

# 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	<p><b>Geoinformatics Center</b>  <b>Asian Institute of Technology (AIT)</b>  P.O. Klong Luang, Pathumthani 12120, Thailand</p> <p><b>In Association with</b>  <b>Sahana Software Foundation (SSF)</b>  350 South Figeroa, Ste 437, Los Angeles  CA 90071, USA</p>
2	FOCAL POINT AT ORGANIZATION AND RELEVANT CONTACT INFORMATION	<p><b>Contact person</b>  <b>Dr. Lal Samarakoon</b>  Associate Director, Geoinformatics Center, Asian  Institute of Technology (AIT)  P.O. Klong Luang, Pathumthani 12120 Thailand  Tel: +66-2-524-6184/6195; Fax: +66-2-524-6147  E-mail: <a href="mailto:lal@ait.asia">lal@ait.asia</a></p>
3	PROJECT TITLE	<p><b>“CAP on a MAP” - Improving Institutional  Responsiveness to Coastal Hazards through Multi-  Agency Situational Awareness</b></p>
4	BENEFICIARY COUNTRIES	<p>1) The Maldives  2) The Philippines  3) Myanmar</p>
5	TARGET GROUP(S)	<p><b>1) The Maldives</b>  National Disaster Management Centre (NDMC)</p> <p><b>2) The Philippines</b>  - Office of Civil Defence (Proposed)  - Philippine Atmospheric Geophysical Astronomical  Services Administration (PAGASA)</p> <p>3) Myanmar  - Department of Meteorology and Hydrology (DMH)</p>
6	TIME FRAME	01/Nov/2014 to 30/Nov/2017
7	TOTAL BUDGET (US\$) AND BREAKDOWN OF FUNDING SOURCES	<p>Total ESCAP contribution = 300,040 USD  Total in-kind contribution = 52,950 USD  <b>Total budget = 352,990 USD</b></p>

## **Executive Summary**

Disasters are increasingly taking a heavy toll of life and property with each passing year around the world and Asia is one of the worst affected continents. Unfortunately, the forces of urbanization, unplanned growth, and extreme climatic events are driving the situations from bad to worse. On the other hand, recent advances in Information and Communication Technology (ICT) are offering opportunities to overcome some of these challenges and reliable Free and Open Source Software (FOSS) platforms are now being deployed around the world for effective disaster management. To this end, we are proposing a Multi-Agency Situational Awareness (MASA) platform, Sahana Alerting and Messaging Broker (SAMBRO), with national and cross-border interoperability to augment the capabilities of the National Disaster Management Organization's (NDMO's), National Warning Centers (NWCs), line-agencies and other stakeholders in disaster management.

SAMBRO is designed to integrate multiple stakeholders and multiple data streams for improved data cohesion. It can facilitate a better coordination among the national and local agencies in a country to create risk-awareness during the pre-disaster phase, while it can be effectively used for integrating information from multiple sources for situational-awareness during the post disaster phase. The platform will thus not only help in integrating all the stakeholders, but also assist in improving the much needed accuracy, timeliness, and reliability in information sharing during the pre and post disaster phases. The platform will also help in avoiding the problems of losing or misdirecting critical information such as alerts and warnings.

The Sahana FOSS platform adopts the International Telecommunications Union (ITU) and the World Meteorological Organization (WMO) advocated Common Alerting Protocol (CAP) standard. CAP layout the policies and procedures for all-hazards and all-media information sharing. With CAP-enabled SAMBRO, we intend to strengthen countries' capabilities to: 1) provide targeted alerts/warnings to communities at risk as well as other stakeholders, and 2) Improve information sharing and situational-awareness among NDMOs, emergency responders, and communities at the time of an emergency.

### **B. Needs Assessment**

Rapid changes in coastal land-use over the past few decades due to high economic growth in South and South-east Asian region, together with the perceived desirability of waterfront locations, continue to expose more and more populations, assets and infrastructures to risk arising from coastal hazards such as floods, storm surges, high winds, and tsunamis and the future link between sea-level rise and increased coastal hazards is clearer, both in terms of the science of sea-level rise and the likely impacts.

Risk assessment is an important element for developing effective disaster management plans and risk maps are useful for early warning and response activities. A risk-map-enabled disaster management system will not only help in augmenting the national agencies' capacities in issuing location and hazard specific alerts/warnings, but also in improving their response capacities by facilitating situational awareness at the ground.

The long-term **goal** of the project is to operationalize a CAP-enabled Multi-Agency Situational Awareness (MASA) platform, SAMBRO, in each beneficiary country in order

to provide location specific alerts/warnings and integrate all the stakeholders through a common information exchange hub for better coordination at the time of a disaster. For achieving this goal the following **objectives** are set forth:

- To improve the national capacities for providing hazard and location specific alerts/warnings according to risk levels.
- To improve the national capacities for maintaining a register of alerting/warnings authorities for creating, authorizing, issuing, auditing, and receiving MASA alerts.
- To help national agencies to share situational-awareness information with the responders, line-agencies, and NGOs to consolidate their efforts and operate as one entity to minimize the duplication of efforts.
- To develop a group of master trainers (Technology Stewards) in each country equipped with training materials in the above-mentioned areas.

