REPORT 2018

BY THE SMART SUSTAINABLE DEVELOPMENT MODEL ADVISORY BOARD

SMART SUSTAINABLE
DEVELOPMENT MODEL INITIATIVE

TOOLS FOR RAPID ICT EMERGENCY RESPONSES
AND SUSTAINABLE DEVELOPMENT

TELECOMMUNICATION DEVELOPMENT BUREAU

ITU

Smart Sustainable Development Model (SSDM)

Report 2018

Tools for rapid ICT emergency responses and sustainable development

This report was prepared by Advisory Board members of the Smart Sustainable Development Model (SSDM) Initiative (www.itu.int/en/ITU-D/Initiatives/SSDM/Pages/default.aspx) launched by the Telecommunication Development Bureau (BDT), International Telecommunication Union (ITU), in 2012 to explore innovative and collaborative ways of harnessing the full potential of ICTs for the benefit of all worldwide.

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I am pleased to present the Smart Sustainable Development Model (SSDM) Report 2018. This report builds on the dedicated work of the Advisory Board of the SSDM Initiative and brings together the realms of information and communication technology for development (ICT4D) and disaster management (ICT4DM). The SSDM Report 2018 charts the way ahead through a number of interlocking proposals. These include a Global Emergency Fund (GEF) for Rapid Response that will unite key stakeholders in finding long-term funding through a variety of partnerships to drive innovative solutions to boost countries' capacity to respond to disasters; a Volunteers for Emergency Telecommunications (VET) Model, that seeks to establish an effective and efficient network of volunteers to further co-operative action and build on the ability of all players; as well as a hands-on regulatory toolkit and guidelines that point out concrete actions t to facilitate the development and the smooth trans-border movement of telecommunications equipment into affected countries during emergencies.

The SSDM Report 2018 shines light on the path ahead, with the ultimate goal of providing telecommunications relief services in the most timely, coordinated and efficient manner to aid those in need. Under the SSDM Initiative, key concepts and important underlying development and disaster management functionalities have been brought together in the same sphere. The concrete steps proposed can guide each and every one of us in the ICT community as we move forward, whether in terms of establishing development priorities that promote economic and social benefits, or responding to emergency situations, where every second counts in saving lives.

I would like to thank the Hon. John Nasasira, Former Minister of ICT, Uganda, who is the Chairman of the SSDM Advisory Board, and Vice-Chairs Mr. José Manuel Toscano, International Government Affairs & Asset Management Director of Intelsat and Ms. Donna Bethea-Murphy, Senior Vice-President Global Regulatory of Inmarsat, and all Board Members for their excellent efforts in compiling this report.

This SSDM report gives us the tools to move forward and make a difference.

Brahima Sanou
Director
Telecommunication Development Bureau
International Telecommunication Union

Foreword

Information and communication technologies (ICTs) play a critical role in saving lives, as well as being a catalyst for sustainable development. To better harness the role of ICTs, the SSDM Initiative was developed in 2012 by the Director of the Telecommunication Development Bureau (BDT) of the International Telecommunication Union (ITU) as an international, multi-stakeholder platform to encourage dual-use of ICT for development (ICT4D) and ICT for disaster management (ICT4DM). The first cycle of the SSDM Initiative, saw the development of a strategy to implement the Initiative.

Moving on to the implementation of concrete actions in this second cycle, the Director of the BDT invited experts from government, private sector and academia to form the new SSDM Board. This report provides the proposals developed by three Working Groups established by the Advisory Board Members of the SSDM Initiative (Working Group on the Global Emergency Fund for Rapid Response, Working Group on the Volunteers for Emergency Telecommunications, and the Working Group on the Regulatory Toolkit and Guidelines). It remains an honour for me to serve my second term as the Chairman of the SSDM Board.

I would like to thank all the members of the SSDM board and the Working Groups for the tremendous work done in developing the report. I would also like to take this opportunity to thank the Director of the BDT for his continued support of this Initiative.

The Smart Sustainable Development Model (SSDM) Report 2018 presents a number of challenges: What kind of mechanism is needed to significantly improve coordination between the wide array of stakeholders involved in emergency ICT response? What financing strategies are needed for building effective partnerships and securing predictable and flexible funding? How can the effectiveness of volunteer training programmes be improved, and how can volunteer exchange networks be expanded? How do you tap into regional networks and build on their know-how and expertise?

At the same time, the SSDM Report 2018 points to a number of opportunities that exist and should be built upon: exploring public-private partnerships to foster regional and global opportunities for collaboration; creating a broader platform for disaster management to ensure disaster telecommunications relief services at all times; putting pre-planned solutions in place to avoid time lost in improvising solutions on the ground; having the right regulatory framework to facilitate relief efforts.

The SSDM Report 2018 represents a bridge between these challenges and opportunities highlighting how important this initiative is in contributing to the successful implementation of the Sustainable Development Goals (SDGs). It provides a clear picture to all the stakeholders in the field about fulfilling the endeavour of SSDM Initiative.

I look forward for continued progress and implementation of the concrete actions of this Initiative.

H.E. Mr John Nasasira
Chairperson, Advisory Board
Smart Sustainable Development Initiative
Former Minister of ICT, Government of Uganda

Acknowledgments

The views expressed in this report are those of the Advisory Board and do not necessarily reflect the opinions of the ITU or its Membership.

Executive Summary

The SSDM Report 2018 provides a number of concrete steps to further and strengthen the implementation of the International Telecommunication Union's (ITU) Smart Sustainable Development Model (SSDM) Initiative. The ITU Development Telecommunication Bureau (BDT) developed the SSDM Initiative in 2012, bringing together ICT for development (ICT4D) and ICT for disaster management (ICT4DM) to benefit both sectors through enhanced efficiency, cost-effectiveness and sustainability. This dual-use approach has become increasingly timely in light of the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals, many of which rely upon information and communication technologies for their fulfillment.

Through the SSDM Report 2018, several concrete proposals have been developed by three Working Groups (**Working Group on the Global Emergency Fund for Rapid Response**, **Working Group on the Volunteers for Emergency Telecommunications**, and the **Working Group on the Regulatory Toolkit and Guidelines**), integrated by Advisory Board Members of the SSDM Initiative. These proposals build upon the previous work of the SSDM Initiative, contributing to its objectives and bringing together a very large array of different stakeholders working towards a common goal: deploying rapid response emergency telecommunication for disaster relief.

This Executive Summary looks at the work of the Working Groups: Part I considers how to broaden the funding base of emergency ICT response through a Global Emergency Fund; Part II provides a model to establish a network of volunteers to facilitate cooperative action; and Part III provides a number of recommended best practices as well as a checklist to facilitate the smooth trans-border movement of telecommunications equipment. Taken together, these steps can make inroads towards more secure and coordinated funding of emergency ICT responses, strengthened coordination between the actors involved in these efforts and making maximum use of their skills, and helping to lay the regulatory groundwork to ensuring that ICT equipment is made available and is optimized, not only during emergency situations, but even outside of these situations for development purposes.

Part I: Global Emergency Fund for Rapid Response (GEF)

In today's world, ICTs are an increasingly essential component of relief efforts during the aftermath of a humanitarian emergency or natural disaster; it is becoming ever more imperative to find funding for projects for emergency communications to respond to these needs. Since 2002, ITU has provided satellite-based assistance to countries in the aftermath of disasters, focusing on the provision of telecommunications/ICT services and applications for disaster mitigation during all phases of disaster management. In this context, ITU's Smart Sustainable Development Initiative, through its Working Group on the Global Emergency Fund for Rapid Response (GEF), is proposing a Global Emergency Fund that will bring together – and maximize the resources and skills of – a wide range of stakeholders, from donors to volunteers on the ground carrying out relief efforts. Existing emergency response funds provide resources for a number of different emergency relief operations, including emergency communications. However, due to the scope of telecommunications deployment, it is important to look at the possibility of funding just for that purpose – which is why a project such as the Global Emergency Fund is so important.

Securing reliable and longer-term resources to fund the emergency communications component of relief efforts will have to include the right mixture of financing strategies, the close involvement of potential donors in planning processes, and reaching out to new partners through public-private partnerships to fund innovative solutions. The SSDM Report 2018 points to a number of options, including syndicated revolving loans and credit facilities involving multiple donor institutions, and in-kind contributions, such as satellite capacity, where dedicated capacity is allocated and paid for by the funding partner. An effective partnership model would also need to include as a partner an equipment

manufacturer who would be able to provide on-the-ground equipment such as remote terminals, uplink/downlink chains, hubs, etc. Partnerships with teleport operators are also essential in providing connectivity to terrestrial networks. National governments should also be fully involved, creating policies, planning, and regulatory frameworks that will enable the success of such partnerships. The national disaster relief policy and response plans should include the possibility of pre-deployment of equipment, training of personnel on such equipment, dissemination of risk awareness, etc. The national disaster policy should also incorporate facilitating the cross-border movement of such equipment, streamlined customs clearance, availability of technical support and manpower, etc. Outreach to regional and international space agencies that support ICT4D projects is also another promising avenue to explore in terms of partnerships for the development of technical solutions involving the use and deployment of new applications and satellite telecommunications services.

Disaster Management and Sustainable Development Platform Proposal

Building on previous work of the SSDM Initiative, the clear need for a broad platform that accommodates both disaster management and sustainable development efforts has emerged. The Disaster Management and Sustainable Development Platform proposed in this report could form the basis for ICT4D partnerships, based on the principles and framework established by the SSDM Initiative. Such a platform would implement the technological, policy, and operational aspects of deploying ICTs for disaster management and be geared up to deliver disaster telecommunications relief services at all times and to all places. The platform could be implemented across a series of models, ranging from addressing disaster recovery and relief, to addressing connectivity needs of the population, to fostering development in education, health and agriculture, etc.

The Global Emergency Fund

Linked to the Disaster Management and Sustainable Development Platform, the SSDM Report 2018 recommends the creation of a Global Emergency Fund as a more stable, long-term operational and financially sustainable platform for delivering disaster telecommunications relief services to any affected countries, dedicated to restoring communications on behalf of and for governments. As such, it would complement, rather than compete with the services provided by UN ETC and other humanitarian international organizations. To address the need for immediate or short-term liquidity, a Disaster Recovery Insurance Facility (ITU/DRIF) is proposed, whereby the governments would purchase insurance coverage to finance immediate post-disaster recovery needs. The proposed ITU/DRIF would combine the benefits of pooled reserves from participating countries with the financial capacity of donor partners, helping to accelerate recovery efforts in affected countries.

Part II: Volunteer Emergency Network

Emergency telecommunications are a vital part of the relief efforts during the aftermath of a humanitarian emergency or natural disaster. ICTs not only give first responders capabilities to share vital information during relief efforts, but also to begin the recovery and redevelopment process. One important aspect of these efforts is the volunteers that set up the ICTs and use these technologies. It is common knowledge that disaster management activities must be expertly coordinated, efficient and timely in order to be effective; therefore having a fully functioning coordination mechanism in place is essential to avoid delay in emergency response efforts. It is often challenging to get highly skilled responders to the emergency location – on-the-ground solutions are greatly needed. Part of the solution lies in improving the effectiveness of training programmes. The SSDM Report 2018 recommends volunteer training programmes are geared to equipping local first responders with the knowledge they need to speed up the recovery process – for example, setting up networks.

Equally important is ensuring that ICT relief efforts on the ground are not hindered, which in some case means adapting the regulatory framework for communications in times of disaster relief. SSDM Report 2018 recommends ensuring all countries have a regulatory framework to allow for temporary licensing in communications emergencies. A corollary requirement is that there be a specific allowance

for waiver of import duties and immigration controls for volunteers assisting in ICT when providing humanitarian aid. A "model law" building on existing legislation should be prepared and made available as an example for those countries that do not have such exemptions in their regulations.

Other issues to consider include overlap and duplication of efforts between training materials; building on successful partnerships – such as ITU's IIV Programme – to expand them to other regions that could benefit from prepared volunteer reserves; and building and expanding regional networks to put in place a coordinated regional disaster strategy.

To meet the challenges outlined above and others, the SSDM Report 2018 proposes a Volunteers for Emergency Telecommunications (VET) Model that will establish an effective and efficient network of volunteers to facilitate cooperative action, build on the strengths of all players, and provide a clear line of support between the various stakeholders and groups at local and regional levels. The model will build on existing structures and encourage coordination amongst the key stakeholders: international and intergovernmental organizations; volunteer relief agencies; and individuals who may volunteer locally within their community. To be viable, the model must generate opportunities and resources, and ensure that there are ties with international organizations that can provide financial and logistical support. To facilitate these efforts, a consolidated web portal which can be used by all stakeholders is proposed to provide communication amongst all stakeholders, coordinate action, provide online training and certification, and to identify volunteers with the appropriate skills who can be called on to provide immediate assistance. Reaching this goal will entail a process that builds trusting relationships, fosters mutual understanding and ensures actions that will bring the various stakeholders together. Bringing the individual talents of the volunteers together to operate in a timely, coordinated and efficient manner will be the VET Model's ultimate goal.

Part III: SSDM Regulatory Toolkit and Guidelines

Emergency telecommunications play a critical role in the immediate aftermath of disasters in many ways, including through ensuring the timely flow of vital information needed by government agencies and other humanitarian actors involved in rescue operations. However, when disaster strikes, many countries are not sufficiently prepared in regard to ICT infrastructure; many do not have contingency policies and plans in place. In that case, many first responders, humanitarian organizations, and donor countries have to move ICT equipment across borders in order to provide services to the affected region. Often, there are barriers to making such vital resources available in the disaster area, which slows down the aid process.

A number of essential stakeholders are involved and affected by the movement of telecommunications equipment across borders during emergency situations, including international organizations, first response agencies, international volunteer networks, regional organizations, telecommunications and customs authorities, various ministries (transport, foreign affairs, etc.), and the private sector, including satellite operators and service providers.

Many tools, mechanisms and guidelines that could help already exist, including the Tampere Convention, the main focus of which is to reduce or remove regulatory barriers to the use of telecommunication resources for disaster relief; IDRL Guidelines, which seek to avoid delays in the dissemination of humanitarian relief; WTO's Trade Facilitation Agreement, which contains provisions for expediting the movement, release and clearance of goods, including goods in transit, and with provisions for special circumstances such as natural disasters and other emergency situations; Model Agreement between the United Nations and Member States, concerning actions to expedite the import, export and transit of relief consignments and possessions of relief personnel in the event of disasters and emergencies. While these mechanisms provide guidelines on how to facilitate movement of ICT equipment across borders for both emergencies and non-emergency purposes, it is up to each country to decide whether they are willing to comply with these guidelines or not.

In this complex landscape of international disaster response, many issues need to be addressed, ranging from licensing and type approval, to customs issues, including delays, restrictions and duties, to difficulties encountered in cross-sectoral collaboration and implementation, not to mention the actual problems encountered on the ground that necessitate immediate solutions.

In order to enable these different moving parts to work together in a coordinated and timely manner, the SSDM Report 2018 recommends establishing an effective coordination process to facilitate the movement of equipment across borders and access during emergencies at both international and national levels. At the national level, it is necessary to have a high-level plan in place for disaster response, including clear delegations and provisions for emergency communications on national broadband plans and national disaster relief efforts. This requires different government agencies at the local level to work together and create collaborative regulation regimes.

The SSDM Report 2018 proposes a number of recommended best practices that when implemented across the globe would enable robust disaster response and development networks. These include: providing for blanket licensing for satellite user terminals; cost-based administrative fees; regulations that are technology neutral; universal service funding that is technology and competitively neutral; temporary authorizations to meet emergency requirements; access to adequate spectrum; no foreign ownership restrictions to land satellite traffic; and ensuring that satellite services are protected from interference from existing and new services that share frequency bands. The report also provides a checklist intended to assist administrations in facilitating the smooth trans-border movement of telecommunications equipment into countries affected by an emergency through assessing their current readiness and identifying new processes and regulatory measures to be established. This checklist functions as a starting point, and should be used to evaluate the types of specific practices that should be developed pursuant to the needs of each administration. The checklist is divided into four categories: preparedness; policy guidelines and tools; communication; and pre-positioning and training. Each of these categories is accompanied by a series of guiding questions. The report concludes with an annex providing an 'Emergency Communications Checklist', which outlines the types of activities and expected decision points that could be considered for inclusion in a National Disaster Communications Plan.

The SSDM Report 2018 provides guidance and hands-on tools for those engaging in disaster telecommunications relief, whether in terms of resource mobilization and training of volunteers at the country and regional level; or setting up a network, such as a Volunteers for Emergency Telecommunications network, aimed at rapid response to disasters and to facilitate the contribution of ICTs in disaster management and sustainable development processes; or providing the needed regulatory measures and guidelines that can serve as a basis for both the development and the smooth trans-border movement of telecommunications equipment into affected countries during emergencies. It is hoped that a broad range of stakeholders will find this report a valuable and enabling resource tool in the journey ahead.

Introduction

The Smart Sustainable Development Model (SSDM) Initiative Advisory Board is designed to provide strategic guidance to the leadership of the Telecommunication Development Bureau (BDT). The Advisory Board helps to ensure that the Initiative remains true to its mission and is aligned with the Strategic Plan of the Development Sector (ITU-D) of the International Telecommunication Union.

The second cycle of the Advisory Board comes at a critical time when the international community has adopted the "Transforming our world: the 2030 Agenda for Sustainable Development", 17 Sustainable Development Goals and their associated 169 targets. The future work of the SSDM Initiative Advisory Board would contribute to the ongoing efforts by the BDT to accompany countries on their development journey by linking the use of ICTs for development to disaster risk reduction and to management efforts.

Through its work, the SSDM Initiative addresses a wide spectrum of interlinked issues:

1. Harnessing the potential of ICTs in socio-economic development and using the same technologies for saving lives in times of emergencies.

2. Linking rural telecommunications/ICT development to both disaster risk reduction and management efforts.

3. Making optimal use of scarce and high cost resources such as satellite systems by putting in use unused satellite capacity.

4. Creating ecosystems where investments made for deploying telecom infrastructures for economic development are also used for disaster response for public safety.

5. Ensuring deployment of robust and resilient communication networks that continue to provide services in the immediate aftermath of disasters.

6. Avoiding duplication in efforts by development partners (governments, private sector, intergovernmental organizations, etc.) focusing on either development only or disaster management only without taking into account the other. This reduces the cost of infrastructure investments for ICTs particularly in rural communities.

Working toward these objectives, the SSDM Initiative Advisory Board has established three working groups: Working Group on the Global Emergency Fund for Rapid Response (GEF); Working Group on the Volunteers for Emergency Telecommunications (VET); and Working Group on the Regulatory Toolkit and Guidelines. The SSDM Report 2018 presents their key recommendations and action points.

Part I of this report is based on the work carried out by the Working Group on the Global Emergency Fund for Rapid Response, tasked with increasing funding for projects for emergency communications. Part I identifies the key stakeholders involved in funding efforts – international and intergovernmental organizations, donor countries, foundations, regional organizations, the private sector, etc. – and their respective roles. It also includes a gap analysis of current funding methods and explores innovative funding models and best practices. It identifies national, regional and global partnership opportunities for allocating resources to SSDM initiatives. Finally, Part I lays out key steps towards a Global Emergency Fund, as well as a proposal for a communication plan to raise awareness on the GEF and mobilize resources.

Part II takes a close look at the stakeholders involved in volunteer deployment such as international agencies and non-profit organizations – the International Telecommunication Union (ITU) and the International Federation of Red Cross and Red Crescent Societies (IFRC), etc. Mechanisms for cooperation and the coordination of volunteer efforts, such as the Emergency Telecommunications Cluster (ETC) are also explored.

In addition, this section analyses some of the gaps in volunteer efforts today, for example, the lack of highly skilled volunteers capable of installing and deploying ICT equipment. This section further explores capacity-building programmes and how extensive they are at training on-the-ground volunteers, as well as improving existing volunteer exchange programmes. Part II concludes with a proposal for a Volunteers for Emergency Telecommunications (VET) Model that builds on existing structures and encourages coordination amongst the groups and stakeholders mentioned above to operate in a timely and coordinated manner in disaster situations.

Part III provides an analysis of the key concepts and issues regarding the trans-border movement of telecommunications equipment (e.g. satellite terminals and ground stations, etc.) during emergency situations, considers key stakeholders and their respective roles, and takes a close look at existing gaps, ongoing needs, and mechanisms for facilitating the trans-border movement of ICT equipment. Importantly, Part III offers a regulatory toolkit and guidelines to help ensure that ICT equipment is made available and is well utilized not only during emergency situations, but even outside of these situations for development purposes. The toolkit identifies i) concrete actions to create the proper policy and regulatory environment to facilitate the development and the smooth trans-border movement of telecommunications equipment into affected countries during emergencies, taking into consideration regional aspects, and (ii) key messages to motivate policy-makers to adopt these best practice regulatory measures to provide rapid response when disaster strikes.

Part I: The Global Emergency Fund for Rapid Response (GEF)

1.   OVERVIEW OF THEGLOBAL EMERGENCY FUND

Information and Communication Technologies (ICTs) play an essential role during emergencies, as they are an important component of relief efforts during the aftermath of a humanitarian emergency or natural disaster. It is therefore crucial to find funding for projects for emergency communications. In this context, the Smart Sustainable Development Initiative (SSDM) decided to establish a task force to propose a Global Emergency Fund (GEF). The first section of this chapter (or Part I) will identify key stakeholders and their respective roles and will also include a gap analysis of current funding methods and proposals for concrete actions. The second section will explore innovative funding models; research best practices for resource allocation; and identify national, regional and global partnership opportunities for allocating resources to such initiatives. Finally, the third section will present a proposal for the fund as well as a proposal for a communication plan to raise awareness on the GEF and mobilize resources.

1.1 Key Stakeholders

1.1.1 International and Intergovernmental Organizations

International Telecommunication Union (ITU)[1]

The ITU is the UN specialized agency for information and communication technologies (ICTs). The development arm of the ITU (ITU-D) considers emergency telecommunications an integral part of its projects integrating telecommunications/information and communication technology in disaster prediction, detection, alerting and relief.[2]

United Nations Office for the Coordination of Humanitarian Affairs (OCHA)

OCHA is the part of the UN Secretariat responsible for coordinating humanitarian actors to ensure a coherent response to emergency situations. OCHA makes sure that there is a framework within which each humanitarian actor can contribute to overall response and relief efforts.

OCHA manages the Central Emergency Response Fund (CERF), a humanitarian fund established by the United Nations General Assembly (UNGA).Its objectives are: i) promote early action and response to reduce loss of life; ii) enhance response to time-critical requirements; and iii) strengthen core elements of humanitarian response in underfunded crises.

CERF's purpose is to enable more timely and reliable humanitarian assistance to those affected by natural disasters and armed conflicts. CERF is funded by

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[1]   For further information, see: http://www.itu.int/en/about/Pages/default.aspx

[2]   https://www.itu.int/en/ITU-D/Pages/default.aspx

voluntary contributions and has, to date, received almost USD 3.8 billion from 125 UN Member States and observers, regional and local authorities, and other public and private donors.[3] A third of CERF's contributors have also received support from the Fund.[4]

United Nations Educational, Scientific and Cultural Organization (UNESCO)[5]

UNESCO is responsible for coordinating international cooperation in education, science, culture and communication. It strengthens the ties between nations and societies, and mobilizes the wider public so that each child and citizen:i) has access to quality education – a basic human right and an indispensable prerequisite for sustainable development; ii) may grow and live in a cultural environment rich in diversity and dialogue – where heritage serves as a bridge between generations and peoples; iii) can fully benefit from scientific advances; and iv) can enjoy full freedom of expression – the basis of democracy, development and human dignity.

World Food Programme (WFP)

The WFP is currently the global lead of the ETC and is responsible for coordinating inter-agency relief efforts in terms of IT and telecoms in emergencies.

WFP's Fast Information Technology and Telecommunications Emergency and Support Team (FITTEST) represents WFP's IT emergency response capacity. FITTEST provides lifesaving Internet connectivity, security telecommunications, customer support and training for humanitarian actors from UN agencies and NGOs around the world. FITTEST is always on the frontline of any emergency situation that needs IT support.[6]

United Nations High Commissioner for Refugees (UNHCR)

UNHCR is a global organization dedicated to saving lives, protecting rights and building a better future for refugees, forcibly displaced communities and stateless people. In addition to these duties, UNHCR also plays a major role in disaster preparedness and response capabilities through capacity-building initiatives and inter-agency cooperation.[7]

Organisation for Economic Development and Co-operation – Development Cooperation Directorate (OECD-DAC)[8]

OECD's mission is to help governments foster prosperity and fight poverty through economic growth and financial stability, and ensure the environmental implications of economic and social development are taken into account.

