

**Disaster Warning and Response Systems in Small  
Island Developing States (SIDS) Regions**

**A Report for the Commonwealth Secretariat  
by  
Umvoto (Pty) Ltd**



**Commonwealth Secretariat**



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## **LIST OF ACRONYMS**

ACMAD	-	African Center of Meteorological Applications for Development
ADPC	-	Asian Disaster Preparedness Center
ADRC	-	Asian Disaster Reduction Center
ADB	-	African Development Bank
AIDS	-	Acquired Immunodeficiency Syndrome
AIMS	-	Atlantic, Indian Ocean, Mediterranean and South China Sea
AMCEN	-	African Ministerial Conference on the Environment
AOSIS	-	Alliance of Small Island States
AU	-	African Union
AU/NEPAD	-	The African Union and the New Partnership for Africa's Development
AusAID	-	Australian Government's Overseas Aid program
BOM Australia	-	Australian Bureau of Meteorology
BPOA	-	Barbados Programme of Action on the Sustainable Development of Small Island Developing States
CAP	-	Country Assistance Plan
CARICOM	-	Caribbean Community
CARITAS	-	Caritas Internationalis confederation of 162 Catholic relief, development and social service organisations
CCA	-	Common Country Assessment
CCA/UNDAF	-	Common Country Assessment/United Nations Development Assistance Programme
CDERA	-	The Caribbean Disaster Emergency Response Agency
CDM	-	Caribbean Comprehensive Disaster Management strategy
CHARM	-	Comprehensive Hazard and Risk Management
COI	-	Commission de l'Océan Indien (Indian Ocean Commission)
COMESA	-	Common Market for Eastern and Southern Africa
CROP	-	Council of Regional Organizations for the Pacific
CS	-	Commonwealth Secretariat
CSD	-	The United Nations Commission on Sustainable Development
DACO	-	Development Assistance Coordination Office

DAMHo	- Detachment of medical support and hospitalisation
DANA	- Damage Assessment and Needs Analysis
DEWA	- Division of Early Warning and Assessment (United Nations Environmental Programme)
DICA	- Detachment de l'Intervention Catastrophe Aéromobile
DIT	- Department of Information Technology
DM	- Disaster Management
DMC	- SADC Drought Monitoring Centre
DRR	- Disaster Risk Reduction
EEZ	- Exclusive Economic Zone
EM-DAT	- Emergency Events Database
ENSO	- El Nino/Southern Oscillation
EMS	- Environmental Management System
EU	- European Union
EWS	- Early Warning System
FAO	- United Nations Food and Agriculture Organisation
FSPI	- Foundation of the Peoples of the South Pacific International
GA	- Geoscience Australia
GEO	- Global Environmental Outlook
GIS	- Geographic Information
GNS	- Institute of Geological and Nuclear Sciences
GPS	- Global Positioning System
HDI	- Human Development Index
HF Email	- High Frequency radio e-mail
HIV	- Human Immunodeficiency Virus
HOG	- CARICOM Heads of Governments
IATF/DR	- Inter-Agency Task Force for Disaster Reduction
IATF-WG1	- IATF Working Group on Climate and Disasters, chaired by WMO (completed work)
IATF-WG2	- IATF Working Group on Early Warning, chaired by UNEP (completed work);
IATF-WG3	- IATF Working Group on Risk, Vulnerability and Impact Assessment, chaired by UNDP;

IATF-WG4	-	IATF Working Group on Wildland Fires chaired by Global Fire Monitoring Centre, Freiburg, Germany (completed work)
ICG/IOTWS	-	Intergovernmental Coordination Group for the Tsunami Warning and Mitigation System in the Indian Ocean
ICG/ITSU	-	International Coordination Group for the Tsunami Warning System in the Pacific
ICPAC	-	IGAD Climate Prediction and Applications Centre
IDNDR	-	International Decade for Natural Disaster Reduction (1990–1999)
IDB	-	Inter American Development Bank
IFRC	-	International federation of the Red Cross and the Red Crescent
IGAD	-	Inter-Governmental Authority on Development
IGO	-	Inter-governmental Organisations
IOC	-	Intergovernmental Oceanographic Commission (of UNESCO)
IODE	-	International Oceanographic Data and information Exchange
ISDR	-	United Nations International Strategy for Disaster Reduction
IT	-	Information Technology
ITIC	-	International Tsunami Information Center
JPOI	-	Johannesburg Plan of Implementation
LDC	-	Least Developed Countries
LLRM	-	Local Level Risk Management
MASC	-	Mountain Administrative Support Center (NOAA)
MDG	-	Millennium Development Goal
MetNZ	-	Meteorological Service of New Zealand
NEPAD	-	New Partnership for Africa's Development
NGO	-	Non-Government Organisations
NIWA	-	New Zealand's National Institute of Water and Atmospheric Research
NOAA	-	National Oceanographic and Atmospheric Agency
NZAid	-	New Zealand Government's overseas Aid Program
OAU	-	Organization of African Unity
OAS	-	Organisation of American States
OCHA	-	United Nations Office for the Coordination of Humanitarian Affairs

ODA	-	Official Development Assistance
Pacific GOOS	-	Pacific Islands Global Ocean Observing System
PEAC	-	Pacific ENSO Applications Center
PIC	-	Pacific Island Countries
PIFS	-	Pacific Island Forum Secretariat
PMA	-	Pacific Maritime Association
PNG	-	Papua New Guinea
PPEW	-	Platform for the Promotion of Early Warning
PRSP	-	Poverty Reduction Strategy Paper
RANET	-	Radio and Internet System
REC	-	Regional Economic Communities
RCMRD	-	Regional Centre for Mapping of Resources for Development
RCSSMRS	-	Regional Centre for Services in Surveying, Mapping and Remote Sensing
RSMC	-	Regional Specialized Meteorological Centre
SADC	-	Southern African Development Community
SEAF	-	Special Emergency Assistance Fund
SID	-	Small Island Developing States
SOPAC	-	South Pacific Applied Geoscience Commission
SPREP	-	South Pacific Regional Environment Programme
SRS	-	Satellite Remote Sensing
TCWC	-	Tropical Cyclone Warning Centres
TOR	-	Terms of Reference
UNCED	-	United Nations Conference on Environment and Development
UN/ISDR	-	United Nations International Strategy for Disaster Reduction
UN/ISDR Africa	-	The Africa Regional Outreach Office of the United Nations International Disaster Reduction
UNDAF	-	United Nations Development Assistance Frameworks
UNDP	-	United Nations Development Programme
UNDESA	-	United Nations Department of Economic and Social Affairs
UNECA	-	United Nations Economic Commission for Africa
UNEP	-	United Nations Environment Programme
UNEP/GRID Adrenal	-	UNEP/Global Resource Information Database
UNEP-INFOTERRA	-	UNEP/global environmental information exchange network

UNEP FI	-	UNEP Finance Initiative
UNEP-OCHA	-	UNEP/Office for the Coordination of Human Affairs
UNESCO	-	United Nations Educational, Scientific and Cultural Organisation
UN-ESCAP	-	United Nations Economic and Social Commission for Asia and the Pacific
UNGA	-	United Nations General Assembly
UN-IATF	-	UN Inter-Agency Task Force on Disaster Reduction
UNOOSA	-	United Nations Office on Outer Space Affairs
UNU	-	United Nations University
USA	-	United States of America
USAID	-	United States Government's overseas Aid Program
WCDR	-	World Conference on Disaster Reduction
WHO	-	World Health Organisation
WMO	-	World Meteorological Organisation
WSSD	-	World Summit on Sustainable Development
World Vision	-	World Vision International Christian relief and development organization

## Executive Summary

The Commonwealth Secretariat in keeping with a decision by the Secretaries-General of the Commonwealth, Caribbean Community (CARICOM), Commission de l'océan Indien (COI), and Pacific Islands Forum (PIF), commissioned this report to:

“ ... briefly examine current arrangements in vulnerable island and coastal communities in the Commonwealth regions to assess whether they are covered by adequate disaster warning and response systems and whether the Commonwealth and regional IGOs have a niche role to play in support of work in the area that is already being undertaken by national governments and regional and international organizations”.

This report documents the relevant international and regional institutions, agencies and initiatives involved in the many aspects of disaster warning, mitigation and management, and their complex array of interrelationships. It offers some comment on their relevance and possible shortcomings as well as giving an indication of where it is all headed. Whilst it was not possible within the scope of this study to undertake a definitive study, so far as possible relevant material has been considered.

The paper reviews three regional reports in the context of background information on the current programmes and frameworks for action arising from the International Decade for Natural Disaster Reduction and the World Conference on Disaster Reduction viz. the Hyogo Framework for Action 2005 – 2015: “*Building the Resilience of Nations communities to Disasters*”. There is an obvious contrast between the different regional contributions and their approaches, which is determined by the local perception of hazards and risk.

The United Nations Secretary General has tasked the UN International Strategy for Disaster Reduction (UN/ISDR) secretariat with the coordination of a “survey of existing capacities and gaps” in cooperation with all United Nations system entities concerned (A/59/2005, paragraph 66). The survey will support the Secretary General’s recommendation for the “establishment of a worldwide early warning system for all natural hazards, building on existing national and regional capacity, to complement broader disaster preparedness and mitigation initiatives”. To support the survey, the Inter-Agency Task Force for Disaster Reduction (IATF/DR) established an ad-hoc Working Group chaired by the World Meteorological Organization (WMO) and the Office for the Coordination of Humanitarian Affairs (OCHA). The survey is being coordinated by the Bonn-based ISDR Platform for the Promotion of Early Warning.

Other relevant processes include:

1. The ISDR-coordinated, multipartner project, UN Flash Appeal Project “Evaluation and Strengthening of Early Warning Systems in Countries Affected by the 26 December 2004 Tsunami” aims to provide an overall integrated framework for strengthening early warning systems in the region, particularly for tsunamis, but also recognizing the context of multiple hazards, risk management and risk reduction.
2. The establishment of the intergovernmental Group on Earth Observation and the endorsement of a 10-year Implementation Plan to create a Global Earth Observation System of Systems.

3. The Intergovernmental Oceanographic Commission of UNESCO, through the Intergovernmental Coordinating Group (ICG) for the Indian Ocean, to establish a tsunami warning and mitigation system for the region.

An aspect noted is that the relative measure of a disaster's impact has a worth in that it highlights the difficult decisions that must be made and the inevitable tensions between urgent and immediate short-term needs arising out of rare, low-frequency but high-impact occurrences, and the as-urgent, but not always necessarily as-immediate, longer-term objectives and priorities of mitigating against slower onset potential disasters.

The study found that Disaster Response is reported as being poorly co-ordinated and hampered by lack of institutional capacity, poor governance at national level in some islands, and poor implementation of policy and plans at local and community level in others. A strong need to develop a regional awareness, education outreach and institutional capacity building programmes is identified as well as the need to engage with the private sector to widen funding opportunities. This broader, often referred to as "end-to-end" approach of the challenge, is the reason behind the integration of early warning systems within disaster risk reduction strategies.

The specific socio-economic setting in the three different regions poses the problem that the populations are generally small and therefore, in some cases; do not have a sufficiently diverse technological and or skills base. Often a single disaster can threaten the livelihoods of the majority or all of the citizens in one island state, e.g., the continuing volcanic crisis on Montserrat in the Caribbean or the recurring drought and locust conditions in Madagascar.

It was observed that it is often the smaller, more frequent, less dramatic disasters that have an insidious and cumulative impact on the populations of the less developed and poorer states and from which the poor seldom recover. This affects all the regions in different measure.

A key issue identified is empowerment, the engagement of local communities and the upgrading of communication networks to achieve 24hr availability.