### **C. Problem Analysis**

In an event of a catastrophic disaster, a large number of individuals are killed, injured and/or displaced, and NDMOs, aid organizations and NGOs often face challenges in coordinating the emergency operations. Aftermath of the 2004 Indian Ocean tsunami, Sri Lanka was facing a similar challenge, and the Lanka Software Foundation came forward to develop a web-based application called “Sahana” in cooperation with like-minded volunteers of the Sri Lankan Information Technology community. Literally, “Sahana” means “relief” in the Sinhala language. Ever since its inception, Sahana has rapidly grown into a global Free and Open Source Software (FOSS) platform. The initiative is now being supported by hundreds of volunteers from different parts of the world and its scope has been expanded beyond the coordination to alerting/warning, creating situational awareness and mapping the community resilience.

Leveraging the Sahana platform’s utilities and robustness, the Asian Institute of Technology (AIT) and the Sahana Software Foundation (SSF) are partnering to expand the scope and applications of the platform. In addition to the existing post-disaster modules, the partnership would also like to improve and customize the relatively now pre-disaster modules in Sahana. AIT's expertise on disaster risk assessment and SSF's ability to develop and customise the Sahana platform will make an excellent partnership for improving the information management and communication needs for disasters. AIT has an ongoing project on “Development of risk maps” under the Japan Aerospace Exploration Agency’s (JAXA) Capacity Building Activities for the Asia-Pacific Nations for its Sentinel Asia Initiative and AIT has implemented such projects in 17 countries so far, including the Philippines, during current financial year (Apr. 2013 – Mar. 2014). This proposal has been developed through a consultative process to address the needs of the countries. Workshops were organized in the Philippines (06 Feb. 2014) under the ongoing project and more than 30 officials and professionals from NDMOs, line-agencies and other stakeholders had participated in each country. During the consultations (individual) and discussions (workshop), most of these countries had indicated that the risk maps developed under the project, could be used for implementing risk-based of early warnings protocols. Similarly, these risk maps will be also useful for having the situational-awareness at the ground during a disaster.

### **D. Target Group**

This project aims to build country specific CAP-Profiles. CAP standardizes the emergency policies and procedures for all-hazards and all-media information sharing in

the beneficiary countries, which will in turn help the countries in issuing location specific alerts/warnings and integrate all the stakeholders through a common information exchange hub for better coordination at the time of a disaster. The main beneficiary of the project will be the NDMOs/NWCs and they will coordinate with all relevant stakeholders such as line-agencies, civil societies and NGOs, and private sector in their respective countries to further enhance their capacities.

- Line Agencies are the technical agencies (such as agencies related meteorological services, tsunami warning, flood forecasting etc.) that have the capacity to create and disseminate alerts/warnings.
- Civil societies and NGOs that have the capacity to interpret and respond to CAP-enabled alerts and warnings.
- Private Sector are the media and communications service providers, such as TV, radio, mobile operators, ISP, etc. with capacity to receive alerts/warnings and relay them over their networks.
- Local Authorities which play a key role in ensuring the delivery of early warnings to the vulnerable populations and triggering the necessary preparedness actions on the "last mile" of the early warning system.

AIT is working with several line-agencies of most of the countries in South and South-east Asian region for hazard and risk assessment in cooperation with NDMOs. These agencies will be also benefit from the project, as the maps produced will be used by themselves or by NDMOs for providing risk-based location specific alerts/warnings using the SAMBRO platform as shown in Table below.

Country	NDMO/NEWC	Line-Agencies	Remarks
The Philippines	Office of Civil Defense (OCD)	Philippine Atmospheric, Geophysical and Astronomical Services Administration. (PAGASA)	Prepare & possess flood, wind and storm surge risk maps in cyclone prone coastal areas.
		Philippine Institute of Seismology & Volcanology (PhiVolcs)	Prepare & possess tsunami risk maps and issuing tsunami early warnings.
		National Mapping and Resource Information Authority (NAMRIA)	Prepare and possess medium-resolution elements-at-risk map, including cyclone, flood, and tsunami prone areas.
The Maldives	National Disaster Management Center (NDMC)	Maldives Meteorological Service (MMS)	Responsible for issuing early warnings.
Myanmar	Relief and Resettlement Department (RRD)	Department of Meteorology and Hydrology (DMH)	Responsible for issuing early warnings for hydro-meteorological hazards and tsunami.

