats.

3) Asian Disaster Reduction Center (ADRC)

Asian Disaster Reduction Center (ADRC) was established in Kobe, Hyogo prefecture, in 1998, with the mission to enhance disaster resilience of the member countries, to build safe communities, and to create a society where sustainable development is possible. ADRC works to build disaster resilient communities and to establish networks among countries through many programs that reduce the natural disaster risks including personnel exchanges in this field.

ADRC was established with the mission to enhance disaster resilience to build safe communities, and to create sustainable society as a regional organization in Asia. Along with 29 member countries, ADRC addresses issues regarding activities of: 1) Information Sharing; 2) Human Resources Development; 3) Building Communities Capabilities through training, drills and workshops. Through the various related activities, ADRC recognized the importance of SOP and Early Warning System relationship for better implementation with further enhancement of cooperation among NMHSs and NDMOs, and further awareness education to the public for actions to be taken.

After the Indian Ocean Tsunami, ADRC conducted various projects to enhance community risk awareness and disaster education, including:

- (1) Questionnaire surveys on tsunami risk awareness in four countries;
- (2) Community-based hazard mapping in Galle, Sri Lanka;
- (3) Evacuation training for schoolchildren in Thailand;
- (4) Disaster education program in Sri Lanka;
- (5) Disaster education program in Indonesia; and
- (6) Community-based hazard mapping for India and Bangladesh (funded by ESCAP).

ADRC also promote Global Unique Disaster IDentifier (GLIDE) Number as a tool for facilitating the sharing of disaster information archived by organizations around the world.

In this project, ADRC will

- (1) Support the coordination with NDMOs and NMHSs throughout the project.
- (2) Support the analysis and constructing synergized SOP for multi-hazard EWS.
- (3) Support providing information on lessons learnt in recent disasters such as the Great Eastern Japan Earthquake and tsunami.
- (4) Support dissemination of outputs by integrating into ADRC's normal activities and discuss the issue at the Asian Conference on Disaster Reduction.

The focal point in ADRC for implementation of the project is senior researcher Mr. Takahiro ONO. His contact information is: 1-5-2, Wakinohamakaigan-dori, Chuo-ku, Kobe 651-0073, Hyogo, Japan. Tel: +81 78 262 5540, Fax: +81 78 262 5546, email: to-ono@adrc.asia.

4) Intergovernmental Oceanographic Commission (IOC) of UNESCO

Established in 1960, the Intergovernmental Oceanographic Commission (IOC) of UNESCO promotes international cooperation and coordinates programmes in marine research, services, observation systems, hazard mitigation and capacity development in service of its [Member States](#). In addition, The Commission strives to further develop ocean governance, which necessitates strengthening the institutional capacity of Member States in marine scientific research and ocean management, including hazard assessment.

On a regional level the IOC facilitates and coordinates the development of [tsunami early warning and mitigation systems in the Pacific Ocean, the Indian Ocean, the North-Eastern Atlantic and Mediterranean, and the Caribbean](#). The Intergovernmental Coordination Groups (ICGs) for the Pacific Ocean and Indian Ocean Tsunami Warning and Mitigation Systems have 38 and 28 Member States respectively. The ICGs hold biennial sessions at which policy issues are discussed and decisions made.

IOC UNESCO has already undertaken much work in developing the tsunami warning and emergency response capacity of Indian and Pacific Ocean Member States. Through its projects, IOC has assessed the capacities, gaps and development needs of institutions involved in tsunami and other coastal hazards risk, preparedness and response. It has also developed and implemented a programme of SOP training workshops in the Indian Ocean and Southeast Asia region through an ESCAP Trust Fund grant (TTF-04).

In this project, IOC UNESCO will:

- Provide general advice on implementation of the project and the content and structure of the manual of synergised SOPs for coastal multi-hazard early warning systems.
- Provide training materials relevant to tsunami and other coastal hazards SOPs and mobilise trainers as required from its network of experienced trainers. In particular, the IOC UNESCO/NOAA International Tsunami Information Center (ITIC) and the IOC UNESCO Jakarta Tsunami Information Centre (JTIC) have extensive resources of training and awareness material and experienced trainers.
- Facilitate liaison with the ICGs to ensure that the activities of this project are aligned and integrated with the workplans of the ICGs and that the outputs are disseminated to the ICG Tsunami National Contacts.