In regard to disaster management, OECD relies on the High-Level Advisory Board on the Financial Management of

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[3]   The United Kingdom, Sweden, the Netherlands and Norway are among the major contributors to CERF. For further information, see: http://www.unocha.org/cerf/donors/donorspage
[4]   For further information, see: https://www.unocha.org/about-us/who-we-are
[5]   For further information, see: http://en.unesco.org/about-us/introducing-unesco
[6]   For further information, see: http://www.wfp.org/ictemergency/fittest
[7]   For further information, see: http://www.unhcr.org/en-us
[8]   For further information, see: http://www.oecd.org/about/whatwedoandhow/; http://www.oecd.org/dac/

Catastrophic Risks Insurance and the OECD Insurance and Private Pensions Committee to support the development of strategies for the financial management of natural and man-made disaster risks. This is accomplished through guidance and analysis and the sharing of experience and best practices through meetings and seminars.[9]

1.1.2 International Funding Organizations

World Bank

The World Bank is a vital source of financial and technical assistance to developing countries around the world, through low-interest loans, zero to low-interest credits, and grants. In terms of emergency relief, the World Bank's Disaster Risk Management (DRM) team assists its client countries in assessing exposure to hazards and addressing disaster risks. The DRM provides technical and financial support for risk assessments, risk reduction, preparedness, financial protection, and resilient recovery and reconstruction.

The Global Facility for Disaster Reduction and Recovery (GFDRR), a global partnership of 41 countries and seven international organizations, is the World Bank's institutional mechanism for DRM. GFDRR helps high-risk, low-capacity developing countries better understand and reduce their vulnerabilities to natural hazards and adapt to climate change. The Global Facility provides grant financing and technical assistance to help mainstream disaster and climate risk management policies into country-level strategies. It also serves as a global platform for knowledge-sharing and capacity building for disaster and climate resilience. Through funding and expertise, GFDRR supports countries to develop and implement tailored financial protection strategies that increase the ability of national and sub-national governments, homeowners, businesses, agricultural producers, and low-income populations to respond quickly to disasters. In 2012-2014, the World Bank invested USD1.4 billion in improving disaster preparedness. This included investing in hydro-meteorological and early warning systems. In Nepal, for example, GFDRR awarded USD 600 000 to civil society organizations to build flood resilience using a community-based approach in the Kosi Basin.[10]

International Finance Corporation (IFC)

The IFC is a member of the World Bank Group. It is the largest global development institution focused exclusively on the private sector in developing countries. With a consistent Triple-A credit rating, the IFC raises virtually all funds for lending activities through the issuance of debt obligations in international capital markets. The IFC can provide funds in a number of ways. Loans, equity and syndicated parallel loans figure among its funding products and services.

The IFC acts as the loan administrator, using its existing syndication platform, deal-structuring expertise, and global presence to identify investments, perform due diligence, and negotiate loan documents in cooperation with parallel lenders. Projects eligible for IFC funding must come from the private sector, from an IFC member country, and meet criteria regarding profitability, environmental and social impact, as well as being technically sound.[11]

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[9]   For further information, see:http://www.oecd.org/finance/insurance/disaster-risk-financing.htm
[10] For further information, see: http://www.worldbank.org/en/about/what-we-do
[11] For further information, see: http://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/about+ifc_new

Bill &Melinda Gates Foundation

The Bill & Melinda Gates Foundation is the largest private foundation in the world. Launched in the year 2000, the primary aims of the Foundation are, globally, to enhance healthcare and reduce extreme poverty.

The Bill & Melinda Gates Foundation has an Emergency Response programme that aims to reduce suffering, disease, and death in countries affected by natural disasters and complex emergencies. In addition to responding directly to emergencies, the Bill & Melinda Gates Foundation work to help improve the speed and performance of first responders in the first critical hours of an emergency.

The Bill & Melinda Gates Foundation has responded, *inter alia*, to the Ebola virus outbreak in West Africa, cholera outbreaks in Cameroon, floods and landslides in Kashmir and Nepal, and Typhoon Haiyan in the Philippines. The   Emergency Response programme focuses on a number of aspects of disaster response. Within their programme, the Bill & Melinda Gates Foundation help respond to three types of emergencies: (i) rapid-onset emergencies; (ii) complex emergencies; and (iii) slow-onset emergencies.

Within the Learning and Innovation programme, the Bill & Melinda Gates Foundation collaborates with other foundation programmes to develop and study new approaches to disaster assistance, including innovative tools and technologies.[12]

International Federation of Red Cross and Red Crescent Societies (IFRC)

The IFRC is the world's largest volunteer network that reaches 150 million people in 190 National Societies through the work of over 17 million volunteers. The IFRC's Disaster Relief Emergency Fund (DREF) was established in 1985 to provide immediate financial support to Red Cross and Red Crescent National Societies, enabling them to carry out their unique role as first responders after a disaster.

The main purpose of the DREF is funding the response of the IFRC and National Societies to large-scale disasters through a "loan facility." The DREF also provides grants for National Society responses to small- and medium-scale disasters and health emergencies for which no international appeal will be launched, or when support from other actors is not foreseen.[13]

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[12]   For further information, see: http://www.gatesfoundation.org/
[13]   For further information, see:http://www.ifrc.org/en/what-we-do/disaster-management/responding/disaster-response-system/financial-instruments/disaster-relief-emergency-fund-dref/

1.1.3 Donor Countries and Regional Organizations

National and regional governments that sponsor and fund humanitarian development activities can play key roles in SSDM partnerships. A small sample of those engaged in ICT for Development (ICT4D) and ICT for Disaster Management (ICT4DM) activities include:

European Commission (EC)[14]

The EC is a body of the European Union (EU) that is responsible for proposing legislation, implementing decisions, upholding the EU treaties and managing the day-to-day business of the EU.

Within the EC, the Emergency Response Coordination Centre (ERCC), operating within the EC's Humanitarian Aid and Civil Protection department (ECHO), was set up to support a coordinated and quicker response to disasters both inside and outside Europe using resources from the countries participating in the EU Civil Protection Mechanism. The ERCC replaces and upgrades the functions of the previous Monitoring and Information Centre (MIC).

With a capacity to deal with several simultaneous emergencies in different time zones, around-the-clock, the ERCC is a coordination hub facilitating a coherent European response during emergencies, helping to cut unnecessary and expensive duplication of efforts.

United States – United States Agency for International Development (USAID)[15]

USAID is the lead US Government agency that works to end extreme global poverty and enable resilient, democratic societies to realize their potential.

USAID's Office of US Foreign Disaster Assistance (OFDA) is responsible for leading and coordinating the US Government's response to disasters overseas. OFDA not only supports first response programmes, but also has disaster risk reduction programmes in place specifically intended to limit the impact of natural disasters.

In addition, USAID has multiple partnerships in ICT: these partnerships include, among others, Intel Corp.; Cisco Systems; Inc.; Microsoft; Global VSAT Forum; and NetHope. The goal of these partnerships is to expand access to and usage of ICTs for populations in developing and emerging markets.[16]

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[14]   For further information, see: https://ec.europa.eu/info/about-european-union_en
[15]   For further information, see: https://www.usaid.gov/
[16]   For further information, see:https://www.usaid.gov/what-we-do/economic-growth-and-trade/information
-technology/partnerships-ict

Canada – International Development Research Centre (IDRC)[17]

IDRC funds research in developing countries to promote growth, reduce poverty, and drive large-scale positive change.

IDRC works with private and public sector actors who help implement solutions. By bringing donor partners together to fund programmes, IDRC addresses a range of development challenges — from testing an Ebola vaccine to conducting research that will help countries adapt to climate change.

IDRC has multiple investments in a wide variety of areas related to ICTs, including infrastructure, access, regulations, health governance, education, livelihoods, social inclusion, technical innovation, intellectual property rights and evaluations.[18]

Luxembourg – emergency.lu[19]

The Government of Luxembourg's programmeemergency.lu is a multi-layer platform consisting of satellite infrastructure and capacity, as well as rapid deployment of communication and coordination services, satellite ground terminals, and transportation of equipment to the disaster area within the first 12 to 20 hours after a disaster.

Emergency.lu collaborates with United Nations agencies to create solutions that take into account the existing communications infrastructures used in humanitarian operations. They partner with the WFP, which is the global lead of the ETC.

United Kingdom – Department for International Development (DFID)[20]

DFID leads the UK's work to end extreme poverty through tackling problems such as disease, mass migration, insecurity and conflict.

UK Aid Direct is DFID's central funding mechanism for awarding grants to small- and medium-sized UK and international civil society organizations working to reduce poverty overseas.

DFID has been a leader in research into appropriate uses of ICTs in the education sector in developing countries, and the related issues and challenges.[21]

Sweden – Swedish Program for ICT in Developing Regions (SPIDER)[22]

As part of its mission, SPIDER seeks to decrease the global differences in the use of ICT. SPIDER promotes the use of ICT as a means to achieve the Sustainable Development Goals (SDGs) as established by the United Nations in 2015.Its work includes support to projects, research and capacity building in developing regions.

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[17] For further information, see: https://www.idrc.ca/
[18] For further information, see:https://prd-idrc.azureedge.net/sites/default/files/openebooks/124-1/index.html
[19] For further information, see:http://www.e-mfp.eu/users/ministry-foreign-and-european-affairs-directorate-development-cooperation-and-humanitarian
[20] For further information, see:https://www.gov.uk/government/organisations/department-for-international-development
[21] For further information, see:http://www.infodev.org/articles/quick-guide-ict-and-education-dfid
[22] For further information, see: http://spidercenter.org/

SPIDER is funded primarily by the Swedish International Development Cooperation Agency (SIDA) through multi-year funding for projects, advisory services, network-building and help desk support to SIDA staff at headquarters and embassies.[23]

Switzerland – Swiss Agency for Development and Cooperation (SDC)[24]

SDC is an office-level agency in the Federal Administration of Switzerland, and a part of the Federal Department of Foreign Affairs. Together with other federal offices, SDC is responsible for overall coordination of Swiss international development activities and cooperation with Eastern Europe, as well as humanitarian aid.

SDC is organized and funded by the Swiss Government and operates by financing programmes both directly and in partnership with other agencies to countries around the world.

The focus of SDC from 2001 to 2008 was to support international mainstreaming efforts of ICTs in development processes, e.g. through supporting a series of targeted publications, thematic roundtables and particularly through strengthening to the development perspective and the multi-stakeholder process in the World Summit onthe Information Society (WSIS). SDC is currently focusing on the integration of ICTs in its own projects and programmes (as a strategic instrument).[25]

1.1.4 Private Sector

As previously noted, the private sector plays a critical role in ICT4D and ICT4DM partnerships, especially when they give in-kind contributions to emergency response and relief operations. Given how satellite is heavily used for emergency situations, many satellite operators have entered into partnerships with ETC and ITU to donate capacity. Below are just a few examples of how the satellite industry is involved in relief efforts.

Eutelsat and the 2016 Earthquake in Ecuador

When a 7.8 magnitude earthquake hit Ecuador's central coast, Eutelsat donated capacity on its EUTELSAT 115 West B satellite to facilitate the relief effort in the earthquake zone. Through a partnership with Palmera Communications Group (PCG), a US provider of rapid-reaction communications solutions to disaster, war zone and crisis areas, a 1.2-meter VSAT system was installed. The VSAT system was used to assist the Ecuadorean Air Force in its relief efforts.[26]

November 2015 Arabsat donation

ARABSAT has signed Crisis Connectivity Charter with United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA) to provide timely, predictable and effective Satellite Communication

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23   *Ibid.*

24   For further information, see: https://www.eda.admin.ch/sdc

25   For further information, see:https://www.eda.admin.ch/deza/en/home/themes-sdc/state-economic-reforms/ information-communication-technologies.html

26   For further information, see:http://www.businesswire.com/news/home/20160610005797/en/Palmera -Communications-Group-Eutelsat-Americas-Newcom-Partner

Services. Arabsat donated C-Band Satellite Capacity on ARABSAT-5C, equipment and technical training to UN Staff to handle Satellite Equipment properly and efficiently.

Intelsat and the 2015 Nepal Earthquakes

In response to the 2015 Nepal earthquakes, Intelsat donated capacity for satellite broadband to organizations working on relief efforts in Nepal, such as the IFRC and Team Rubicon to support critical medical and logistical relief operations. The satellite operator Spacecom also increased capacity on its Amos 4 satellite to support relief efforts in Nepal and other regions affected by the earthquake.[27]

Thuraya and 2013 Relief Efforts for Typhoon Haiyan in the Philippines

Typhoon Haiyan, one of the strongest tropical storms ever recorded, hit the Visayas region of the Philippines in November 2013, affecting over 14.1 million people and destroying much of the region's communications infrastructure. Satellite operator Thuraya and its Philippine service partner SMART provided satellite equipment to connect first responders to satellite networks to keep them connected at all times during relief operations for Typhoon Haiyan. Thuraya gave versatile satellite handsets and broadband terminals, enabling responders to use their own devices for communications which allowed them to respond quickly and efficiently.[28]

Inmarsat partnership with Team Rubicon

In 2017, Inmarsat entered into a partnership with Team Rubicon UK to support relief efforts wherever and whenever natural disasters strike. This partnership will supply Team Rubicon with essential satellite communications equipment, such as BGAN terminals for broadband connectivity and handheld satellite phones, to coordinate relief efforts.[29]

SES Partnership with the Luxembourg Government for Emergency.lu

As previously mentioned, Emergency.lu is a multi-layer platform that supports first responder relief efforts. It uses SES satellites for its operations and it has partnered with the ETC to deploy emergency communications in many cases, such as Haiti, Nepal and Vanuatu, and earlier in Mali, the Philippines, South Sudan, Venezuela and Ebola-affected countries in West Africa.[30]

1.1.5 Receiving Countries

During emergency situations, the afflicted country has a key role in making sure that their regulatory environment is conducive to receiving aide. This is especially important for telecommunications regulators, who should include backup networks for communications, such as satellite technology, and the pre-positioning of ICT equipment in their planning strategies.

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[27] For further information, see:http://www.intelsat.com/news/intelsat-donates-satellite-solutions-in-support-of-red-cross-and-team-rubicon-relief-efforts-in-nepal/#sthash.P2yojA8B.dpufm
[28] For further information, see:http://www.thuraya.com/sites/all/modules/ckeditor/ckfinder/userfiles/files/case-studies/Connecting%20first%20responders%20during%20Typhoon%20Haiyan_FINAL.pdf
[29] For further information, see:http://www.inmarsat.com/news/inmarsat-teams-military-veterans-aid-disaster-relief/
[30] For further information, see:https://www.ses.com/press-release/ses-enabling-disaster-response-and-connecting-affected-communities

1.2. Gap Analysis

1.2.1 Coordination

From a surface level perspective, it is evident that there are many different resources for funding ICT for disaster management projects and emergency communications relief efforts. However, it is unclear how effective coordination is between funding institutions and humanitarian actors. An entity that coordinates the initial emergency communications response to emergency situations already exists: the ETC. It is one of the 11 clusters designated by the Inter-Agency Standing Committee (IASC), an inter-agency forum of UN and non-UN humanitarian partners founded in 1992, to strengthen humanitarian assistance. The ETC is a global network of organizations in charge of coordinating ICT responses during emergencies such as humanitarian crises and natural disasters. It is usually activated within the first 48 hours of an emergency; and ETC services are expanded within four weeks to provide continued emergency relief. However, if the ETC is not activated, it is nearly impossible for a coordinated effort to happen.

The ETC is chaired by the WFP and its member organizations include UN agencies such as the ITU, UNHCR and OCHA, among others. Some national ministries are also a part of the cluster, such as the US Department of State, and the Ministry for Development Cooperation and Humanitarian Affairs of Luxembourg, as well as humanitarian organizations such as the IFRC and Télécoms Sans Frontières. These organizations rely on the activation of the cluster to coordinate their efforts.[31]

In regard to satellite operators and in-kind contributions to emergency relief, Eutelsat, Hispasat, Inmarsat, Intelsat, SES, Thuraya and Yahsat, under the umbrella of the EMEA Satellite Operators Association (ESOA) and the Global VSAT Forum (GVF), signed a Crisis Connectivity Charter in 2015 with the global humanitarian community represented by OCHA and the ETC.[32] The charter ratifies terms and protocols to facilitate access to satellite-based communications for emergency response teams when local networks are down after a disaster. The charter also includes increased coordination to prioritize access to bandwidth for humanitarian purposes during disaster operations, pre-positioned satellite equipment and transmission capacity at times of disaster in high-risk countries in Europe, the Middle-East, Africa and Asia, as identified by the ETC.

1.2.2 Resource Allocation

Existing emergency response funds, such as those administered by the World Bank and the Bill & Melinda Gates Foundation, provide resources for a number of different emergency relief operations, including emergency communications. However, due to the scope of telecommunications deployment it is important to look at the possibility of funding just for that purpose, which is why a project such as the Global Emergency Fund (GEF) is so important.

Inside the scope of emergency communications funding, there are two separate courses of action. One is to use funding for disaster relief pre-planning such as pre-positioning and the deployment of resilient infrastructure, which can also be used for sustainable development. On the other hand, it is also necessary to have funds on hands for the immediate aftermath of an emergency situation to help pay for on the ground equipment.

In addition to this, it is important to take into account the kinds of resources that are deposited into the Fund. For example, satellite operators and other private sector actors might give in-kind contributions such as satellite capacity while other actors might give a monetary amount. Therefore, the GEF has to take into account these kinds of resources when defining the scope of operations.

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[31]   For further information, see: https://www.etcluster.org/about-etc

[32]   For further information, see:http://www.satellitetoday.com/regional/2015/10/15/7-satellite-operators-sign-uns-crisis-communications-charter/

Another separate issue regarding resource allocation is the use of pre-existing infrastructure for emergency communications. In previous SSDM reports, the Emergency.lu platform has been regarded as a cost-effective and efficient model because it relies upon existing infrastructure for its emergency communications operations, which cuts down on a considerable amount of money.[33]

1.3 Concrete Actions

1.3.1 Financing Strategies

In previous reports, the SSDM identified the financial strategies discussed below:

- ***Monetary Contributions***

Syndicated revolving loans and credit facilities[34]

Through a syndicated loan system, a group of lenders collectively lends money to a borrower. Syndicated revolving loans and credit facilities, where the funders would be more than just one of the institutions above mentioned, can be a good way to provide continuity. This could be one strategy for continuous funding of the GEF.

Contributions for specific purposes

Some international and humanitarian organizations can increase the amount of money they donate or grant to a programme if it includes aspects that are part of their mission or complement their other initiatives. For example, many organizations have capacity-building initiatives and can increase their in-cash contribution to the fund if the projects include capacity-building components.

- ***In-kind Contributions***

Satellite Capacity[35]

Satellite operators may not be able to provide "free" capacity for a multi-year development initiative, but may be willing to offer it for a conditional discount, i.e. the fee could increase according to a fixed schedule or as project milestones are achieved. Similarly, in disaster relief efforts, in order to ensure access to capacity, a deal could be negotiated where the operator is compensated for keeping a dedicated pool of capacity available, even if the compensation is not at market value. This would allow the operator to provide support without having to sacrifice near-term objectives. Emergency.lu, which is funded by the Government of Luxembourg, uses a similar model, where dedicated capacity is allocated and paid for by the funding partner.

On-the-ground Equipment[36]

Although satellite operators can provide satellite capacity, they may be unable to provide on-the-ground equipment such as remote terminals, uplink/downlink chains, hubs, etc. Thus, an effective partnership model should include as a partner an equipment manufacturer with the ability to contribute on-the-ground equipment. In addition, partnerships with teleport operators might be necessary to provide connectivity to terrestrial networks. Once again, the model for Emergency.lu addresses this need by including a telecommunications equipment manufacturer as a contributing member of the partnership.

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[33]   See the 2016 SSDM Report: http://www.itu.int/en/ITU-D/Documents/SSDM_2016_report.pdf
[34]   Ibid.
[35]   Ibid.
[36]   Ibid.

1.3.2 Outreach to Potential Donors

In this section, a variety of different donors have been identified, from financial institutions and charitable organizations such as the World Bank and the Bill & Melinda Gates Foundation that can give monetary resources to the fund, to private sector companies that can give in-kind contributions like satellite capacity and on-the-ground technology and equipment.

In order to create a fund that is both effective at setting up communications networks for relief services, allocating resources and, at the end of the day, being able to sustain itself with numerous funding sources, it is essential to include donor entities as important stakeholders and involve them in the planning process. That means that contact with these agencies should be established and developed during the planning phases of the GEF.

The SSDM Initiative should create a preliminary model for the Fund and present it to the above-mentioned potential donors for their feedback. In doing so, the GEF can receive valuable input and recommendations, as well as ensuring that the donors feel connected enough to the process to safeguard their continued interest, ownership and funding.

1.3.3 Organization of the Global Emergency Fund

Through its SSDM Report 2016, the SSDM had proposed the "Global Platform for Recovery and Development (GPRD)" –a platform that could be implemented in a modular, step-by-step approach allowing the solution to grow over time[37]. The idea was that the setup of the platform and the service would be under the progressive model(to address a sustainable satellite communications solution globally for development purposes for periods of 6 to 36 months) and the sustainable model (to address both the disaster recovery and relief and the connectivity needs of the population on a more stable basis to help development in education, agriculture and health issues, for example),while building on the existing infrastructure of emergency.lu. Such an approach would enable maximum reuse of, and synergies with, the existing emergency.lu infrastructure by sharing both ground equipment and satellite capacity and the incremental cost for additional applications.

In regard to the GEF, these issues regarding the different models of disaster relief funding still stand. When proposing the model for the GEF later in the report, it will be necessary to have a consensus on what exactly the role and scope of the GEF will be in order to get a better sense of what the budget will look like. For example, some of the issues that will need to be defined later on include the following:

- **Scope of operation** – will it be directed towards disaster preparedness and risk reduction, first response operations, telecommunications rehabilitation, or all of these issues?

- **Administration of the Fund** – will there be a board of directing organizations or will the fund be organized like the ETC, where one organization has the leading role?

- **Beneficiaries –**will these be national governments or humanitarian actors or both?

- **Donors** – how much can the fund feasibly get in monetary and in-kind contributions?

1.3.4 Outreach to Beneficiaries

Once the GEF has been defined and ready for deployment, it is important that beneficiary countries know that it is a resource they can depend on for their disaster preparedness regimes and during their times of need. In order for that to happen, we have to define strategies for dissemination.

One way of doing so is through a regional approach. For example, the GEF could identify individual countries in each region that are suitable for a disaster preparedness project and able to carry such

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[37]   SSDM Report 2016, see pages 66 and 67. https://www.itu.int/en/ITU-D/Documents/SSDM_2016_report.pdf

a project out, thereby tangibly disseminating the benefits of the GEF. Outreach to beneficiaries will be addressed at a later stage.

2.   Funding Opportunities

2.1 Best Practices

2.1.1 Regional and International Agencies

European Space Agency (ESA)

Regional and international space agencies support ICT4D projects as long as they promote the use and deployment of new applications and satellite telecommunications services. In the past, ESA has made specific agreements with large international organizations such as UNICEF and could be willing to engage with ITU-D on the SSDM ICT4D objectives.

ESA, an international organization with 22 Member States, is Europe's gateway to space. Its mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world. By coordinating the financial and intellectual resources of its members, it can undertake programmes and activities far beyond the scope of any single European country. ESA's mandatory activities (space science programmes and the general budget) are funded by a financial contribution from all the agency's Member States, calculated in accordance with each country's gross national product. In addition, ESA conducts a number of optional programmes, and each Member State decides in which optional programme they wish to participate and the amount they wish to contribute. ESA's budget for 2017 was EUR 5.75 billion. ESA operates on the basis of geographical return, i.e. it invests in each Member State, through industrial contracts for space programmes, an amount more or less equivalent to each country's contribution.

ESA's Telecommunications and Integrated Applications Directorate (TIA) in particular is responsible for coordinating, shaping and supporting innovation in satellite telecommunications and for the promotion of applications that involve the combined use of space-based systems.

ESA's Integrated Applications programme in particular is dedicated to the development, implementation and pilot operation of integrated applications. These are applications of space systems that combine different types of satellites, such as telecommunications, Earth observation and navigation. Integrated Applications projects offer solutions to problems that range from improving and securing transport systems to developing emergency and disaster management systems. The programme addresses a number of themes such as space for health, safety, development, energy and transport.

ITU and ESA could initiate a discussion and bring together stakeholders and users within the space industry and service provider organizations. These stakeholders could assist in the development of the necessary technical solutions and the feeding back of experience into the development of end-to-end solutions for disaster relief, together with large-scale demonstrations that could help governments to prepare in case of catastrophe – but to deploy sustainable solutions as well. Examples of these are listed below.