### E. Project Strategy

The project focuses on operationalizing a CAP-enabled SAMBRO platform to provide location specific alerts/warnings to the communities according to their risk levels. Moreover, the platform will integrate all the stakeholders through a common information exchange hub for better coordination during an emergency. In order to achieve the project goal and objectives, as described in Section B, we propose the following **strategies**:

### **E-1: Information Stocktaking and Stakeholder Consultation**

Availability of reliable data and timely information is a challenging issue in most of the developing countries. Commonly encountered problems include absence of recognized standards and practices, inadequate technical expertise, and lack of affordable tools. We plan to organize a kick-off workshop in each beneficiary country by inviting NDMOs/NWCs, line-agencies and other stakeholders to discuss about the scope, work plan, and implementation of the MASA platform, SAMBRO. Focus group discussions and interviews with key stakeholders will be conducted to identify and understand the existing systems. The proposed platform will be an extensible, federated, and user-friendly system, which will allow not only the integration of data and information in a country, but also their existing systems. In addition, a study area will be identified in consultation with all the stakeholders in each country for developing country specific case studies.

The workshop will also help us to understand the existing technical capacities and resources with NDMOs/NWCs, line-agencies and other stakeholders. This will further help us to identify the training and capacity building needs of NDMOs/NWCs, line-agencies and other stakeholders in order to prepare a suitable training and capacity building plan, and training materials. Needs and concerns of the key stakeholders regarding outputs and deliverables will be taken into account. Since the outputs of the project will be also helpful at community level, therefore, attention will be given to assess community needs and customize the platform accordingly.

### **E.2: Implementation of Common Alerting Protocol (CAP)**

We propose to use CAP that standardizes the content of alerts and notifications across all hazards and media platforms. Key benefits of CAP enabled system are as follows:

- Automatically disseminating the multi-channel alerts/warnings to extend the reach and effectiveness of alerts and warning messages.
- Simplifying the work of alerting officials by giving them a write-it-once method for issuing alerts/warnings over multiple media platforms without duplicating their efforts.
- Enhancing the ‘situational awareness’ at local and regional levels.
- Decoupling the diverse elements of the national warning system and allowing technology developers to expand and upgrade existing infrastructures.

### **E-3: Applications of Multi-hazard Risk Maps and Value-added Products from Emergency Satellite Observations**

The Asian Institute of Technology (AIT) has been AIT working with the line agencies in all the beneficiary countries (except the Maldives) over the past few years for multi-hazard risk assessment in cooperation with NDMOs. We plan to use these risk maps for providing location and hazard specific alerts/warnings for coastal hazards using Sahana. Further, AIT has been designated as the regional hub for 1Sentinel Asia, which is activated at the time of a major disaster in a country for post-disaster response. Such satellite data are immediately made available to AIT for emergency processing and preparing value-added products by overlaying satellite data-derived hazard extent maps with exposed, buildings, roads, and populations. Such near real-time and reliable data and information will be further augment SAMBRO’s capacity to generate the situational awareness information and help the NDMOs of the affected countries to

share the same across the responders, line- agencies and NGOs for carrying out the response activities efficiently.

#### **E-4: Harmonization of interests and priorities**

Disaster management is multi-disciplinary field and each stakeholder involving in disaster management will have their own interests and priorities. However, a MASA platform like SAMBRO can contribute greatly for harmonizing the efforts by respecting the jurisdictions of each and every stakeholder.

#### **E-5: Training and Capacity Building**

##### **a) Training sessions**

A Training Need Assessment (TNA) will be carried out during the kick-off workshop in order to prepare a suitable training and capacity building plan, which will be further improved in consultations with NDMOs, line-agencies and other relevant stakeholders. The plan will include transfer of knowledge and skills to technical personnel and professionals in (i) CAP messaging standards and specification, (ii) Policies and procedures for developing a Country CAP-Profile, (iii) Protocols for using Object Identifiers (OIDs) for implementing a Register of Alerting Authorities, (iv) Development of hazard specific CAP-enabled pre-populated alerts/warnings templates, and (v) Community resilience mapping, including, collecting and managing exposure data on buildings, assets, populations as well as hazard and risk maps; and sharing information across the responders, line-agencies and NGOs for situational awareness purposes.

AIT and Sahana Software Foundation have extensive experiences in organizing training and capacity building activities in several of countries in Asia. We plan to develop a group of master trainers equipped with presentation materials, manuals, case studies and guidelines for sustaining the capacity building efforts in future.

##### **b) Workshop**

A workshop will be organized in each beneficiary country to disseminate the findings of the study, primarily targeting the senior officials and policy makers.

### **F. Results Framework**

#### **F-1: Goal and Impacts**

The **long-term goal** of the project is to operationalize a CAP-enabled Multi-Agency Situational Awareness (MASA) platform, SAMBRO, in each beneficiary country. The **impact** of the project will be as follows:

##### **a) Standardization**

The CAP-enabled MASA platform, SAMBRO, will be an internationally accepted standard for all-media, all-hazards alerting/warning, and will ensure both interoperability and interpretability of National and International Warning Systems for end-to-end early warning dissemination.