The focal point in IOC UNESCO for implementation of the project is the head of Secretariat for ICG/IOTWS, Mr. Tony Elliott. His contact information is: Intergovernmental Oceanographic Commission UNESCO, PO Box 1370, West Perth, WA 6872, Australia, Tel: 61-8-9226 0191, Fax: 61-8-9226 0599. E-mail: t.elliott@unesco.org.

5) WMO

WMO will provide TC and PTC with general guidance for implementation of the project through WMO/Tropical Cyclone Programme (TCP). TCP will help develop close linkage between this project and the relevant activities of the Programme. It will also establish cooperative relationship between this project and the WMO's projects in the TC and PTC regions such as in particular Coastal Inundation Forecast Demonstration Project and Severe Weather Forecast Demonstration Project.

In the recent years, TC and PTC Members have been looking into the feasibility of providing local weather and flood warnings in the Common Alert Protocol (CAP) format as promoted by WMO which provides a simple and general format for emergency alerting for wide range of hazards and fits

various communication media including the Internet. Implementation of CAP in the target group will be facilitated in this project to contribute to the three components of EWS, i.e. “issuance”, “interpretation” and “communication” of warnings (see E. Project Strategy).

6) ESCAP

ESCAP will provide the general guidance as well through the Disaster Risk Reduction Section of ESCAP for the implementation of the project, especially from the social and economic perspectives associated with the concept of the people-centered early warning system.

7) RIMES

RIMES will share their experience and expertise on this field. Some of the Member states of RIMES are also Members of TC (Cambodia, Lao PDR) and PTC (Bangladesh, India, Maldives, Sri Lanka), which can facilitate the realization of joint training activities and the participation of experts from RIMES in missions under the TC/PTC project. The RIMES Executive Board, in its meeting held in Bangkok (April 2010), developed a Master Plan to be implemented in the 5 years (2010-2014). Addressing coastal hazards in low elevation coastal hazards has been adopted as one of the priority regional programme for RIMES Member States. RIMES in cooperation with WMO is conducting a project “Reducing risks of tsunami, storm surges, large waves and other natural hazards in low elevation coastal zones” funded by ESCAP Trust Fund.

J. Capacity of Implementing Organization

TC has a structure to support its cooperative mechanisms on water related disaster reduction. TC Secretariat has a meteorologist, hydrologist and a disaster risk reduction (DRR) expert linked with Working Groups on meteorology, hydrology and DRR. TC has leaderships and focal points for each working groups in its Members. This network ensures TC cooperative mechanisms (See figure 1).

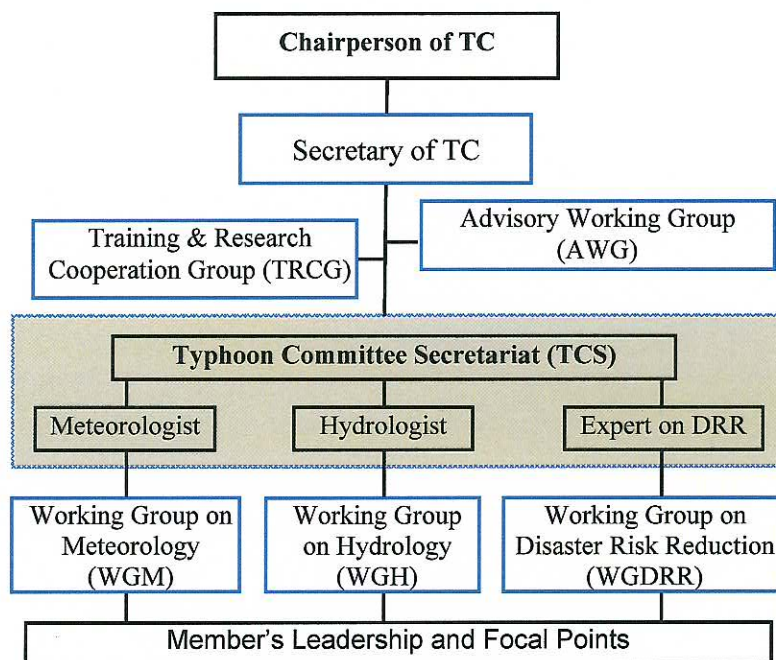


Fig. 1 The Structure of Typhoon Committee

All TC members can share their experience and expertise on water-related disaster reduction. Each year TC provide very good platform for its members to exchange the progresses and discuss the lessons on implementation of Annual Operating Plans through TC Integrated Workshop, Annual Session and working group meetings.