## **Recommendations**

The recommendations submitted below are of a strategic nature and focus on the niche areas and gaps identified which are common to all three regions, but at the same time recognise that national or area-specific interventions are in some instances best. They highlight areas where more work is needed and opportunities present themselves which could be initiated through existing programmes or working relationships common to all three regions, as well as those organisations whose activities are focussed more in one region than in another. They are based on the current longer-term international programmes that can be taken up by the regions themselves, or in co-operation with each other and supported by the Commonwealth Secretariat. The three responsible regional organisations are best placed to adapt the recommendations at sub regional and national level together with the implementation and funding partners operating within the regions.

The twelve recommendations, which it is proposed that the three regions in collaboration with the Commonwealth Secretariat pursue, are summarised as follows:

1. The establishment and/or elaboration of regional offices and capacity, linked to the ISDR System, to assist national authorities with the implementation and integration of

uniform Disaster Risk Reduction and Disaster Management assessments within the UN's development assistance frameworks.

2. The establishment and/or elaboration of regional offices and capacity, linked to the ISDR System, to assist with the implementation and integration of Poverty Relief Strategic Programmes at national level.
3. Seek agreement on what Millennium Development Goal and Poverty Relief Strategic Paper indicators should be established and monitored at regional and national levels.
4. Seek agreement on inter-regional co-operation to develop capacity building programmes, which can be tailored to meet regional and national priorities with particular emphasis on primary school education and education for women.
5. Establish regional and inter-regional working groups linked to the ISDR System to interface with the IFRC, UNDP-BCRP, UNEP, OCHA, inter alia, to develop and support links that will ensure that DRR measures and capacity building are integrated into Disaster Response and DM activities and planning;
6. Engage with the International Federation of the Red Cross and the Red Crescent and other partners to expand the training programme in local communities.
7. Engage strongly with local, national, international NGO community in support of empowering local communities, documenting, supporting and integrating local knowledge in early warning and response programmes;
8. Establish regular inter-regional exchange and co-operation programmes using the designated central organisations to highlight the lessons learned in different regions.
9. Develop a Caribbean Centre for Hazard Assessment and Risk Management institutional model, around a recent University of West Indies initiative based at the Mona campus in Jamaica and emphasizing regionally based centres of research and training and training, and use it as a basis for parallel developments in the other two regions.
10. Review and consider the limitations posed by there being no organizational counterpart of South Pacific Applied Geoscience Commission or The Caribbean Disaster Emergency Response Agency to advise and support the Commission de l'Océan Indien
11. The Commonwealth Secretariat can best assist by providing the promotion, co-ordination and facilitation effort needed to bring about the speedy implementation of the various international initiatives in the three regions.
12. There have been continued calls for improved financing for disaster risk reduction and an early response to emerging disasters, shifting expenditures from disaster relief, to much more cost-effective and humane disaster risk reduction and disaster management. At the World Conference on Disaster Reduction in Kobe, the UN Under-Secretary-General for Humanitarian Affairs, Jan Engeland, called for ten per cent of current disaster relief expenditure by all nations to be earmarked over the next ten year for disaster risk reduction. This call has been supported by a number of

governments. The Commonwealth can help to track progress on this initiative and advocate for greater expenditures on disaster risk reduction.

# 1. Introduction

## 1.1 Background

This Report arises from a meeting of the Secretaries-General of the Commonwealth, Caribbean Community (CARICOM), Indian Ocean Commission (henceforward COI<sup>1</sup> – Commission de l’Océan Indien), and Pacific Islands Forum (PIF), at which, following the tsunami disaster of 26 December 2004, they decided to examine ways in which their institutions could collectively reduce the future impact of natural disasters by strengthening advance warning networks across international borders (I. Coomaraswamy, personal communication, 18 July 2005). The context of this decision was the five-day (10-14 January 2005) International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, hosted by the Republic of Mauritius and held in Port-Louis, was attended by 18 Presidents, Vice-Presidents and Prime Ministers, some 60 ministers and nearly 2000 delegates, civil society representatives and journalists from 114 countries, and by 15 UN or multilateral agencies.

The heads of the four intergovernmental organizations (IGOs) specifically decided “to develop inventories of the advance warning resources and systems available in the Caribbean, Indian and Pacific Ocean regions and through this, to identify aspects of these systems which need strengthening, including the human and institutional capacity and the information systems that underpin effective disaster warning and response” (*op. cit.*). The current project, facilitated by the Commonwealth Secretariat, aims to present the four Secretaries-General with concrete proposals at the next meeting.

## 1.2 Terms of Reference and concurrent developments

The full Terms of Reference (ToR) document of the current assignment is appended to this report as **Annex A**, in which the project objective is summarily stated as follows:

“ ... briefly examine current arrangements in vulnerable island and coastal communities in the Commonwealth regions to assess whether they are covered by adequate disaster warning and response systems and whether the Commonwealth and regional IGOs have a niche role to play in support of work in the area that is already being undertaken by national governments and regional and international organizations”.

Coming so soon after the tragic Indian Ocean tsunami disaster of 26 December 2004, the Mauritius meeting was closely followed by other important international meetings and assemblies, during which similar resolutions have been adopted. In particular, consequent to the United Nations Secretary-General’s report (A/59/2005, 21 March 2005) to the UN General Assembly (UNGA), the secretariat of the United Nations International Strategy for Disaster Reduction (UN/ISDR) is presently tasked with the coordination of a “survey of existing capacities and gaps” with regard to the “establishment of a worldwide early warning system for all natural hazards, building on existing national and regional capacity, to complement broader disaster preparedness and mitigation initiatives”. The draft scope and timetable of the UN/ISDR survey overlaps substantially with the Commonwealth Secretariat assignment (see attached **Annex B**).

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<sup>1</sup> The French acronym not only records the dominant language of this regional community, but serves to avoid confusion with another IOC, namely, the Intergovernmental Oceanographic Commission of UNESCO.

Another parallel, interlinked development is the launch on 19 January 2005 at the World Conference on Disaster Reduction (WCDR), of the International Early Warning Programme (IEWP), and the preparations for the Third International Early Warning Conference (EWC-III) to be held in Bonn, Germany during March 2006. The UN system-wide survey of world early warning capacities and gaps is being closely coordinated with the EWC-III, thus providing an opportunity to address the gaps identified.

The third important parallel development is the establishment, by formal resolution of the Third Earth Observation Summit held in Brussels, Belgium, on February 16, 2005 of the intergovernmental Group on Earth Observation (GEO), and the endorsement of a 10-year Implementation Plan to create a Global Earth Observation System of Systems (GEOSS). The sections of this plan dealing with the societal benefit area of “Disasters”, particularly the 2-year targets (GEO, 2005,p. 35-36), are germane to the present assignment. The new GEO Secretariat office is housed in the Geneva headquarters building of the WMO.

A fourth, and most recent, significant development is the establishment, by formal resolutions of the Twenty-third Assembly of the Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO), of new Intergovernmental Coordination Groups (ICGs) for tsunami warning and mitigation systems (see attached **Annex C**).

### **1.3 Methodology**

The reports received from the three SIDS regions were reviewed in the context of background information on current programmes and frameworks for action arising from the International Decade for Natural Disaster Reduction (IDNDR) and the WCDR, viz., the Hyogo Framework for Action 2005 – 2015: “*Building the Resilience of Nations communities to Disasters*”.

Independent internet-based research on global, regional and national initiatives on disaster warning and response systems, within the relevant IGO domains and regional and global programmes related to observation of earth systems, as well as knowledge management policies were considered. Information and material germane to natural hazard occurrence in these regions as well as the management and mitigation of disasters (potentially) arising from them was obtained by internet and hardcopy literature search to supplement our existing knowledge. The research programmes and results of specific institutes and or organisations known to be involved in the seismic, hydro-meteorological, oceanographic processes most likely to impact on the SIDS, were scanned.

Background material such as the Guidelines for integrating Disaster Risk Reduction (DRR) into the Common Country Assessment (CCA) and United Nations Development Assistance Framework (UNDAF) processes ([http://www.un.org/special-rep/ohrlls/ohrlls/cca\\_undaf\\_prsp.htm](http://www.un.org/special-rep/ohrlls/ohrlls/cca_undaf_prsp.htm)), the initial material available on the UNEP programme to implement the Hyogo Framework for Action, the Africa Regional Strategy and Programme of Action for Implementation of the Africa Strategy for DRR, the Mauritius Strategy, the SOPAC document “An Investment for Sustainable Development in Pacific Island Countries DRR and DM: Building the Resilience of Nations and Communities to Disasters A Framework for Action 2005–2015”, numerous declarations such as the Kingston Declaration and others pertaining to the CARICOM region were studied

Where needed, contact was made with representatives of CDERA, SOPAC, COI and other regional organisations including UN agencies to obtain information or direction with respect to identifying and prioritising common needs between the three regions.

Whilst it was not possible within the scope and budget of this appointment to undertake a definitive study, so far as possible relevant material has been considered. It is assumed that the regional and local experts and representatives who will be present at the meeting to be held in Barbados (August 8–9, 2005) will facilitate regional and national adaptation of the recommendations and if needs be corrections.

The recommendations made are of a strategic nature and focus on the niche areas and gaps common to all three regions, but recognize that national and area-specific interventions are in some instances best. The focus is to facilitate a co-operative approach to securing the sustained resources (financial, data and knowledge) and the building of leadership and expertise needed at the regional, national and local level.

#### **1.4 Structure of Report**

The report is structured to follow closely the ToR of the assignment (**Annex A**):

*Section 2* provides an preliminary overview of the work being done by the UN and some other international organizations in the area of disaster warning and response systems, with appropriate reference to the regions and countries covered by this assignment; (**Annex D & E**).

*Section 3* reviews the findings of the regional situation reports that are provided by the three IGOs, namely, the Pacific Island Forum (PIF), the Caribbean Community (CARICOM), and the Indian Ocean Commission (Commission de l’Océan Indien – COI) and provides an overall perspective informed by the UN/ISDR approach to hazard classification (**Annex, G & H**);

*Section 4* identifies critical gaps in Early Warning (EW) and Disaster Response (DR) systems within the different regions and highlights niche areas for immediate or short-term intervention, in order to bring EW and DR components into line with the ISDR’s Hyogo Framework for Action (HFA) for building community and national resilience, and also to contribute to the current regional and global initiatives towards a multi-hazard and multi-sectoral approach to DRR;

We recommend elements of a programme of action that could be undertaken collaboratively between the Commonwealth, the three IGOs, and other appropriate partners, including local civil society. (**Annex J**)

“This tsunami tragedy has taught us once again the need for prevention and early warning. Last week’s meeting in Jakarta called for the establishment of a regional early warning system for the Indian Ocean and Southeast Asia. But we should do even more. We need a global warning system – and one that covers not just tsunamis but all other threats, such as storm surges and cyclones. In such an endeavour, no part of the world should be ignored. We must think globally, and consider measures equal to the task.”

Mr Kofi Annan, UN-Secretary General, in his address to the UN Conference on Small Islands Developing States held in Mauritius in January 2005

## 2. Overview of International Developments relevant to Early Warning and Disaster Response Systems

In 1994, the United Nations Global Conference on the Sustainable Development of small island developing States (SIDS) was convened in Barbados. The Conference adopted the Barbados Programme of Action (BPOA) that set forth specific actions and measures to be taken at the national, regional and international levels in support of the sustainable development of SIDS.

The World Summit on Sustainable Development (WSSD) in 2002 reaffirmed the special case of SIDS and highlighted a series of SIDS-specific issues and concerns in the Johannesburg Plan of Action, adopted by the Summit. In a follow-up to WSSD, the United Nations General Assembly (UNGA) adopted Resolution A/57/262, which, among other things, called for a comprehensive review of the BPOA at an international meeting to be held in Mauritius, some ten years after its adoption.