##### **b) Integration**

In many of the beneficiary countries, the common carriers such as radio, television and telephone networks use individual public alerting/warning technologies. Sahana

platform will allow an alert/warning to be disseminated simultaneously over the common carriers. Alerts/warnings from international and national agencies can all be received in the same format and Sahana can even activate a specific alarm based on the alert/warning received.

c) Decentralization

d) Stakeholders within a country can receive standardized alerts/warnings through CAP from several designated sources. CAP also facilitates flexible geographic targeting using latitude/longitude information.

e) Efficiency

CAP not only increases efficiency but also simplifies the task of activating an alert/warning and it can serve a wide range of audiences with multilingual messaging capabilities.

f) Security and Authenticity

The system will facilitate digital encryption and signature capability for security and authenticity for alerts/warnings.

#### **F-2: Outcomes, expected changes, and performance indicators**

Outcomes, expected to changes in policy and institutional capacity that the project aims to bring about, as well as the performance indicators are listed in the Table below.

<b>Outcomes</b>	<b>Expected changes</b>	<b>Performance indicators</b>
1) Awareness creation on CAP-enabled MASA and SAMBRO	<ul style="list-style-type: none"> <li>• Understand and follow CAP standards, policies, and procedures.</li> <li>• Prepare country CAP-Profile and develop policies and procedures.</li> <li>• Installation of Sahana software and applications for SAMBRO.</li> </ul>	<ul style="list-style-type: none"> <li>• Participatory evaluation of CAP-enabled MASA's strengths, weaknesses, opportunities, and threats.</li> <li>• Participants' feedbacks on CAP-enabled MASA:               <ul style="list-style-type: none"> <li>◦ Raising awareness level.</li> <li>◦ Usefulness of SAMBRO.</li> </ul> </li> </ul>
2) Formation of a National working group on CAP-enabled MASA and SAMBRO	<ul style="list-style-type: none"> <li>• Nomination of members to national working group by the stakeholders.</li> <li>• Selection of "<i>Technology Stewards</i>" by the stakeholders to lead the activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Number of Stakeholders willing to participate in the working group.</li> </ul>
3) Developing the National CAP-Profile	<ul style="list-style-type: none"> <li>• Initiation of stakeholders' discussion for developing the National CAP-Profile.</li> <li>• Set internal policies for implementing the National CAP-Profile.</li> <li>• Make operational changes for</li> </ul>	<ul style="list-style-type: none"> <li>• Acceptability of the National CAP-Profile across the stakeholders.</li> <li>• Number of design, development, and testing cycles the working group has to go through for accepting the National CAP-</li> </ul>

Outcomes	Expected changes	Performance indicators
	adopting National-CAP profile compliant alerting practices.	Profile (< 3 is good; 3-5 acceptable. > 5 unacceptable)
4) Make Sahana Alerting and Messaging Broker (SAMBRO) operational	<ul style="list-style-type: none"> <li>• Implement policies and procedures publishing and subscribing to alerts/warnings</li> <li>• Prepare a Register of alerting authorities and designate a <i>National Editor</i> for managing the register.</li> <li>• Develop hazard specific and reusable CAP message templates with pre-populated information to be used for alerting/warning</li> <li>• Training of trainers (preferably the <i>Technology Steward</i>) to build institutional capacities.</li> </ul>	Measure the acceptability of the SAMBRO through: <ul style="list-style-type: none"> <li>– Ease-of-use</li> <li>– Usefulness</li> <li>– Efficacy</li> </ul>
5) Simulation exercises	<ul style="list-style-type: none"> <li>• Awareness creation on CAP-MASA through simulation exercises.</li> </ul>	<ul style="list-style-type: none"> <li>• Acceptability of the National CAP-MASA plans, policies, and procedures.</li> </ul>
6) Hazard, exposure and risk maps	<ul style="list-style-type: none"> <li>• Use of hazard specific exposure and risk maps for alerting/warning.</li> </ul>	<ul style="list-style-type: none"> <li>• Success in providing location and hazard specific alerts/warnings.</li> </ul>
7) Make the Community Resilience Mapping Tool (CRMT) operational	<ul style="list-style-type: none"> <li>• Use hazard, exposure and risk maps developed by AIT or available from other sources (including those already developed by the grantees of the tsunami trust fund).</li> <li>• Capacity building in NDMOs and other stakeholders for using the Community Resilience Mapping Tool.</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of community resilience mapping tool in case study areas of each beneficiary country.</li> <li>• Replication of the same in other parts of each beneficiary country.</li> </ul>

### F-3: Activities and Outputs

a) Activity 1: Kick-off workshop for information stocktaking & stakeholder consultations

Description	Outputs
Organize a kick-off workshop in each beneficiary country by inviting	<ul style="list-style-type: none"> <li>• Focus group discussions and interviews with key stakeholders.</li> </ul>