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In recent years, ESCAP/WMO Typhoon Committee Secretariat (TCS), in a close cooperation with Working Groups of TC, has been conducting and coordinating a series of projects on typhoon-related disaster reduction, such as: Effective Warning of Tropical Cyclone (EWTC); Transfer of the Typhoon Information Processing System technology; Community-based Flood Forecasting and Warning System (CBFFWS); Flash Flood and Sediment Disaster Forecasting and Warning; Urban Flood Risk Management (UFRM) in TC Area; Storm surge watch scheme for UFRM; Pilot project of community weather stations in TC members for raising public awareness on climate change; and WEB-GIS based Tropical Cyclone Disaster Information System (WEB-TCDIS), etc.

The Project on Flood Hazard Mapping (FHM) was concluded in 2010. FHM is a vital component for appropriate land use planning in flood-prone areas and emergency response in real-time flood events. It creates easily-read, rapidly-accessible charts and maps which facilitates the decision-makers, planners and dwellers in communities to identify areas of risk and prioritize their mitigation/response efforts. Therefore, as one of major non-structural measures for Flood control, FHMs play very important roles in reduction of flood-related disasters.

The Project on Sediment-Related Disaster Forecasting/Warning System was concluded in 2010. Sediment-related disaster (flash flood, debris flow, mud flow and landslide) is becoming the severest threaten to people's life losses especially in Asia and Pacific region because of the extreme weather events in changing climate. The aim of this Project is to build the framework for non-structural measures by simply using rainfall indexes, especially the necessity of a sediment-related disaster forecasting and early warning, which helps in judgment during public evacuations in community to reduce the damage, particularly life losses.

The cross-cutting project on Urban Flood Risk Management Project (UFRM) was launched with three goals: (1) to exchange and share experiences on urban flood management among the Typhoon Committee members, including technologies on urban flood monitoring, forecasting and warning; (2) to enhance capacity of urban flood risk management; and (3) to strengthen regional cooperation towards flood resilient cities considering climate change.

The Web-GIS-based Typhoon Committee Disaster Information System (Web-TCDIS) was developed to standardize climate and disaster information and to build a disaster management and early warning system that can reduce damages from extreme events via information sharing and research.

The project on developing Operational System for Urban Flood Forecasting and Inundation Mapping (OSUFFIM), which is funded by Macao Science and Technological Development Fund, is jointly coordinated by TCS and Macao Meteorological and Geophysical Bureau (SMG) of Macao, China with the objective of establishing a real-time operational system for UFRM which will be freely used in TC Members and accordingly promoting the capacity building on urban flood hazard early warning and risk management.

K. Knowledge Management and Dissemination of Results

The results and experiences from the proposed project will be developed into a Manual/Handbook. The members of TC and PTC will share the results and experiences through the workshops and training courses under the framework of the Strategic Plan of TC and PTC, respectively.

ADRC also will spread the achievements of the proposed project in its future research and training activities as well as at the Asian Conference on Disaster Reduction organized annually by ADRC to the member countries.

This project will provide visibility for the ESCAP Trust Fund for Tsunami Disaster and Climate Preparedness in certain ways:

- Since both TC and PTC are regional bodies affiliated to ESCAP, the Project will need to be conducted under the supervision of ESCAP DRR. Since TC and PTC are regional intergovernmental organizations affiliated to ESCAP, it is expected ESCAP to collaborate in

the dissemination of the results, namely in the meetings of the ESCAP Committee on Disaster Risk Reduction and through information papers to be presented in the ESCAP sessions.

- During the implementation of the project, the activities related to the workshop, training courses and visiting are expected to be conducted jointly by TC, PTC and ESCAP.
- The handbook will be published with ESCAP logo and mentioning of the ESCAP Trust Fund, following approval from ESCAP;
- The credit and the progresses of the project will be presented on the TC and PTC website, etc.

L. Sustainability

The results, outputs, publication of good practices summarizing workshops and knowledge gained from the proposed project will continually be disseminated and built on through the Annual Operation Plan (AOP) of TC and PTC. The two regional bodies of the WMO Tropical Cyclone Programme (TCP) will promote the results and knowledge gained as a high priority among Members' cooperation activities.