The major outcome document of the conference, the Mauritius Strategy for further implementation of the BPOA, emphasizes that SIDS “are located among the most vulnerable regions in the world in relation to the intensity and frequency of natural and environmental disasters and their increasing impact, and face disproportionately high economic, social and environmental consequence,” as highlighted by the tragic impacts of the 26 December Indian Ocean tsunami and the 2004 hurricane/cyclone/typhoon season in the Caribbean and Pacific.

International and UN agencies, regional and local NGOs will be informed by these agreements as are the global programmes described in sections 1.2 and 1.3.

There are numerous UN Agencies that have or are increasingly involved in DRR and DM related work, some of which are summarised briefly below. A preliminary summary of some of the programmes of these as well as other UN agencies, IGOs, international NGOs, regional and donor organisations are summarised in **Annex D**.

The UN/ISDR has spear headed the initiative to mainstream Disaster Risk Reduction, to improve the efficacy of EWS and to integrate DRR initiatives in to DM activities. The co-ordinating and facilitation role of the UN/ISDR is critical to the success and co-ordination of efforts by not only other UN agencies but also by regional and international organisations, NGOs and key government and civil society players.

### UN/ISDR

The United Nations **International Strategy on Disaster Reduction (UN/ISDR)** is the “focal point in the UN System to promote links and synergies between, and the coordination of, disaster reduction activities in the socio-economic, humanitarian and development fields, as well as to support policy integration. It serves as an international information clearinghouse on disaster reduction, developing awareness campaigns and producing articles, journals, and other publications and promotional materials related to disaster reduction” ([http://www.unisdr.org/eng/about\\_isdr/isdr-mission-objectives-eng.htm](http://www.unisdr.org/eng/about_isdr/isdr-mission-objectives-eng.htm)). The ISDR combines the strengths of many key players through the Inter-Agency Task Force for Disaster Reduction (IATF/DR) and the Inter-Agency Secretariat of the ISDR.

The **Inter-Agency Task Force for Disaster Reduction (IATF/DR)** is mandated for four functions:

1. to serve as the main forum within the United Nations system for devising strategies and policies for the reduction of natural hazards;
2. to identify gaps in disaster reduction policies and programmes and recommend remedial action;
3. to provide policy guidance to the ISDR secretariat; and
4. to convene ad hoc meetings of experts on issues related to disaster reduction.

From 2001-2003 the IATF/DR had had a Working Group on Early Warning (IATF-WG2), chaired by UNEP. The efforts of the IATF-WG2 culminated in the Bonn Second International Conference on Early Warning, which called for the creation of a platform (i.e., an organizational capacity) in order to stimulate and support the development of early warning, to implement the conference's policy and program recommendations, and generally to sustain the dialogue on early warning. The **Platform for the Promotion of Early Warning (PPEW)**, which, with the joint support of ISDR and the Government of Germany started operations in 2004, aims to "help the development of early warning and preparedness systems by

- (i) advocating for better early warning systems, especially in development assistance policy and programs;
- (ii) collecting and disseminating information on best practices, and
- (iii) stimulating cooperation among early warning actors and the development of new ways to improve early warning systems" (<http://www.unisdr.org/ppew/about-ppew/in-brief.htm>).

The "UN Flash Appeal" project titled "Evaluation and Strengthening of Early Warning Systems in Countries Affected by the 26 December 2004 Tsunami" is coordinated by UN/ISDR-PPEW in close collaboration with UNESCO's Intergovernmental Oceanographic Commission (IOC-UNESCO) and other UN organizations, such as the World Meteorological Organization (WMO), United Nations Development Program (UNDP), United Nations University (UNU), United Nations Environment Programme(UNEP), the UN Economic and Social Commission for Asia and the Pacific (UN-ESCAP), and regional partners such as the Asian Disaster Reduction Centre (ADRC) and the Asian Disaster Preparedness Centre (ADPC). This project aims to link the tsunami early warning system to other disaster risk management policies and institutions, such as national platforms for disaster risk reduction and risk management, including seeking possible synergies with other early warning systems.

The UN/ISDR conducts outreach programmes through regional units in Costa Rica and Kenya and in Asia and the Far East. The primary purpose of the ISDR outreach programme is to ensure that there is a coordinated, participatory and iterative process of thought and action that manages progress towards disaster risk reduction objectives. The work of the outreach office is to build on and assist in co-ordinating existing skills and initiatives, to institutionalise processes that build a culture of consultation, negotiation, mediation and consensus building on priority societal issues where interests may differ. Thus a region or a countries engagement with either the local outreach office or Geneva would be critical to the success of programmes developed and run not only by other UN Agencies (UNDP, UNEP, OCHA *inter-alia*) but also by key international organisations such as IFRC, specialist research and or Aid and Donor communities.

Mr Sálvano Briceño, Director of UN/ISDR has stated that "... education is for us the single most important activity; disaster reduction is in its essence about education. Then, secondly,

it is about organisation and planning.....We as an inter-agency secretariat at the ISDR will ...bring in the different agencies and, using the various structures in place, we will take the commitments forward through different mechanisms (according to our mandate).”

## **IOC/UNESCO**

The Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO) is primarily involved at present in the first preparatory steps toward developing comprehensive tsunami early-warning system for the Indian Ocean region, the Inter-Americas Seas / Caribbean, and elsewhere within a wide global framework. Key resolutions to this effect were adopted by the recent Twenty-third Assembly of IOC (IOC XXIII) in June 2005 (see **Annex C**). The project aims to secure public confidence in their security against further tsunami in the Indian Ocean and other regions, by supporting the coordination and planning needed to develop tsunami early warning capacities and by rapidly boosting necessary awareness and capacities of public authorities in the region.

Because the IOC/UNESCO programme is to be embedded within a wider multi-hazard and multi-sectoral global early-warning framework promoted by ISDR, any regional development of EW and DR systems should take cognisance of IOC/UNESCO initiatives, and vice versa.

## **UNEP**

The United Nations Environmental Programme (UNEP) mandate and programmes have always been aligned with the three strategic goals adopted in the Hyogo Framework for Action. UNEP’s specific role in DRR and DM was mandated by the governing council and, since Kobe 2005, it has initiated a review of their key objectives and strategies on DRR. It is currently expanding its focus and actions in this regard as well as reviewing the Strategic Framework for Environmental Emergency that would include sudden onset disasters as well as those resulting from human activities which can be either slow or sudden onset in nature. At a regional as well as a national level UNEP can support and facilitate Multilateral Environmental agreements and the development and review of national environmental legislation. Support of these activities and the associated institutions will facilitate international co-operation during all phases of DRR and DM.

UNEP strongly advocates sound environmental management and has been developing and working on Environmental Management Systems (EMSs) for Disaster Mitigation as a critical strategy to prevent disasters and reduce the risks/vulnerabilities of disaster prone countries and communities. Their emphasis on preventing ecosystem failure, degradation and biodiversity loss supports the longer-term perspective needed to ensure the DRR is integrated into development initiatives. UNEP undertakes post-disaster assessments of environmental impacts and can support the incorporation of environmental concerns in the recovery, reconstruction and restoration processes. This is a critical element of integrating DRR activities and education into the response and recovery phases of DM.

Since 1998 UNEP has, through the Awareness and Preparation for Emergencies at Local Level Programme (APELL) has been operating at the community level in order to support prevention of, mitigation of and preparedness for natural or human-induced disasters. It is the intention of UNEP to strengthen the APELL programme by developing further training material and the development/implementation of pilot/demonstration projects that will enable local communities to identify, assess, prevent and prepare for impacts of a disaster. This could assist with Damage Assessment and Needs Analysis (DANA) gaps identified by the

SIDs as well as the involvement of the local communities in hazard mapping and vulnerability assessments. It is planned that these projects will be developed and implemented in an integrated, community based and participatory way which is in and of itself a training opportunity at local level.

There is a clear need, not only for data, but for locally value added information in both the risk assessment, monitoring and the early warning phases of DRR and DM. This relationship between risk assessment, EWS, knowledge management, education and training supports an iterative approach to developing resilient communities using systems that are community-based but also integrated into and supported by the increasing global network of observation systems, knowledge, information and technical resources. The UNEP-GRID, UNEP-INFOTERRA UNEP/DEWA and the Global Environmental Outlook programmes can be used to support regional and national SID initiatives in this regard. These activities can be coordinated also with the current GEO programmes run by the WMO as well as the IATF-WG1,2,3,4 of the UN/ISDR.

The problem of being under resourced whether financially or in human terms is a common factor in the SIDS environment. Through the UNEP Finance Initiative (UNEP-FI) the issue of financing can be pursued further together with other stakeholders in this arena, such as the World Bank, Development Banks and Insurance Agencies.

Finally the joint UNEP/OCHA Environment unit can be approached and opportunities explored for addressing the problems associated with post disaster assessments from the environmental perspective and for integrating EMS strategies into the Rehabilitation and Reconstruction Phases of DM.

## **UNDP**

The Common Country Assessment (CCA) and United Nations Development Assistance Framework (UNDAF) were adopted as strategic planning tools in 1997 for the UN system to better support the national efforts to achieve sustainable development within the context of the MDGs. This CCA/UNDAF process is undertaken in close collaboration with national government, key stakeholders, NGOs, civil society and the private sector. Together with academic and research groups as well as the media these comprise the five main stakeholder groups of a national community as identified by the IUCNs National Conservation Strategy (NCS) model. Thus incorporating DRR assessments into the CCA process will facilitate the mainstreaming of DRR into development programmes and planning. Similarly because the CCA/UNDAF process is implemented in line with the Poverty Reduction Strategy Papers (PRSPs) these programmes can play a significant role in mitigating the impact of disaster on those most vulnerable in society.

By ensuring the DRR policies are integrated into the CCA/UNDAF programme at national level, impetus is given to the common purpose of enabling more resilient societies and ensuring that development does not increase vulnerability to hazard. This is implemented by applying the Local Level Risk Management (LLRM) approach developed by UNDP and presented at the WCDR 2, to ensure that risk management will become a routine activity coordinated and supported at national level. In this way the CCA can be a diagnostic tool for national government to assess risks. Through the UNDAF process, countries can realise

consensus with development partners as to how to address the underlying challenges and the risk factors facing a country.

The UNDAF is the common strategic framework for operational activities of the UN agencies at country level. It can support national (and by implication regional) efforts to include elements that strengthen national and regional institutions capacity to act in all stages of DRR, including EW and Disaster Response. By adopting a multi-sectoral, multi-hazard approach, different programme initiatives that support the MDGs and the PRSPs and tailored to country-specific circumstances can realise appropriate and maintained investment. These programmes will not only work towards reducing the underlying risk factors but also support good governance, knowledge management and education, preparedness, hazard analysis and effective early warning systems, i.e., the guiding principles of the Hyogo Framework for Action (HFA).

Through the CCA/UNDAF process it is also possible to establish indicators to monitor the implementation of the HFA, as well as the MDGs and PRSPs. In this way EW and DR as two elements of DRR are well integrated into activities at all levels of government and community.

### **IFRC and other civil society organisations (e.g Oxfam, Care and Save the Children)**

NGOs' awareness of the importance of DRR in fulfilling their mandate increased during the 1990s. International relief organisations also involved in development, such as Oxfam, Care and Save the Children, launched disaster-mitigation programmes and incorporated disaster prevention in their operations.

Civil society repeatedly emphasises that DRR and DM activities must first and foremost be community focused and address needs at the grassroots level. Many NGOs push concrete, on-the-ground programmes. These organisations have significant and relevant experience in community empowerment, they often work closely with Community-based organisations (CBOs) and have a different approach to those organisations more usually involved in policy development and research. The largest of these organisations involved in Disaster response is the International Federation of Red Cross and Red Crescent Societies (IFRC).