Satellite African e-Health Validation (SAHEL)

An example of an ICT4D partnership, the SAHEL project was funded by ESA, the EC, and the Telemedicine Task Force (TTF). The primary partners in addition to the sponsors spanned the domains of private companies, academia, and local charities, and included EADS Casa Espacio, SES Astra, Indra Sistemas, the UNF3S – Université Médicale Virtuelle Francophone, Le Kinkeliba (Senegal) and Amref Health

Africa (Kenya). This pilot project was implemented at primary and secondary care centres in Senegal and Kenya, connecting them with reference centres in both countries: National Kenyatta Hospital in Nairobi (Kenya) and the African Telemedicine Centre in Dakar (Senegal).

Thanks to the SAHEL platform and the satellite connection, doctors at rural centres and remote areas were able to request direct assistance from specialists at reference centres. In addition, the eLearning service provided training for medical staff at small and remote centres, adding value to the health-care offered in these regions. The results of the SAHEL project are enabling a qualitative step in the progressive adoption of telemedicine services in Sub-Saharan Africa

Satellite Way for Education (SWAY4Edu and SWAY4Edu2)

Another example of an ICT4D partnership is the ESA-sponsored SWAY4Edu. One of the initiatives under the umbrella of this partnership aims at developing a satellite ICT solution for effective eLearning services to support education in rural schools in South Africa, dubbed "Space4education." SES is a key partner in Space4education activities, working in collaboration with the "Rally to Read"/"Read Educational Trust" NGO to provide interactive training courses for local teachers leading to teaching certifications, sessions for intra-school collaboration, and light cyber café outside educational time.

SWAY4Edu2 is a spin-off of SWAY4edu which will add an additional cluster of 12 satcom-enabled schools in the rural area of Mpumalanga in South Africa and one school (three classes, about 75 students) in a rural area of the Basilicata Region (Italy) for the development of competences in IT and in the preservation of the natural environment. The aim is to i) assist rural children and teachers to be more techno savvy and become aware of the benefits that information and communication technologies bring with them; and ii) implement and validate a set of pilot "edutainment" services (e.g. small digital cinema in classrooms, radio channels, etc.) to foster awareness and facilitate the utilization of the system by the local communities.

The project will support an additional cluster of 20 satcom-enabled radio stations in rural areas of the Democratic Republic of Congo in order to expand the current network of rural radio stations deployed in SWAY4edu, with an additional 20 pilot sites to promote the "cloud" service. This enables radios to generate their own radio programmes and to share them online with other radios, enabling collaborative creation and sharing of content before final FM broadcasting to the local communities.

Biological Light Fieldable laboratory for Emergencies – B-Life

The objective of the ESA IAP-ARTES 20 (B-LiFE) project is to bring a diagnostic capability as close as possible to the crisis area, thus providing an essential element of fast emergency response while pre-serving the safety of deployed staff and of the surrounding populations. The B-LiFE project is adding to a transportable bio-laboratory a set of space technologies and functions improving considerably the quality of the services offered: 1) satellite telecommunications to connect with the distant reach back home base laboratory, stakeholders and end users, and 2) GNSS (Global Navigation Satellite System) data for geo-location and Earth observation data for site selection and monitoring.

B-LiFE has already been successfully deployed in Guinea to fight the 2014-2015 Ebola epidemics. The primary users of the B-LiFE service are the teams operating the B-LiFE laboratory, who shall benefit from the value added from the space assets during their operations.

B-LiFE is an integrated service including a set of analytical tools able to support the provision of a rapid assessment of bio-threats present in the environment where the laboratory is deployed (e.g. Ebola epidemics in Guinea in 2015). B-LiFE is receiving information and field samples for analysis and delivers at the end the results to the customers. For an optimal interaction with the customer/stakeholder supervising the global crisis management system at distant and local level, all relevant information (i.e. medical, epidemiological, biological, etc.) is delivered in a timely manner to the right stakeholder, with accurate geo-location information and in a secured way through an autonomous and robust satellite communication system.

UNITED NATIONS

The United Nations (UN) has long been committed to providing support and assistance to the victims of natural disasters. With the passing of Resolution 2013 in December of 1965[38]and Resolution 2435 of 1968, it became clear that the UN was dedicated to the provision of assistance, emergency relief, rehabilitation, and disaster mitigation to the international community, and continues to be.

No single mechanism exists to provide financing and governance coordination of these activities across the UN System; and funding largely depends upon voluntary contributions that are managed by various government frameworks.[39] The UN has two primary sources of funding: assessed contributions and voluntary contributions.[40]

A. Assessed Contributions

The UN "Regular Budget", which is approved by the UN General Assembly (UNGA) for a two-year period, is funded by Member States. The amount that Member States pay toward the UN's budget is determined by a number of factors, including their gross national income, population, and ability to pay.[41] A "ceiling rate" sets the maximum amount that any Member State can contribute to the UN's budget to prevent it from becoming overly dependent on any one nation to finance its projects.[42] As of 2000, the ceiling rate was 22% of the UN Budget and the minimum "floor rate" was set at 0.001%.[43]The 2016-2017budget totaled approximately USD 5.402 billion[44]out of which a budget of USD 1billion is set aside for the coordination of humanitarian action and emergency response led by OCHA.

The UN Peacekeeping Budget is assessed separately from the Regular Budget and is used to fund the UN's global peacekeeping and humanitarian endeavours.[45] In accordance with Article 17 of the UN Charter, each Member State is obligated to contribute to this budget an amount contingent upon a similar scale as that used for the assessment of payment amounts to the regular fund, but adds a surcharge to the five Permanent Members of the UN Security Council.[46]The approved budget for 2013-2014 was USD 7.83 billion.[47]It is interesting to note that although it is understood that peacekeeping contributions are necessary and mandatory, as of 2013, approximately USD 2.20 billion were owed in Member State dues.[48]

B. Voluntary Contributions

In addition to Member State contributions, UN projects are funded by a variety of other sources such as NGOs, and private donors.[49]Many countries also make additional contributions to peacekeeping efforts through the donation of supplies, aid, and personnel.[50]

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[38]   GA Resolution 2034 provides the framework for humanitarian assistance for victims of natural disasters as well as disaster relief and mitigation. Id.

[39]   Financing Peacekeeping, United Nations Peacekeeping, last accessed 1 Jan 2014. http://www.un.org/en/peacekeeping/operations/financing.shtml

[40]   Id.

[41]   As of 2013, the United States contributes 22% of the UN budget, Japan 10.8% of the UN budget, France 5.5% of the budget and United Kingdom 5% of the budget. Id.

[42]   Weiss, Thomas G. and Sam Daws, Eds. The Oxford Handbook on the United Nations. Oxford: Oxford University Press, 2007 at 682.

[43]   Id.

[44]   https://documents-dds-ny.un.org/doc/UNDOC/GEN/N16/176/67/PDF/N1617667.pdf?OpenElement

[45]   Linda, Fasulo, An Insider's Guide to the UN. New Haven, CT: Yale University Press, 2004, page 115.

[46]   Financing Peacekeeping, supra note 14.

[47]   Id.; the top 10 providers of contributions to the UN Peacekeeping Budget in 2013 were the United States (28.38%), Japan (10.83%), France (7.22%), Germany (7.14%), United Kingdom (6.68%), China (6.64%), Italy (4.45%), Russian Federation (3.15%), Canada (2.98%), Spain (2.97%). Id.

[48]   Id.

[49]   Id.

[50]   Id.

Events such as the Indian Ocean tsunami of December 2004 served as a catalyst for the United Nations to reform its humanitarian assistance and funding mechanisms.[51]In 2005, the General Assembly passed Resolution 60/124 which established the **Central Emergency Response Fund** (CERF).[52]CERF is based on a grant[53]component as well as unallocated funds paid-in general contributions from Member States, NGOs, and private donors.[54] These funds are organized as pooled, multi-donor trust funds (MDTFs).[55] MDTFs can be used for a variety of purposes and can be country specific.[56] MDTFs receive contributions which are then disbursed by an administrator to various recipients such as NGOs, or the United Nations, depending on their intended purpose.[57]In 2015, the need for CERF reached a historical high with unprecedented levels of humanitarian suffering and the highest level of global displacement. CERF remained a critical enabler of effective, timely and life-saving humanitarian action throughout the year, helping frontline partners on the ground to kick-start or reinforces emergency activities in 45 countries. In December 2016, the UN General Assembly endorsed the UN Secretary-General's call to expand CERF's annual funding target to USD 1 billion by 2018. Recognizing the significant achievements of the CERF in facilitating life-saving assistance to crisis-affected people, GA Resolution A/RES/71/127 calls upon all Member States, and invited the private sector and all concerned individuals and institutions, to consider increasing their voluntary contributions to the CERF.[58]

CERF allocations are made to ensure a rapid response to sudden-onset emergencies or to rapidly deteriorating conditions in an existing emergency and to support humanitarian response activities within an underfunded emergency.

Additionally, UN reform led to the establishment of Emergency Response Funds (ERFs) and Common Humanitarian Funds (CHFs) which are also based on contributions from governments and private donors.[59]Such funds are often used to cover the initial stages of emergency response operations.[60]

The CHF are managed by humanitarian coordinators and ERF are managed, in turn, by OCHA country offices.[61]Many different MDTF regimes exist and sometimes overlap. For example, in some countries such as the Sudan, UN MDTFs administered by the Multi-Partner Trust Fund (MPTF) provide assistance. However, the World Bank and the UN Department of Political Affairs (DPA) also provide funding and support.[62]

The UN's ICT Humanitarian Emergency Platform provides solutions via the ETC. The ETC provides vital IT and telecommunications services to help humanitarian workers carry out operations efficiently and effectively, and ultimately to save lives. Within 48 hours of a disaster, the ETC provides basic security communications services and shared voice and Internet connectivity to humanitarian actors in the field. Timely, predictable, and effective ICT services provided by the ETC help to improve response and coordination among humanitarian organizations; the operational security of the environment for staff and assets; and decision-making through timely access to critical information.

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[51]   Humanitarian Operations, supra note 1 at 19.
[52]   Id.
[53]   The grant component is divided into two segments, one for rapid responses to disaster which accounts for approximately two-thirds of the grant element and one for underfunded emergencies which accounts for about one-third of the grant element. Central Emergency Response Fund, United Nations, 2012, last accessed 1 Jan 2014: http://www.unocha.org/cerf/resources/information-products/annual-reports
[54]   See OCHA, "Central Emergency Response Fund life-saving criteria", January 2010, available at:http://ochaonline.un.org/cerf/HowtoApply/CERFGuidance/tabid/5818/language/en-US/Default.aspx
[55]   Humanitarian Operations, supra note 1 at 20.
[56]   Pooled Funding Mechanisms, United Nations Development Group. Last Accessed 1 Jan 2014. http://www.undg.org/content/post-crisis_transition/financing_for_transition/pooled_funding_mechanisms
[57]   Id.
[58]   Read the 5-page briefing note, "Making the case for an investment in CERF" to find out why a $1 billion CERF is an absolute necessity in today's humanitarian reality.http://www.unocha.org/cerf/sites/default/files/CERF/About%20CERF/AboutCERF_EN_20161111.pdf
[59]   Humanitarian Operations, supra note 1 at 20.
[60]   Id.
[61]   Id.
[62]   Id.

CERF Allocations around the World – 2017

CERF Funding by Country (2017) – Summary (01/01/2017 to 22/05/2017) – Figure 1

	Country	Funds Allocated US$	Percentage of Total
		2017	2017
1	Somalia	32,992,835	13.31 %
2	Yemen	24,953,107	10.06 %
3	Nigeria	21,997,157	8.87 %
4	Ethiopia	18,512,690	7.47 %
5	South Sudan	15,524,589	6.26 %
6	Uganda	14,986,704	6.04 %
7	Madagascar	10,960,423	4.42 %
8	Kenya	10,329,268	4.17 %
9	Niger	10,058,848	4.06 %
10	Cameroon	10,005,413	4.04 %
11	Iraq	10,000,001	4.03 %
12	Congo, The Democratic Republic of the	9,611,948	3.88 %
13	Republic of the Sudan	8,650,052	3.49 %
14	Mali	6,905,824	2.79 %
15	Central African Republic	6,000,028	2.42 %
16	Libya	5,997,815	2.42 %
17	Korea, Democratic People's Republic of	5,996,745	2.42 %
18	Peru	5,167,962	2.08 %
19	Myanmar	4,359,153	1.76 %
20	Chad	3,561,841	1.44 %
21	Burundi	3,500,011	1.41 %
22	Sri Lanka	3,175,132	1.28 %
23	Mozambique	2,000,095	0.81 %
24	Zimbabwe	1,585,201	0.64 %
25	Mongolia	1,107,613	0.45 %
	Total	247,940,455	100 %

Services are deployed in defined "common operational areas," i.e. areas approved by the Humanitarian Country Team in which the majority of UN agencies and NGOs are based. The ETC has been activated in 25 countries since 2007.

The WFP is the global ETC lead, and normally acts as such at country level as well, to enhance response predictability. The ETC country lead has responsibility for coordinating the deployment and implementation of security and data communications services and also must fulfill the role of "Provider of Last Resort." UN agencies and programmes, NGOs, stand-by partners, governments and other humanitarian organizations partner with the ETC to fulfill its mandate and objectives. In emergency situations, members exchange information and expertise, and provide personnel, equipment and solutions. Innovation of information management tools is a priority, and facilitates collaboration and coordination between members, while ensuring staff security in the field.

EUROPEAN COMMISSION (EC)

The EU's humanitarian aid is now recognized in the Lisbon Treaty as a self-standing policy in the area of the EU's external action, bringing a high level of added value. A coherent, complementary and co-ordinated EU approach to the provision of humanitarian aid ensures that scarce resources are used efficiently to meet identified needs and supports the drive to more effective international humanitarian response. The increase in the number of natural and man-made disasters and their economic impact calls for systematic action at the European level to strengthen preparedness and to enhance response capacities, both inside and outside the EU. The EC proposes that crisis response, prevention and management be pursued with the Humanitarian Aid Instrument, and the Civil Protection Mechanism responding to natural and man-made disasters, which will continue as the effects of climate change make themselves felt.

The Emergency Response Coordination Centre (ERCC), operated within DG ECHO, has been set up to support a coordinated and quicker response to disasters both inside and outside Europe using resources from 32 countries participating in the Civil Protection Mechanism. ERCC is a coordination hub facilitating a coherent European response during emergencies helping to cut unnecessary and expensive duplication of efforts. Based at the European Commission in Brussels, the ERCC is accessible 24/7 and can spring into action immediately when it receives a call for assistance. The ERCC works in close cooperation with national crisis centres throughout the 32 countries participating in the Mechanism (EU 28, the former Yugoslav Republic of Macedonia, Iceland, Liechtenstein and Norway). The ERCC handles over 20 emergencies a year, up from single digit figures in the first few years of its existence. In addition, it monitors many more emergencies.

The ERCC also supports a wide range of prevention and preparedness activities, from awareness raising to field exercises simulating emergency response.

The mechanism can be activated by any participating State seeking prompt international assistance following a major disaster that overwhelms national civil protection capacities. As soon as a request for assistance is received, it can be viewed by all participating States via the Common Emergency Communication and Information System (CECIS). The national contact points then assess their available resources and inform the ERCC whether or not they are in a position to help. The ERCC then liaises between the offering and the requesting country to ensure the prompt delivery of the accepted assistance.

As the use of the mechanism is not restricted to interventions within the EU, any third country affected by a disaster can also make an appeal for assistance through the ERCC. Following a formal request for assistance from a third country, different procedures are applied for the activation of the Mechanism. Arrangements for the dispatch of the accepted assistance (delivery, transport, visa requirements, customs, etc.) are made directly between the offering and requesting States. If required, the ERCC may play a facilitating role. Any intervention teams or assistance sent from the EU to a disaster area remains under the direction of the national authorities of the affected country, which has the right to ask European teams to stand down at any time. European teams are subject to local law and should operate in conformity with national rules and procedures governing their work.

To facilitate the technical coordination of European civil protection assistance, a small team of experts can be dispatched on site by the ERCC. This team will ensure effective liaison with local authorities and any other relevant actors so as to integrate European civil protection assistance into the overall relief effort, and facilitate the work of European teams on the ground. Moreover, as they continue to monitor the emergency and assess its development, they can keep ERCC headquarters updated.

The budget of the ERCC for the period 2014-2020 was EUR 144.65 million (current prices). In addition to support to the crisis centre, a budget of EUR 6 621 million was foreseen for Humanitarian Aid and Civil Protection.

2.1.2 Private Sector Sponsorships – Crowd funding

Humanitarian organizations involved in disaster response typically factor in connectivity and the ability to communicate as part of their operational needs and costs. The International Committee of the Red Cross's (ICRC) rapid response deployment mechanism, for example, includes both the deployment of additional IT specialists and equipment as an integral part of the response to sudden-onset disasters or other crises, such as a sudden upsurge of armed violence creating significant humanitarian needs. The costs of this are typically included in the funding appeals issued to donors.

Over recent years, humanitarian organizations have also been broadening the range of tools and methods they use to inform and structure their humanitarian response. They now typically include anything from crowd sourcing information by monitoring social media, to digitally mapping humanitarian needs with the help of digital volunteers. In the upstart world of social media, crowd sourcing and crowd funding have already established themselves as two of the most disruptive and creative forces at work.

Humanitarian actors have also been increasingly focusing on the connectivity and communication needs of populations directly affected by humanitarian disasters. Together with media development organizations and private telecommunications companies, they have been developing the notion of "information as aid" which describes information as a need that is as essential as food and water to people affected by *disaster.*

In summary, there appears to be strong interest in tackling the problems at the core of the SSDM Initiative. The extent and breadth of related initiatives, ideas and pilot projects is impressive as shown by the 2013 World Disasters Report "Technology and the future of humanitarian action", published by the IFRC.[63] Further research and outreach to stakeholders including foundations and corporate actors would likely show that interesting and innovative pilot projects that enhance the implementation of suitable communications technologies as part of disaster response and prevention could attract broader backing – well beyond the limited survey of potential supporters provided in this chapter.

2.2. Partnership Opportunities

2.2.1 In-Kind Contributions

The private sector can engage in in-kind contributions provided long-term commitments are made either by the national governments or by international/regional organizations. One proposal could be to allocate a yearly donation budget that is used towards in-kind donations through the NetHope organization, a US-based non-profit organization that has more than 40 international NGOs as members. NetHope provides connectivity as well as other services through their 40 members who respond to natural and man-made disasters. For example, during Typhoon Haiyan, the Ebola outbreak and Nepal's earthquakes, satellite operators collaborated with NetHope for immediate relief through the donation of airtime, terminals and handsets for voice and broadband data.

Through the ESOA-UN Humanitarian Crisis Connectivity Charter,[64]satellite operators have committed to a specific yearly in-kind donation towards the Charter's response during an emergency; this could also serve as an example to build partnership. For example, a similar charter could be signed between the ITU and the private sector.

Projects could also be sponsored through international NGOs, including through the donation of airtime and terminals towards a specific project. In return, the project could raise awareness around satellite communication. For example, Thuraya worked with SOS Children's Villages International in the

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[63] For further information, see: http://www.ifrc.org/en/publications-and-reports/world-disasters-report/world-disasters -report-2013/
[64] For further information, see: https://www.esoa.net/Resources/ESOA-UN-Charter-Doc-v2.pdf

Central African Republic to connect internally displaced persons (IDPs). Connectivity was added to a school in the SOS Children's camps. Furthermore, Eutelsat and Inmarsat have worked with Télécoms Sans Frontières to send emergency telecoms response teams to the center of natural disasters and conflict across the planet, most recently in responding to Hurricanes Irma and Maria where Eutelsat provided TSF with dedicated bandwidth for VSAT services and Inmarsat provided TSF with donated airtime on its network.

Local and multinational companies can be approached in every country to raise their awareness about ITU-SSDM initiatives, and explain how they could incorporate their own CSR activities in ITU SSDM projects, including through securing cash donations or in-kind donations. For example, participate in the local regional countries ministries conferences to raise awareness about SSDM activities.

2.2.2 Public-Private Partnerships (PPPs)

Increasingly, Public-Private Partnerships are used in the international arena as a mechanism to finance projects, promote cooperation, build capacity and reach shared objectives. They can also be used as an effective instrument in the delivery of important services. They will play a strong role in implementation efforts towards the 2030 Agenda for Sustainable Development and the SDGs. Public-Private Partnerships could foster regional and global opportunities for collaboration, thus forming a wider base for increasing resource allocation to SSDM.

Already the ITU and the private sector have specific partnership arrangements in place that involve provision of airtime, bandwidth, terminals, applications and technology solutions for disaster management by the private sector, whereas ITU supports the arrangement through on-the-ground deployment, transportation, technical support and manpower, coordination and supervision of the relief activities. The private sector's contribution can be in the form of cash, but mostly it is in-kind contributions, consisting of airtime, bandwidth, terminals, applications and solutions. ITU currently has different types of agreements and arrangements in place with a number of entities from the private sector, including but not limited to satellite operators, terminal manufacturers, solution providers, technology leaders, etc., as well as NGOs. In addition to the initiatives in the disaster management arena, ITU has also forged partnerships in the development domain, including the furthering of communications technologies in such applications as Earth observation and telemedicine.

Emergency.lu is another example of a PPP. The Luxembourg Government (Ministry of Foreign Affairs, Directorate for Development Cooperation) and three Luxembourg companies (SES, Hitec, Luxembourg Air Ambulance) have partnered to deliver on ICT4DM. The "solution" includes ground equipment and satellite capacity that is, in effect, "owned" by the Luxembourg Government, and the companies work as service providers in order to rapidly deploy emergency satellite-based telecommunications infrastructure in the event of a disaster. The companies are paid a monthly retainer fee plus additional performance-based fees in the event of an emergency use of the service. The Luxembourg Government, in cooperation with the ITU Framework for Cooperation in Emergencies (IFCE), provides the service as a contribution to the ETC.

NGOs can also be associated with the private sector and the governments. SATMED, an e-health satellite platform, is a partnership between the Luxembourg Government, the Minister for Cooperation and Humanitarian Action and five NGOs, including three from Luxembourg: Friendship Luxembourg, Médecins Sans Frontières, and Fondation Follereau, and two from Germany: Archemed and German Doctors. The e-Health platform was conceived by SES TechCom. Its aim is to improve public health in emerging and developing countries, most significantly in isolated areas with poor connectivity. SATMED enables communication between doctors, thus propagating the transfer and exchange of medical knowledge and supporting tools for medical e-learning and e-teaching. IT cloud infrastructure accessible around the globe facilitates data exchange between professionals and the setup of a medical infrastructure, such as electronic medical records and tele-radiology systems. Technically, the SATMED platform is hosted implemented on emergency.lu by using its satellite equipment, technology and connectivity. SATMED allows leveraging of satellite connectivity knowledge and satellite

capacity to connect even the remotest areas, enabling real-time exchange between medical teams and participants of governmental, institutional, scientific and humanitarian projects worldwide.

In that sense, ITU could approach regional organizations to allocate yearly budgets for funding, or allocating their own country's resources through encouraging their government's departments and ministries to establish a plan and designate the appropriate focal point for funding SSDM activities and collaboration. Many of these countries would like to take part in disaster response activities, however they do not have the right planning or the know how to take part in such activities. Working through an international body such as the ITU would facilitate their ability to take part in such activities.

2.2.3 Disaster Management and Sustainable Development Platform Proposal

In reviewing the partnership models and financing mechanisms in the SSDM Initiative of 2015, we identified at that time the emergency.lu model of ICT4DM as a successful and workable model that could be adapted and scaled in order to create a broader platform for disaster management.

We determined that in order to have global reach and availability, such a platform would need to be owned and operated by a multi-lateral and international anchor organization having the appropriate telecommunications knowledge, capabilities, expertise and influence to implement the technological, policy, and operational aspects of deploying ICTs for disaster management, such as, but not limited to, ITU. In addition, in a manner similar to the way in which the emergency.lu resources have been leveraged by the SATMED development initiative, such a platform could form the basis for ICT4D partnerships that would be based on the principles and framework established by the SSDM Initiative.

The financing, based mainly on in-kind contributions (equipment, space segment/air-time) and funding from other institutions, would require ITU to base the support services more on an ad-hoc contribution model, rather than on a recurrent and stable platform on which all ITU Member States could rely.

Moreover, we understand from the ITU itself that it is a cumbersome and expensive process, since buying capacity on an ad-hoc basis has proven to be much more expensive than anticipating the costs on a longer-term basis.