The results of the proposed project also will be utilized in ADRC and IOC UNESCO research and activities.

The results of the project will be used by IOC/UNESCO in the on-going effort to assist Member States with the development of SOPs for Tsunami Warning and other coastal hazards.

The handbook will be distributed to NMHSs, NDMOs and NTWCs of all TC and PTC Members as guidelines of EMS, as well as the participants of Annual Sessions, integrated workshops and training courses.

M. Counterpart Contributions

Information collecting and experience sharing on coastal multi-hazards and early warning from TC and PTC and their Members will be available as in-kind contribution towards this project. For example, US NOAA ITIC and PTWC will contribute in-kind labour and expertise. ITIC staff includes tsunami warning operations, disaster management, and community preparedness expertise and experience that have developed and conducted training manuals internationally and in the US.

Expertise on coastal multi-hazards risk reduction from ADRC will be available towards the project as an in-kind contribution.

N. Monitoring, evaluation and audit

The project provides for in-house monitoring through a Project Coordinator, as well as an end of project review, along with an independent evaluation and audit budgeted under the Programme Management heading of the Activity Work plan.

Typhoon Committee Secretariat (TCS) shall submit to ESCAP biannual progress reports, together with cumulative financial reports, by 31 May (covering the period to 30 April) and 30 November (covering the period to 31 October) each year within the duration of the project, following a progress reporting template provided by ESCAP.

An independent end of term evaluation would be commissioned by the Typhoon Committee Secretariat in consultation with partners and ESCAP. The evaluation process should aim at facilitating learning.

TCS will arrange an independent audit of the project funds at the end of the project and will submit to ESCAP with agreed timeframe.

O. Payment schedule

An initial payment of USD89,890 (costs of activity 1.1.1 to 1.2.1 plus the indirect cost) will be provided by ESCAP upon signature of the Agreement by both to start the activities 1 as indicated in the attached Activity Work Plan (Annex Q).

Subsequent payments will be provided upon approval by ESCAP of a written request for payment from the Typhoon Committee Secretariat, together with the relevant progress reports containing both substantive and financial sections, and will take into account the progress of the project and projected liquidity needs, as contained in the Activity Work Plan (Section Q).

P. Annexes

Table of Contents

Annex Number	Annex Name
1	TC Strategic Plan 2012-2016
2	Report of TC 44th Session
3	PTC Coordinated Technical Plan 2012-2015(draft)
4	Report of PTC 39 th Session
5	Project Partners Summary (TC, PTC, ADRC and IOC of UNESCO)



Q. ACTIVITY WORK PLAN

A. Activity		B. Time Frame (in months)	C. Tsunami Trust Fund		D. Partner Institution Contribution		E. Third Party Co-financing		
			Budget Breakdown	Amount (US\$)	Budget Breakdown	Amount (US\$)	Budget Breakdown	Amount (US\$)	
Activity 1: Reviewing and synergizing the existing SOPs for coastal multi- hazard EWS and developing the Manual/Hand book of Synergized SOPs for Coastal Multi- Hazards EWS	1.1 Conducting Workshop for collecting and exchanging the performance status of coastal multi-hazard EWS in the Members of TC and PTC at high risk	Months 3-4	Travel costs for participants Organizing costs Consultant costs Personnel costs Sundry costs Total for activity 1.1	42,000 4,500 900 6,000 1,500 54,700					
	1.2 Piloting in selected countries, focusing on institutional capacity building and extending where applicable downstream in CEEM approach	Month 5-10	Travel costs for missions Consultant costs Sundry costs Total for activity 1.2	47,600 3,600 2,000 53,200	Total for activity 1.1		Total for activity 1.1		
	1.3 Synergizing the existing SOPs to compile a Manual/ Handbook of Synergized Standard Operating Procedures for Coastal Multi-Hazards Early Warning Systems	Month 10-18	Consultant costs (data collection, etc) Personnel costs Travel costs Publication costs Sundry costs Total for activity 1.3	54,000 91,500 17,000 10,000 2,000 174,500	Total for activity 1.2		Total for activity 1.2		
			Total for activity 1	282,400	Total for activity 1.3		Total for activity 1.3		
	2.1 Conducting Training of users in the interpretation of EWS products for decision- making, media, etc.	Month 10-20	Travel costs for participants Personnel costs Consultant costs Training costs Sundry costs Total for activity 2.1	70,000 16,300 900 10,000 1,823 99,023	Total for activity 1		Total for activity 1		
	2.2 Conducting working meeting on building a cooperation mechanism between TC and PTC for coastal multi-hazard EW information sharing and technical transferring for target countries.	Month 15-18	Travel costs for participants Personnel costs Organizing costs Sundry costs Total for activity 2.2	28,000 7,800 3,000 1,000 39,800	Total for activity 2.1		Total for activity 2.1		
			Total for activity 2	138,823	Total for activity 2.2		Total for activity 2.2		
	Monitoring & Evaluation	Monitoring & Evaluation	Month 21-24	Consultant costs Travel costs for consultant Personnel cost (audit professional) Total for Monitoring & Evaluation	10,000 2,500 5,700 18,200	Total for activity 2		Total for activity 2	
				Total for all activities	439,423				
				Indirect Cost (40%)	17,577				
		Total Project Cost for ESCAP	457,000	Total Partners Contribution		Total Third Party Co-financing			