The IFRC is committed to working closely with ISDR. Disaster reduction and preparedness are priorities for their National Societies that focus on operations at the community level. The activities of the IFRC seek to connect the issue of sustainable development to risk reduction, and thus to the Millennium Development Goals (MDGs). They also seek to address the particular vulnerability of SIDS and primarily those that arise because of their remoteness. Since the IFRC works in many remote parts of the world, not only in SIDS the experience gained elsewhere, even in land locked countries is of relevance. Frequently it is only the Red Cross/Red Crescent National Societies, which have community outreach programmes throughout a given country or region. This is particularly evident in the PIFS. The IFRC community risk reduction strategies fit well into national development planning, which is aimed at helping address long-term vulnerabilities, which is an important component of DM

Increasingly the IFRC is acting on and implementing in its programmes and interventions in the knowledge that it is always the local community who are on the scene in the first critical eight hours after a disaster has struck. Their focus will be to increase the understanding of the relationship between sustainable development and strong communities and to increase the involvement of local communities in the design and implementation of programmes oriented

towards the most vulnerable in society. This will work towards sustaining the links between MDG 7 on sustainable development, and MDG 1 on poverty reduction.

The IFRC, which is made up of national societies in most nations of the world, provides the UN and governments with information and experience collected from the ground during its disaster-response operations. This allows them to identify and share good practices through their networks. The IFRC documents the scale of and response to disasters in their “World Disasters Report”, which they publish annually.

The IFRC can play an important role in using modern communication technology to upgrading response and relief efforts in remote areas as well as in training local communities both in responding to EW and in acting in the event of a disaster. It can be a significant partner in the SIDS regions, empowering local communities and integrating modern technology with traditional practise.

### **UN Office for the Coordination of Humanitarian Affairs (OCHA)**

OCHA has for many years focussed on natural disasters in Asia and the Regional Office for Asia and the Pacific was set up in Bangkok in March 2005.

In the SIDS regions various natural hazards and threats of a technological nature are coupled with uneven levels of development and affluence. There is also, in some states and in the COI, a pattern of repeated low-level disasters and absence of a viable regional framework to enable coherent disaster management technical enhancement and emergency response, both inter-country within the region as well as with the global society. The recently reviewed approach of OCHA to disaster risk reduction and management (DRR/M) could support the SIDS to overcome their specific vulnerabilities in this regard. The OCHA approach has been stated as:

- Improved, and more diversified, support to strengthen response tools and capabilities, as well as coordination mechanisms, at the international and local level in collaboration with IASC members and national counterparts;
- Increased support to strengthen disaster preparedness, including early warning capabilities, to prioritised disaster-prone countries, in collaboration with all relevant actors including, in particular, the UNCTs;

Effective EW and DR systems require that an appropriate alert system is in place, that precautionary measures are taken, and that concerned authorities are able to launch an effective and timely response. If “early warning” is really to move to “early action”, especially in the case of slow onset disasters, the preparedness capabilities need to be strengthened and/or expanded at all levels of the international system and, in particular, in those countries that have low resilience to disasters.

OCHA has stated that it aims to support initiatives to strengthen disaster preparedness capabilities, including early warning, in collaboration with all concerned actors and, especially, UNCTs, by:

- Promoting stronger investment in disaster preparedness by affected countries, donors, and others; and

- Facilitating stronger linkages and synergies between different early warning capabilities and initiatives in order to achieve greater coherence and effectiveness in the development, or strengthening of, people-centered, multi-hazard early warning systems and related precautionary measures.

These objectives support the ISDR-PPEW programme which aims to “help the development of early warning and preparedness systems by:

- (i) advocating for better early warning systems, especially in development assistance policy and programs;
- (ii) collecting and disseminating information on best practices, and
- (iii) stimulating cooperation among early warning actors and the development of new ways to improve early warning systems”

These aims and objectives are supportive of the common generic needs reported by the SIDS. Since it is the intent of OCHA to strengthening suitable *technical* options and *international cooperation* along with putting in place appropriate resources supporting multi-hazard, multi-sectoral and multi-nodal approaches for tsunami and other disasters they must be considered as a potential partner.

### **United Nations Food and Agriculture Organization (FAO)**

Food insecurity arising both from poverty, insecure water supplies, recurring drought and vulnerability to climate change is a common need identified by the SIDS. The risk of drought in DRR and DM is traditionally the preserve of the FAO and the WMO. The FAO leads international efforts to defeat hunger. It is necessary to integrate and minimise the risks associated with drought into the development process and to expand the network that can address the issues both within and between UN Agencies. An UNDP-ISDR collaboration on the relationship between drought, risk and development has made significant progress in Africa. This initiative need not be limited to Africa only.

The FAO acts in developed and developing countries and is a source of knowledge and information. Their programmes assist developing countries in transition to modernize and improve agriculture, forestry and fisheries practices and ensure good nutrition for all. Since 1945, it has focused special attention on developing rural areas.

The activities of FAO comprise four main areas:

- ◆ Putting information within reach;
- ◆ Sharing policy expertise
- ◆ Providing a meeting place for nations;
- ◆ Bringing knowledge to the field

These activities will support the SIDS, especially those in the COI and PIF regions to overcome the existing gaps in both the early warning of, and the response to, these slow-onset disasters.

### **Canadian International Development Agency (CIDA)**

The Government of Canada (GoC) supports the importance of prevention, mitigation and preparedness in limiting the impact of natural disasters. CIDA supports strong international

commitments to disaster reduction made in the context of the UN system and the International Red Cross and Red Crescent Movement.

In recent years, Canada has supported training, education, capacity-building and policy efforts related to natural hazard mitigation through a number of international organizations for country-specific programming, as well as for multilateral initiatives

The Humanitarian Assistance, Peace and Security (HAPS) division's Disaster Preparedness Strategy addresses CIDA's interest in international work on risk reduction. In addition, the Agency addresses risk reduction, where it has been identified as a priority within CIDA's development strategy for that region, through bilateral development programmes.

The HAPS Disaster Preparedness Strategy identifies capacity building at the country and regional levels (e.g. government policy, risk mapping, mitigation activities and coordination mechanisms) through the UN and other organizations, as well as at the community level (e.g. community disaster preparedness, plans, training materials) through NGOs and the Red Cross as primary programming areas. HAPS is currently working on the follow-up to an evaluation of its Disaster Preparedness Strategy undertaken in 2002, and CIDA is working to integrate disaster risk management at the policy and programme levels including environmental policy. The work undertaken by HAPS in the field of Climate Change includes assessing how the information can be used in disaster reduction and integrated into development programming, i.e. timely response to early warning.

CIDA is very active in the CARICOM region and working through local offices of international NGOs and key organisations involved in local emergency response and risk reduction it aims to reduce risk and lessen the impact of disasters in local communities and promote sound risk management in the implementation of local development plans, projects and programmes. CIDA works with CARE, OXFAM, IFRC and others in the Caribbean. It also manages Canada's Climate Change Development Fund (CCCDF), which also seeks to reduce the vulnerability and increase the capacity of developing countries to adapt to adverse effects of climate, such as droughts, storms and floods. This experience in managing the secondary and tertiary hazards associated with cyclones is a resource that can be shared amongst all the SIDS regions.

### **Japanese International Co-operation Programme (JICA)**

JICA makes ongoing contributions to human resources and socio economic development in the countries of Central America and the Caribbean and in the PIFS. JICA promotes effective and efficient regional cooperation projects that can be adapted and utilized by several countries confronting similar issues and is a donor partner on many projects.

Key areas for such cooperation include disaster prevention, infectious diseases control, environmental conservation, and utilization of marine resources. JICA supports the enhancement of disaster-prevention capabilities in these regions, which suffers from a high frequency of natural disasters that cause enormous damage, including hurricanes, earthquakes, and volcanic eruptions. JICA has a presence on the African continent as well.

### **International Financial Institutions (IFIs)**

IFIs have been involved in DRR and DM efforts in different ways. The World Bank, has been working on disaster reduction for many years and the smaller banks have been very active,

for example, the Andean Development Bank, because of El Niño (a climate change in the Pacific Ocean). The El Niño Southern Oscillation (ENSO) impacts the PIFS. The Inter-American Development Bank equivalent (IADB) in the Caribbean has been very advanced and effective after Hurricane Mitch. They are all developing stronger programmes in relation to DRR. The AfDB is involved through co-operation with the UN/ISDR Africa Outreach programme and the AU/NEPAD in supporting the Programme of Action for the Implementation of the Africa Strategy for Disaster Risk Reduction (2005 – 2015).

It is appropriate to engage with smaller FIs and other financial sectors such as insurance houses, local banks in micro-financing schemes. Know how and experience from one region can save valuable and scarce resources in another if models are adapted to local conditions.

### **Concluding Remarks**

Further details of programmes undertaken by international agencies, various regional and inter-regional intergovernmental organizations, and other international and national bodies, are contained in a spreadsheet format as **Annex D** to this report. This table is unlikely to be comprehensive and will be further supplemented by information supplied by the three SIDS regions. If further developed, systematised, and maintained on a regular basis, it can be expected to provide a useful source of information.

### 3. Review of Regional SIDS Situation Reports

#### 3.1 Introduction

Following initial recognition in Chapter 17 of Agenda 21, the outcome of the UN Conference on Environment and Development (UNCED) at Rio de Janeiro in 1992, the sustainable development of Small Island Developing States is supported by specific actions and measures at national, regional and international levels, set forth in 1994 in the Barbados Programme of Action (BPOA). The World Summit on Sustainable Development (WSSD) in 2002 reaffirmed the special case of SIDS, and highlighted a series of SIDS-specific issues and concerns in the Johannesburg Plan of Action, adopted by the Summit.

In a follow-up to WSSD, the United Nations General Assembly (UNGA) adopted Resolution A/57/262, which, among other things, called for a comprehensive 10-year term review of the BPOA. This review occurred at the January 2005 meeting held in Mauritius. The major outcome document of the conference, the Mauritius Strategy for further implementation of the BPOA (cf. Annex E), emphasizes that SIDS “are located among the most vulnerable regions in the world in relation to the intensity and frequency of natural and environmental disasters and their increasing impact, and face disproportionately high economic, social and environmental consequence”. This contention is highlighted by the tragic impact of the Indian Ocean tsunami (26 December 2004) and the exceptional hurricane/typhoon season of 2004 in the Caribbean and Pacific.

The key thematic areas of the Mauritius Strategy (listed herewith as **Annex E**) include the following leading elements:

- I. Climate change and sea-level rise
- II. Natural and environmental disasters
- III. Management of wastes
- IV. Coastal and marine resources
- V. Freshwater resources,

which for many SIDS regions also represents an order of priority or concern. Implementation of the Mauritius Strategy includes measures to “develop partnerships to implement schemes that ... (inter alia) ...*establish and strengthen effective early warning systems as well as other mitigation and response measures*” (Annex E; our emphasis). It is significant to note that, under current UN/ISDR practice, the two related issues listed as Key Thematic Area I are recognized as parts of the broad hazard class known generally as “Environmental Degradation”.

The Global International Waters Assessment (GIWA) project of the United Nations Environment Program (UNEP) has indicated that the top “priority concern” common to both the Pacific Islands and Caribbean Sea regions is “Global Change”. In the Western Indian Ocean GIWA report, however, “Global Change” is concern-wise ranked second to “Pollution”, which in UN/ISDR terms constitutes a “Technological Hazard”. In this latter context, the growing problem of solid waste disposal is viewed as particularly critical <sup>2</sup>, which resonates with Key Thematic Area III in the Mauritius Strategy.

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<sup>2</sup> See UNEP, Payet, R.A., et al., Indian Ocean Islands, GIWA Regional Assessment 45b, University of Kalmar, Sweden, 2004.