Based on ITU's experiences in addressing these needs in an ad-hoc fashion, we recommended that a more stable and long-term operational platform be established for delivering disaster telecommunications relief services at all times and to all places based on the Ëmergency.lu model.

The proposed platform would be dedicated to restoring communications for local governments, as opposed to for responding IGOs, NGOs, or populations. As such, it would complement, rather than compete with, the services provided by emergency.lu and other humanitarian international organizations, whose focus is specifically on supporting NGOs and humanitarian aid organizations.

This platform could be implemented in a modular, step-by-step approach allowing the solution to grow over time, e.g.:

- **Elementary model** to address a disaster recovery and relief satellite communications solution to be deployed at the request of a participating Government to the Global Platform/anchor organization for periods of up to six months;

- **Progressive model** to address a sustainable satellite communications solution globally for development purposes for periods of six to 36 months; and

- **Sustainable development model** to address both disaster recovery and relief and the connectivity needs of the population on a more stable basis to foster development in education, agriculture and health issues, for example.

The proposal assumes the setup of the platform and the services under both the progressive and sustainable modes, building on the existing infrastructure of Emergency.lu. Such an approach would

enable maximum reuse of, and synergies with, the existing emergency.lu infrastructure by sharing both ground equipment and satellite capacity and the incremental cost for additional applications.

The owner of the platform, in a role analogous to that of the Luxembourg Government in Emergency. lu, would have to set up its own team for management of the deployment priorities and establish the technical and logistical operations through sub-contractors.

2.2.4 Key Drivers to Partnerships

There are different kinds of partnership models that are contemplated as well as implemented for activities related to pre-positioning and pre-deployment of equipment earmarked for disaster management and disaster relief. Notwithstanding existing arrangements between international donor agencies, the satellite industry (consisting of satellite operators and their service distributors and partners), international and national NGOs, and the telecommunication industry in general have proven to be successful and effective (e.g. NetHope, Télécoms Sans Frontières, Emergency.lu), there is also a need to expand services using similar partnership models through the involvement of and to serve the emergency-response needs of local and national governments, in addition to the services currently provided. There is also a need for work with the international finance institutions to fund pre-deployment of sufficient equipment in areas and regions that are prone to natural disasters, planning and design of resilient systems, and training. The partnership models should also include continuous access to the full solution (e.g satellite capacity, services provision, terminals, human resources) and training of personnel, as well as support for the continuous monitoring of the operational readiness of the equipment.

Greater predictability and flexibility of funding would enable more cost-effective management of resources and improved programming outcomes for both parties, Public and Private. Achieving more predictable and flexible humanitarian financing should be a major focus of advocacy on funding, with a range of options open for consideration. In return, recipient organizations will need to concede far greater transparency as to how those funds are used in a way that respects public obligations and accountability, and demonstrate impact to their constituencies. Limited predictability exacerbates the risks of not being able to deliver in due time, leaving whole parts of the affected population without access to valuable connectivity. In addition, significant resources are used up preparing procurements, revising plans, re-calculating budgets, and securing new funding on a yearly basis even though the situation may require a multi-year approach.

To complement the role of an International Coordination Body for ICT4D and ICT4DM, such as the ITU, national governments should also be fully involved as they are key players in the success of the above-mentioned partnership models. It is critical that national governments create policies, planning, and regulatory frameworks that will enable the success of such partnerships. The national disaster relief policy and response plans should include the possibility of pre-deployment of equipment, training of personnel on such equipment, dissemination of risk awareness, etc. The national disaster policy should also incorporate facilitating the cross-border movement of such equipment, streamlined customs clearance, availability of technical support and manpower, etc.

ITU could act as a facilitator between the Coordination Body and national governments, facilitating the development of efficient national plans which would support, facilitate and improve response efforts in the case of a disaster. Equally important is regional collaboration which can help if the affected country is not in a position to support disaster relief activities on its own, as is most often the case.

ITU should also encourage its Members to subscribe to risk insurance that would be paid annually and would cover the costs of restoring telecommunications in case of disaster. The role of ITU could be to achieve policy consensus and a set of messages to help foster growing interest in funding support from each member concerned by disaster response. This can also be used to encourage donors and intermediary funding organizations to commit, in principle, to enabling access to financing for organizations that are best placed to respond. Although growing diversity among financing actors

can be seen as a great opportunity, the private sector, ideally, needs to engage with one international financial organization that can manage DRIF functions sensitivity and with all technical expertise. There are many examples of promising models, approaches and experiences to draw on, which point to far greater opportunities to drive increased cost-efficiency and responsiveness within existing systems.

3   Proposed Model for GEF

Figure 2 below illustrates the proposed model for GEF.
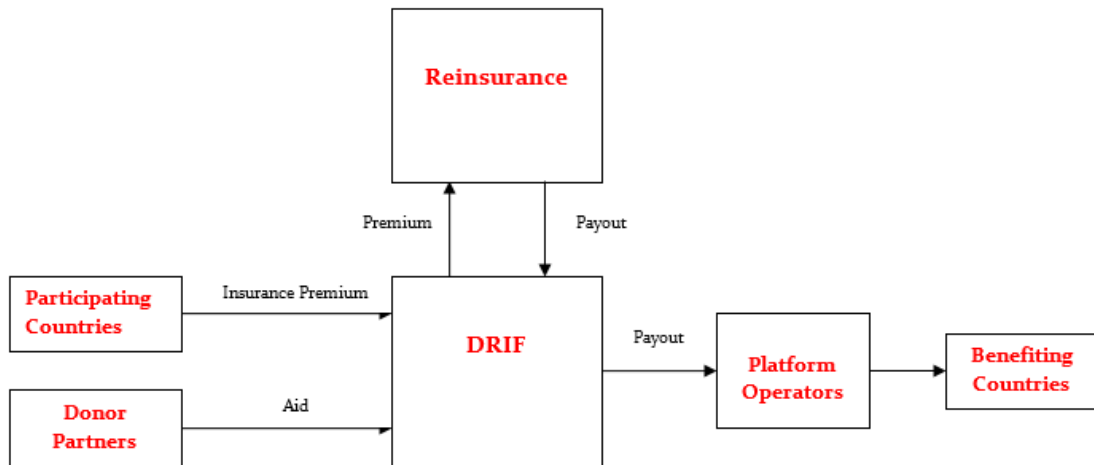
3.1   The Global Emergency Fund

The review of key stakeholders and funding opportunities reinforces the recommendation that a more stable, long-term operational and financially sustainable platform be established for delivering disaster telecommunications relief services to any affected countries, based on the Emergency.lu model. As indicated in previous reports, the proposed platform would be dedicated to restoring communications on behalf of and for governments. As such, it would complement, rather than compete with the services provided by UN ETC and other humanitarian international organizations – where the focus is specifically on supporting populations, NGOs and humanitarian aid organizations. The financing of these disaster preparedness and recovery activities will be in the form of monetary or in-kind donations from member nations or private partners.

This fund hopes to solve the issue that many countries face in the preparing for or the aftermath of a disaster of liquidity shortages. This challenge is particularly acute for developing countries, undermined by the combination of poor infrastructure, insufficient skills, and high levels of indebtedness.

3.1.1   Main Features of the Proposed GEF: Creation, Stakeholders, Business Model

In reviewing the financing mechanisms surveyed by the SSDM Working Groups, as well as ITU's past experiences in delivering disaster relief assistance to its member countries, we came to the conclusion that setting up an ITU "Disaster Recovery Insurance Facility (ITU/DRIF)", whereby the governments of ITU Member States would purchase insurance coverage to finance immediate post-disaster recovery needs, could be a more viable and sustainable vehicle for making liquidity available for the recovery efforts in affected countries, in the aftermath of major natural disasters. The annual premium paid by insured countries would be commensurate with their own specific risk exposure. With such an insurance facility, it would be possible to provide participating governments with coverage tailored to their needs at a significant lower cost than if they were to purchase it individually in the financial markets.

The proposed facility would be set up with initial funding from donor partners – following a promotional communication and outreach campaign about the DRIF by ITU. Initial funding is needed to allow the facility to cover set-up costs, retain some of the risks.

The ITU/DRIF would operate like a business interruption insurance that would provide countries with immediate liquidity, to help initiate service restoration activities, when hit by major disasters. It would function as a mutual insurance company controlled by participating governments, through ITU – whose role should be to work with other relevant organizations or itself identify especially disaster prone areas. In other terms, ITU/DRIF could be presented as a system through which several countries would agree to combine their emergency reserve funds into a common pool. If each country were to build up its own reserves to sustain a catastrophic event, the sum of these country-specific reserves would be much larger than the actual needs of the pooled countries in a given year.

Based on the above, the proposed ITU/DRIF would combine the benefits of pooled reserves from participating countries with the financial capacity of donor partners. It is also proposed that it would retain some of the risks transferred by the participating countries and transfer the ones it could not to international financial markets. This could be done through reinsurance through other financial coverage instruments. This would make the structure a particularly efficient risk-financing instrument that would provide participating countries with insurance policies at much lower price than they would obtain if they approached the reinsurance industry on their own.

It is important to make sure the proposed ITU/DRIF would use parametric insurance instruments to allow for speedy payouts to the benefit of affected countries. The advantage of using such instruments is that, contrary to traditional indemnity insurance that makes claims payments based upon confirmation of a loss, parametric insurance makes payments based on the occurrence of an event – without having to wait for on-site loss assessment.

To avoid a situation in which a participating country would receive a payout superior to the losses experienced on the ground, participating countries would only be allowed to purchase coverage up to a proportion which is believed to be sufficient enough to cover their immediate liquidity needs until other sources of funds can be mobilized.

3.1.2   Administration of the ITU/DRIF

We recommend that the ITU/DRIF be established as an independent legal entity, created as an Insurance Captive managed by a specialized firm (perhaps an international insurance firm) under the supervision of a Board of Directors, composed of representatives from ITU, the donors and participating countries. This Board would receive support and technical advice from both a Facility Supervisor and the Platform Manager.

3.1.3   Exploration of Platform Operators

We recommend that stakeholders explore various mechanisms for making available Platform Operators that can provide needed emergency telecommunications services directly to governments when the system is activated. No one model or one entity would be able to meet the needs of all governments, in all regions, especially in the context of multiple simultaneous emergencies, or a single emergency that spans a large region. We therefore recommend that stakeholders explore whether the DRIF should work with regions to identify different Platform Operators for different regions, a group of on-call Platform Operators that are funded by the DRIF to provide service when needed, or some other model, and whether it can take advantage of existing emergency response organizations as part of this process.

3.2   Communications Plan

It is recommended that ITU:

- Lead the preparation of project and communication plans for the promotion of SSDM and GEF.

- Call a donor pledging conference under the auspices of the World Bank that would bring together ministerial representatives of interested countries; representatives of regional and international organizations; and donors, including the private sector and other interested stakeholders.

- Call a meeting of its Members States over the SSDM Initiative, exclusively.

Part II: Volunteer Emergency Network

1. OVERVIEW OF VOLUNTEER EMERGENCY NETWORKS

Emergency telecommunications are a vital part of relief efforts during the aftermath of a humanitarian emergency or natural disaster. Information and Communication Technologies (ICTs) not only give first responders capabilities to share vital information during relief efforts, but also to begin the recovery and redevelopment process. One important part of that implementation is the volunteers that set up the ICTs and use these technologies.

The 2016 Smart Sustainable Development Model (SSDM) Report underlines the need for first responders to be immersed in knowledge about emergency communications: "The first responders and personnel employed by local and national disaster management agencies, NGOs and international agencies deploying teams in response to incidents of disasters should be up-to-date on the functionalities and capabilities of new technologies. Such new technologies include space- and terrestrial-based technologies and platforms."[1] The report also argues that first responders and/or personnel should get continuous hands-on training on the use and operation of equipment that will be used during such events.

Part II of this report analyses the stakeholders involved in volunteer deployment, such as international agencies, including the International Telecommunication Union (ITU), and non-profit organizations such as the International Federation of Red Cross and Red Crescent Societies (IFRC). Mechanisms for cooperation and the coordination of volunteer efforts, such as the Emergency Telecommunications Cluster (ETC), will also be explored.

In addition, Part II looks at some of the gaps in volunteer efforts today, including, for example, the lack of highly skilled volunteers capable of installing and deploying ICT equipment. This section will also look at capacity-building programmes and how extensive they are at training on-the-ground volunteers. It will also consider existing volunteer exchange programmes in order to later make suggestions on how they can be improved. Finally, Part II concludes with a proposal for a Volunteers for Emergency Telecommunications (VET) Model that builds on existing structures and encourages coordination amongst the groups and stakeholders mentioned above to operate in a timely and coordinated manner in disaster situations.

1.1 Key Stakeholders

The following organizations are members of the ETC, which means that they are in charge of coordinating relief agencies and volunteer networks for effective disaster management operations. This is not a comprehensive list of all international organizations and UN agencies involved in ICT services for emergency relief and coordination, but it does include some of the most prominent actors.

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[1]   For further information, see: http://www.itu.int/en/ITU-D/Documents/SSDM_2016_report.pdf

International and Intergovernmental Organizations

International Telecommunication Union (ITU)

The ITU is the UN specialized agency for information and communication technologies (ICTs). The development arm of the ITU (ITU-D) considers emergency telecommunications an integral part of its projects integrating telecommunications/information and communication technology in disaster prediction, detection, alerting and relief.[2]

World Food Programme (WFP)

The WFP is currently the global lead of the ETC and is responsible for coordinating inter-agency relief efforts in terms of IT and telecoms in emergencies.

WFP's Fast Information Technology and Telecommunications Emergency and Support Team (FITTEST) represents WFP's IT emergency response capacity. FITTEST provides lifesaving Internet connectivity, security telecommunications, customer support and training for humanitarian actors from UN agencies and NGOs around the world. FITTEST is always on the frontline of any emergency situation that needs IT support.[3]

United Nations Office for the Coordination of Humanitarian Affairs (OCHA)

OCHA is the part of the UN Secretariat responsible for coordinating humanitarian actors to ensure a coherent response to emergency situations. OCHA makes sure that there is a framework within which each humanitarian actor can contribute to overall response and relief efforts. OCHA also oversees the United Nations Disaster Assessment and Coordination (UNDAC), which partners with NGOs and the private sector for logistical support. In terms of telecommunications, UNDAC's partners include Télécoms Sans Frontières (TSF), UNITAR's Operational Satellite Applications Programme (UNOSAT), and DHL Disaster Response Teams.[4]

United Nations High Commissioner for Refugees (UNHCR)

UNHCR is a global organization dedicated to saving lives, protecting rights and building a better future for refugees, forcibly displaced communities and stateless people. In addition to these duties, UNHCR also plays a major role in disaster preparedness and response capabilities through capacity-building initiatives and inter-agency cooperation.[5]

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[2] https://www.itu.int/en/ITU-D/Pages/default.aspx
[3] For further information, see: http://www.wfp.org/ictemergency/fittest
[4] For further information, see: https://www.unocha.org/undac-members-and-partners
[5] For further information, see: http://www.unhcr.org/en-us

Volunteer Relief Agencies

The International Federation of Red Cross and Red Crescent Societies (IFRC)

The IFRC is the world's largest volunteer network that reaches 150 million people in 190 National Societies through the work of over 17 million volunteers. In regard to telecommunications resources during emergency situations, the IFRC deploys IT/Telecommunication Emergency Response Units (ERUs) who "establish local communication networks and links to help ensuring the smooth flow of information in the operation".

IFRC is responsible for establishing and maintaining contacts with relevant regional entities, including regional offices of the European Commission's Humanitarian Aid and Civil Protection (ECHO), regional development banks, such as the Inter-American Development Bank (IDB), and regional entities such as the African Union. This is important for coordinating a disaster response or contingency plan between regional entities and National Societies.[6]

Télécoms Sans Frontières (TSF)

Founded in 1998, Télécoms Sans Frontières is the leading humanitarian NGO specialized in emergency technology and telecommunications for humanitarian crises of all kinds. From the onset of any humanitarian emergency, TSF deploys telecom specialists from its headquarters or from one of its regional bases in Mexico or Thailand to be on-site and operational in under 24 hours.

At the heart of a crisis, TSF teams will install emergency communication centres for the humanitarian community that strengthen aid coordination by providing relief organizations, UN agencies and local authorities with satellite connectivity for voice and Internet access. TSF's mandate equally focuses on providing access to information and communication for those affected by humanitarian crises such as refugees and victims of natural disasters, reconnecting them through the provision of priority voice or Internet connectivity.[7]

Télécoms Sans Frontières is part of the United Nations Emergency Telecommunications Cluster (ETC) and a partner of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), within the framework of which its experts intervene directly alongside UN Disaster Assessment and Coordination (UNDAC) teams in the direct aftermath of a disaster.

International Amateur Radio Union (IARU)

IARU brings together over 160 national amateur radio societies around the world. Created in Paris in 1925, IARU is the voice for the world amateur radio community. IARU is presently organized into three regional organizations that correspond to the three radio regions of the ITU. IARU has an emergency communications coordinator and three regional coordinators who assist in directing amateur radio resources during times of crisis. Volunteer amateur radio operators in each member society provide emergency communications.[8]

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[6] For further information, see: http://www.ifrc.org/. See also: http://www.ifrc.org/en/what-we-do/disaster -management/responding/disaster-response-system/dr-tools-and-systems/eru/

[7] For further information, see: http://www.tsfi.org/en. See also: http://www.tsfi.org/en/presentation/action/48 -organisation-humanitaire-durgence

[8] For further information, see: http://www.iaru.org/emergency-communications.html

NetHope

NetHope's mission is to "enable cross-sector collaboration between nonprofits and innovative companies to develop better programmes, mitigate risks, and scale benefits for greater impact in the communities in which [it] works" through a collaborative model that utilizes public and private partnerships (PPPs). NetHope seeks to incorporate ICT in emergency relief by locating and purchasing equipment that it provides to other humanitarian actors. NetHope's Field Capacity Initiative focuses on training individuals on telecommunications/satellite technology and IT project management.[9]

Team Rubicon

Team Rubicon is a disaster relief organization that combines the skills and experiences of military veterans with first responders to rapidly deploy disaster response teams.[10] During the 2015 Nepal earthquake, Team Rubicon relied on deploying satellite-based broadband networks to support critical medical and logistical operations.[11]

Save the Children

Save the Children works at the country and regional level to build local capacity to collect and analyse information, identify opportunities to reduce vulnerability to disasters, and plan effectively before disaster strikes. During emergencies, staff depend on pre-positioned supplies to enable responders to reach a greater number of affected people with timely and appropriate relief. Save the Children develops and maintains a range of different local and international partnerships with international non-governmental organizations (INGOs), community-based organizations (CBOs) and the UN for collaboration.[12]

The Global VSAT Forum GVF)

GVF, the largest association in the satellite industry with global membership and reach, provides an emergency database of equipment and trained technicians available across the globe.[13]

1.2　Existing Tools and Mechanisms

1.2.1 The Emergency Telecommunications Cluster (ETC)

The ETC is a global network of organizations in charge of coordinating ICT response during emergencies such as humanitarian crises and natural disasters. The ETC is one of the 11 clusters designated by the Inter-Agency Standing Committee (IASC). It is usually activated within the first 48 hours of an emergency and ETC services are expanded within four weeks to provide continued emergency relief. If the ETC is not activated, it is nearly impossible for a coordinated effort to happen.

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[9]　For further information, see: https://nethope.org/our-approach/
[10]　For further information, see: https://teamrubiconusa.org/our-mission/
[11]　For further information, see: http://www.intelsat.com/news/press-release/intelsat-donates-satellite-solutions-in-support-of-red-cross-and-team-rubicon-relief-efforts-in-nepal/#sthash.P2yojA8B.dpuf
[12]　For further information, see: http://www.savethechildren.org/
[13]　For further information, see: https://gvf.org/solutions/disaster-preparedness.html

The ETC is chaired by the WFP, and its member organizations include UN agencies such as the ITU, UNHCR, OCHA, among others, as well as international volunteer networks such as the IFRC and TSF. Some national ministries are also a part of the cluster, such as the United States Department of State and the Ministry for Development Cooperation and Humanitarian Affairs of Luxembourg.[14]

1.2.2 National Voluntary Organizations Active in Disaster (VOAD)

National VOAD is the primary point of contact for voluntary organization in the United States' National Response Coordination Center (at FEMA headquarters), a signatory to the National Response Plan, and an Emergency Support Function partner of many other federal agencies as delineated in the National Disaster Recovery Framework. It is a mechanism in which organizations cooperate together to deploy volunteers to nationwide emergencies. National VOAD is a coalition of 56 of the nation's most reputable national organizations (faith-based, community-based and other non-profit organizations) and 56 State/Territory VOADs, which represent Local/Regional VOADs and hundreds of other member organizations throughout the country.[15]

1.2.3 The Emergency Response Coordination Centre (ERCC)

The ERCC, operating within the European Commission's Humanitarian Aid and Civil Protection department (ECHO), was set up to support a coordinated and quicker response to disasters both inside and outside Europe using resources from the countries participating in the EU Civil Protection Mechanism. The ERCC replaces and upgrades the functions of the previous Monitoring and Information Centre (MIC).

With a capacity to deal with several simultaneous emergencies in different time zones, around-the-clock, the ERCC is a coordination hub facilitating a coherent European response during emergencies, helping to cut unnecessary and expensive duplication of efforts.

It collects and analyses real-time information on disasters, monitors hazards, prepares plans for the deployment of experts, teams and equipment, and works with Member States to map available assets and coordinate the European Union's (EU) disaster response efforts by matching offers of assistance to the needs of the disaster-stricken country. Better planning and the preparation of a set of typical disaster scenarios will further enhance the ERCC's capacity for rapid response.

The ERCC also supports a wide range of prevention and preparedness activities, from awareness-raising to field exercises simulating emergency response.[16]

1.2.4 ITU's International ICT Volunteers (IIV)

The IIV sends skilled volunteers to destinations that are vulnerable to natural disasters or other emergency situations to share their knowledge of emergency communications with local actors such as non-profits and volunteer agencies.

Key activities of the volunteers include:

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14   For further information, see: https://www.etcluster.org/about-etc
15   For further information, see: https://www.nvoad.org/about-us/
16   For further information, see: http://ec.europa.eu/echo/what/civil-protection/emergency-response-coordination-centre-ercc_en

Boot Camp

Prior to dispatching the volunteers to countries, ITU organizes a Boot Camp which prepares volunteers and trains them in necessary skills required for their assignments during field work. The Boot Camp also provides an opportunity for the volunteers to meet with their respective country coordinators before they set off to the countries together.

ICT Training/Education

IIV volunteers provide basic and advanced IT training in accordance with the needs of local organizations/communities. The training targets include government officials, teachers, students, young people, persons with disabilities, and any other people who wish to learn more about ICTs. Training courses include basic programming, office applications, Internet, web design and development, multimedia applications, etc.

ICT Project

IIV volunteers assist local organizations in implementing small projects such as website development, database development, computer networking, mobile application development, etc.

Cultural Exchange

Volunteers participate in sports, traditional games, cuisine, language, music and arts with the local communities. The cultural exchange has proven effective in attracting and encouraging local people to join other volunteer activities and has helped build long-term relationship among them.[17]

Example: the NIA/ITU International ICT Volunteers

The NIA/ITU International ICT Volunteers was established under the auspices of the IIV Programme and is jointly implemented by the National Information Society Agency (NIA) of the Republic of Korea and ITU.

Since 2012, ITU and NIA have dispatched more than 400 young Korean volunteers to over 10 countries in the Asia-Pacific region. The volunteers are organized in groups, each with four members. They are dispatched to work with local governments and authorities in various countries in the region for a period of 1-2 months, usually during July and August each year.[18]

1.3   Training Programmes

This section compiles existing training programmes to map out the scope of emergency communications capacity building. Two different kinds of training programmes for volunteers will be examined: i) specific courses on emergency telecommunications technology, and ii) telecommunications in general.

1.3.1 Specific Courses on Emergency Telecommunications Technology

WFP FITTEST

WFP's FITTEST Training Services brings together a team of qualified instructors from the WFP, who have extensive experience in both emergency and development settings. Practical knowledge of the humanitarian context allows instructors to bring real-world understanding to the ICT community. FITTEST training programmes focus on inter-agency capacity building which means they offer training

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[17]   For further information, see: http://www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/Pages/Events/2016/Jul -IIV2016/home.aspx

[18]   For further information, see: https://www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/Documents/Events/2015/ December-YILF2015/day2/S3_ITU_Wisit.pdf

and practical exercises for staff from the UN, NGOs, governments and Stand-by Partner organizations. FITTEST also focuses on the training needs of the ETC. The courses cover the following:

- Telecommunications and Data Communications – including satellite communications, VHF/HF radio, wireless links, phone systems, and mesh networking;

- Project Management in Emergencies – including emergency assessment, planning, budgeting and leadership;

- Emergency Management – including preparedness, response, relief and recovery.