Annex II
STANDARD TERMS AND CONDITIONS

Article I
General Responsibilities of the Parties

1. The Parties agree to carry out their respective responsibilities in accordance with the provisions of this Agreement. The Parties agree to join efforts and maintain close working relationships, and consult each other on a regular basis in order to achieve the objectives of the Project activities described in the TOR.
2. The Partner Institution shall not be considered, for any purposes, as having a legal status connected with or dependant upon the United Nations or ESCAP.
3. The Partner Institution shall keep ESCAP informed of all activities undertaken pursuant to this Agreement and shall consult with ESCAP if any circumstances arise which may interfere or threaten to interfere with the successful completion of the Project activities or the Project or the achievement of the objectives of the Project activities described in the TOR. The Parties shall cooperate towards the rectification or elimination of the circumstances in question and shall exert all reasonable efforts to that end, including prompt corrective steps by the Partner Institution, where such circumstances are attributable to it or within its responsibility or control. ESCAP shall determine whether such circumstances will require an amendment, suspension or termination of this Agreement, under Articles X and XVI below.
4. The Partner Institution shall not take any action which may adversely affect the United Nations, ESCAP or their interests. The Partner Institution shall fulfil its commitments with fullest regard for the interests of the United Nations and ESCAP. The Partner Institution shall not use the emblem, name or official seal of ESCAP or of the United Nations, or any abbreviation of the names thereof, in connection with its Project activities described in the TOR or otherwise, without the prior written approval of the United Nations.
5. The Parties shall cooperate and consult each other in any public relations or publicity exercises, where ESCAP deems these to be appropriate or useful.
6. ESCAP shall act as the principal channel for communicating, as necessary, with the relevant national and local coordinating authorities regarding the Project activities under this Agreement, unless otherwise agreed to by the Parties and the authorities.
7. ESCAP shall facilitate access to information, advisory services and technical and professional support available and assist the Partner Institution in availing itself of the advisory services of other United Nations organizations, whenever possible.

Article II
Personnel Requirements and Obligations

1. The Partner Institution shall be fully responsible for all work and services performed by its personnel, agents, employees, contractors or subcontractors (hereinafter referred to as "Personnel") for the implementation of the Project activities described in the TOR.
2. The Personnel shall not be considered in any respect as being officials, staff members, personnel, agents, contractors or subcontractors of the United Nations or ESCAP. The Partner

* Article I, paras 2, 4-7 do not apply to UN agencies.



Institution shall ensure that all relevant national labour laws are observed. The Partner Institution shall provide and maintain all salaries and other compensation for its Personnel.