Both the Mauritius Strategy and the UNEP-GIWA results indicate that issues of Early Warning and Disaster Response cannot only be confined to consideration of “Natural Hazards”, whether of hydro-meteorological, geological or biological origin, but have also to include the technological and environmental and social dimensions.

### **The Indian Ocean Tsunami of December 26, 2004**

The December 26, 2004 Indian Ocean tsunami has tragically demonstrated the urgent need for early warning systems that provide timely understandable warnings, which motivate ordinary citizens to move quickly out of harm's way. While implementation of the Indian Ocean tsunami warning and mitigation system is being pursued with highest urgency, the tsunami hazard exists in all oceans and seas and it is likely that the next tsunami catastrophe will occur outside the Indian Ocean. In response and drawing upon the experience of the 40-year system in the Pacific, the IOC of UNESCO is leading the effort to build tsunami warning systems globally. The establishment of Intergovernmental Coordination Groups for the Indian Ocean, the Caribbean Sea and adjacent regions, and the Northeastern Atlantic, the Mediterranean and its connected seas is demonstrating a high-level commitment to initiate comprehensive tsunami risk reduction programmes. Programme activities include hazard risk assessment, warning guidance, and mitigation, education, and preparedness targeted at all levels within the government and down to households at the community level. Because of the infrequency of the tsunami hazard, the systems are being developed in the context of other ocean-related hazards and under the umbrella of the GEOSS platform that encourages the use of environmental instrumentation for multiple uses.

In the Indian Ocean, interim tsunami advisory information is being provided by the existing centers in Hawaii and Japan, and instrument networks are being enhanced to continuously monitor seismicity and confirm when a destructive tsunami is generated. Over USD \$150 million dollars has been committed to building national tsunami monitoring and warning systems in Australia, India, Indonesia, Iran, Malaysia, Pakistan, Thailand and other nations, and protocols for emergency response and the dissemination of warnings are being developed by all countries bordering and within the Indian Ocean.

In the Caribbean region, CDERA and the IOC's Regional Programme IOCARIBE have taken leadership roles in convening consultations to build support and develop an action plan for strengthening the real-time monitoring network, improving evaluation capabilities, and ensuring effective early warning dissemination. High-level advocacy and resources for implementation are still needed to realize the system. Although the USA has announced over USD \$35 million to support seismic and sea level network upgrades and enhancements in tsunami operations in the Caribbean and the Pacific to strengthen warnings of US residents, further support is required to improve instrumental monitoring of the southern and eastern Caribbean region.

In the Pacific, CEPREDENAC and ITSU have sponsored a workshop to invigorate the Central America - Pacific Coast TWS initiative that was elaborated upon after the Americas Early Warning Consultation in Guatemala in 2003; for this, inter-ocean coordination must incur between the Caribbean and Pacific systems with countries that share both oceans. Coordination amongst the technical agencies and national disaster management organizations continues to be challenging in this region where funding has been minimal.

For the southwest Pacific, the IOC's ICG/ITSU and SOPAC continue to build upon the work programme developed in the South Pacific Tsunami Awareness Workshop in 2004. Priorities are to establish a sub-regional tsunami warning service in the southwest Pacific for this earthquake-prone region, and for the urgent need for NDMOs to develop, implement, and exercise national tsunami response plans and build capacity in disaster prevention to mitigate future losses. To support the warning service, Australia has announced USD \$2 million for technical capacity building. Of particular note, however, is that despite its proximity to the Indian Ocean and the known fact that more than 80 per cent of the observed tsunamis occur in the Pacific, no significant investment beyond that offered by Australia has been identified to target proactive tsunami risk reduction of SIDS member states.

### 3.2 Region Reports

As part of the current assignment, situation reports were to be obtained and reviewed from the three intergovernmental organizations (IGOs) for the Pacific, Caribbean and Indian Ocean regions. The geographic setting of these regions is illustrated in the attached **Annex F1**. The reports and/or materials delivered are not reproduced here, but are obtainable from the Commonwealth Secretariat.

The brief for these reports was, to:

- ◆ Identify disaster warning and response systems and compile an inventory by country and on a regional basis;
- ◆ Identify aspects of these systems that need strengthening, including the human and institutional capacity and information systems, and potential measures required to address the gaps, avoiding added reporting burdens on government and regional organizations; and
- ◆ Examine the work being done by the UN and other international organisations in the area of Disaster Warning and Response systems by country and on a regional basis.

The present review comments on whether additional information could still be collected and collated. If it was considered that certain risks and data gaps have not been comprehensively mapped, largely because the data/insight is relatively new and confined to the traditional scientific field, this has been mentioned. It is not considered to be a shortfall of the report, rather a confirmation of a common gap or niche identified in all the reports; viz., that of access to information, technology and the need for ongoing upgrade of a data base and risk assessment within and outside of the DRR/DM community.

Where it would seem that there is incomplete information we have so far as possible obtained additional information in order to complete the following sections of this report. However a comprehensive coverage of all the information available was not possible within the tight constraints of time and budget, and this must be considered an important part of any programme to be developed.

The forthcoming meeting in Barbados in early August is seen as an opportunity to support a common standard between the reports, so as to have a benchmark base-line study from which reliable and more detailed planning can commence.

### 3.2.1 Pacific Islands Forum (PIF) Secretariat Report

The geographic setting of the PIF region is provided by a map (**Annex F1**), reproduced with acknowledgement of the Global International Water Assessment (GIWA) programme of the United Nations Environment Program (UNEP).

The preliminary report to the Commonwealth Secretariat, prepared on behalf of the PIF Secretariat by the South Pacific Applied Geoscience Commission (SOPAC)<sup>3</sup>, summarises the context in which DRR and DM can happen, as well as providing a broad philosophical background and details of methodology used in preparing the required inventories. This report follows a comprehensive and detailed Framework for Action document, also prepared by SOPAC in May 2005<sup>4</sup>, in alignment with the Hyogo Framework for Action (HFA), a product of the recent (January 2005) Second World Conference on Disaster Reduction (WCDR-2).

These two documents can be read together and constitute a thorough record of the status, challenges, needs and priorities of the PIFS in the medium term. The question is how to map these needs and priorities onto the existing national and international programmes so as to ensure steady and maintained progress towards the medium term goals over the time frame of these programmes as well as those programmes in the pipeline. It is likely that further iteration could achieve this, once collaboration between country states and the different SIDs regions is more concrete.

The information presented in the attached EW Systems Summary Table (**Annex G1**) is taken from the SOPAC June 2005 report and, where it is stated that information is outstanding, it is as submitted in the report under review. The well-structured SOPAC approach to preparing and analysing the inventory of Early Warning (EW) and Disaster Response (DR) systems is adopted in the Summary Table, and serves as a standard for extension to the other regions (see **Annexes G2 and G3**).

One modification that has been effected to the SOPAC scheme is the ordering by row of the hazard types, into the classes recognized by the UN/ISDR's "Living with Risk" volume<sup>5</sup>, namely;

- ◆ Hydrometeorological hazards (hydromet-hazards)
- ◆ Geological (or geophysical) hazards (geohazards);
- ◆ Biological hazards (biohazards)
- ◆ Technological hazards (technohazards)
- ◆ Environmental degradation.

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<sup>3</sup> SOPAC, "Baseline Survey of Hazard Warning and Disaster Response Systems for the Pacific Island States", June 2005 (received by Umvoto Africa on 5 July 2005).

<sup>4</sup> SOPAC, "An Investment for Sustainable Development in Pacific Island Countries: Disaster Risk Reduction and Disaster Management: Building the Resilience of Nations and Communities to Disasters; A Framework for Action 2005-2015, May 2005.

<sup>5</sup> See again Table 2.1 in UN/ISDR, "Living with Risk", p. 39, 2004

When this ordering is applied to the SOPAC situation report (**Annex G1**), it becomes clear that the inventory is dominated by hydromet-hazards and geohazards, with no reference to biohazards and possible kinds of technohazard that might threaten the PIF region, even though these are indeed briefly mentioned in the main text of the report (p. 11). Except for mention of the problem of waste disposal and associated pollution of freshwater lenses in atoll environments, there is also scant reference to the hazards of environmental degradation, such as climate change, sea-level rise, water and air pollution, wildland fires, deforestation, soil erosion, loss of biodiversity, and the like. In all of the latter, the principle of EW still applies, even though many are slow-onset, developing disasters on long time scales.

Apart from this first-order restructuring, the EW Systems Summary table also arranges the hydromet- and geohazards in a phenomenological pattern, depending on their relation to the natural forces of wind (cyclone and tornado), precipitation (or the absence/scarcity thereof), and ocean, in the case of the hydromet group. This second-order grouping, within and between hazard classes (e.g., storm surge-coastal flooding-tsunami, at the hydromet-/geohazard interface), is designed to facilitate a genuinely multi-hazard approach to EW and DR applications.

The SOPAC situation assessment of DR systems is presented on a country basis, and not linked to causative hazards. Insofar as community preparedness and human resources training are both aspects of the assessment that are likely to be unevenly related to hazard type. In general there appears to be good preparedness/training for frequent or commonly encountered hazards, such as annually recurring cyclones, but poor or negligible preparedness/training for very infrequent and/or unfamiliar hazards, such as catastrophic tsunamis and technohazards. This could also possibly result that the analysis will only be completed once the UNISDR process is complete. The impact of different kinds of hazard on the emergency operations centres (EOCs), the communications systems and stockpiles, is also yet to be considered, in terms of their vulnerability to damage, disruption or disablement during particular types of crisis.

These are aspects that may require future modification of the SOPAC-derived format in which the regional DR Systems Summary (**Annex H1**) is presented. The key issue identified is empowerment and engagement of local communities and upgrading of 24hr communication coverage.

### **3.2.2 Indian Ocean Commission (COI) Report**

The geographic setting of the COI region is provided by a map (**Annex F2**), reproduced with acknowledgement of the Global International Water Assessment (GIWA) programme of the United Nations Environment Program (UNEP). The UNEP-GIWA report draws attention to the special context of COI states, which are separated by large expanses of the Western Indian ocean and do not share any coastal marine environments or freshwater resources. The percentage of land to sea area in the COI region is very low, and the states have large expanses of the ocean under their jurisdiction as specified in the UN Convention on the Law of the Sea (UNCLOS), with respect to territorial waters, continental shelves and Exclusive Economic Zones (EEZs). The combined EEZ in the region covers an ocean area of

approximately 3.8 million km<sup>2</sup>, whereas the total land cover is only 586 250 km<sup>2</sup>, of which Madagascar constitutes about 99 per cent <sup>6</sup>.

The COI report to the Commonwealth Secretariat <sup>7</sup>, presents a succinct summary of those natural disasters that can impact the islands of Mauritius, Reunion, Seychelles, Madagascar, Comoros, and also makes comment on the impact of the recent tsunami on the Maldives. In the overall context of the impact of all disasters impacting on these islands, the impact of the December 2004 tsunami in the Western Indian Ocean - while devastating to the Maldives in terms of lives, livelihood, natural environment and infrastructure, and to the Seychelles in terms of infrastructure - was small on the outer islands of the Comoros and Mauritius. In the greater context of losses incurred by this SIDS region, it was less than 2 per cent.

This relative measure of impact has a worth in that it highlights the difficult decisions that must always be made around competing priorities. There are inevitable tensions between urgent and immediate short-term needs arising out of rare, low-frequency but high-impact occurrences, and the as-urgent, but not always necessarily as-immediate, longer-term DRR objectives and priorities. The Mauritius Strategy can go some way to initiating a COI Framework for Action that addresses this issue more particularly than it can be addressed in the Programme of Action for the Implementation of the Africa Strategy for Disaster Risk Reduction (2005 – 2010).