Telecoms Sans Frontières

Since 2009, TSF has organized several training sessions that aim to reinforce IT specialists' skills in the emergency response field, through the use of information and communication technology. More than 800 representatives from various NGOs, UN agencies and local authorities have been able to benefit from these programmes. These sessions enable TSF to contribute to the strengthening of aptitudes in the emergency response domain, optimizing global response, and supporting life-saving operations.

Subject covered include:

- Telecoms and satellite communications in the emergency context;

- TCP/IP, routers and advanced Wi-Fi;

- GPS/mapping and tracking;

- BGAN data connection and monitoring;

- VSAT installation;

- Data collection and sharing (ODK, Frontline SMS, Kobo Toolbox).[19]

NetHope

NetHope's Field Capacity Building initiative trains individuals in telecommunications/satellite technology and IT project management for humanitarian purposes. The initiative branched off NetHope Academy, the initiative's largest project that trained 1 000 computer science students in Africa and Latin America in just three years.

The Field Capacity Building initiative enhances knowledge sharing and innovation of its member organizations to build capacity, focuses on furthering the development of these organizations by facilitating the sharing of knowledge, expertise and innovations through deeper collaboration, while keeping them abreast of critical ICT trends and technologies.

International Federation of Red Cross and Red Crescent Societies (IFRC)

IFRC has a training programme in place that builds the capacity of staff and volunteers from National Societies, and delegates from the IFRC to improve preparedness and coordination at all levels – before, during and after an emergency situation. The IFRC standardizes the training curricula, trains trainers in National Societies, facilitates and supports training in disaster management at national, regional and international level. Trainings revolve around field-proven technology, including satellite phone systems, High Frequency (HF) and Very High Frequency (VHF) radio systems and Very Small Aperture Terminals (VSAT), depending on the geographical location and needs.

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[19] For further information, see: http://www.tsfi.org/en/action/emergency-response/258-echo-training-2016

1.3.2 General Telecommunications Courses

International Telecommunication Union

The International Telecommunication Union (ITU) has long been one of the most important players in telecommunications capacity building. One of the objectives of the ITU is "to build human and institutional capacity in order to improve skills in the development and use of telecommunication/ICT networks and applications, and to foster digital inclusion for people with special needs, such as persons with disabilities, through awareness raising, training activities, sharing information and know-how and the production and distribution of relevant publications."

The ITU offers over 100 training programmes, workshops and online course on various different aspects of telecommunications, including courses on the installation and deployment of various different types of telecommunications equipment.

International Telecommunications Satellite Organization (ITSO)[20]

The International Telecommunications Satellite Organization (ITSO) is an intergovernmental organization headquartered in Washington, D.C. with 149 member countries. ITSO's Capacity-Building Initiative provides Member States with the opportunity to enhance and improve ICT access and utilization while at the same time facilitating the development and effective use of international public telecommunication services. ITSO provides three separate courses on satellite communications: i) a combined technical and regulatory course; ii) one intended for policy-makers and regulators; and iii) one course for Earth station operators and engineers. This programme can be carried out in cooperation or back-to-back with other events through short duration events such as seminars or workshops. In addition, ITSO also designs tailored courses that respond to specific concerns from Member States.

To ensure the effective implementation of the programme, ITSO has signed Partnership Agreements with several organizations including: ITU, the Commonwealth Telecommunications Organization (CTO), the African Telecommunications Union (ATU), and the Inter-American Development Bank (IDB), among others.

Global VSAT Forum (GVF)[21]

The GVF, founded in 1997, provides a unified voice of the satellite industry on a global scale. As a non-profit, international association, GVF represents the interests of the VSAT system and service providers, as well as end users. GVF also provides worldwide training courses for satellite communications skills, ranging from basic satellite communications to various VSAT installation scenarios.

The GVF also certifies technicians for VSAT installations. Over 10 000 technicians around the world have been certified and are in the GVF VSAT Installer Database. Certified Installers can be contacted by first responders during emergency situations and are a vital local asset that has already proven effective for disaster response.

The GVF is constructing a database from its membership to show where its members are active and what satellite solutions are readily available in each country.

1.4   Gap Analysis

1.4.1 Effort Coordination

Given the fact that there several different stakeholders send volunteers into emergency situation locations, it is essential to have an effective coordination mechanism in place.

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[20]   For further information, see: http://www.itso.int/index.php?lang=en
[21]   For further information, see: https://gvf.org/training/training.html

Humanitarian relief agencies are generally not mobilized until the ETC is activated, which may take up to 48 hours[22]. That is not to say that humanitarian organizations will not deploy their telecommunication services; however it does mean that it is more difficult to coordinate efforts, which could result in duplication of efforts and further delay.

One factor in the activation delay of the ETC is the difference in time zones. As the WFP has the authority to activate the ETC, and is based in Rome, there can be a time gap in activation when the emergency is located on the other side of the world.

1.4.2 Effective Deployment of Skilled Volunteers

Many organizations, most notably TSF and IFRC, have specialized volunteers that can be assigned important emergency communication tasks, such as setting up networks and providing technology.

The IFRC has an IT/Telecommunications Emergency Response Unit (ERU), which consists of personnel and equipment that can be deployed on short notice, with a duration of up to four months. The IT/Telecommunications ERUs are tasked with establishing local communication networks and links to help ensure the smooth flow of information in the operation. In order to assist the host National Society with its communication systems, ERUs employ satellite phone systems, HF and VHF radio systems as well as VSAT. Each ERU has two or three specialists. There are currently four IT/Telecommunications ERUs within IFRC – they are kept by the American, Danish, New Zealand and Spanish Red Cross. In order for an ERU to be deployed, the Field Assessment and Coordination Team (FACT) assessment or disaster response plan has to recommend deployment. Then, the sponsoring National Society has to make the ERU available, which, generally speaking, means that the ERU can be operational within a week.[23]

TSF depends on a combination of full-time staff and volunteers all over the world for its deployments. These individuals are ready to be deployed anywhere in the world with only a few hours' notice. TSF is among the first to arrive after a catastrophe. According to TSF, its top priority is "to reach the affected destination and set up communication facilities as quickly as possible, in the first hours of an emergency. The initial part of the response is the most critical part of the emergency."

Unfortunately, it is evident that these highly skilled responders are scarce, and in some cases it can be a long process to get them to the emergency situation location.

Capacity building in identifying potential volunteers and training them is of critical importance.

1.4.3 Scope of Training Programmes

As mentioned earlier, there are different kinds of training programmes that volunteers can use as a resource. However, there are a few elements that need to be addressed in order to improve the effectiveness of these programmes and widen the number of volunteers reached and trained.

First of all, many of these training programmes are catered towards professional responders and it is unclear how much training local volunteers get in the aftermath of an emergency situation. If the ETC is not activated in a timely fashion, it can take days before telecommunications specialists are deployed. Therefore, it is important that local first responders have some knowledge of setting up networks to speed up the recovery process.

The existing training courses teach many different skillsets, ranging from technical aspects like setting up VSATs to how to manage an emergency communications team. However, there is considerable

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[22]   Currently there is no such requirement for the ETC to be activated in order for relief agencies to react. NGOs, UN Agencies and others are free to intervene as soon as a disaster strikes.

[23]   For further reference, see: http://www.ifrc.org/en/what-we-do/disaster-management/responding/disaster-response -system/dr-tools-and-systems/eru/emeregency-response-units-deployment/

overlap between training materials, therefore it might be beneficial for members of the ETC to partner on their materials and courses in order to expand these programmes and avoid duplication.

1.4.4 Volunteer Exchange Networks

As discussed in section 1.2.4, ITU's IIV Programme is an innovative way to increase volunteer reserves for emergency communications. This usually involves skilled volunteers going to a destination that is vulnerable to natural disasters or other types of emergency situations in order for them to share their knowledge and expertise of ICTs for disaster management on the ground with local non-profits and volunteer agencies.

The programme has had a lot of success in the Asia-Pacific region which is prone to natural disasters and therefore a priority for disaster preparedness programmes. However, it has yet to be expanded into other regions that could also benefit from prepared volunteer reserves.

1.4.5 Easy to Deploy Satellite Terminals

The deployment of satellite terminals has often presented a barrier in disaster situations in terms of difficulty in shipping, customs and training. The satellite industry must address this issue by providing more user-friendly and intuitive consumer equipment. In addition, the design of a new class of terminals must be complemented with other training and deployment tools which allow self-installation, thereby reducing the need for professional installation technicians and equipment.

1.4.6 Holistic Terminal Design

All satellite terminals supplied for disasters must be complete down to the smallest detail. This would allow for readily available solutions in times of disaster.

2.   OPPORTUNITIES AND BEST PRACTICES

2.1   Regional Networks

The first report of the Smart Sustainable Development Model (SSDM) ("First Report"[24]) identifies a number of initiatives by governments, UN agencies, NGOs, private sector bodies and other stakeholders that combined could help bridge the digital divide in various developed and developing countries. This approach is considered key in ensuring critical connectivity in disaster response.

It is common knowledge that disaster management activities must be expertly coordinated, as well as efficient and timely in order to be effective. The First Report identifies a need for robust systems, training, sharing of best practice, as well as the ability to adapt systems to respond to requirements. Key stakeholders in carrying out these efforts include governments, industry, NGOs and citizen users. Citizen users are identified as *de facto* "first responders" in a disaster who can provide critical communications when there is a lack of infrastructure.

While citizen users may be well coordinated at a national level in some countries, they can suffer from a lack of coordination in others. The key will be to take best practices from those countries with a well-coordinated volunteer base, and expand those best practices to a regional scope.

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[24]   https://www.itu.int/en/ITU-D/Documents/SSDM_2016_report.pdf

2.2   Identification of Regional Opportunities

Possible areas where regional networks could be expanded are:

Caribbean

Many Caribbean countries have well-organized infrastructure to deal with emergencies. This geographic area deals with a number of weather-related issues each year and over time some States have developed an organized protocol to deal with the impact of hurricanes and tropical storms which often seriously impact communication infrastructure. Other countries, including many small island States, are ill-equipped and not well prepared to meet these challenges. The region could greatly benefit from a coordinated disaster strategy.

Central America

Like the Caribbean, many countries in Central America have a good protocol for disaster situations. Weather-related disasters tends to impact many countries in the region and quite often will have a severe effect on communications with remote areas.

Africa

A number of emergent situations, ranging from weather-related disasters to conflict, can seriously impact communications infrastructure in some parts of the continent. Further, in some countries there may be a lack of volunteers that have the necessary skills to support the recovery of communication infrastructure. Many African countries rely heavily on outside resources to aid in recovery efforts.

Asia-Pacific

The Asia-Pacific region – which faces repeated threats from hurricanes, tropical storms, tsunamis and earthquakes – has well-developed infrastructure in some countries, but is much more limited in others. Small island States are particularly prone to natural disasters, with a corresponding adverse effect on communication facilities. This region in particular benefits from volunteer agencies from outside the region that assist with humanitarian relief.

2.3   Best Practices

The Regulatory Framework

One of the hindrances to effective coordination of volunteers in times of disaster relief is dealing with the regulatory framework for communications. Indeed, very few telecommunication regulations at a national level provide for "fast tracking" of communication licenses or permits. Further, there are restrictions on importation of communications equipment in many countries with no method of alleviating such regulations in communications emergencies. Accordingly, volunteers are often hindered when assisting in emergency situations in other countries by:

a.   National regulations that lack the ability to provide for emergency or expedited licensing in the impacted country;

b.   Restrictions on importing necessary communications equipment to assist in the emergency; and,

c.   Mobility of volunteers into an affected area.

The standard provision found in many telecommunications regulations is that national authorities may commandeer the network or equipment in the event of an emergency to address national security issues, which may not specifically address emergent or humanitarian situations.

The intent of such a provision in a regulation is not primarily intended to assist authorities in expediting use of communications by individuals or other third parties. Even if some national regulations provide for special or emergent licensing on a "fast track" basis, the reality is that while such a provision may be enshrined in national law, the requirements to actually implement such an expedited license are often lacking. In other words, while the regulation may provide for a "fast track" license or authorization, the actual procedural steps in how such a license is to be granted are often not in place and a regulator has very little guidance in how to issue licenses to comply with the regulation.

2.4   Regulatory Best Practices

A number of countries have provided for specific emergency provisions in their telecommunications regulations to provide for licensing on an emergent basis.

In the Caribbean, for example, Anguilla has specific emergency provisions in its *Telecommunications Act*[25] to grant a special license where it determines that an emergency or other exigent circumstance exists. Barbados allows, under the *Emergency Powers Act*, the Governor-General to direct:

> "[T]he importation of all telecommunications and radiocommunications apparatus by a non-governmental organization or a non-state entity for the purpose of granting assistance in disaster mitigation and emergency relief
>
> (a) shall not require the issue of a license; and
>
> (b) shall not be subject to payment of any duties or taxes."[26]

In addition, Barbados provides for a special spectrum license in the event of an emergency.[27]

Honduras is an example of a Central American country that allows for temporary communications licenses.[28] Uganda has developed a reputation of moving expeditiously to grant permits and approvals. Australia exempts the need for a license or authorization in emergent situations[29] and Bangladesh makes special provision for the approval of satellite phones in cases of humanitarian disaster.[30]

Similarly, the Philippines has a number of emergency provisions and specifically mentions UN agencies:

> "[P]rovided furthermore that specialized bodies of the United Nations (UN) and other international governmental organizations accredited to the Government of the Republic of the Philippines may be allowed direct access to any international fixed and/or mobile satellite systems...."[31]

Accordingly, in many countries the need to alleviate the burden of licensing and import duties in emergent situations is increasingly recognized. However, these practices are not widespread, may not be well known and, in fact, may not always be implemented in a timely fashion.

2.5   Amateur Radio

One of the benefits of amateur radio is its resources, designated spectrum and a trained cadre of volunteers. While amateur radio operators are often "on the ground" and already in country during turns of a national emergency, there are also provisions which allow amateur operators licensed in one country to use amateur spectrum in another country without needing to obtain a license from another organization.

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[25]   The Telecommunications Act of 2003 (Anguilla)
[26]   The Telecommunications Act of 2002 (Barbados)
[27]   The Telecommunications Act of 2002 (Barbados)
[28]   Article 167, The Telecommunications Law General Regulation (Honduras)
[29]   S. 49(1), The Radiocommunications Act 1992 (Australia)
[30]   S. 8.4.1 Information and Communication Technology Act (Bangladesh)
[31]   Memorandum Circular No. 05-06-2003

Some examples:

CEPT ECC Recommendation T/R 61-01

The 1985 initiative by the European Conference of Postal and Telecommunications Administrations (CEPT), which resulted in CEPT ECC Recommendation T/R 61-01, has made it possible for radio amateurs from CEPT countries to operate during short visits in other CEPT countries without obtaining an individual temporary license from the visited CEPT country. The Recommendation was revised in 1992 to make it possible for non-CEPT countries to also participate in this licensing scheme.

In practice, a visitor has to:

a.   Check that their national license class qualifies as a CEPT License and that their national license document confirms this. If not, then confirmation that the license held is equivalent to the CEPT license is needed from their national licensing authority.

b.   Check what national license class in the country to be visited is equivalent to the CEPT License.

c.   Check the operating privileges and regulations covering the use of that national license class in the country to be visited and use the appropriate prefix that has to be appended before their own national call-sign.

The key point is that the operating privileges for the visitor operating under the CEPT license are defined by the country being visited and not by the visitor's own country.

CEPT ECC Recommendation T/R 61-01 was revised in October 2003 to reflect the outcome of the 2003 ITU World Radiocommunication Conference (WRC-03) concerning the revision of Article 25 of the ITU treaty. At WRC-03 the mandatory Morse code requirement for amateur operations below 30 MHz was removed. Consequentially the number of amateur license classes in T/R 61-01 was reduced from two to one. Other changes to T/R 61-01 include the removal of ambiguity concerning portable and mobile operation, and the freedom to use any amateur station in the country visited, not just the visitor's "own" station.[32]

CITEL

The Inter American Telecommunications Commission (CITEL) is the Regional Telecommunications Organization for the administrations of the Member States of the Organization of American States (OAS) in ITU Region 2, which is responsible for administering and licensing the Amateur Service and Amateur-Satellite Service in this region. The Inter-American Convention on an International Amateur Radio Permit (IARP) is a Convention having treaty status that provides for temporary operation (up to one year) of amateur radio stations in one Member State of CITEL by persons holding IARP permits issued by another Member State without need for further review. Any CITEL Member State may issue permits to its citizens to operate in another Member State. This Convention does not alter or affect any multilateral or bilateral agreements that are already in force concerning temporary operation in the Amateur Service in CITEL Member States. The General Secretariat of the OAS is the depository for its instruments of ratification, acceptance and accession.

Unfortunately, no similar protocol is available in ITU Region 3 through the Asia-Pacific Telecommunity (APT).

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[32]   As of December 2015, T/R 61-01 has been implemented by 42 CEPT administrations: Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, FYRO Macedonia, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, which also embraces the overseas or semi-autonomous territories of Denmark, France, Greece, Italy, Netherlands, Norway, Portugal, Russian Federation, Spain plus the constituent parts of the United Kingdom as well as the Channel Islands and the Isle of Man.
The following non-CEPT countries are also party to T/R 61-01: Australia, Canada, Israel, New Zealand, South Africa, Netherlands Antilles, Peru and United States.

While these provisions are very helpful for amateur radio operators, they obviously would not apply to other citizen users who wish to assist in the communications emergency. Further, the provisions of being able to operate in other countries is limited to CEPT countries and those countries in the Americas which are signatories to the IARP. Despite the IARP being in place for almost 25 years, relatively few countries in the Americas are signatories. The concept of "roaming" for amateur radio operators has been a useful one in deploying volunteers in times of crisis, but one that could be further expanded on a worldwide basis. Previous attempts by IARU to introduce "global roaming" at the ITU level have not met with success.

In addition to this limitation, amateur radio operators still have to deal with the issues of custom and immigration regulations when bringing needed telecommunications equipment into another country. While many countries allow an individual's personal radio equipment to be imported duty free, others do not, and in some cases may place bonds or restrictions on such equipment.

Import Duties

One of the major regulatory hurdles during times of crisis is ensuring vital communications equipment is not restrained from being provided to the end user due to import controls and duties. There have been many documented cases where vital equipment has been held in customs' quarantine for an inordinate amount of time during humanitarian disasters. The easy answer would be to exempt this equipment from customs' duties, but that brings its own issues and related revenue risk associated with the proliferation of exemptions, and on administrative measures to improve their effective monitoring and control.

It is beyond the scope of this paper to discuss the economic consequences of removing export controls, but there is certainly a case to be made for discretionary exemptions. In other words, such exemptions can be provided on an ad hoc basis, or when they are directly related to equipment for humanitarian aid and to relieve suffering as a consequence of natural disasters.

The difficulty is the implementation of such exemptions and an effective administrative process to ensure that they are applied equitably and with the appropriate urgency during times of crisis. Specific requirements would need to be drafted to capture the type of equipment that could be imported exempt from duties, for what purposes and for how long. For example, in many cases, the equipment being imported is only for a temporary amount of time (e.g. less than 90 days) which should provide an appropriate benchmark in rendering equipment exempt from duties if it is removed from the country in question within that time-frame. Other equipment which is being donated by aid agencies should be exempted from duties if in fact such equipment can be used in future emergencies.

The difficulty is that with most State revenue codes, all exemptions must be provided for by law. Provisions relating to exemptions are usually compiled in a specific code, or, more likely, scattered in various pieces of legislation. It would be vital then for any exemption on communications equipment to be provided to volunteers, and be specifically set out in a code that is easily accessible by all stakeholders. As noted above, Barbados has a specific exemption in its Telecommunications Act.

A further difficulty is that while exemptions may be proposed by the applicable government departments who have authority during times of crisis, it is usually difficult to put such changes into legislation with the necessary State authority. This process can be lengthy and face internal hurdles as a number of government departments may wish to have oversight on the granting of exemptions.

In practice, there is very little regulatory precedent set out in a single code or piece of legislation which allows for the importation of communications equipment on an expedited duty-free basis during times of crisis. Such reform needs to be considered and embodied in national legislation and easily accessible by all participants.

Immigration Issues

A related issue concerns the free movement of volunteers into an affected country. It may be necessary for trained individuals from outside the region to be allowed entry for specific humanitarian purposes. The need for waiver of visa requirements for such individuals and a "fast track" immigration process is paramount. Again, these issues need to be considered and adopted in national legislation.

2.6 Exchange Programmes

One of the most effective ways to coordinate volunteer efforts in times of communications emergencies and when building communication capacity is with the use of exchange programmes. We have seen in some situations that there is a lack of highly skilled volunteers capable of installing and deploying communications equipment. We have also maintained that first responders and volunteer personnel should continue to receive "hands on" training on the use and operation of communications equipment that will be used during times of crisis.

Such programmes can be carried out through a coordinated approach or on an ad hoc basis. As noted earlier, ETC consists of a global network of organizations in charge of coordinating ICT responses during emergencies. The ITU IIV Program provides a basis for those involved with communications emergencies to share their knowledge with other individuals, non-profits and volunteer agencies. Both of these programmes are examples of where there has been a free flow of information to other groups.

The IARU, in consultation with the ITU periodically arranges for Amateur Radio Administrative Courses (ARAC) in a number of developing countries. This provides an opportunity for IARU volunteers to set out the benefits of the Amateur Radio Service within the overall ICT infrastructure, educate regulators in emerging countries about the regulatory framework for the Amateur Radio Service, and provide a model for a licensing exam process. This exchange of information has proven highly beneficial in the African continent, for example.

The bulk of exchange programmes, however, are not carried out on a coordinated basis, other than with the ITU IIV Programme. It would therefore be of great assistance if one particular UN agency could act as global coordinator for volunteer exchange programmes. A formal and structured exchange programme amongst the agencies identified earlier (e.g. ITU, OCHA, UNHCR, WFP, etc.) could play a key role in the sharing of vital information. It should be further noted that such exchange programmes could be coordinated on a virtual basis in order to save cost and time.

2.7 Deployment

The new consumer class of terminals are both intuitive and simple, allowing the end user to install the terminals with minimal training. This new class of terminal is complemented by YouTube installation films (available 24/7/365) and free smartphone apps that allow end users to install them without specialist equipment and to a professional standard. The new design has also reduced installation time, often to one hour or less. The smartphone apps connect to the terminal using only a WiFi connection and do not require a 3G Internet connection.

These terminals have also been designed to facilitate easy logistics which allow easy bulk transport, thereby reducing volume by up to 50 per cent. This new class of terminals also allows normal cars to transport the terminals in disaster zones.

The new class of terminals needs to be complete in order to reduce the number of potential problems encountered by end users, which could include cables, connectors, masts, etc.

Summary and Conclusion

Opportunities and best practices for volunteers in emergency communications can be succinctly summarized as follows:

(a)   Ensure all countries have a regulatory framework to allow for temporary licensing in communications emergencies. A corollary requirement is that there be a specific allowance for waiver of import duties and immigration controls for volunteers assisting in ICT when providing humanitarian aid. A "model law" building on existing legislation should be prepared and made available as an example for those countries that do not have such exemptions in their regulations.

(b)   The four regions identified as having a need for further expansion of regional networks (Africa, Asia-Pacific, Caribbean, Central America) should be the prime focus of volunteer agencies in the immediate future.

(c)   There is a need for global coordination of volunteer efforts amongst the various stakeholders as identified earlier in Part II. A corollary is that formal exchange programmes should be developed in the areas identified as regional opportunities.

(d)   De-ratification and implementation of the Tampere Convention[33] is encouraged. This treaty sets out an existing framework for cross-border movement of both telecommunications equipment and natural persons as well as operations within the borders of the effected country.

3.   Proposed Model for Volunteer Network

It is very clear that there various stakeholders fulfill numerous roles during times of a communications emergency, ranging from international and intergovernmental organizations to relief agencies and individuals. The latter group, whether they are structured formally to assist in an emergency or remain unstructured and are simply available and express a willingness to assist, are integral players in emergencies. Accordingly, a model which focuses on the effective utilization of both individual and aid groups should be the key outcome of this report.