3. ESCAP shall not be liable for any claims arising out of the activities performed under this Agreement, or any claims for death, bodily injury, disability, damage to property or other hazards which may be suffered by the Personnel as a result of their employment or work pertaining to the activities described in the TOR. The Partner Institution is responsible to obtain and maintain adequate medical and life insurance for its Personnel, as well as insurance coverage for service-incurred illness, injury, disability or death. The Partner Institution shall also obtain and maintain adequate liability insurance coverage for its Personnel.
4. The Partner Institution shall ensure that its Personnel meet the highest standards of qualification and technical and professional competence necessary for the achievement of the Project activities described in the TOR and that decisions on employment related to the implementation of the Project activities described in the TOR shall be free from discrimination on the basis of race, religion or creed, ethnicity or national origin, gender, disability status or other similar factors. The Partner Institution shall ensure that all Personnel are free from any conflicts of interest relating to the Project activities described in TOR.
5. The Partner Institution undertakes to be bound by the terms and obligations specified below, and shall accordingly ensure that the Personnel performing Project activities under the present Agreement comply with these obligations:
 - (a) The Personnel shall be under the direct charge of the Partner Institution, which functions under the general guidance of the United Nations or ESCAP;
 - (b) Further to subparagraph (a) above, they shall not seek nor accept instructions regarding the Project activities under the present Agreement from any Government or other authority external to the United Nations or ESCAP;
 - (c) They shall refrain from any conduct that would adversely reflect on the United Nations or ESCAP and shall not engage in any activity which is incompatible with the aims and objectives of the United Nations or ESCAP;
 - (d) Subject to the requirements outlined in the public information disclosure policy applicable to ESCAP, information that is considered confidential shall not be used without the authorization of ESCAP. In any event, such information shall not be used for personal benefit or profit. This obligation shall not lapse upon expiration or termination of this Agreement.

Article III Supplies and Procurement

1. Each Party shall contribute to the Project the resources indicated in the detailed Project budget in the TOR (Annex I).
2. Equipment, non-expendable materials, supplies, vehicles and other property provided or financed by ESCAP shall remain the property of ESCAP and shall be returned to ESCAP in the same condition as when delivered to the Partner Institution, normal wear and tear excepted, within one month upon completion of the Project activities described under the TOR or upon termination of the Agreement, unless otherwise agreed between the Parties in

* Article II, paras 2,4 and 5 do not apply to UN agencies.



writing. Prior to such return, the Partner Institution shall be responsible for the proper custody, maintenance and care of all equipment and it shall, for the protection of such equipment, materials and supplies, during the implementation of the Project activities under the TOR, obtain appropriate insurance in such amounts as may be agreed between the Parties and incorporated in the Project budget in the TOR.

3. ESCAP may place on the supplies, equipment and other materials it provides or finances such markings as will be necessary to identify them as being provided by ESCAP.
4. In case of damage, theft or other loss of property made available to the Partner Institution by ESCAP, the Partner Institution shall provide ESCAP with a comprehensive report, including a police report where appropriate, and any other evidence giving full details of the event leading to the damage, theft or other loss of such property.
5. In its procedures for the procurement of goods, services or other requirements with the Funds, the Partner Institution shall ensure that, when placing orders or awarding contracts, it will safeguard the principles of highest quality, economy and efficiency and that the placing of such orders will be based on an assessment of competitive quotations, bids or proposals, unless otherwise agreed to in writing by ESCAP.
6. The Partner Institution shall maintain complete and accurate records of supplies, equipment and other property purchased with the Funds or provided by ESCAP and shall take periodic physical inventory of such supplies, equipment and other property and non-expendable materials and supplies. The Partner Institution shall provide ESCAP with such records promptly upon request.

Article IV Title Right

1. Unless otherwise agreed in writing, ESCAP shall be entitled to all intellectual property and other proprietary rights, including but not limited to patents, copyrights and trademarks, with regard to maps, drawings, photographs, plans, reports, documents, products and all other materials which have a direct relation to or are produced or prepared or collected in consequence of or in the course of the execution of the Project activities described in the TOR. At ESCAP's request, the Partner Institution shall take all necessary steps, execute all necessary documents and generally assist in securing such proprietary rights and transferring or licensing them to ESCAP.

Article V Financial and Operational Arrangements

1. The Partner Institution shall issue a written receipt upon each receipt of an instalment of the Funds.
2. The Partner Institution shall utilize the Funds and any supplies and equipment provided by ESCAP in strict accordance with TOR. The Partner Institution shall be authorized to make variations not exceeding ten per cent (10%) on any one line item of the budget described in the TOR, provided that the total overall budget allocated by ESCAP is not exceeded. The Partner Institution shall notify ESCAP of any expected variations on the occasion of the periodic consultations set forth in Article I, paragraph above. Any variations exceeding ten per cent (10%) on any one line item that may be necessary for the proper and successful implementation of the Project activities described in the TOR shall be subject to prior consultations with and written approval of ESCAP.