The latter document specifies that the African Union and its New Partnership for Africa's Development (AU/NEPAD) initiative will assume responsibility for working together with the Regional Economic Communities (RECs) to create an enabling environment for the implementation of the Africa Regional Strategy for DRR, and the adoption of the Guidelines for the Mainstreaming DRR at sub-regional, national, and local level. The RECs, namely, Southern African Development Community (SADC) Common Market for Eastern and Southern Africa (COMESA) and Intergovernmental Authority on Development (IGAD) will be primarily responsible for advocacy, training and capacity building. Funding of small-scale pilot projects by the African Development Bank (AfDB) and AU/NEPAD will be through the RECs. Of the COI states, Mauritius and Seychelles are members of the AU, SADC and COMESA (although the commitment of Seychelles to SADC is in the balance), in addition to being Commonwealth members.

Because of the limited resources available in the COI, and the common or similar threats between much of the eastern sea board of the African continent and the Indian Ocean's western side, SIDs themselves (drought, cyclone, volcanoes, tsunami, epidemics, famine, technological hazards, wild fires), it could make sense for the COI SIDS to align themselves where appropriate with mainland AU/NEPAD programmes and projects, particularly since the majority (except the Comoros Union and Reunion) are member states of the AU. However, the generally Francophone character of the COI region contrasts with the Anglo- and Lusophone character of the states of Eastern and Southern Africa, which may represent a communication obstacle.

In comparing the COI report with that produced by SOPAC, it is evident that there is a lack of an appropriate scientific/technical agency in support of the regional IGO secretariat, in

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<sup>6</sup> See UNEP, Payet, R.A., et al., Indian Ocean Islands, GIWA Regional Assessment 45b, University of Kalmar, Sweden, 2004, Table 1, p. 13.

<sup>7</sup> Roberts, J.R., "Commonwealth Secretariat Collaborative Project on Disaster Warning and Response Systems: Indian Ocean Commission Interim Review, May 2005 (received by Umvoto Africa on 3 June 2005).

contrast to the PIF region (where SOPAC supports the PIF Secretariat) and in the Caribbean region (where CDERA supports the CARICOM Secretariat). Furthermore, in the latter regions, there is critical interaction between institutions in the adjacent mainland states and the regional SIDS organisations responsible for DRR and DM. There is potential to expand this element of inter-regional co-operation also in the COI domain.

The COI report documents natural as well as the escalating risk of human-induced disasters but the geohazard potential arising from submarine landslides on the African continental margin and the flanks of the active oceanic-island or “hotspot” volcanoes, such as Piton de la Fournaise on Reunion, and Karthala on Ngazidja, Comoros, is possibly underestimated. The attached EW Systems Summary table (**Annex G2**) presents a synopsis of the threats facing the region, limitations of DRR and DM strategies, institutions, infrastructure, funding, skills and knowledge base, as well as possible initiatives and partnerships to advance EW and DR in the COI region in such a manner as to promote sustainable development and more resilient communities.

In some instances information has been assumed and or is based on available data and knowledge. It is suggested that for the purposes of planning and motivating proposals it would be valuable to obtain additional detail and material to supplement the inventory of existing capabilities and gaps in early warning and response systems.

In contrast to the SOPAC report, the COI report contains explicit reference to some biohazards and techno-hazards facing the region, e.g., major transport accidents and the threat of marine pollution due to substantial oil-tanker traffic between the Middle East and Africa. It also indicates wildland fires, coral-reef bleaching and sea-level rise as some hazards of environmental degradation. Given the known threat of extensive deforestation and land degradation, as well as loss of biodiversity in areas such Madagascar, more emphasis could have been laid on these aspects.

With regard to the vulnerability of COI states to sea-level rise, as one aspect of the “Global Change” syndrome, the recent (re-)emergence of the tsunami hazard has placed a different temporal perspective on this concern. Until regional, geodetically rigorous (International Terrestrial Reference Frame ITRF2000 basis), sea-level monitoring is in place – ideally through a geographically well-distributed system of collocated tide-gauge and continuous Global Positioning System (cGPS) stations – the EW systems against coastal inundation will remain fundamentally compromised. At present, the vertical tectonic motions of the Indian Ocean island groups are very poorly constrained in the ITRF2000 frame, but recent GPS data from the Maldives, for example, indicates relatively rapid present-day uplift approaching 10 mm/yr, meaning that long-term, climate-change-induced, sea-level rise (on the order of 1 mm/yr) is simply not an issue here. Instead, other latent geophysical hazards related to the deeper causes of this anomalous tectonic motion (e.g., major “intraplate” earthquakes) might be more important.

As for the PIF region, the regional DR Systems Summary (**Annex H2**) is presented in SOPAC-derived format, with the reservation noted earlier. This region (other than in Mauritius Island & Reunion Island themselves and to an extent Madagascar) is significantly impacted by limited institutional capacity, poor infrastructure, lack of resources for maintenance and upgrade of communication network, limited co-ordination of response activities, dependence in the regions on national or international agencies and limited resilience and coping capacity within the rural and outlying areas. These issues are

documented in the report and further detailed information would be useful when planning and co-ordinating a programme between states and within countries.

### **3.2.3 Caribbean Community (CARICOM) Secretariat Report**

The geographic setting of the CARICOM region is provided by two maps (**Annex F3**), reproduced with acknowledgement of the Global International Water Assessment (GIWA) programme of the United Nations Environment Program (UNEP). The CARICOM comprises 15 states of which 12 belong to the Commonwealth.

It is well understood that the unprecedented 2005 season of early, major hurricanes has impacted on the delivery of the CARICOM report to the Commonwealth Secretariat. With the information available in the CDERA contributions it is not yet possible to compile a systematic inventory on a country-specific basis of existing EW and DR systems, nor of those that need strengthening, including the human and institutional capacity and information systems. This information is partially contained in documents referred to in the material submitted, and some has also been found in Internet-based resource research. Once human resources are made available, such an inventory can be further fleshed out in preparation for the anticipated world-wide survey being coordinated by the UN/ISDR secretariat of existing capabilities and gaps in early warning systems in a multi-hazard context.

The summary of work being done by the UN and other international organisations in the area of EW and DR systems can be gleaned from supporting Declarations and other available material, and is presented in the form of an EW Systems Summary table (**Annex G3**), based on the SOPAC report format. However, the time and resources to do so as part of this report was limited, and it is assumed that the data and knowledge base used to prepare the summary table is incomplete. The summary table can be upgraded as the current input is corrected or additional information becomes available. This applies also to geohazards that have possibly been underestimated and to bio- and techno- hazards that have not been documented in any detail in material sourced by ourselves.

As in earlier sections, a regional DR Systems Summary (**Annex H3**) is presented in the SOPAC-derived format. The CARICOM states have relatively advanced EW and DR systems for the management of hydro-meteorological hazards, viz., cyclones, floods, heavy rains, and the secondary and tertiary associated hazards. These systems are based on co-operation with the Regional and International partners, the WMO and the other Caribbean states. There are initiatives underway to further the detection and monitoring of geologic and seismic activity and the ability to issue effective EWS for these hazards. This is primarily being undertaken by the scientific institutions that are also responsible for the EWS of the CARICOM states as well as for other Caribbean States in similar geotectonic setting.

Disaster Response is reported as being poorly co-ordinated and hampered by lack of institutional capacity, poor governance at national level in some islands and poor implementation of policy and plans at local and community level in others. There is an expressed need to enhance policy definition, define strategies, mobilize and allocate resources for DR at the national level. Within the region it is agreed that it is necessary to mobilize and secure resources over an appropriate time frame to support the operationalisation of existing policies and protocols at regional, national, local and community level within the DM arena.

CDERA through its regional programme framework 2005 – 2015 which is linked to the Hyogo Framework of Action and the Barbados Plan of Action (BPoA) and which incorporates the principles of Comprehensive Disaster Management (CDM) has identified priority areas for the region as: Hazard Mapping and Vulnerability Assessment, Flood Management, Community Disaster Planning, Early Warning Systems, Climate Change and Knowledge Enhancement. A strong need to develop a regional awareness, education outreach and institutional capacity building programmes is identified as well as the need to engage with the private sector to widen funding opportunities and to establish innovative models for addressing investment in and upgrade of local communities during DM phases as well as innovative models for insuring against selected disasters.

There are initiatives underway to further the monitoring of, and ability to issue effective EW for, volcanic and earthquake related hazards. This is primarily being undertaken by the scientific institutions who are also responsible for the EWS of the CARICOM states, as well as for other Caribbean states in similar geotectonic setting. The Caribbean Community Regional Programme Framework (2005 –2015) prepared by CDERA was presented at the second WCDR held in Kobe, Japan in January 2005 and can be referred to for further details on the strategic framework for action.

### **3.3 Summary Comparative Observations**

There is an obvious contrast between the different regional contributions, which is a reflection of the character of the responsible agencies (i.e., SOPAC on behalf of PIF, CDERA on behalf of CARICOM, and COI, respectively) and also, in some measure, the present circumstances surrounding the assignment.

As befits its applied geoscientific basis, the SOPAC report provides a greater focus on early-warning aspects, whereas the focus of CDERA, as gauged from its website, available publications and news releases, leans heavily towards disaster or emergency response, as its motto, “Managing disasters with preparedness”, and statement of main function ([http://www.cdera.org/about\\_history.php](http://www.cdera.org/about_history.php)) also indicates.

CDERA acknowledges that the 2004 disasters in the Caribbean revealed the limitations of existing early warning systems. The COI report focuses on a multi-hazard approach and reflects the disparity in the early warning systems associated with cyclones and those with other less dramatic but devastating hazards such as drought, famine and epidemics.

Some particular comment is warranted on Education and Public Outreach (EPO) opportunities that are generic to all the regions with particular reference to mainstreaming gender in these activities. The latter is an element along with the issue of the socio-psycho elements of DM that have not seemingly been specifically identified by the regions, but which must impact significantly on the planning and the implementation of any programmes and the ultimate success thereof. It has however been hinted at in the identification by CDERA on the need for special emphasis on training in Crisis Communication.

#### **Research, Education and Public Outreach opportunities**

Issues related to changing awareness and enhancing community preparedness and resilience through education and public outreach (EPO) efforts, are identified in the reports and material received from all three SIDs regions. The intensity, the scale and the nature of the need for

raising awareness of risks, preparedness for the disaster itself and opportunities to address the problems vary. The need to raise awareness and empower at individual, community and institutional level is generic to all the regions. In some regions both planning and implementation are exacerbated by the lack of good governance and or resources.

It is recognised that the success of EW and Disaster Response systems in preventing or mitigating the impacts of these disasters depends as much on sophisticated technology and investment in international institutions in the first world, and at regional research institutions, as it does on investment in transfer of technology and skills, maintenance of and investment in infrastructure and training in human resources at the national, community, and local level. It also depends on the integration and evaluation of both scientific and first world technology in local social and economic conditions and on documentation and evaluation of traditional coping strategies, observations and preparedness in the light of often rapidly changing environmental and social circumstances.

The essence of EW is that a community understands and is prepared for action when the warning comes. What can conceivably happen, what is prepared for in practice and what hazards are monitored, however, is in itself a risk-based decision. Therefore EPO as well as quantitative risk assessment initiatives, based on the best international and locally available knowledge, are always needed at all levels of society, and should be regularly upgraded in line with new information possibly outside of the traditional DRR fields.

EPO is an iterative process that will result in planned and continual updating of the information and knowledge databases. It is inseparable from the Knowledge and Information Management Strategies and networks either already in place or yet to be established. For example an element of an inter-regional EPO programme could be the accelerated development of the CARICOM regional Centre of Excellence in Disaster Management at UWI Jamaica expanded to include other hazards, in line with the SOPAC paradigm. ([http://www.cdera.org/cunews/news/jamaica/article\\_1093.php](http://www.cdera.org/cunews/news/jamaica/article_1093.php)) Indeed some of the funding provided to the Caribbean region by the European Union (EU) under the 9th European Development Fund (EDF) is earmarked for building capacity in disaster teaching and research.