A model that establishes an effective and efficient network of volunteers will entail a process that builds trusting relationships, fosters mutual understanding and ensures actions that will bring the various stakeholders together. Providing some structure and coordination amongst these varied groups is critical. A process for any model must also facilitate further cooperative action, while recognizing the strengths and weaknesses of the groups involved. The model must generate opportunities and resources that are realized through a clearly defined network; it must also recognize the limitations and ability of all players. In short, the proposed model must do the following:

1.   Bond the various stakeholders within communities at the local and regional level.

2.   Bridge and provide a clear line of support between the various groups at the local and regional level.

3.   Ensure that there are ties with international organizations that can provide financial and logistical support.

Bonding within Local or Regional Communities

Integration, cohesion, solidarity, networking, communications and sustained interaction between and amongst the various volunteers at the local and regional level will be essential in order to integrate deployed resources in an effected area. Leadership in these communities at the local and regional

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[33]   https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXV-4&chapter=25&clang=_en; Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations Tampere, 18 June 1998.

level must also be identified whether it is individuals or designated organizations. Strengthening the bonding within these groups at the local and regional level is key in order for stakeholders to understand their various strengths and weaknesses and how they can best utilize their resources together. In the field of emergency communications, running disaster communications exercises involving all stakeholders will not only strengthen the bonds within these groups, but will also identify critical areas for improvement.

Bridging between Communities

Local groups must be encouraged to reach out to other similar groups – whether locally, regionally or internationally – in order to develop trust and understanding of how these groups can work together. Joint collaboration efforts that go beyond the local level will likely be necessary.

Linking Community Ties with International Agencies

As described earlier, a number of non-governmental organizations and voluntary agencies have played an important role in mitigating the consequences of disasters, specifically with respect to emergency communications. In many cases their effectiveness in working together has proved crucial in mobilizing a group's resources, expertise and volunteers immediately after disaster strikes and during the recovery phase.

Recent trends, however, suggest that volunteers are less accepting of any formal organization or structure. Many individuals will want to assist, but may also resist entering into any formal agreements with other groups or agencies, or taking proposed or necessary training. Logistically, it should also be recognized that many volunteers will be unable, for economic reasons, to participate in formal training sessions or formally become a member of any overriding group even though they may have a willingness to assist.

Thus, the use of social media both for training and for coordinating activities will be key. Any model must make full use of this medium, including a well-recognized suitable online facility where online training can be provided and registration of interest and indication of skills can be set out.

3.1 Amateur Radio Services as an Example

As outlined in previous sections, amateur radio services are well placed to provide support in a natural disaster.[34] Amateur radio operators are organized internationally through IARU and nationally in over 170 UN Member States. A vast majority of these Member Societies have formal amateur radio emergency service groups and an amateur radio service infrastructure which coordinates and organizes radio amateurs in a structured fashion at the local level. Member Societies coordinate with other organizations in their respective countries including disaster relief agencies. Organized radio amateur groups also coordinate with local and national first responders. There are many examples where the coordinated use of amateur radio operators using amateur radio equipment on amateur spectrum have been utilized by emergency services during times of natural disaster.

This means a significant number of radio amateurs are coordinated, both at the national and local level. In many cases these amateurs receive training, participate in disaster exercises and may even be formally recognized as first responders. There will likely be significant communication links between the authorities and amateurs both at the national and local/community level. However, there

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[34] In 2017 the United States Government recruited over 50 amateur radio operators from mainland United States to travel to Puerto Rico to provide communication support for a period of 14 days immediately after the island had been devastated by a hurricane. It was estimated that Puerto Rico had lost over 90% of its communication infrastructure after the storm and there was an urgent need for emergency communication operators. Puerto Rico has a small number of radio amateurs but most of their equipment was damaged by the storm. Additional amateur radio operators were recruited by the government and flown into the most heavily devastated areas on the island to provide critical communication support, using both amateur and commercial frequencies for over two weeks.

are also many radio amateurs who are not "structured" and may not belong to a national Member Society, nor have any formal role in emergency communications. These individuals, however, will be situated throughout a country, typically have their own equipment and networks and would be able to communicate even in times of a natural disaster. While these radio amateurs may lack formal training, they are available, likely willing to help and most importantly have the requisite knowledge and background in order to use communications equipment. In a communications disaster they may be pressed into service simply because they happen to be on the ground and in the affected area. While they may not be coordinated with their national Member Societies, or even at the local level, they would have enough experience and training to be able to communicate from a disaster-stricken area to the appropriate agencies.

One key advantage of amateur radio services is that they are often coordinated and work not only within their communities, but also with national and international organizations to provide communication support. They do not necessarily rely on commercial communications equipment to be provided from outside the disaster-stricken area and will likely have their own communication facilities and networks. They will, as necessary, participate in drills and take training in order to provide the appropriate level of assistance. There will be others that do not have that same level of organized formal training, but – importantly – they are available and can be called upon if necessary. However, trying to coordinate other individuals outside the amateur radio services can be a challenge.

3.2 The Proposed VET Model

The proposed Volunteers for Emergency Telecommunications (VET) Model must then build on existing structures and encourage coordination amongst the various groups and actors. If it is to be effective, there must be one web portal which can be used by all stakeholders to coordinate their efforts. This portal must necessarily provide effective communications amongst all groups and provide a single point of contact for anyone trying to contact volunteers who can assist in a communications disaster.

In this instance, we would recommend that a single UN agency develop such a portal where volunteers can be identified and registered together with their requisite skills and level of training. The portal must be online so it can be accessed by all interested stakeholders with a level of management that is not restrictive, but sufficient simply to ensure the requisite information is located in one central place.

3.2.1 Stakeholders

The main stakeholders have already been identified, but generally they fall into three categories. The first being international and intergovernmental organizations such as the ITU, UNHCR, OCHA, and others. The second category is typically volunteer relief agencies such as the IFRC, TSF, Team Rubicon, IARU and others. For many of the relief agencies, these organization extends to both the national and local level, and in many cases they also maintain a registry of volunteers in various countries. A third category includes individuals who may volunteer locally within their community, or may work nationally or internationally with other organizations or groups.

All of these stakeholders have vast experience dealing with natural disasters and communications emergencies. In some cases, volunteers from one agency will coordinate with other agencies. In other cases, there is limited contact between the groups. The key to a successful VET Model will be bringing these various groups together to identify volunteers with the appropriate skills who can be called on to provide immediate assistance.

In order to be effective, a VET Model must establish contacts with international and intergovernmental organizations and volunteer relief agencies to designate a single focal point who can identify individual volunteers at the local, national and regional and level that can be called upon in an emergent situation. Furthermore, the portal must ensure cooperation and good faith efforts amongst the various individual groups.

3.2.2. Organization of the Network

Web-based applications and reliance on social media will, to a large extent, facilitate communication and organization efforts at the local and regional level. We have already highlighted the importance of "bonding, bridging and linking" the various groups in order to establish trusting relationships and mutual understanding, and the most cost effective way to do that is through web-based applications and social media.

A single web-based portal will be essential in accomplishing these goals.

3.2.3 Exchange Programmes

A key concept in forming bonds amongst the various relief agencies will be the ability of volunteers to work with other agencies. The proposed portal will allow individual volunteers to indicate their interest in working with other agencies and what talents they might bring to those other individuals working with that agency. For example, there is no reason an amateur radio operator could not assist with the activities of the IFRC.[35]

A portal should then allow volunteers from each of the various relief agencies to outline their skills and to indicate what other agencies and activities they would be interested in. Typically, volunteers who are involved in relief efforts are quite willing to expand their skills through training and activities organized at national and regional levels.

3.2.4 Capacity Building and Training

Many volunteers who are involved in emergency communications take online training offered by various governmental agencies to improve their skills. Indeed, in some countries such online training is a requirement before a volunteer can access a disaster area or work with first responders. However, in many other countries, online training is not available or if the training is provided on site, it is sometimes difficult for volunteers to either access that training or receive sufficient funding to be able to travel to increase their skills.

It is thus essential for the portal to offer online training, complete with some form of certification process that can enable volunteers to increase their skills and receive documentation allowing them to work with agencies at the national and regional level. Many agencies have some form of online training and there is no reason why that cannot be adapted and utilized at the international level.

In the past, the ITU has been involved with the Spectrum Management Training Programme (SMTP), which was structured to provide online courses for those interested in spectrum management. The same format could be adapted for online training of volunteers in emergency communications. The online training would obviously have to start at a basic level, providing key information about the various stakeholders, their roles and the skills they bring to emergent situations. It would then develop into further specific training, including on how to utilize various communication networks with the goal of having some form of certification at the end. The certification may or may not be important for the volunteers, but it should provide some level of comfort to other agencies and stakeholders in identifying those volunteers who are sufficiently skilled to operate various levels of communication equipment. Online training will be absolutely necessary for the success of the model. The expense in developing online training will be costly initially, but well worth it in providing volunteers with a sufficient level of training, and to a greater extent, will assist in building bridges between the various stakeholders.

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[35] In fact, many radio amateurs cooperate and volunteer with other agencies providing communication support, including the IFRC. In the earlier example of radio amateurs assisting with communications in hurricane-ravaged Puerto Rico, amateur radio volunteers were not only called on to provide communication services, but quite frequently had other skills (construction, electrical contracting, heavy equipment operations) which they could use during the crisis.

4. IMPLEMENTATION AND DISSEMINATION

4.1. Milestones

The milestones to be achieved in implementation of the VET model would be as follows:

a) **Milestone 1**: Initial meeting between stakeholders (allowing for virtual participation) to develop the model and outline key milestones.

b) **Milestone 2**: Identification of the lead agency who will assume responsibility for developing the model and hosting the web portal.

c) **Milestone 3**: Development of the portal and beta-testing.

d) **Milestone 4**: Develop the structure for online training and roll out of the online training programme.

e) **Milestone 4**: Full implementation of the VET Model and web portal.

4.2 Experts and Consultation

Funding for the portal and the online training will be a key requisition to meeting these milestones.

Developing and sustaining the VET Model will require a dedicated group of individuals who have expertise in their field. This will include:

a) **A board or governing body** made up of representatives of the key stakeholders who have sufficient influence within their own organization to ensure implementation of the VET model and to provide the support necessary to sustain the model moving forward.

b) **Experts, either paid or volunteer**, who have experience in providing and developing online portals and the proposed online training programme.

c) **Experts and volunteers from each of the key stakeholders** who can be given discrete tasks to ensure implementation of the VET model.

d) **Consultants and volunteers** who can coordinate dissemination of information through social media and implement the overall social media outreach strategy through the portal.

4.2 Raising Awareness of the VET

The key with the VET Model is to ensure that all of the stakeholders are on board with the concept and are prepared to "sell" the model within their own organizations. We envision that the model would have good exposure through:

a) Various communications workshops hosted by the stakeholders, including the ITU.

b) An immediate social media presence together with a social media platform to both promote the VET model and encourage volunteers to become part of the process.

c) Recognition of the VET model by governments, both nationally and at the regional level.

4.3 Working with Relevant Organizations

The VET Model can be successful if: i) all stakeholders are committed to its success; and ii) it has the support of relevant international organizations. In addition, commercial organizations will be called upon to provide either material or financial support. They must be included as participants in the VET model from the outset. The acceptance of this model by all interested parties is vital. In order to embody the concept of "linking" between various organizations and stakeholders, the initial

meeting to establish the VET Model must reach out to and include a wide number of key organizations. Commercial organizations and other must have sufficient faith in the VET Model that they will continue to provide it with their long-term support.

Accordingly, we would recommend:

a)   That **invitations** to the initial meeting between stakeholders as outlined under the timeline in this report **be extended to a wide group of stakeholders** and **organizations** to participate. In order to ensure sufficient exposure, the meeting should encourage virtual participation.

b)   A **framework agreement** between the stakeholders and other organizations which would propose a Memorandum of Agreement **outlining the activities of each of the participants**. This will be particularly important **to ensure the VET Model can attract contributions**, whether in-kind or financial, in order to proceed with the construction of the portal.

c)   The VET Model should have a **governing board** hosted within the ITU, which recognizes key stakeholders, aid agencies, international organizations and other commercial contributors. The board should be responsible for directing the establishment of the VET Model and its various component parts (portal and online training) and coordinate operations in the future. In order to keep the VET Model sustainable and dynamic, it would be important to limit the number of terms individuals can serve on the board to maintain and encourage new ideas, and to ensure sufficient bridging and bonding amongst the various stakeholders.

4.4 Summary

The VET Model must build on already established networks and the organizational strengths of the stakeholders. It must also be sufficiently organized and flexible enough to ensure that the goals of the VET Model can be met. It is vitally important that the VET Model embrace the concepts of bonding, bridging and linking (identified earlier in the report) and that it is structured so as to attract individual volunteers.

The key components of the VET Model will then be:

a)   A governance structure that involves all players, including stakeholders, international organizations and commercial interests.

b)   A portal to allow for the registration of volunteers and expression of interest from others, together with an online training programme to provide some level of certification.

c)   The activities of the VET Model must encourage the key concepts of bonding, bridging and linking through the use of social media.

d)   The VET Model should be up and running within two years from the date of this report.

In any disaster situation, volunteers are key whether they are structured or unstructured. There are countless individuals in numerous organizations that can assist in times of a communications emergency. Bringing these individual talents together to operate in a timely, coordinated and efficient manner will be the VET Model's ultimate goal.

Part III: REGULATORY TOOLKIT AND GUIDELINES

1. OVERVIEW ON TRANS-BORDER MOVEMENT OF TELECOMMUNICATIONS EQUIPMENT

According to the International Telecommunication Union (ITU), "[e]mergency telecommunications play a critical role in the immediate aftermath of disasters by ensuring the timely flow of vital information needed by government agencies and other humanitarian actors that are involved in rescue operations and by providing medical assistance to the injured."[1] However, when disaster strikes, many countries are not sufficiently prepared in regard to information and communication technologies (ICT) infrastructure or contingency plans and policies. In that case, many first responders, humanitarian organizations, and donor countries have to move ICT equipment across borders in order to provide services to the affected region. In many cases, there are barriers to making such vital resources available in disaster area, which slows down the aid process.

The objective of this toolkit is to ensure that ICT equipment is made available and can be well utilized during emergency situations, even outside of said situations for development purposes. One of the most important aspects of ICT for disaster management is satellite communications (both voice and data/broadband solutions). After a natural or man-made disaster, permanent terrestrial infrastructure is often damaged or destroyed, severely hampering relief efforts by government agencies and humanitarian organizations. Satellite capacity is a linchpin resource in such circumstances. Because space-based satellite communications networks are independent from terrestrial infrastructure, satellite connectivity is considered physically invulnerable from virtually all natural or humanitarian disaster; because most satellite terminals and ground equipment are easily deployed, highly resilient and durable, satellite networks are often the most reliable option in disasters.

This section of the report provides an analysis of the key concepts and issues regarding the trans-border movement of telecommunications equipment (e.g. satellite terminals and ground stations, etc.) during emergency situations, considers key stakeholders and their respective roles, and takes a close look at existing gaps, ongoing needs, and mechanisms for facilitating the trans-border movement of ICT equipment. In addition, regulatory barriers that hinder the deployment of communications for humanitarian development projects that could also make use of equipment already in place when an emergency situation occurs will also be discussed.

1.1 Key Stakeholders

There are several different important stakeholders involved and affected by the movement of telecommunications equipment across borders during emergency situations at the international, regional and national levels, both in public and private sectors.

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[1]   For further information, see: http://www.itu.int/en/ITU-D/Emergency-Telecommunications/Pages/default.aspx

1.1.1   International Level

At the international level, international organizations and first response agencies play a critical role in organizing assistance and aid during emergency situations and in natural or man-made disasters.

Network of International Organizations and Agencies

The Emergency Telecommunications Cluster (ETC)

The ETC is a global network of organizations in charge of coordinating ICT responses during emergencies, such as humanitarian crises and natural disasters. The ETC is one of the 11 clusters designated by the Inter-Agency Standing Committee (IASC), a unique forum involving key United Nations (UN) and non-UN humanitarian partners. The ETC is usually activated within the first 48 hours after an emergency, and its services are expanded within four weeks to provide continued emergency relief. If the ETC is not activated, it is nearly impossible for a coordinated effort to happen.

The ETC is chaired by the World Food Programme (WFP), and its member organizations include UN agencies such as the ITU, the United Nations High Commissioner for Refugees (UNHCR), the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), among others, as well as international volunteer networks such as the International Red Cross and Red Crescent (IFRC) and Télécoms Sans Frontières (TSF). Some national ministries are also a part of the cluster, such as the United States Department of State and the Ministry for Development Cooperation and Humanitarian Affairs of Luxembourg.[2]

International Organizations

International organizations play an important role in facilitating the cross-border flow of ICT equipment and enabling regulatory practices that promote emergency response preparedness. These entities, along with other international and inter-governmental organizations, have produced many

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[2]   For further information, see: https://www.etcluster.org/about-etc

agreements, recommendations and other literature regarding the trans-border flow of ICT equipment. These organizations are all a part of the ETC.[3]

International Telecommunication Union (ITU)

The ITU is the UN specialized agency for information and communication technologies (ICTs). The development arm of the ITU (ITU-D) considers emergency telecommunications an integral part of its projects integrating telecommunications/information and communication technology in disaster prediction, detection, alerting and relief.

World Food Programme (WFP)

The WFP is currently the global lead of the Emergency Telecommunications Cluster (ETC) and is responsible for coordinating inter-agency relief efforts in terms of IT and telecoms in emergencies.

WFP's Fast Information Technology and Telecommunications Emergency and Support Team (FITTEST) represents WFP's IT emergency response capacity. FITTEST provides lifesaving Internet connectivity, security telecommunications, customer support and training for humanitarian actors from UN agencies and non- governmental organizations (NGOs) around the world. FITTEST is always on the frontline of any emergency situation that needs IT support.[4]

United Nations Office for the Coordination of Humanitarian Affairs (OCHA)

OCHA is the part of the UN Secretariat responsible for coordinating humanitarian actors to ensure a coherent response to emergency situations. OCHA also makes sure that there is a framework within which each humanitarian actor can contribute to overall response and relief efforts.[5] OCHA also oversees the United Nations Disaster Assessment and Coordination (UNDAC), which partners with NGOs and the private sector for logistical support. In terms of telecommunications, partners of the UNDAC include Télécoms Sans Frontières (TSF), the United Nations Institute for Training and Research Operational Satellite Applications Programme (UNOSAT), and the DHL Disaster Response Teams.[6]

United Nations High Commissioner for Refugees (UNHCR)

UNHCR is a global organization dedicated to saving lives, protecting rights and building a better future for refugees, forcibly displaced communities and stateless people. In addition to these duties, UNHCR also plays a major role in disaster preparedness and response capabilities through capacity-building initiatives and inter-agency cooperation.

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[3]   Not an exhaustive list.
[4]   For further information, see: http://www.wfp.org/ictemergency/fittest
[5]   For further information, see: https://www.unocha.org/about-us/who-we-are
[6]   For more information, see: https://www.unocha.org/what-we-do/coordination-tools/undac/partners

World Customs Organization (WCO)

The WCO is an intergovernmental organization that represents over 180 customs administrations. WCO is noted for its work in areas covering the development of international conventions and mechanisms regarding international trade facilitation and the enhancement of the effectiveness and efficiency of customs administrations. In terms of relief consignments and ICT equipment, WCO has developed various mechanisms regarding the efficiency of customs processes during emergency situations. WCO is not a member of the ETC.

International Volunteer Networks

Generally speaking, first response agencies and international volunteer networks are usually the first people on the ground when disaster strikes. These organizations are dependent on emergency communications technologies, and many volunteers that are a part of these organizations bring in their own communications equipment with them in an emergency.

The International Federation of Red Cross and Red Crescent Societies (IFRC)

The IFRC is the world's largest volunteer network, reaching 150 million people in 190 countries through the work of over 17 million volunteers.[7] In regard to telecommunications resources during emergency situations, the IFRC deploys IT/Telecommunication Emergency Response Units (ERUs) that establish local communication networks and links to help ensuring the smooth flow of information in the operation. Furthermore, to assist the host country with its communication systems, ERUs have a range of technology at their disposal including satellite phone systems, high-frequency and very high frequency radio systems, and VSAT terminals, depending on the geographical location and needs.[8] The IFRC also provides recommendations to countries on how to facilitate the movement of relief consignments, such as ICT equipment, through the International Disaster Response Laws, Rules and Principles (IDRL) guidelines.

Télécoms Sans Frontières (TSF)

Founded in 1998, TSF is the leading humanitarian NGO specialized in emergency technology and telecommunications for humanitarian crises of all kinds. [9] From the onset of any humanitarian emergency, TSF deploys telecom specialists from its headquarters or from one of its regional bases in Mexico or Thailand to be on-site and operational in under 24 hours.

At the heart of a crisis, TSF teams will install emergency communication centres for the humanitarian community that strengthen aid coordination by providing relief organizations, UN agencies and local authorities with satellite connectivity for voice and Internet access. TSF's mandate equally focuses on providing access to information and communication for those affected by humanitarian crises such as refugees and victims of natural disasters, reconnecting them through the provision of priority voice or Internet connectivity.[10]

Télécoms Sans Frontières is part of the United Nations Emergency Telecommunications Cluster (ETC) and a partner of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA),

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[7]   For further information, see: http://www.ifrc.org/
[8]   For further information, see: http://www.ifrc.org/en/what-we-do/disaster-management/responding/disaster
       -response-system/dr-tools-and-systems/eru/
[9]   For further information, see: http://www.tsfi.org/en
[10]   For further information, see: http://www.tsfi.org/en/presentation/action/48-organisation-humanitaire-durgence

within the framework of which its experts intervene directly alongside UN Disaster Assessment and Coordination (UNDAC) teams in the direct aftermath of a disaster.

NetHope

NetHope's mission is to "enable cross-sector collaboration between nonprofits and innovative companies to develop better programmes, mitigate risks, and scale benefits for greater impact in the communities in which [it] works" through a collaborative model that utilizes public and private partnerships (PPPs). NetHope seeks to incorporate ICT in emergency relief by locating and purchasing equipment to provide to other humanitarian actors. NetHope's Field Capacity Initiative focuses on training individuals on telecommunications/satellite technology and IT project management.

Team Rubicon

Team Rubicon is a disaster relief organization that combines the skills and experiences of military veterans with first responders to rapidly deploy disaster response teams.[11] During the 2015 Nepal earthquake, Team Rubicon relied on deploying satellite-based broadband networks to support critical medical and logistical operations.[12]

1.1.2   Regional Level

Regional organizations are integral in coordinating relief efforts from nearby countries, and regional cooperation plays an essential role in the movement of telecommunications during emergency situations. Regional organizations are also key in the dissemination of best regulatory practices to create an enabling regulatory environment for emergency communications.[13]

The Association of Southeast Asian Nations (ASEAN)

The ASEAN is a regional organization comprised of ten Southeast Asian States that promotes intergovernmental cooperation and facilitates economic integration amongst its members.[14] The ASEAN Agreement on Disaster Management and Emergency Response Vientiane, ratified on 26 July 2005, affirmed a regional response to emergency situations. Article 14, Section A of that Agreement states: "[A]ccord(s) the Assisting Entity exemptions from taxation, duties and other charges of a similar nature on the importation and use of equipment including vehicles and telecommunications, facilities and materials brought into the territory of the Requesting or Receiving Party for the purpose of the assistance."[15]

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11   For further information, see: https://teamrubiconusa.org/our-mission/
12   For further information, see: http://www.intelsat.com/news/press-release/intelsat-donates-satellite-solutions-in-support-of-red-cross-and-team-rubicon-relief-efforts-in-nepal/#sthash.P2yojA8B.dpuf
13   Not an exhaustive list.
14   Indonesia, Malaysia, the Philippines, Singapore, Thailand, Brunei, Cambodia, Laos, Myanmar and Vietnam.
15   For further information, see: http://asean.org/?static_post=asean-agreement-on-disaster-management-and-emergency-response-vientiane-26-july-2005-3

The European Commission (EC)

The EC is the body of the European Union (EU) that is responsible for proposing legislation, implementing decisions, upholding EU treaties and managing the day-to-day business of the EU. Within the EC, the Emergency Response Coordination Centre (ERCC), which operates within the European Commission's Humanitarian Aid and Civil Protection department (ECHO), supports a coordinated and quicker response to disasters, both inside and outside Europe, using resources from the countries participating in the EU Civil Protection Mechanism. The ERCC is a coordination hub facilitating a coherent European response during emergencies helping to cut unnecessary and expensive duplication of efforts and can deal with several emergencies at a time.[16]

Arab League

The Arab League is a regional organization of Arab countries in and around North Africa, the Horn of Africa and Arabia.[17] In 1987 the Arab League adopted "the Arab Cooperation Agreement Regulating and Facilitating Relief Operations" which discussed, among other things, the facilitation of cross-border relief consignments. In regard to telecommunications, that Agreement states that "Member States pledge to provide all the facilities possible to accredited national relief organizations and committees, and telecommunications services including telex, telegrams, telephones and wireless services in the event that a natural disaster or emergency takes place in any Member State: this applies to both internal and external communications."[18]

Coordination Center for the Prevention of Natural Disasters in Central America (CEPREDENAC)

CEPREDENAC is the regional body responsible for disaster management in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. With contributions from IFRC and the nations of Central America, the "Central American Protocol for the Shipment, Transit and Reception of Humanitarian Assistance" was recently adopted by CEPREDENAC. The Protocol increases operational coordination during disaster situations, in order to provide more effective humanitarian and technical assistance in the Central American region, and it standardizes procedures for i) nations in the midst of emergencies, ii) donor countries, and iii) transport and customs concerning relief consignments, such as telecommunications.[19]

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[16] For further information, see: http://ec.europa.eu/echo/what/civil-protection/emergency-response-coordination -centre-ercc_en

[17] Algeria. Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen.