Description	Outputs
<p>NDMOs/NWCs, line-agencies and other stakeholders to discuss about the scope, work plan, and implementation of a CAP-enabled MASA platform, SAMBRO. A Training Need Assessment (TNA) will be also carried out in order to prepare a suitable training and capacity building plan, which will be further improved in consultations with NDMOs/NWCs, line-agencies and other relevant stakeholders.</p>	<ul style="list-style-type: none"> <li>• Agreements on scope, work plan, and implementation of the CAP-enabled MASA platform, SAMBRO.</li> <li>• Identification of potential locations in each country for developing case studies.</li> <li>• Understanding the existing technical capacities and resources with NDMOs/NWCs, line-agencies and other stakeholders.</li> <li>• Identification of the training needs of NDMOs/NWCs, line-agencies and other stakeholders in order to prepare a suitable training and capacity building plan, and training materials.</li> <li>• Workshop report</li> </ul>

b) Activity 2: Training

Description	Outputs
<p>Organize training at AIT by inviting technical personnel &amp; professionals from the NDMOs/NWCs and other stakeholders of each beneficiary country. AIT will provide it's the state-of-the art- training facilities equipped with high-end personal computers and the necessary software and tools. The training will consist of:</p> <ul style="list-style-type: none"> <li>• Installation of software and demonstration</li> <li>• Lecture and Hands-on Exercises</li> <li>• Demonstration on deployment of SAMBRO.</li> </ul>	<p><b>1) Installation of software &amp; demonstration</b></p> <ul style="list-style-type: none"> <li>• Installing of CAP-enabled MASA platform SAMBRO and Community Resilience Mapping Tools (CRMT).</li> <li>• Operationalize the Sahana Alerting and Messaging Broker (<b>SAMBRO</b>) and Community Resilience Mapping Tools (<b>CRMT</b>) tools.</li> <li>• Demonstration of existing “case studies” on implementation of CRMT and SAMBRO.</li> </ul> <p><b>2) Lecture and Hands-on Exercises</b></p> <ul style="list-style-type: none"> <li>• Introduce CAP messaging standards and specification.</li> <li>• Explain the policies and procedures for developing the country CAP-Profile.</li> <li>• Explain the protocol for using Object Identifiers (OIDs) for implementing a Register of Alerting Authorities.</li> <li>• Develop hazard specific CAP-enabled pre-populated alerts/warnings templates.</li> <li>• Community resilience mapping using CRMT <ul style="list-style-type: none"> <li>– Collecting and managing data on hazards, exposures and risks.</li> <li>– Sharing information across the volunteers, line-agencies, and NGOs, enabling them to have situational awareness.</li> </ul> </li> <li>• Deployment of Sahana at the time of an emergency.</li> </ul> <p><b>3) Evaluation of Training</b></p> <ul style="list-style-type: none"> <li>• Evaluation report.</li> </ul>

c) Activity 3: Implementing a Country CAP-Profile

Description	Outputs
Develop country specific CAP Profiles in consultations with NDMOs/ NWCs and other stakeholders.	<b>Reports on Country CAP-Profiles</b> <ul style="list-style-type: none"> <li>• CAP specifications - with relevant instructions on selected CAP elements in context of a country.</li> <li>• Exercises - to be carried out with the Stakeholders in developing the CAP-Profile.</li> <li>• Administrative procedure for managing the Register of Alerting Authorities - how to add or remove an alerting authority with necessary documentations.</li> </ul>

d) Activity 4: Installation of servers and software for operationalizing the system

Description	Outputs
Installation, customization and operationalization of Sahana platform in each beneficiary country.	<b>1) GIS-enabled tools</b> <ul style="list-style-type: none"> <li>• Configured and customized SAMBRO and CRMT tools in each country.</li> </ul> <b>2) Enabling SAMBRO</b> <ul style="list-style-type: none"> <li>• Implementing and enabling the SAMBRO by defining roles and permissions to publishers and subscribers for specific alerts/warnings.</li> <li>• Generating and storing relevant alert-area-descriptions for CAP messaging.</li> <li>• Creating hazard specific CAP message templates to store in SAMBRO</li> <li>• Creating and issuing a CAP message using SAMBRO</li> <li>• Analysing situational-awareness messages using SAMBRO, to determine the severity, certainty, and urgency of a message.</li> </ul> <b>3) Enabling CRMT</b> <ul style="list-style-type: none"> <li>• Importing hazard, exposure, and risk maps.</li> <li>• Generating &amp; analysing community resilience maps.</li> <li>• Generating alert-area-description polygons.</li> <li>• Exporting alert-area-description to SAMBRO.</li> <li>• Generating hazard specific CAP message templates</li> <li>• Analysing situational-awareness messages.</li> </ul>

e) Activity 5: Simulation and Testing

Description	Outputs
Develop country specific case studies and conduct	<ul style="list-style-type: none"> <li>• Execution of SAMBRO simulations in each country.</li> <li>• Usability and acceptability of the simulation results</li> </ul>

simulations.	by the countries. • Recommendations for improvements, if necessary.
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f) Activity 6: Knowledge Management and Result Dissemination