### **Awareness**

Quantitative risk assessments (QRA) can improve the decisions on how to spend scarce resources. The efficacy will depend on the awareness of the potential risks as well as knowledge of the potential damage and cost of disaster prevention or mitigation measures. For example, because earthquakes are relatively more frequent and have occurred more than once in the PIFS, the hidden dangers of earthquakes do not need as much to be the focus of a monitoring, education or awareness-raising programme as they might need to be in the CARICOM states. For the most part the communities in the COI are completely unfamiliar with major earthquakes or ocean related hazards that will inevitably affect them. Because of the long recurrence intervals between extreme events in this region, they will generally strike out of the blue, suddenly and without warning, as did the December 2004 tsunami.

In the CARICOM states, the risk of local tsunamis has usually been associated with the risk of explosive volcanic sources, such as the submarine Kick 'em Jenny volcano near Grenada. However, within the last few years, many more local tsunami sources are being recognised in the scientific literature, often as a result of other investigations, such as detailed bathymetric surveys related to definition and description of the Exclusive Economic (EEZ) or exploration

for hydrocarbon (oil and gas) prospects. For example, detailed shelf and slope surveys around Puerto Rico indicate a considerable risk of major submarine landslide in the northern Caribbean region, and recent oil-related research off the coasts of Trinidad, Tobago and Venezuela, around the Orinoco River delta, reveals the important role of episodic and catastrophic “mass transport complexes” (MTCs) in shaping the evolution of the submarine continental margin. These are newly discovered hidden dangers, and much greater awareness and preparedness is needed not only in the CARICOM context, but also in the PIF and COI states. They deserve the special attention within the EPO programmes with a focus on those institutions that do onshore and offshore research in the SIDS regions and that could deliver relevant information and knowledge, but are not necessarily aware of the implications of the research results in other seemingly unrelated fields.

There is good early warning in the Caribbean for hydro-meteorological hazards and other visible hazards such as floods, landslides, volcanoes and hurricanes. However, the eruption of Montserrat in 1996 came as a big surprise largely because its previous eruption occurred centuries before and had been forgotten. Up to three or more years before the disastrous culmination there were evident early warning signs of a developing volcanic crisis that were not recognised or heeded. If generic natural phenomena become a component of education and awareness training in the early warning processes, it can positively impact on community empowerment for hazard mapping, monitoring and preparedness. They often involves observation and know-how that is passed from generation to generation in oral traditions and practise, and involves skills and environmental intelligence that most people living and depending on the sea and the land for their livelihoods possess in different measure.

### **Knowledge Management**

A composite education programme involving players and institutions throughout the levels of society and that contributes to all phases of DRR and DM as well as (Early Warning) as well as Disaster Response is needed. A key element is to manage the different means/expression of recording and interpreting the observations and in establishing mutual confidence in different methodology used by the traditional and the scientific community. Engaging local communities in observation, monitoring, recording and communication is a crucial component of disaster preparedness which can also address the element of early warning often lacking; viz, receptivity to the warning as well as added value information on what to do. It can facilitate documenting local or indigenous knowledge and evaluation of the reliability of both hazard mapping and early warning insights. At the same time it can document and assess the suitability of traditional environmental practise in current social and environmental conditions (e.g. governance aspects, migration to urban and coastal areas, climate change, increasing industrialisation and risks associated with techno-hazard).

Thus it can also address the appropriate response to early warning signs of a slow-onset disaster such as that posed by climate change, viz., adaptation of human behaviour. The ability of societies and individuals to adapt and to optimise the few resources available is a corner stone of resilience and sustainable development. Knowledge is a significant resource.

The PACE-SD project “Integrated Methods and Models for Assessing Coastal Vulnerability and Adaptation to Climate Change in Pacific Island Countries” (AAIAAC); builds progressively on recent advances in integrated assessment and modelling carried out under the recent Pacific Island Climate Change Assistance Programme (PICCAP) and the World Bank funded case studies undertaken by other institutions in the region. The proposed project will occupy a vital niche in the comprehensive programme of climate change activities

endorsed by the SIDS of the region, and will complement the new climate change adaptation activities getting underway in the Pacific, especially those funded by CIDA. The AAIACC project “promises generic methodological developments that can be transported to SIDS elsewhere, e.g. in the Caribbean and Indian Ocean regions” (<http://www.usp.ac.fj/pace/projects/aiacc/aiacc.html>).

Slow onset or infrequent disasters pose a particular challenge to societies that have been or are for whatever reason fractured, since the time perspective is often lost as generational and historical knowledge is not passed on. There is an opportunity for shared knowledge exchange and learning between similar and different communities and regions and from the most to the least technologically sophisticated.

### **Partnerships**

The NGO community is largely engaged at community level while the big international organisations such as the IFRC and others (CIDA, FICA inter alia) are engaged throughout the hierarchy of social, policy and political development. Some have focussed their interventions on response (IFRC) and are realising that the most cost effective intervention is in training local communities in the skills that they bring into a disaster afflicted community. Sensitising, awareness raising and motivating to such organisations and engaging with them in addressing the education and preparedness needs in the SIDS can be mutually beneficial and supportive.

The NGO community often have an approach to community engagement and participation that has been developed and grown outside of the disaster arena. It is most likely that the DRR and DM community has much to learn from these players and potential partners in approach to community empowerment, decentralisation of roles and in empowering women to contribute.

Awareness and education begins at primary school and in the media (radio and television). Distance learning in the SIDS is likely to become increasingly necessary. It is also a good opportunity for PPP partnership in DRR and DM education and outreach programmes as well as in those agents who can support the technology that will underpin it such as the high tech and communications industry. Given that it is also the first year of the UNDP Decade of Sustainable Education this would be an ideal opportunity to engage a cross sector of players from the government, private sector (media and high tech communications), IGO, NGO, academic and civil society in realising the vision articulated by the HFA in a thorough integrated programme planned and implemented over the next decade in some of the most culturally and socially diverse societies as well as in the most demanding geography.

### **3.4 Summary Conclusion**

A summary outline of possible actions is tabled by region in **Annex J** in a format adapted from the HFA.

The HFA is taken to be the most suitable Framework of Action for Implementing any inter-regional programme agreed upon by the regions. This together with some funding options, albeit not comprehensive, is discussed further in Section 4.

## **4. Gaps/Niche Areas for Intervention and Recommended Programme of Action**

### **4.1 Overview**

The Mauritius Strategy (cf. **Annex E**) emphasizes that SIDS are “among the most vulnerable regions in the world in relation to the intensity and frequency of natural and environmental disasters”. The three SIDS regions under discussion have a common tropical-subtropical geographic situation and consequently face a similar suite of hydro-meteorological hazards typically associated with the seasonal development of tropical cyclones. They differ widely, however, in their respective social, economic and tectonic settings. Accordingly their experience of hydro-meteorological and solid earth geohazards is different.

The specific socio-economic setting of SIDS in these three different regions poses the special problem that the populations are generally small and therefore, in some cases, do not have a sufficiently diverse technological and or skills base to support comprehensive DRR and EM, either locally, at country or at sub-regional level. Often a single disaster can threaten the livelihoods of the majority or all of the citizens in one island state, e.g., the continuing volcanic crisis on Montserrat in the Caribbean or the recurring drought and locust conditions in Madagascar.

This challenge therefore has to be taken up by a specialised regional agency, such as SOPAC in the case of the PIF states, whereby certain functions can be centralised and others not. Conversely, it offers opportunities of blending high technology with soundly participative social processes that underpin resilience and are often traditional in these areas. Where decentralisation is essential it needs to be developed by well-designed education and outreach programmes, ensuring also that the necessary skills and communication technology is in place for these areas to benefit from the central institution. It will also be necessary that the central institution thoroughly understands and respects the local issues, capacities, cultural practices and social processes. In the COI region, the larger countries, Mauritius and Madagascar, belong to the Regional Economic Communities (REC) of the African Continent. They share some of the geohazards of the mainland but have a different language, culture and history.

In the case of the CARICOM states, the recent Kingston Declaration (Part IV) drew nine conclusions for the “guidance of the Caribbean countries to improve their disaster risk management capabilities, by increasing regional cooperation, national planning and community participation initiatives:

There is a need for a higher level of regional/national/local level coordination for disaster management, with particular emphasis on damages and needs assessments.

- a. There is a need to improve early warning systems to allow for greater level of community participation.
- b. There is a need for standardization of information protocols, in order to ensure effective disaster response.
- c. There is a need to build greater community resilience.
- d. There is the need for more equitable risk sharing and risk transfer mechanism.
- e. There is a need to better incorporate disaster risk management into development policies and action plans.

- f. There is a need for improvement in the communication systems throughout the entire disaster management spectrum.
- g. There is the need for improvement of regional response mechanisms.
- h. There is a need for greater donor coordination to ensure greater efficiency in disaster prevention, preparedness, mitigation and response.”  
([http://www.cdera.org/cunews/news/article\\_1072.php](http://www.cdera.org/cunews/news/article_1072.php))

Conclusions b), d), f), and g) have explicit or implicit reference to early warning issues. Conclusions a), c), and h) relate more to disaster response.

These nine elements represent CDERA’s considered identification of existing gaps and deficiencies following a review of the previous hurricane season. During the annual pre-hurricane press conference of the 2005 season, Mr Jeremy Collymore, CDERA coordinator, maintained that the “period under review, June 2004 to May 2005 represents for us the biggest opportunity we had in the last couple of decades to change the character of disaster management practice and the culture of resilient development” ([http://www.cdera.org/cunews/speeches/article\\_1096.php](http://www.cdera.org/cunews/speeches/article_1096.php)). In varying degrees they can apply to the other regions as well.

An increased awareness and enhanced community preparedness and resilience will be needed in order to address any of the needs identified above by CDERA. This is identified in the reports and material received from all three SIDS regions. The success of EW and DR systems in preventing or mitigating the impacts of disasters depends as much on sophisticated technology and investment in international institutions in the first world, and at regional research institutions, as it does on investment in transfer of technology and skills, maintenance of and investment in infrastructure and training in human resources at the national, community, and local level. The planned and continual updating of the information and knowledge databases is inseparable from the Knowledge and Information Management strategies and networks, which could develop within regional Centres of Excellence.

The engagement of local communities in observation, monitoring, recording and communication is an integral component of disaster preparedness, which can also address the appropriate response to early warning signs of a slow-onset disaster. The ability of societies and individuals to adapt and to optimise the few resources available, is a corner stone of resilience and sustainable development. Limited resources, and in some instances governance issues, are factors inhibiting improvement in EW and DM in different states in all three regions. Quantitative risk assessment and disaster assessment and needs analyses (DANA) are critical to making cost benefit decisions in the best use of limited resources.

In addition to the UN Agencies, international NGOs, academic institutions and civil society, the European Development Fund (EDF), which covers cooperation with 71-member African, Caribbean and Pacific (ACP) Group of States under the Cotonou Agreement, offers secure and viable long-term structure for development cooperation. The Agreement sets the framework for ACP and the EU partnership to support and strengthen ACP regional institutions. Cooperation with the ACP is the most advanced form of cooperation between the EU and developing countries, and sets an example for cooperation between the EU and other regions, in terms of specificity of development objectives; namely, poverty eradication, equality of partnership, participation and ownership.

The ACP Vision for Sustainable Development, articulated in Johannesburg at the WSSD (2002), emphasizes the promotion and strengthening of research to tackle the development

challenges being faced by ACP states. It stresses the importance of applied and practical-oriented research efforts for improving the quality of life of people in ACP states. The need to reduce the vulnerable status of ACP states in the global economy, by increasing capacity to address national and international challenges, means that ACP states require special arrangements with economically strong counterparts.