[18] For further information, see: http://www.ifrc.org/Docs/idrl/N644EN.pdf

[19] For further information, see: http://www.ifrc.org/docs/IDRL/Protocolo%20Centroamericano%20%282%29.pdf

The Caribbean Community (CARICOM)

CARICOM is an organization of 15 Caribbean nations and dependencies, whose mission is to promote economic integration and cooperation among its members, to ensure that the benefits of integration are equitably shared, and to coordinate foreign policy.[20] The Caribbean Disaster Emergency Management Agency (CDEMA) is a regional inter-governmental agency for disaster management in CARICOM.

African Union (AU)
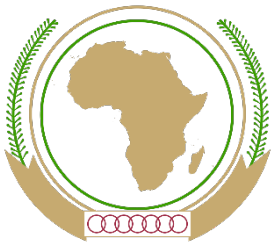
The AU is a continental union consisting of all 55 countries on the African continent. The Secretariat, which runs the AU, is the African Union Commission. The AU's Humanitarian Policy Framework has incorporated many of the IDRL guidelines, establishing an effective coordination mechanism for humanitarian operations on the African continent, such as armed conflict and natural and man-made disasters.[21]

Commonwealth of Independent States (CIS)

The CIS is a regional organization formed during the dissolution of the Soviet Union. Of the 15 former Soviet States, nine are members. In 2014, the CIS adopted the Model Act on International Disaster Assistance by the Inter-Parliamentary Assembly of Member Nations of the Commonwealth of Independent States. The Model Act was proposed to CIS by the IFRC and OCHA, and draws heavily from the pre-existing IDRL guidelines.[22]

1.1.3   National Level

Telecommunications Authorities

On the national level, telecommunications authorities play a key role in making sure that a country's ICT infrastructure is ready in advance of an emergency situation. Effective policies for telecommunications regulators can include backup networks for communications, such as satellite technology and the prepositioning of ICT equipment.

Telecommunications authorities are also tasked with creating an enabling regulatory environment that addresses emergency situations as they occur and afterwards. When disaster strikes, it is important to identify and minimize regulatory barriers in the deployment of communications for humanitarian development projects. This would facilitate the ability to benefit from equipment already in place, as well as offers of new resources in response to the event.

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[20]   Antigua & Barbuda, Belize, Commonwealth of Dominica, Grenada, Republic of Haiti, Montserrat, Federation of St. Kitts & Nevis, St. Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago.

[21]   For further information, see: http://www.ifrc.org/fr/introduction/-droit-des-catastrophes/dernieres-nouvelles -et-derniers-rapports-sur-le-droit-des-catastrophes/idrl-newsletter-june-2011/au-to-incorporate-idrl-in-new -humanitarain-policy-framework-/

[22]   For further information, see: http://www.ifrc.org/en/what-we-do/disaster-law/news/europe/ifrc-sg-elhadj-as-sy -commends-the-endorsement-of-a-model-disaster-law-by-the-interparliamentary-assembly-of-the-commonwealth-of -independent-states1-67665/

Customs Authorities

Customs authorities are often the first point of contact for telecommunications infrastructure as they establish and enforce a country's rules and regulations about what can be admitted into the country, the appropriate vetting process, and the applied tariffs and duties. In cases of emergencies where telecommunications equipment has to be imported, customs authorities should promote an efficient procedure that facilitates the cross-border flow and movement of ICT equipment. Empowering customs agencies in advance to waive certain cumbersome administrative steps and duties or tariffs should an emergency strike is a useful step.

Ministries of Foreign Affairs

In addition to telecommunications and customs authorities, other government entities such as foreign affairs ministries are also involved in the process of moving ICT equipment during emergencies. In the case of countries that are donating resources, the government body charged with foreign affairs and diplomacy is usually the first point of contact to a country in need.

Transport Ministries

In some cases, transport ministries or authorities may also have an important role to play during the transportation of ICT equipment across borders during an emergency. They can authorize ICT cargo to go through transport more efficiently, and not lose time in clearance storage. They may also be able to reach across myriad government agencies and international organizations to facilitate shipments of crucial telecommunications equipment and coordinate donations of equipment with existing networks and services.

Selected Examples

United States of America (as a Donor Country)

In the United States, the Department of State has a very important role in ICT for disaster management. The Department of State advocates for the importance of international collaboration during times of emergency, especially regarding ICT resources. The Department of State formed an International Disaster Response Subcommittee of the Advisory Committee on International Communications and Information Policy (ACICIP). This Subcommittee is made up of representatives from ICT companies and NGOs focused on the ICT aspects of international disaster response, aimed at heightening coordination between different governments, their telecommunications and customs entities, and NGOs. Some of the areas that the ACICIP recommends that countries incorporate in their ICT response in emergency situations include:

- Telecommunications and ICT systems and services and usage scenarios (such as use of messaging and notification, collaboration, crowd sourcing, social media, mapping, data collection/assessment, broadcast technologies, supply chain management)

- Connectivity, including mobile networks, landline, radio, satellite, fibre

- Logistics; transportation – including import/export compliance requirements

- Regulation and licensing

- Customs duties

- Credentialing, visa requirements

- Funding sources for preparedness assistance and training

- Public private partnerships

- Restoration of critical ICT infrastructure[23]

Jamaica (Internal Regulations and Inter-Agency Cooperation)

The Spectrum Management Authority of Jamaica (SMA) is responsible for approving the importation/licensing of telecommunications equipment that utilize the radio frequency spectrum, but does not have purview over the importation of equipment.

SMA accomplishes this through two processes:

1. Type Approval process.

2. Authorization of C-87 Entry and Detention Notice. This notice is issued by the Customs Authority at the port of entry.[24] The following documents should be submitted at the offices of the SMA to facilitate authorization:

   - Original C-87 or Detention Notice

   - Original technical specifications of the equipment (i.e., manual)

   - Valid identification

Type Approval applications are processed within 15 business days, and the authorization of a Detention Notice is processed within 24 hours after receipt of required information. The law in Jamaica does not provide for rapid licensing or elimination of licensing requirements in times of disaster. However, the SMA is amenable to accommodating rapid licensing during times of disaster. Some telecommunications equipment is not subject to SMA licensing, as outlined in the 1973 Radio and Telegraph Control (Exemptions) Regulations.

There is no provision under the Radio & Telegraph Control Act or the Telecommunications Act for exceptions on import restrictions. However, equipment which is on the List of Type Approved Equipment will not require additional authorization in order to be imported into Jamaica. Please note, however, that such equipment may require a license for use.

Afghanistan (Inter-Agency Cooperation)

The Afghanistan Telecoms Regulatory Authority (ATRA) and the Ministry of Communications and Information Technology (MCIT) signed a Memorandum of Understanding (MoU) in 2017 with the State Ministry for Disaster Management on cooperation for development of the Afghanistan Emergency Telecom Regulatory Framework (AETRF). The AETRF will address the role of ICT with regard to pre-disaster, during-disaster and post-disaster situations, and will provide a roadmap for the creation of a coordinated mechanism to handle related issues. Governmental bodies and private stakeholders are set to coordinate emergency telecommunications services within the scope of the AETRF, based on the MoU.[25]

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[23] For further information, see https://www.state.gov/e/eb/adcom/acicip/disasterresponse/179203.htm
[24] For further information, see: https://www.jacustoms.gov.jm/. For the list of restricted items, see: https://www.jacustoms.gov.jm/service/commercial-exporting
[25] For further information, see: https://www.telegeography.com/products/commsupdate/articles/2017/05/17/atra-mcit-ink-mou-on-framework-for-emergency-telecoms-system/

1.1.4   Private Sector

Regarding the role of the private sector in emergencies, satellite operators and service providers typically recommend the pre-positioning of equipment to prepare for an emergency, along with periodic training to ensure familiarity with that equipment. Pre-positioned equipment can provide the most immediate vital connectivity in emergency situations, but can also offer useful capability when deploying infrastructure for development purposes. However, private sector efforts to encourage pre-positioning can face various administrative hurdles which can hamper emergency preparation efforts.

Satellite technology should be included in early planning for any disaster response to facilitate efficient damage assessments and communicate with emergency responders. After a natural or man-made disaster, permanent terrestrial infrastructure is often damaged or destroyed, severely hampering relief efforts by government agencies and humanitarian organizations. Satellite capacity is a linchpin resource in such circumstances. Because space-based satellite communications networks are independent from terrestrial infrastructure, satellite connectivity is considered physically invulnerable from virtually all natural or humanitarian disaster. As most satellite terminals and ground equipment are easily deployed and are highly resilient and durable, satellite networks are often the most reliable option in disasters.

In 2015 and under the umbrella of the EMEA Satellite Operators Association (ESOA) and the Global VSAT Forum (GVF), seven satellite operators – Eutelsat, Hispasat, Inmarsat, Intelsat, SES, Thuraya and Yahsat – signed a Crisis Connectivity Charter with the global humanitarian community, represented by OCHA and the ETC. The charter is the first of its kind between the UN and a whole private sector (the satellite industry), and provides worldwide coverage with several mobile-satellite system (MSS) and fixed-satellite system (FSS) solutions. The aim of the charter is to provide a pre-planned, scalable, redundant satellite communications solution for over 1 000 people, scaled to nine disasters per year.

The charter ratifies terms and protocols to facilitate access to satellite-based communications for emergency response teams when local terrestrial networks are down after a disaster. The charter also includes increased coordination to prioritize access to bandwidth for humanitarian purposes during disaster operations, pre-positioned satellite equipment and transmission capacity at times of disaster in high-risk countries in Europe, the Middle-East, Africa and Asia, as identified by the ETC.[26]

1.2   Existing Tools and Mechanisms: Conventions, Treaties, Agreements and Guidelines

There are several different international mechanisms, including conventions, treaties and agreements by international organizations – such as the ITU, the UN, the World Trade Organization (WTO) and the WCO – that facilitate the movement of telecommunications equipment across borders during an emergency. Regional organizations, as previously mentioned, also have their own mechanisms in place to facilitate cooperation between member countries. These mechanisms provide guidelines on how to facilitate movement of ICT equipment across borders for both emergencies and non-emergency purposes. However, it is up to each country to decide whether they are willing to comply with these guidelines or not.

1.2.1   The Tampere Convention

The Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations came into force on 8 January 2005. The Convention was initially ratified by 30 countries, and there are currently 60 signatories and 48 Parties to the Convention. The main focus of this Convention is to reduce or remove regulatory barriers to the use of telecommunication resources for disaster relief.

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[26]   For further information, see: http://www.satellitetoday.com/regional/2015/10/15/7-satellite-operators-sign-uns-crisis-communications-charter/

Some countries still have reservations about the Tampere Convention, most notably members of the EC that stated that the extent to which certain provisions of the Convention fall within the area of responsibility of the EC, the full implementation of the Convention has to be done in accordance with the procedures of the EC. Other countries, such as Colombia and Venezuela, signed the convention but formulated their reservations regarding dispute settlement.[27]

1.2.2   The IDRL Guidelines

The IFRC's IRDL "Guidelines for the domestic facilitation and regulation of international disaster relief and initial recovery assistance", also known simply as the IDRL Guidelines, were unanimously adopted by the State Parties to the Geneva Conventions and the International Red Cross Red Crescent Movement. The IDRL Guidelines are meant to guide governments on how to prepare for common legal problems in international response operations. The objective of the Guidelines is to avoid delays in the dissemination of humanitarian relief, and to ensure better coordination and quality of the assistance are provided. In 2008, the UN General Assembly adopted three resolutions (Res. 63/139, 63/141, and 63/137) encouraging States to use the IDRL Guidelines. In regard to telecommunications relief consignments, the IDRL Guidelines recommend the following:

> *Affected States should waive or expedite the granting of any applicable licenses and reduce any other barriers to the use, import or export of telecommunications and information technology equipment by assisting States and assisting humanitarian organizations or on their behalf in disaster relief and initial recovery assistance. Without discrimination against or negative impact to domestic relief actors, affected States should also grant (or where, appropriate, encourage other domestic actors to grant) assisting States and eligible assisting humanitarian organizations priority access to bandwidth, frequencies and satellite use for telecommunications and data transfer associated with disaster relief operations.*[28]

1.2.3   The World Trade Organization's Trade Facilitation Agreement

The WTO's Trade Facilitation Agreement (TFA) was ratified by two-thirds of the WTO membership and entered into force on 22 February 2017. The TFA contains provisions for expediting the movement, release and clearance of goods, including goods in transit, and includes provisions for special circumstances such as natural disasters and other emergency situations. The TFA also sets out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues.[29] In terms of the trans-border movement of consignment relief, the TFA's recommendation is to have a "single window" for documentation submission during customs. This is especially relevant for volunteers that bring in their own telecommunications equipment who commonly cite bureaucracy and redundant documentation as one of their chief complaints.[30]

1.2.4   Mechanisms of the World Customs Organization

As previously mentioned, the WCO has several mechanisms that discuss customs activities during an emergency situation. The Recommendation of the World Customs Organization (WCO) to Expedite the Forwarding of Relief Consignments in the Event of Disasters was published in 1970, and is a non-binding instrument that calls on WCO member countries to facilitate relief consignments, through provisions such as waiving restrictions on the export or import of relief consignments; simplification of associated documentation; waiver of duties, taxes and fees on consignments to approved

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[27]   See: https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXV-4&chapter=25&lang=en&clang=_en for the complete list of reservations

[28]   For further information, see: http://www.ifrc.org/Docs/idrl/I271EN.pdf

[29]   For further information, see: https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm

[30]   For further information, see: http://siteresources.worldbank.org/WBEUROPEEXTN/Resources/268436 -1322648428296/8288771-1453462012900/9871283-1463682297629/trade-humanitarian-emergencies-final-web .pdf

organizations; and the authorization of customs clearance outside normally prescribed hours and locations.[31]

The WCO Convention on Temporary Admission, ratified in 1990, is also aimed at facilitating disaster assistance and is notable for its ATA ("Admission Temporaire"/"Temporary Admission") mechanism, which relieves the burden of import and duty and tax exemption for humanitarian goods. Unfortunately, this Convention does not include goods brought in by relief personnel which are critical for humanitarian operations but not provided as aid to disaster victims, such as ICT equipment. To remedy this, the IFRC, OCHA and WCO submitted an information paper to the administrative committee of the Convention in 2014. However, an amendment to this Convention has to be proposed by a contracting party.[32]

1.2.5   Model Agreement between the United Nations and Member States

OCHA and WCO also developed a Model Agreement between the United Nations and Member States concerning actions to expedite the import, export and transit of relief consignments and possessions of relief personnel in the event of disasters and emergencies. The Governments of Belarus, Bhutan, Dominican Republic, Honduras, Liberia, Mali, Moldova, Nepal and Uzbekistan have signed this Agreement.[33]

Summary Table of Existing Mechanisms

Mechanism	Measures
Tampere Convention[1]	Requires countries to reduce or remove regulatory barriers to the use of telecommunications resources for disaster relief such as: • Pre-clearance of telecommunications resources for use in disaster mitigation and relief. • Recognition of foreign type approvals. • Expedited processes. • Temporary waiver of regulations.

[1] For further information, see: http://www.itu.int/en/ITU-D/Emergency-Telecommunications/Documents/Tampere_Convention/Tampere_convention.pdf

[2] For further information, see: http://www.ifrc.org/Docs/idrl/I271EN.pdf

[3] For further information, see: https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm

[4] For further information, see: http://www.wcoomd.org/en/topics/facilitation/activities-and-programmes/natural-disaster.aspx

[5] For further information, see: http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/conventions/pf_ata_system_conven.aspx

[6] For further information, see: http://www.wcoomd.org/~/media/wco/public/global/pdf/topics/facilitation/activities-and-programmes/natural-disaster/united-nation-model-of-agreement.pdf?db=web

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[31]   For further information, see: http://www.wcoomd.org/en/topics/facilitation/activities-and-programmes/natural-disaster.aspx

[32]   For further information, see: http://siteresources.worldbank.org/WBEUROPEEXTN/Resources/268436-1322648428296/8288771-1453462012900/9871283-1463682297629/trade-humanitarian-emergencies-final-web.pdf

[33]   For further information, see: http://www.wcoomd.org/~/media/wco/public/global/pdf/topics/facilitation/activities-and-programmes/natural-disaster/united-nation-model-of-agreement.pdf?db=web

Mechanism	Measures
IDRL Guidelines[2]	Its objective is to assist governments to become better prepared for common legal problems in international response operations. It calls for: • Expediting the granting of any applicable licenses and reducing any other barriers to the use, import or export of ICT equipment by relief actors. • Prioritizing bandwidth for the use of relief actors.
Trade Facilitation Agreement (TFA)[3]	• Article 10.4 encourages members to establish "single window" for documentation submission during customs. • Article 8 requires national border authorities to cooperate and coordinate border controls and procedures to facilitate trade. • Article 1 requests each member to make information on customs clear and specific.
Recommendation of the WCO to Expedite the Forwarding of Relief Consignments in the Event of Disasters[4]	• Non-binding agreement that calls on countries to adopt a number of measures to facilitate relief consignments. • Waiver of restrictions on the export of import of relief consignments. • Simplification of associated documents. • Waiver of duties taxes and fees on consignments to approved organizations. • Authorization of customs clearance outside normally prescribed hours.
WCO Convention on Temporary Admissions (Istanbul Convention)[5] -	• Established the ATA system, which allows the free movement of goods across frontiers and their temporary admission into a Customs territory with relief from duties and taxes. The goods are covered by a single document known as the ATA carnet that is secured by an international guarantee system. • Binds countries to eliminating customs duties on personal effects and professional equipment carried by visitors. • Import and duty and tax exemption for humanitarian goods. • Limited to items intended for re-exportation. • Limited to ICT goods. • IFRC, WCO, OCHA information paper to discuss deficiencies, waiting for Member State to bring it up.

[1] For further information, see: http://www.itu.int/en/ITU-D/Emergency-Telecommunications/Documents/Tampere _Convention/Tampere_convention.pdf

[2] For further information, see: http://www.ifrc.org/Docs/idrl/I271EN.pdf

[3] For further information, see: https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm

[4] For further information, see: http://www.wcoomd.org/en/topics/facilitation/activities-and-programmes/natural-disaster.aspx

[5] For further information, see: http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/conventions/pf_ata _system_conven.aspx

[6] For further information, see: http://www.wcoomd.org/~/media/wco/public/global/pdf/topics/facilitation/activities-and -programmes/natural-disaster/united-nation-model-of-agreement.pdf?db=web

Mechanism	Measures
UN Model Agreement Between UN and Member States[6]	• OCHA and WCO developed. • Concerning import, export, and transit of relief consignments and possessions of relief personnel during disasters and emergencies. • Signed only by a few countries (Belarus, Bhutan, Dominican Republic, Honduras, Liberia, Mali, Moldova, Nepal and Uzbekistan, as of 2014).

[1] For further information, see: http://www.itu.int/en/ITU-D/Emergency-Telecommunications/Documents/Tampere _Convention/Tampere_convention.pdf

[2] For further information, see: http://www.ifrc.org/Docs/idrl/I271EN.pdf

[3] For further information, see: https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm

[4] For further information, see: http://www.wcoomd.org/en/topics/facilitation/activities-and-programmes/natural-disaster.aspx

[5] For further information, see: http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/conventions/pf_ata _system_conven.aspx

[6] For further information, see: http://www.wcoomd.org/~/media/wco/public/global/pdf/topics/facilitation/activities-and -programmes/natural-disaster/united-nation-model-of-agreement.pdf?db=web

1.3   Gaps and Needs

1.3.1   Licensing and Type Approval

A major issue in the cross-border movement of telecommunications is the need to comply with local standards for ICT equipment, which typically falls under the jurisdiction of telecommunications authorities. In some instances, vital telecommunications equipment has been barred from entering the country because it did not comply with local standards. This echoes the greater need for global standardization of ICT equipment, as well as published, readily-available information on standardization requirements and certification processes.

In regard to licensing, it is important that spectrum be readily available for emergency use and that appropriate allocations be in place for the specific types of services envisioned for use in the course of an emergency. An example of this is the C-band frequency spectrum used by satellite systems throughout the world, which is especially critical for emergency relief given that governments and international agencies rely heavily on this resource for emergency communications and during disaster recovery management situations.

1.3.2   Import and Export Issues

Customs issues, including delays, restrictions and duties, remain among the most widely cited legal problems in international disaster response. These can include delays of processing vital emergency communications equipment at the border or uncertain schedules for duties or tariffs applied to the incoming equipment.

Over 40 per cent of all respondents to the IFRC's IDRL survey reported having encountered problems in the importation of telecommunications equipment and other relief items in one or more disaster settings. These figures were much greater for NGO headquarters respondents, 80 per cent of whom reported problems in the importation of relief goods. Similarly, 71 per cent of humanitarian organizations responding to the 2004 Indian Ocean tsunami surveyed by the Fritz Institute, and 52 per cent of local organizations responding to the 1999 Marmara earthquake in Turkey surveyed by the Turkish Red Crescent Society reported that they had encountered delays in customs.

Figure 3: IDRL survey – per cent of respondents reporting problems with the entry of goods and equipment
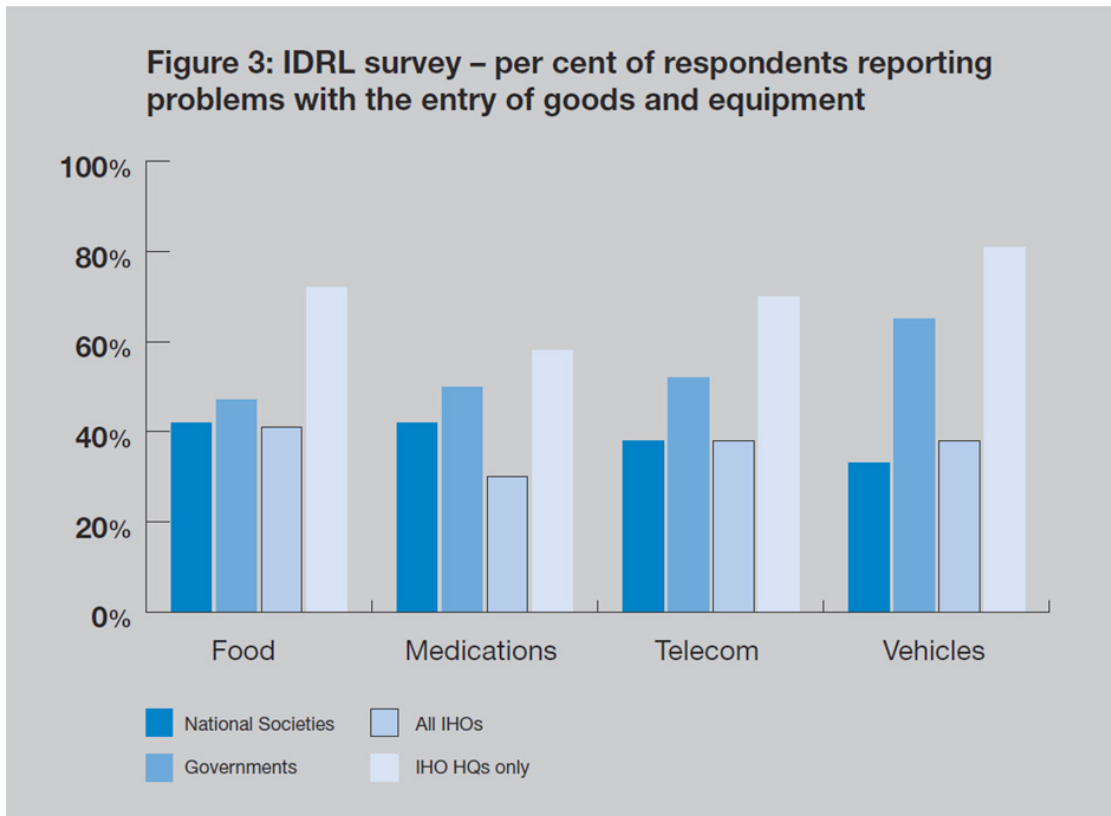
Figure IDRL survey on problems faced by respondents in regards to the entry of goods and equipment.[34]

One of the main complaints of volunteers from organizations, such as the IFRC, is the amount of paperwork needed in order to transport telecommunications equipment across borders. Volunteers have to show copious amounts of documentation several times throughout the process. In many instances, the process seems disorganized and disjointed, causing major delays for time sensitive equipment. For example, in 2002 the ICT equipment of the IFRC was trapped in customs in Mozambique for several months.