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3. The Partner Institution shall make available the Personnel, supplies and other services as provided for in the budget of the TOR.
4. Any unspent or uncommitted funds upon completion of the Project activities under this Agreement or the termination of this Agreement shall be returned to ESCAP in the same currency in which they were provided as soon as practicable, but in any case within one month of the submission of the final report. In the event of a delay of such return, the Partner Institution shall be financially responsible for any adverse movement resulting from currency exchanges.
5. ESCAP shall not be liable for the payment of any expenses, fees, tolls or any other cost not outlined in the budget as detailed in the TOR, unless ESCAP has explicitly agreed otherwise in writing prior to such expenditure or expense being made by the Partner Institution. It is understood that ESCAP contributions to the budget do not cover overhead costs incurred by the Partner Institution unless agreed in writing in the detailed budget of the TOR.

Article VI Representations and Warranties

1. The Partner Institution represents and warrants that:
 - (a) it has the power and authority to enter into this Agreement and to perform its respective obligations hereunder;
 - (b) the entry into and performance by it of, and the transactions contemplated by, this Agreement, do not and will not conflict with any law or regulation applicable to it;
 - (c) all authorizations required or desirable to enable it lawfully to enter into, exercise its rights and comply with its obligations under this Agreement, and for it to carry on its activities, have been obtained or effected and are in full force and effect; and
 - (d) the person who signed this Agreement is its authorized signatory.
2. In the case that the Partner Institution is not a Government or UN agency, it represents and warrants that it is duly organized and is in good standing under the laws of its jurisdiction of organization.

Article VII Maintenance of Records

1. The Partner Institution shall keep accurate and up-to-date records and documents in respect of all expenditures and expenses incurred with the Funds made available by ESCAP, to ensure that any obligations entered into and all expenditures and expenses are in conformity with the provisions of the TOR. For each disbursement, the Partner Institution shall maintain proper supporting documentation, including original invoices, bills and receipts pertinent to the transaction. Any accrued interest on the Funds shall be accrued income to ESCAP and the Partner Institution shall promptly disclose all such relevant information to ESCAP. The Partner Institution shall record such income in a revised budget in the TOR as accrued income to ESCAP, unless otherwise agreed between the Parties.



2. The Partner Institution shall maintain the records for a period of at least five (5) years after the Expiration Date or the termination of this Agreement whichever is later, unless otherwise agreed between the Parties.

Article VIII **Reporting Requirements and Audit**

1. The Partner Institution shall submit to ESCAP progress reports as agreed between the Parties in the TOR. At a minimum, the Partner Institution shall prepare and provide to ESCAP an annual progress report.
2. Within one month of the completion of the Project activities described in the TOR or of the termination of the present Agreement whichever is sooner, the Partner Institution shall submit to ESCAP a final substantive report on the outcome of the Project activities described in the TOR and a final financial report, duly certified by an authorized official of the Partner Institution, on the use of the Funds, supplies, and other equipment provided or financed by ESCAP under this Agreement. Expenditures incurred shall be reported in the financial report by object of expenditure as per the budget detailed in the TOR. The Partner Institution shall provide copies of supporting documentation to ESCAP upon request.
3. ESCAP has the right, at its own expense, to have the records of the Partner Institution pertaining to the implementation of the Project activities under this Agreement audited, reviewed and/or copied by the audit service of ESCAP, the internal auditors of the United Nations and/or the United Nations Board of Auditors, and the Partner Institution hereby consents thereto.
4. ESCAP, through its authorized representatives, shall have the right, at all reasonable times, to make site visits to review the Project activities and management control systems. The Partner Institution shall provide and require any contractor or sub-contractor of the Partner Institution to provide all reasonable facilities and assistance for such site visits, which shall be performed in a manner that will not unduly delay the Project activities.

Article IX **Responsibility for Claims**

1. The Partner Institution shall indemnify, hold and save harmless and defend, at its own expense, ESCAP, its officials and persons performing services for ESCAP, from and against all suits, claims, demands and liability of any nature and kind, including their cost and expenses, arising out of acts or omissions of the Partner Institution or its Personnel.
2. The Partner Institution shall be responsible for, and deal with, all claims, brought against it by its Personnel.
3. In compliance with Article IX, paragraphs 1 and 2 above, the Partner Institution shall maintain adequate liability and property damage insurance in respect of any tort action or tort claim arising out of the Partner Institution's acts or omissions relating to this Agreement and the Project. The Partner Institution shall, upon request, provide ESCAP with proof of such insurance.