In terms of the *Cape Town Declaration on Research for Sustainable Development* of 28 July 2002 (Doc. ACP/84/049/02 Final, para. 5-7), the Ministers responsible for Research, Science and Technology declared themselves as follows:

“5. We undertake to create support and strengthen Centres and Networks of Excellence and promote the sharing of facilities and expertise among our countries to build training and research capacity.

We reaffirm our commitment to science particularly mathematics and technology education as one of the essential foundations for human and economic development.

We acknowledge the critical role of technical and vocational training for all the ACP States and commit ourselves to its promotion in the achievement of sustainable development”

(cf. [http://www.dst.gov.za/programmes/acp\\_eu/acp\\_eu.htm](http://www.dst.gov.za/programmes/acp_eu/acp_eu.htm)).

Under the subheading of “Research Coordination” in the *Cape Town Plan of Action* (Doc. ACP/84/048/02 Final, para. 10-12), the First ACP Ministerial Forum on Research for Sustainable Development

“10. We urge the strengthening of existing research institutions and networks and the expansion of collaboration and inter-linkages between researchers and policy-makers within ACP nations as well as intra-ACP. This would lead to substantial partnership for research with EU institutions.

11. We urge the ACP States to develop, use and promote efficient operating conditions of researchers, both at the intra-ACP, and ACP-EU levels so as to limit brain drain and develop research capacity in the relevant sectors.

12. We encourage ACP states to establish research co-ordination frameworks, with a greater utilization of the complimentary and comparative advantages of ACP regional research institutions. This will ensure that research makes a positive contribution to sustainable development in ACP states.

## Summary

The gaps identified in Annex J fall under separate themes in the HFA but are more broadly reflected in the sum of the Cross Cutting Issues; viz. Multi-Hazard Approach, Gender Perspective and Cultural Diversity, Community and Volunteers Participation, and Capacity Building and Technology Transfer.

It is often the smaller, more frequent, less dramatic disasters that have an insidious and cumulative impact on the populations of the less developed and poorer states and from which the poor seldom recover. They affect all the regions, in different measure and in addressing them, key elements needed to secure the success of any tsunami or cyclone related early

warning and response systems will not only enhance but will in also be crucial to the success thereof.

It is more difficult to secure the attention of donors/funders to address these hazards on a national basis and often on a regional basis. Donors and the public suffer more readily from donor fatigue given the almost intractable nature of the problem. They can seldom become fashionable and glamorous and therefore rely on the support of international names to keep them in the common eye and conscience.

The appropriate response to the slow-onset, the chronic and the long recurrence disasters is adaptation of human behaviour. The Response or DM system can be geared to this as well as the more traditional relief operations.

The Commonwealth Secretariat can support and dovetail with the global and major initiatives currently underway, but determinedly maintain the focus on the everyday. The niche area is the small man, women and child, on whom DRR and DM in the end depends. This is also most important when the primary limitation is resources, both financial and human, as is documented by the three regions.

#### **4.2 Hyogo Framework of Action and other Guiding Principles**

A summary format of the Hyogo Framework for Action (HFA) 2005 – 2015 (see **Annex I**) provides, under the five themes of the WCDR, an easily accessible synthesis of actions needed to realise the strategic goals and expected outcomes defined at Kobe (January 2005). The HFA defines five Priorities for Action, namely:

1. Ensure that disaster risk reduction (DRR) is a national and local priority with a strong institutional basis for implementation
2. Identify, assess and monitor disaster risks and enhance early warning
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels
4. Reduce the underlying risk factors
5. Strengthen disaster preparedness for effective response at all levels.

The over-arching philosophy is that DRR is an investment in sustainable development and, if undertaken, will result in the building of nations and communities that are more resilient to disasters.

Of the above five priorities, two have explicit reference to the objectives of the Commonwealth Secretariat assignment; namely, Priority for Action 2, which aims to “enhance early warning”, and Priority for Action 5, which aims to strengthen “disaster ... response”. Therefore, in presenting an analysis of regional priorities for action (Annex J), a matrix format has been adopted, in which the *main elements* and *expected results* of these two Priorities constitute the rows, and the particular Actions and Responsible Parties of the three regions constitute the columns.

This format is a prelude to the “Matrix of roles and initiatives” that is proposed to serve as a tool for a systematic process to support HFA implementation. After testing of the draft matrix by IATF/DR members between March and July 2005, IATF/DR will proceed between August and December 2005 to develop, populate and update the matrix as part of the ISDR information system.

The full Hyogo Framework matrix elaborates on programme (initiative, tool), scope, resources, key partners, responsible organization, and contact/web details for each main element and expected result. The reduced form of **Annex J** (Specific Action and Responsible Parties, by region) provides a synoptic regional overview that will facilitate the harmonization of programmes of common SIDS relevance across the three widely separated regions. It also highlights possible DRR differences in respect of state of development, emphasis and/or urgency between the regions. It thus provides a straightforward start to the planning of regional (and national) programmes within and between the three SIDS communities. It is a guide or template for collecting and collating the outstanding information that will be required in future for full Hyogo Framework implementation.

By making use of the Hyogo Framework template, the intergovernmental organizations in the Pacific (PIF), Indian Ocean (COI) and Caribbean (CARICOM) - as an aligned body of nations and recognised by the international community as needing particular attention with special vulnerabilities and challenges - are better able to approach and motivate or sensitise UN Agencies, other IGOs, specialised national and international agencies, donor organisations, and others, to support and actively assist them in realising their common goals. Because many UN Agencies and donor bodies are represented in the IATF/DR membership, and will therefore be contributing to the refinement of the HFA implementation process, an early alignment with the Hyogo Framework themes, strategic goals and expected outcomes, is likely to find a favourable resonance with potential funding sources or partnering agencies. Coordination and harmonization of DRR efforts within the Hyogo Framework context could also potentially assist in constructively managing the inevitable competition for resources. It is possible that one island country with different priorities and needs from other countries in its region can be supported in the application for resources, skill and technology support by countries from other SIDS regions.

The HFA implementation process is expected to contribute significantly towards reaching the Millennium Development Goals (MDGs), and in particular that of Reducing Poverty. Most nations have already agreed to monitor progress towards realising the MDGs and those countries that have prepared Poverty Reduction Strategy Papers (PRSPs) are also committed to regular reporting to international bodies. Integration of DRR into the MDG and PRSP processes will not only ensure that development plans and actions are sustainable in the longer term, but will also ensure that well defined and measurable indicators are set and measured by different countries.

### **4.3 Recommended Programme of Action**

The recommendations are not all encompassing but highlight areas where more work is needed and which could be initiated through existing programmes or working relationships common to all three regions, e.g., programmes associated with the IFRC, UNDP, CCA/UNDAF, PRSPs, UN/ISDR, GEO, ACP-EU 9th EDF grant as well as those organisations whose activities are focussed more in one region than in another, e.g., CIDA, JICA.

They are based on the premise that sustainable results require investment maintained for long enough and agreeable to the recipients at regional, national and local scale, appropriate to the local conditions and communities and adaptable to social, environmental and technological changes over the duration of the programme.

The recommendations are based on the current longer term international programmes that could be taken up by the regions themselves, either in co-operation with each other or separately, and/or supported by the Commonwealth Secretariat. The distances between the three SIDS regions could make inter-regional co-operation difficult but given the strong similarities in the needs and hazards they face and a common emphasis in most international programmes as regards SIDS, inter-regional co-operation is to be encouraged. The identified responsible regional organisations (SOPAC, COI and CDERA) are best placed to adapt the recommendations at sub regional and national level together with implementation and funding partners operating within the regions.

It is recommended that the three SIDS regions and the CS together lobby and motivate for the following:

1. Establish or strengthen regional offices, policies and relationships with implementation partners linked to the ISDR System to support and to ensure integration and implementation of DRR and DM strategies in: (a) CCA/UNDAF programmes at national level; (b) the preparation and operationalisation of the PRSPs at national level;
2. Agree on national, regional and inter-regional indicators to be established and monitored as a matter of routine in MDG and PRSP reporting;
3. Agree and detail inter-regional co-operation measures to develop a capacity building programme, tailored to individual regions and nations priorities, as part of the International Decade of Sustainable Education with particular emphasis on primary school education, education for women, distance learning and the role of the media;
4. Establish regional and inter-regional working groups linked to the ISDR System to interface with the IFRC, UNDP-BCRP, UNEP, OCHA, inter alia, to develop and support links that will ensure that DRR measures and capacity building are integrated into Disaster Response and DM activities and planning;
5. Engage with the IFRC and other partners to expand the training programme in local communities as key to effective and sustainable disaster preparedness and response;
6. Engage strongly with local, national, international NGO communities in support of empowering local communities, documenting, supporting and integrating local knowledge in early warning and response programmes;
7. Establish regular inter-regional exchange and co-operation programmes using the designated central organisations to highlight the lessons learned in different regions and to ensure that:
  - the plans, policies implemented to realise the MDGs and in particular Poverty Eradication are in fact beneficial to DRR and DM;
  - Gender mainstreaming is addressed on all programmes;
  - the need for evaluating and responding to the socio-psycho impact of disasters in the receiving communities is addressed;
  - the voice of SIDS in key international geospatial and EW programmes is co-ordinated with emphasis on implications for Risk and Vulnerability Assessment of not only primary but also secondary and tertiary hazards;

- lessons learned are shared and acted on with regard to the integration of DRR and DM into rural development programmes, poverty eradication programmes, technological and other economic development programmes (See Multi year programme of Commission on Sustainable Development (CSD) (<http://www.un.org/esa/sustdev>))
8. Develop a Caribbean Centre for Hazard Assessment and Risk Management (C-CHARM) institutional model, around a recent University of West Indies initiative based at the Mona campus in Jamaica and emphasizing regionally based centres of research and training and training, and use it as a basis for parallel developments in the PIF and COI regions:
    - Relate the PIF regional initiative to the Pacific Centre for Environment and Sustainable Development (PACE-SD; <http://www.usp.ac.fj/pace/>) in the University of the South Pacific (USP), Laucala campus, Suva, Fiji, geographically proximal to the SOPAC secretariat;
    - Relate a COI regional research and training initiative, probably based in the University of Mauritius (<http://www.uom.ac.mu/#>), to the USP development in the PIF region, making use of USP experience in covering scattered communities over a wide geographic area through “distance and flexible learning”;
  9. Review and consider the limitations posed by there being no organizational counterpart of SOPAC or CDERA to advise and support the Commission de l’Ocean Indien (COI). The development of such a body for the Indian Ocean’s western side could well support early warning, emergency response, and sustainable development in this region, including the African Commonwealth states on its margin, particularly since the Programme of Action for the Implementation of the Africa Strategy for Disaster Risk Reduction (2005 – 2015) will be driven by the RECs (viz. SADC, COMESA, IGAD) of which the COI member states are part.
  10. The Commonwealth Secretariat can best assist by providing the promotion, co-ordination and facilitation effort needed to bring about the speedy implementation of the various international initiatives in the three regions.
  11. Ensure that adequate funding allocated to Humanitarian and Development aid is used for DRR and DM programmes.

#### 4.4 Conclusion

The tsunamis illustrated our common humanity.

EW and DR systems are measured as much by the success in mitigating the impacts of extreme and unavoidable disasters related to larger scale natural hazards as they are by their success in:

- ◆ adapting human behaviour timeously;
- ◆ in the learning of new skills to diversify income;
- ◆ in the undramatic but sustained improvement in small communities lives and security, and
- ◆ in the improvement of statistics related to famine, epidemics, drought, environmental degradation and conflict or poor governance.

#### **4.5 Additional Input**

During the Expert's meeting in Barbados, a World Bank Discussion Document -Natural Disaster Insurance Scheme for Small States was tabled. This discussion document is contained in Appendix K.