Description	Outputs
Construct websites and prepare brochures.	<ul style="list-style-type: none"> <li>• Constructing a project website.</li> <li>• Publishing the project activities and outputs in AIT newsletter.</li> <li>• Preparing and printing project brochures.</li> <li>• Result dissemination workshops in beneficiary countries.</li> </ul>

g) Activity 7: Reporting

Description	Outputs
Report preparation	<ul style="list-style-type: none"> <li>• Prepare and submit six-monthly report and final report to ESCAP.</li> </ul>
External Evaluation	<ul style="list-style-type: none"> <li>• Evaluation report.</li> </ul>

### G. Contribution to Regional Coordination/Cooperation

Since the project aims at the multi-country country participation, therefore, it will ensure regional cooperation through exchanging ideas and adopting best practices among the participating countries. By bringing NDMOs/NWCs, line-agencies and other stakeholders from each beneficiary country, a network of organizations will be created in the region. Establishment of such a network will an important step in future to share experience, skills and resources in an event of disaster in the region.

There is already a diverse group of institutions and professionals that are exposed to Sahana in countries such as in Bangladesh, China, Chile, Haiti, India, Indonesia, Japan, Myanmar, Pakistan, Sri Lanka, and USA and their experiences and skills along with the Sahana Community around the world will help in regional cooperation not only by adopting best practices in the beneficiary countries of this project, but also by assisting them remotely in deploying Sahana in a country at the time of an emergency.

Since we are proposing an international standard, namely CAP, for alerting/warning, and therefore it will be beneficial for each country to adopt same standard and practices. There are several international and regional organizations that issue alerts/warnings to individual countries and adopting international standards by these countries will help in their integration and regional/international cooperation.

### H. Gender Considerations

Women are disproportionately vulnerable to disasters due to social norms that, for example, place them in greater physical harm or negatively affect their access to immediate relief. The Southeast Asian tsunami of 2004, three to four times more women

than men died across the region (World Bank, 2008<sup>1</sup>). Gender is an important dimension in disaster management and we will encourage participation of women in the project to this effect. We are including a gender specialist in our team to include the concept of "gender sensitive alerting systems" which is gradually being adopted by emergency communication planners. It ensures that alerting strategies are inclusive and considers women and men's interests and stakes in disaster preparedness. For example, a Tsunami warning should consider the fact that women have both specific livelihoods and caring responsibilities and thus may need to retrieve their children from schools before any kind of evacuation. To that end, a Tsunami "watch" is a more appropriate advance warning that should precede a "warning". However, they should be able to comprehend such alerts; i.e. understand the distinction between a tsunami watch and a warning. A CAP-enabled alerts/warnings allows for distinguishing such ambiguity. Whereby, the "instruction" element of a CAP message would define the actions to be executed with respect to a "watch" and a "warning". Thus, warning authorities will be able to have a robust messaging tool to ensure that terms used by them are socially inclusive and are clearly understood by the message recipients to act appropriately.

While selection of participants from the beneficiary countries for the project will be based on qualifications, experiences and skills, but we will ensure a proportionate representation of women participants in the project. We will invite women from the NDMOs/NWCs, line-agencies and other stakeholders to the workshops to be organized in the countries and we will also encourage participation of women as facilitators of these events. We will also promote gender-sensitive risk assessment using existing population data in the countries and effectively use them while we operationalize the proposed SAMBRO platform.

## **I. Partners**

Partnership being proposed here will bring a wealth of knowledge and expertise available in the region. We will combine the AIT's expertise on hazard, exposures and risk mapping and the Sahana Software Foundation's skills and experiences to operationalize Sahana in each beneficiary country. Partners joining for this project are:

### **a) National Partner in the Maldives**

Maldives National Disaster Management Center (NDMC) is under Ministry of Defense and National Security Services. NDMC is committed to taking pro-active and timely measures to prevent or reduce the impact of disasters in the Maldives through its collaborative efforts with National, Regional and International Agencies.

### **b) National Partner in the Philippines**

Philippine Atmospheric, Geophysical and Astronomical Services Admin. (PAGASA) is a national institution dedicated to provide flood and typhoon warnings, public weather forecasts and advisories, meteorological, astronomical, climatological and other specialized information and services primarily for the protection of life and property. The major function of PAGASA includes maintaining a nationwide network pertaining to observation and forecasting of weather and flood and other conditions affecting national safety, welfare and economy.

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<sup>1</sup> World Bank, 2008. Gender and Crises: Implications for Agriculture. Module 11 in Gender in Agriculture Sourcebook. Washington, DC: World Bank.

Office of Civil Defence in the Philippines has been requested to join and we have received a positive response from the Office of Civil Defence, Region 3.

**c) National partner in Myanmar**

The Department of Meteorology and Hydrology (DMH) is the agency responsible for dissemination of early warnings for hydro-meteorological and geological hazards in the Myanmar.