Article X Termination

1. This Agreement may be terminated by either Party upon thirty (30) days written notice to the other Party.
2. ESCAP may also terminate or suspend this Agreement (i) by giving seven (7) days written notice to the Partner Institution when ESCAP determines that such action is necessary and reasonable to protect the interests of ESCAP or the United Nations; or (ii) if the Partner Institution has materially breached the terms and conditions of this Agreement, which shall be determined by ESCAP, and such breach is not cured to ESCAP's satisfaction within seven (7) days of the receipt of notice of the breach.
3. Upon receipt of a notice of termination in accordance with Article X, paragraphs 1 and 2 above, the Parties shall take immediate steps to terminate their activities under this Agreement in a prompt and orderly manner so as to minimize losses and further expenditures. ESCAP shall not make any further disbursement of funds to the Partner Institution. The Partner Institution shall undertake no forward commitment and shall return to ESCAP, within one month from the date of receipt of notice of termination, all unspent and uncommitted funds, supplies, equipment and other property provided, financed and/or owned by ESCAP in the same condition as when delivered by ESCAP, normal wear and tear excepted, unless ESCAP agrees otherwise.
4. In the event of termination under Article X, paragraphs 1 and 2 above, ESCAP shall reimburse the Partner Institution only for the costs actually incurred to carry out the Project activities described in the TOR in conformity with the express terms of this Agreement. In addition, in the event of termination under Article X, paragraph 2, sub-paragraph (ii) above, ESCAP may request full or partial reimbursement of the sums paid to the Partner Institution and determine the manner and time for such full or partial reimbursement and the Partner Institution shall effect such reimbursement in accordance with the request.
5. Notwithstanding any other provision of this Agreement, its applicable provisions shall survive its early termination to the extent necessary in order to permit an orderly settlement of accounts between ESCAP and the Partner Institution, including any refunds to ESCAP by the Partner Institution under Article V, paragraph 4, and Article X, paragraphs 3 and 4 above.

Article XI Force Majeure

1. For the purpose of this Agreement, "force majeure" shall mean acts of nature, war (whether declared or not), invasion, revolution, insurrection or other acts of a similar nature or force.
2. In the event of and as soon as possible after the occurrence of any cause constituting *force majeure*, the affected Party shall give the other Party notice and, if possible, full particulars in writing of such occurrence if the affected Party is rendered unable, in whole or in part, to perform its obligations or meet its responsibilities under this Agreement. The Parties shall consult on the appropriate action to be taken, which may include suspension of the Project activities or termination of the Agreement, in accordance with Article X above, with the affected Party giving at least seven (7) days' written notice to the other Party.
3. In the event that this Agreement is terminated owing to causes constituting *force majeure*, the provisions of Article X, paragraph 2, above shall apply.



Article XII
Arbitration

1. The Parties shall use their best efforts to settle amicably any dispute, controversy or claim arising out of, or relating to, this Agreement or the breach, termination or invalidity thereof. Where the Parties wish to seek such an amicable settlement through conciliation, the conciliation shall take place in accordance with the UNCITRAL Conciliation Rules then obtaining, or according to such other procedure as may be agreed between the Parties.
2. In the case where the Donor is not a government, any dispute, controversy or claim between the Parties arising out of this Agreement or the breach, termination or invalidity thereof, unless settled amicably under the preceding paragraph within sixty (60) days after receipt by one party of the other party's written request for such amicable settlement, will be referred by either party to arbitration before a single arbitrator in accordance with the UNCITRAL Arbitration Rules then obtaining. The arbitral tribunal will have no authority to award punitive damages. The Parties will be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of any such controversy, claim or dispute.

Article XIII
Observance of the Law

1. The Partner Institution shall observe and comply with all laws, ordinances, rules and regulations bearing upon the performance of its obligations under the terms of this Agreement.

Article XIV
No Assignment

1. The Partner Institution shall not assign, transfer, pledge, subcontract or make disposition of the Agreement or any part thereof, or of any of its rights, claims or obligations under this Agreement except with the prior written consent of ESCAP.

Article XV
Privileges and Immunities

1. Nothing in or related to this Agreement shall be deemed a waiver, express or implied, of any of the privileges and immunities of the United Nations and ESCAP.

Article XVI
Amendments

1. This Agreement may be modified or amended only by written agreement between the Parties.