**d) International Partner**

The World Meteorological Organization (WMO) has been requested to join as an international partner in this project. WMO maintains a registry of Alerting Authorities in its member countries and participation of WMO will be very useful in developing CAP profiles in the countries. Our consortium partner Sahana Foundation has been closely collaborating with WMO in several other activities.

**J. Capacity**

Asian Institute of Technology (AIT) is an international institute established in 1959 in Thailand to meet the growing need for advanced engineering education in Asia. AIT promotes technological change and sustainable development through higher education, research and outreach. The Geoinformatics Center was established at AIT to support the countries in the Asian region in applications of geoinformatics. The Center has implemented more than 50 projects and 150 training courses in the South, Southeast and Central Asia countries and the Center has the state-of-the-art training and research facilities. The Geoinformatics Center is collaborating with the GFDRR (Global Facility for Disaster Reduction and Recovery) of the World Bank for implementing the Probabilistic Risk Assessment initiative for multi-hazards called CAPRA in the region encompassing several hazards such as flood, landslide, tropical cyclone, earthquake, and tsunami. The Center has also been designated as the regional hub for the Sentinel Asia as well as International Charter initiatives for emergency data processing. Based on satellite observations carried out immediately after a disaster, the Center creates value-added products in order to help the affected countries in their emergency response and recovery efforts.

The Sahana Software Foundation is based in California, USA and the foundation is supported by a diverse international group of including software developers, emergency managers, disaster risk assessment experts and academics. The foundation responds to requests from countries for support during emergencies. It has deployed Sahana during disasters in Bangladesh, China, Chile, Haiti, India, Indonesia, Japan, Myanmar, Pakistan, Sri Lanka, and USA. During the typhoon Yolanda in 2013, Sahana Software Foundation supported the Philippines Red Cross, the Department of Social Welfare and Development and the Department of Health. Sahana Software Foundation works around the world to build the capacity of volunteers, organizations and corporates to support Sahana. An activity called “Sahana Camp” for in-country capacity building has been organized in India, Taiwan, Vietnam, Portugal, Thailand and USA. Sahana Camp provides participants hands-on experience implementing and using Sahana in their own countries and enhances their skills to develop customized solutions.

We propose the following team composition and task assignment for the project:

Name of Experts and Affiliations	Position Assigned	Expertise Relevant to the Assignment	Qualifications
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<b>Name of Experts and Affiliations</b>	<b>Position Assigned</b>	<b>Expertise Relevant to the Assignment</b>	<b>Qualifications</b>
1) Dr. Lal Samarakoon, Asian Institute of Technology	Project Advisor	<ul style="list-style-type: none"> <li>• Project coordination</li> <li>• Remote Sensing and GIS</li> </ul>	<ul style="list-style-type: none"> <li>• 17 years experience in project coordination.</li> <li>• Extensive experience in implementing projects in 17 developing countries.</li> </ul>
2) Dr. Manzul Kumar Hazarika, Asian Institute of Technology	Project Manager	<ul style="list-style-type: none"> <li>• Project management</li> <li>• Multi-hazard risk assessment</li> <li>• Remote Sensing</li> <li>• Capacity building</li> </ul>	<ul style="list-style-type: none"> <li>• 11 years experience in project management in Multi-hazard risk assessment.</li> <li>• Capacity building in 17 developing countries</li> </ul>
3) Mr. Nuwan Waidyanatha, Sahana Software Foundation	Emergency Communication Expert	<ul style="list-style-type: none"> <li>• Common Alerting Protocol</li> <li>• Early warning sys.</li> <li>• End-to-end system design &amp; integration</li> </ul>	<ul style="list-style-type: none"> <li>• 14 years experience in Computer Engineering and ICT solutions.</li> <li>• Chairs the Sahana standards and interoperability committee</li> </ul>
4) Mr. Francis Boon, Sahana Software Foundation	Sahana Software Development Expert	<ul style="list-style-type: none"> <li>• Software development</li> <li>• Sahana Web 2.0 software</li> </ul>	<ul style="list-style-type: none"> <li>• 20 years experience in developing disaster management related software.</li> <li>• Chairs the Sahana products Management Committee.</li> <li>• Member of the Open Street Map (OSM) Team.</li> </ul>
5) Dr. Babette P Resurrección, Stockholm Environment Institute (SEI)-Asia	Gender Specialist	<ul style="list-style-type: none"> <li>• Gender,</li> <li>• Environment</li> <li>• Participatory processes</li> <li>• Climate adaptation.</li> </ul>	<ul style="list-style-type: none"> <li>• 15 years of experience in issues related to gender.</li> <li>• Founding member of the Mekong Program on Environment, Water and Resilience (M-POWER)</li> </ul>
6) Mr. Timothy C. Rice Jr. - Programmer, Asian Institute of Technology	Programmer	<ul style="list-style-type: none"> <li>• Programming</li> <li>• Web application developed in MVC 4</li> <li>• JQuery, JavaScript, and HTML5 with MySQL</li> </ul>	<ul style="list-style-type: none"> <li>• Experience in designing, developing, and testing windows application systems and web systems for clients in USA, Thailand, Sri Lanka, and Myanmar.</li> </ul>
7) Mr. Bajinder Pal Singh	Knowledge Management Specialist	<ul style="list-style-type: none"> <li>• Website content management</li> <li>• Social media</li> <li>• Blogging</li> <li>• Graphic design</li> </ul>	<ul style="list-style-type: none"> <li>• 20 years of experience in Journalism and communication.</li> <li>• Science communication and disaster reporting</li> </ul>
8) Dr. Louiqa Raschid, University of Maryland and Founding Chair of the Sahana Board	Database Advisor	<ul style="list-style-type: none"> <li>• Database design; data science</li> <li>• BIGDATA</li> <li>• Linked Data management.</li> </ul>	<ul style="list-style-type: none"> <li>• 10 years of participation in FOSS.</li> <li>• 3 decades of research, teaching, consulting in data science and data management.</li> </ul>
9) Ms. Sudchai Naikaset	Support Staff	<ul style="list-style-type: none"> <li>• Administration</li> <li>• Finance</li> <li>• Personnel</li> </ul>	<ul style="list-style-type: none"> <li>• 20 years experiences in administration, finance and personnel management.</li> </ul>

## **K. Knowledge Management and Results Dissemination**

Outcome of these project-monitoring activities as elaborated in Section-N will be documented and submitted to UN-ESCAP every six months. Following activities will

serve as important documents for enumerating and highlighting the project work, progress outputs, achievements and milestones for public dissemination:

- **Dedicated project website:** The task involves creating a dedicated project website with a custom URL. This website will act as a repository of project work and progress, and will be a repository of project related documents. The website will be created within the first six weeks after the commencement of the project, and will be updated on at least a monthly basis.
- **Analytical Paper:** The project team will synthesize the lessons learned in a brief analytical paper on "Challenges of integrating CAP into DM plans in high risk countries".
- **Branding Materials and Templates:** A branding strategy based on branding principles of ESCAP and AIT (including the use of logo) is planned. Templates will be created for the purpose of
  - a) **For training and workshop**
    - Overhead banner
    - Presentation template (MS PowerPoint)
    - Training folder binder and cover
    - ID tags of participants and facilitators
  - b) **For information products**
    - Project website
    - Report Covers

## L. Sustainability

Development of capacities of the NDMOs and line-agencies will be an important step in this project for its sustainability. To this end, we propose to train so called "Technology Stewards" drawn from NDMOs/NWCs, line-agencies and other stakeholders as the master trainers, and they will act as focal points for catering the future capacity building needs in their respective countries. Technology Stewards will receive teaching materials and they will be sufficiently trained to offer such kind of courses independently to the staff of NDMOs/NWCs, line-agencies and other stakeholders in their respective countries with a multiplier effect and make the efforts sustainable.

We also propose to use Free and Open Source Software (FOSS) platform Sahana so that all the applications developed under the project can be used freely through MIT Licenses<sup>2</sup> after completion of the project to ensure sustainability. Sahana has a vibrant community with high technical competencies to assist the beneficiary countries and organizations embracing the Sahana products can be benefited from the community in the long run.

We are also establishing a regional hub for Sahana at AIT and this hub will be happy to provide assistance to the countries even after the project period in order to ensure the sustainability of the efforts.

## M. Counterpart Contributions

Expected counterpart contribution in kind is **52,950 USD** covering the follows:

- Cost of staff time related to project activities, including administrative support.

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<sup>2</sup> The MIT License - Open Source Initiative, <http://opensource.org/licenses/MIT>

- Facilities provided by AIT for holding trainings.
- Facilities provided by national partners for holding project related workshops and meetings in respective countries.
- Resources such as data and maps.

#### **N. Monitoring, Evaluation and Audit**

For monitoring purpose, the project team will conduct meeting in every *two-months* for progress review, while *quarterly* progress reports from each national partners of the beneficiary country will be sought and evaluated. AIT and Sahana Software Foundation staff will be also visiting the beneficiary countries for implementing the project and they will hold discussions with the national partners in order to monitor the progresses. Moreover, AIT has a few on-going projects in some of the beneficiary countries and while AIT staff visit these countries for implementing the projects, they will be also able to have additional meetings with national partners of this project which will further reinforce the monitoring efforts. The Project Coordinator will monitor the overall planning and monitoring the progress of the project. Other mechanism for internal self-evaluation is the peer review of the project guidelines. Suitable interventions will be suggested if there are any shortcomings, while implementing the project. *Six-monthly* progress report will be provided to UN-ESCAP for their evaluations and feedbacks.

In order to assess the effectiveness of the workshops and trainings, SWOT analysis will be carried at the end of each event. Evaluation of the training programs will be conducted using Feedback Forms. AIT and Sahana Software Foundation staff will visit beneficiary countries and the projects participants in each country are expected to enhance their capacities to use SAMBRO independently in their own environment.

External auditing will be carried out and audit report will be submitted.