Moreover, volunteers often report re-exportation issues. Many times, when returning to their country of origin, volunteers come across multiple obstacles when attempting to bring back their personal telecommunications equipment.

1.3.3   Issues with Cross-Sectoral Collaboration and Implementation

One upfront problem often encountered is a lack of coordination in that the trans-border flow of ICT equipment during emergencies is addressed by different government agencies. For example even if the local Ministry of Communications or telecommunications regulatory agency is on board to address licensing matters for the equipment, the local agency responsible for customs and equipment importation might not necessarily be aligned. High-level recognition of the nature of the disaster and the need for a response, coupled with coordination between dissimilar government agencies are essential to ensuring the effectiveness of a response. This requires immediate access to the telecommunications regulator and their collaboration, as well as directives that remove any issues with importing ICT equipment.

In some cases, special regulations were created, but there were issues with implementation of said rules. For example, in both Turkey and Fiji special rules had been devised prior to a disaster, but

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34   For further information, see: http://www.ifrc.org/Global/Photos/Secretariat/201506/Report%20of%20the%20IDRL %20Survey%20(final).pdf

officials failed to fully implement them. In addition, in both Sri Lanka and Indonesia new rules for customs clearance of relief consignments were developed after the 2004 tsunami, and then repeatedly changed over the course of the response operations, creating confusion among customs officials and relief providers alike. Lack of training of customs officials has also contributed to such problems.

In some cases, governments applied no special rules with regard to customs regulation of disaster relief consignments, notwithstanding the urgency of the circumstances. For example, when the 2007 floods struck Bolivia, no special expedited process for the importation of goods during an emergency was in place. International organizations and NGOs were expected to abide by the same process and rules for customs clearance applicable during non-emergency situations.

Clearance delays can also have other financial consequences to relief providers. After the 1999 earthquake in Turkey, a legal storage deadline was exceeded for some relief consignments awaiting customs clearance, and as a result they were nationalized rather than cleared for distribution. After the tsunami in Indonesia, storage charges accumulated for relief cargo awaiting clearance sometimes exceeded the value of the goods themselves.

1.3.4   Effective Coordination of Relief Actors

Humanitarian relief agencies are generally not mobilized until the ETC is activated, which as previously mentioned, can take up to 48 hours. NGOs will often respond early, even before the ETC has been activated, or in the absence of ETC activation altogether. Coordination is therefore very difficult. For example, TSF was present in Ecuador during the April 2016 earthquake, even though the ETC was not activated until days later, and could not import fixed-satellite system (FSS) equipment.[35]

A factor in the activation delay of the ETC can be the difference in time zones. Since the authority to activate the ETC, the WFP, is based in Rome, there can be some delay in activation if the location of the emergency is on the other side of the world.

1.3.5   Lack of Commitment to Sign Treaties and Agreements

As previously mentioned, the provisions in agreements such as the Tampere Convention and the TAF are very extensive and can assist nations in preparing for efficient movement of communications equipment generally and in times of emergency. However, many countries have not signed on to these agreements, whether due to the obligations entailed in the conventions or for budgetary reasons. For example, the Tampere Convention is the most detailed in regard to telecommunication equipment, but it only has 60 signatories and 48 Parties. In some cases, countries voiced their reservations about this Convention. On the other hand, agreements such as the TFA and the IDRL Guidelines have many signatories, but many countries choose not to follow them.

Another reason behind this could be budgetary constraints. Some of the provisions of an agreement could result in expenditures, and in the face of an abstract emergency it could be difficult to prioritize the implementation of mechanisms that seek to facilitate the movement of ICT equipment in an emergency, thus resulting in delay. Lastly, due to the fact that so many government stakeholders are involved, it can be difficult to build a framework to coordinate between ministries.

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[35]   For more information, see: https://www.tsfi.org/en/action/emergencyresponse/251-dernieres-infos-seisme-en -equateur-la-base-ameriques-de-tsf-se-deploie

1.3.6   Implementation issues

Improvised solutions

Improvising solutions during disasters takes time and can often be hindered by lack of suitable equipment, thus losing valuable time for relief efforts. Pre-planned solutions need to be put in place to avoid time lost in improvising solutions. These solutions could also be refined with simulations.

Equipment

Sourcing the correct equipment in a timely manner is a major hurdle to solutions being put in place. A system of caches worldwide would need to be developed.

Ease of deployment

Complicated and expensive VSAT systems are often difficult to install, requiring a high level of expertise. These systems can also be difficult to transport both to and within the disaster zone. Easy to deploy communications or even low-cost automated installation systems would need to be developed.

To shorten deployment time, which is the primary objective of network recovery with substitute, a guideline which shows how to optimize the process that starts with equipment preparation in daily operation to service offering at the site of the disaster would be needed.

Network scale

For every disaster or emergency situation, communications networks should be scaled to approximately 1 000 people to include the needs of the affected population.

Granular and redundant network

Due to the improvised nature of some communications solutions during disasters, they may rely on too few points of failure. Having one or two communications points may limit the ability to communicate with the outside world. Disaster networks need to have strong redundancy and multiple terminals.

Power

In many cases, power sources have either been destroyed in the disaster or were scarce to begin with, thus limiting the use of disaster response communications. A selection of varied, flexible, pre-planned power solutions should be created to address this problem.

2.   BEST PRACTICES

In the previous section, we considered the key stakeholders, the existing mechanisms as well as the needs and gaps related to the trans-border movement of ICT equipment into affected areas during emergencies. The objective of this section is: (i) to identify concrete actions to create the proper policy and regulatory environment to facilitate the development and the smooth trans-border movement of telecommunications equipment into affected countries during emergencies, taking into consideration regional aspects; and (ii) to identify key messages to motivate policy-makers to adopt these best practice regulatory measures to provide rapid response when disaster strikes.

2.1 Concrete Actions

2.1.1 Establishing an Effective Coordination Process

International Coordination

As we saw in the previous section, there are many stakeholders involved in an emergency, and the lack of coordination can be an issue. Therefore, it is essential to increase coordination so that both the affected populations and response communities know where to turn for information and assistance after a disaster. Taking into account the key stakeholders and the overall mission of the ITU, we propose a coordination process whereby the ITU takes the lead with the ETC and NGOs to facilitate trans-border equipment access during emergencies. Since most of the key stakeholders are members of the ETC, "the ETC disaster siting representative phone conference" could be used as an arena for these discussions in order to establish an effective coordination process.

In addition, it would be prudent to include organizations such as the WCO and the WTO in the ETC so as to better coordinate the customs and trade aspects of the cross-border transit of ICT equipment.

National Coordination

Two of the major issues in national coordination are the importation and licensing of ICT equipment used by foreign or domestic agencies to respond to emergencies. These matters, which are often related, are addressed by different government agencies which can result in a lack of coordination and coherence. For example, the telecommunications authority might have a policy in place to address licensing matters for the equipment, but the customs authority might have a conflicting policy. Therefore, it is necessary to have a high-level plan in place for disaster response, such as including clear delegations and provisions for emergency communications on national broadband plans and national disaster relief efforts. This requires different government agencies at the local level to work together and create collaborative regulation regimes.

2.1.2 Establishing an Enabling Regulatory Environment

It is essential to create an enabling regulatory environment to avoid problems of delays and to ensure the smooth trans-border movement of ICT equipment into affected countries during emergencies.

General Regulatory Considerations

When examining some of the existing mechanisms in place, we can find very useful guidelines. As previously mentioned, several international organizations have provided general recommendations for facilitating the trans-border flow of ICT equipment through regulatory procedures. For example, under Article 9 (3) of the Tampere Convention,[36] the reduction of regulatory barriers may take the form of, but shall not be limited to:

- revising regulations;
- exempting specified telecommunication resources from the application of those regulations during the use of such resources for disaster mitigation and relief;
- pre-clearance of telecommunication resources for use in disaster mitigation and relief, in compliance with those regulations;
- recognition of foreign type-approval of telecommunication equipment and/or operating licenses;

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[36] For further information, see: http://www.itu.int/en/ITU-D/Emergency-Telecommunications/Documents/Tampere_Convention/Tampere_convention.pdf

- expedited review of telecommunication resources for use in disaster mitigation and relief, in compliance with those regulations; and

- temporary waiver of those regulations for the use of telecommunication resources for disaster mitigation and relief. As mentioned in the 2015 SSDM Report[37], national governments should establish a regulatory environment to facilitate preparedness and establishment of robust and redundant infrastructures. When doing so, consideration should be given to the following:

- Incorporating disaster risk reduction and disaster communications considerations into ICT development plans.

- Adopting simple, transparent and non-discriminatory authorization procedures and licensing conditions for ICT services, including new technologies.

- Facilitating testing and type approval requirements by recognizing foreign type approvals.

- Ensuring spectrum plans and strategies associated with information and communication technology for development (ICT4D) take account of diverse radiocommunications requirements for supporting disaster management.

- Developing procedures to efficiently address interference considerations and coordination requirements when allocating spectrum.

- Easing requirements for landing rights or restrictions on use of specific ICT resources to maximize the number and kind of networks available to rural communities prior to, and during, times of crises.

- Removing requirements for in-country gateways if none are needed for the functioning of portable terminals or handsets.

- Facilitating the trans-border flow of end-user equipment.

- Facilitating (and sometimes creating) partnerships, such as private-public partnerships, with aid donors, governments, ministries and NGOs.

- Collaborating with stakeholders in the development of policies and regulations.

- Considering power supplies and how to ensure continuity of communications when the existing main power supply has been interrupted or is unavailable.

- Establishing customs duties and possible waivers of duties for equipment imported in emergency response scenarios.

- Analyzing import and export rules and their impact on rapid import of equipment.

- Ensuring that tax regimes are aligned with national ICT development goals, including those relating to closing the digital divide.

- Ensuring that taxation of airtime or use of ICT services for development or disaster management purposes does not serve as a deterrent to adoption by citizens and other non-government stakeholders.

The 2015 SSDM Report[38] also highlighted the following best practices to enable rapid deployment of ICT for disaster response:

- Developing licensing procedures and class or temporary licenses for short-term or emergency use, for all applicable ICT services. This includes elimination of local incorporation and capitalization requirements and performance bonds as a condition for issuance of a license for short-term or emergency use.

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[37]   See 2015 Report of the SSDM Working Group on Policy, Regulation and Advocacy SSDM, page 10, available: http://www.itu.int/net/itu_search/index.aspx?cx=001276825495132238663%3Anqzm45z846q&cof=FORID%3A9&ie=UTF-8&q=SSDM

[38]   *Ibid*, pages 10 and 11.

- Establishing license-exempt regulations for ICT services for disaster response, including satellite dishes and handsets operating in accordance with the relevant Resolutions or Recommendations adopted by the ITU-R.

- Increasing the ability of foreign service providers or operators to provide services in a country in times of disaster response, including assessing whether licensing regulations can be streamlined to cover only the service provider and not the ICT or satellite system itself.

- Designating a government contact in the local government who has the authority to authorize temporary importation during a disaster event. This would include spectrum and equipment licensing for technologies such as cellular, satellite, broadband, wireless, HF and LMR. Having clear points of contact is critical when a disaster strikes.

Specific Regulatory Recommendation

As previously mentioned, governments often have several different agencies that act as stakeholders during the process of deploying emergency telecommunications, such as telecommunications and customs authorities as well as foreign affairs ministries and transport agencies. Each of these groups has specific recommendations that they can enact to make the process of allowing emergency communications equipment in during emergency situations much easier.

Telecommunications Authorities

Licensing

One of the main actions that telecommunications authorities can take to facilitate the trans-border flow of emergency telecommunications is to facilitate the licensing process routinely applied apart from emergency situations. This can be done by either temporarily reducing licensing regulations or having more flexible licensing regulations in the first place. Some examples of best practices include the licensing process under the European Conference of Postal and Telecommunications Administrations (CEPT), the South African regulatory regime, and the GVF template.

The CEPT license allows radio amateurs to travel to and operate from most European countries without obtaining an additional licensee or permit. Individuals who are not citizens of CEPT countries can receive this license if certain requirements of the CEPT European Radio Committee (ERC) are met by their countries of origin.[39]

South Africa has a horizontal licensing approach which allows for more flexibility in licensing and also allows operators to more easily deploy their telecommunications equipment.[40]

The GVF also has a template for a license application that can be used by telecommunications authorities to simplify the application process.[41]

One way of disseminating best practices is through a regional approach. Each region could identify individual country governments and regulators in the region that offer favorable regimes and then propose a template for other countries to follow. Nevertheless, understanding the business case, political context and connectivity needs and requirements in each country is essential.

Type Approval

According to the ITU, standards enable global communications by ensuring that countries' ICT networks and devices are speaking the same language. In emergency situations, communications technology can be arriving from different countries that may clash with the recipient country's type

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[39]   For further information, see: http://www.arrl.org/cept
[40]   For further information, see: http://www.gov.za/sites/www.gov.za/files/37119_gon953.pdf
[41]   For further information, see: https://gvf.org/media/com_casestudies/documents/gvf%20satellite%20policy %20guidelines%202013.pdf.

ITU's Standardization Ladder[1]

Source: ITU-T: "Bridging the standardization gap — ITU–T Research Project: Measuring and Reducing the Standards Gap," December 2009. The report can be downloaded at www.itu.int/oth/T3202000001/en

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[1]   For further information, see: http://www.itu.int/net/itunews/issues/2010/02/27.aspx

approval. Mechanisms such as the Tampere Convention call for universal standardization to prevent this from happening.

The ITU's Telecommunications Standardization Sector (ITU-T) is a useful resource for guidelines on standardization. ITU-T Study Groups assemble experts from around the world to develop international standards which act as defining elements in the global infrastructure of ICTs.[42] ITU uses a consensus-based approach, where the position of each country and company involved is taken into account. The graph below explains how countries can get involved in this process.

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[42]   For further information, see: http://www.itu.int/en/ITU-T/about/Pages/default.aspx

In the absence of standardization, a recognition mechanism of foreign type-approval of telecommunication equipment should be put in place when it is used for disaster mitigation and relief.

Under the ITU's Global Mobile Personal Communications by Satellite Memorandum of Understanding (GMPCS MoU) framework, some MSS terminals are authorized to affix the "ITU GMPCS MoU mark" as a sign of compliance with this framework.

Import and Export Issues

As addressed earlier in Part III, the importation of telecommunication equipment can be restricted due to customs issues, mainly because of the large amount of paperwork needed to transport telecommunications equipment across borders and the disorganization of the process. This can be further complicated by the concurrent competence of several governmental agencies such as the ICT ministry, telecommunications regulatory agency, and customs and import agencies.

In order to lessen customs delay and bring more coherence and consistency to the system, governments should be encouraged to establish a clear delegation of authority plan in advance of an emergency. Ideally the plan would offer a single window for telecommunications operators and service providers in emergency situations, with simplification of necessary paperwork into a single document/process.

Pre-positioning

Having a plan in place in the event of an emergency is the first step in establishing an effective relief effort. The pre-positioning and pre-deployment of equipment is therefore an essential part of disaster management and relief. Although the requirement is of immediate deployment, use and operation, delays in shipping and transportation may often occur. For example, during earthquakes airports may get damaged, thereby curtailing flight operations and delaying delivery of emergency ICT equipment. It is therefore of utmost importance that not only the equipment to be deployed be readily available, fully functional, and ready for immediate use, but also that first responders are trained and equipped to use it. An effective disaster response and management plan requires immediate deployment and use: time should not be wasted on transportation, shipping and training.

In order for this to happen seamlessly, there should be national policies and regulations put in place to recommend and encourage pre-positioning, training, and pre-deployment of subscriber equipment.

According to the 2016 SSDM Report, national policies and regulations should facilitate and support the following important elements that are part of disaster response, management and relief:

- "Developing partnerships with donors willing to provide assistance through international conventions such as the Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations or under a bilateral agreement and arrangement to provide and support ICT capabilities.

- Creating a favorable policy and regulatory environment that enables the timely and efficient deployment of services. A strong ICT infrastructure cannot function effectively unless it exists within a framework that facilitates the pre-deployment and pre-positioning of the ICT equipment.

- Establishing and maintaining an up-to-date database of equipment suppliers and service providers. The partnership models for pre-positioning and pre-deployment for disaster management and subsequent development, training of personnel and risk awareness can be established and implemented through varied business arrangements and corporate social responsibility."[43]

The 2016 SSDM report also argues that the "involvement of the private sector in disaster management activities and operations helps in mobilizing resources under joint actions, sustainability/corporate social responsibility as well as knowledge transfer. There are different kinds of partnership models

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[43]   For further information, see: http://www.itu.int/en/ITU-D/Documents/SSDM_2016_report.pdf

that are contemplated as well as implemented for activities related to pre-positioning and pre-deployment of equipment earmarked for disaster management and disaster relief. Existing arrangements between international donor agencies, satellite industry (consisting of satellite operators and their service distributors and partners), the international and national NGOs, and the telecommunication industry in general at different levels, have proven to be successful and effective (e.g. NetHope, TSF, emergency.lu)."[44]

Customs Authorities

Both the WTO and the WCO have provided extensive recommendations on relief consignment border processes during emergency situations. In particular, the WCO, through many of the mechanisms described earlier, has recommended the following specific practices for its member customs authorities:

- Simplify associated documentation; waiver of duties, taxes and fees on consignments to approved organizations;

- Provide relief from import duties and taxes and from economic prohibitions and restrictions for a blanket of relief consignments; and

- Waive or reduce inspections, or as an alternative, rapid clearance through preclearance processes; and inspection and release outside business hours and/or at a place other than a customs office as necessary to minimize delay.[45]

The WTO, through its TFA, requires that Member States implement to the extent possible a specific practice, "the single window" for a single submission of all documents and/or date required by customs authorities to simplify procedures. This is also a way to ensure that information that has already been supplied should not be requested again, except in exceptional circumstances.[46]

Foreign Affairs Authorities

Another important stakeholder in the cross-border transportation of emergency communications equipment is the donor, origin, or transit countries. The United States' Department of State, which is often a donor entity, has provided the following recommendations to ensure that donor countries get their equipment to the location of an emergency.

- Donor countries should analyse their own ability to offer direct ICT assistance to foreign governments following a disaster.

- Donor countries should support and share guidance on its international best practices for host country ICT impact, needs, and capability assessments.

- Donor countries should cooperate with other countries and multilateral organizations to improve the availability of communications technologies in emergencies through programmes to implement best practices by first providing country case studies and recent innovations to partner countries, and then by fostering development of improved internal disaster ICT preparedness capacities in these countries.

- Donor countries should work with host governments to accomplish ICT resource planning in advance of emergencies, including pre-positioning of ICT equipment and information/collaboration services and training of personnel, by countries and organizations.[47]

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44   Ibid.
45   For further information, see: http://siteresources.worldbank.org/WBEUROPEEXTN/Resources/268436
      -1322648428296/8288771-1453462012900/9871283-1463682297629/trade-humanitarian-emergencies-final-web
      .pdf
46   Ibid.
47   For further information see: https://www.state.gov/e/eb/adcom/acicip/disasterresponse/179203.htm

Transport Authorities

Transportation authorities have a small but important role to play in the transit of communications equipment for emergency situations. There are several things transport authorities can do to ensure that that ICT equipment is effectively transported to the location of the emergency:

- Having a plan in place for the swift deployment of relief consignments.

- Reduce cost of holding items that have not passed through clearance.

- Reduce regulations on types of automobiles that pass through the country.

2.1.3   Existing Best Practices[48]

Very few telecommunications laws actually make provision for fast-tracking of any sort and for any reason. The standard provision for emergencies in telecommunications laws is that national authorities may commandeer a communications network in the event of an emergency.

a)   To address national security issues of the sort that makes the government feel imperiled as to its own continuance rather than any sort of concern for the people.

B   The takeover is not intended prima facie to help those national authorities actually assist in humanitarian cases (for the reason set out in a).

In those few cases in which the national law does provide for fast-tracking, the procedure for a "fast-track" application (not called by that actual name anywhere) is exactly the same as for routine applications. In short, there is little or no gain in time afforded by such language (there might be a gain in time afforded by a concerned telecommunications regulator). Most of the examples are with governments that are doing well in governance generally, emergency or not, and can basically process applications expeditiously.

Below are selected examples of best regulatory practices.

The Americas

A few of the Caribbean nations have provisions similar to the ones laid out here for Anguilla and Barbados, where clearly some common approach has been adopted, under which "special licenses shall be for 10 days only and not renewable".

Anguilla – Specific Emergency Provision

The revised *Telecommunications Act of 2004* provides that the regulator of Anguilla may grant a special license where it determines that an emergency or other exigent circumstance exists.

The special license shall be for a term not exceeding 10 calendar days and may be renewed for a good cause.[49]

Barbados – Specific Emergency Provision

The *Telecommunications Act of 2002, as amended in 2006,* provides that when the Governor-General has declared a state of public emergency, importation of telecommunications equipment by a non-governmental organization or a non-state entity does not require a license and is not subject to payment of any duties or taxes, when granting assistance in disaster mitigation or emergency relief.[50]

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[48]   References for this section have been provided by the ETC, the UN, NGOs, Hyde and Associates, David Hartshorn of the GVF and Jennifer Manner of Echostar.

[49]   For further information, see: http://pucanguilla.org/Downloads/T006-Telecommunications%20Act.pdf

[50]   For further information see: http://www.barbadosparliament.com/htmlarea/uploaded/File/Bills/Bill(Amendment)_Telecommunications_Act_2006.pdf

The definitions of "non-governmental organisation" and "non-state entity" are provided in Tampere Convention.

In addition, the *Telecommunications Act of 2002* provides that in case of an emergency, a special frequency license may be granted. However, an application form must be submitted, the relevant fee must be paid, and the duration of the license shall not exceed 10 calendar days. The Ministry shall decide at its discretion the circumstances in which the special use of frequencies will be permitted.

Honduras – Specific Emergency Provision

The *Telecommunications Law General Regulation of 1995* provides that in special cases, the the Comisión Nacional de Telecomunicaciones (CONATEL) may grant temporary licenses for purposes such as humanitarian assistance and relief in emergency situations. The duration of these licenses shall not exceed 90 days and may be renewable.[51]

Panama

Panama is currently building the Humanitarian Logistics Center (the Hub) – the UN logistics base for the Americas. The Hub will occupy an area of 6.12 hectares within the Panama Pacifico International Airport, formerly the Howard Air Force Base, near the Panama Canal. The Hub will include three warehouses, an administration building, training rooms, parking space, cargo handling areas, and a heliport.[52]

Africa

Uganda

Article 86 of the *Uganda Communications Act of 2013* gives power to the Uganda Communications Commission during a state of emergency, as proclaimed by the President under Article 110 of the Constitution, in the interest of public safety to:

(a)   direct any operator to operate a network in a specified manner in order to alleviate the state of emergency;

(b)   take temporary possession of any communication station within Uganda, and any apparatus which may be installed and used in the station, for a specified period not exceeding six months.[53]

South Africa

This is the first country to implement a blanket consumer VSAT license in response to the Yahsat consumer product. This is one of the best regulatory tools to reduce the digital divide and could be seen as an example for other regulatory regimes in the region.

Asia, Pacific and Middle East

There are several UN logistics bases in the Pacific region, including Australia, Tonga, Papua New Guinea and other smaller countries. These must be incorporated into the pre-positioning of satellite equipment to allow a quick response.

Australia – Specific Emergency Provision

The *Radiocommunications Act 1992* provides that a person is not liable for operating or possessing a radiocommunication device in case of emergency situations.This Act also provides that a person

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[51]   For further information see: http://www.conatel.gob.hn/doc/Regulacion/leyes/REGLAMENTO_GENERAL.pdf
[52]   For further information, see: https://www.unops.org/panama
[53]   For further information, see: http://www.ucc.co.ug/files/downloads/UCC%20Act%202013.pdf

is not liable for causing a radio transmission to be made by a non-standard transmitter, or having a non-standard device in his or her possession in case of dealing with an emergency.[54]

Bangladesh – Specific Emergency Provision:

Pursuant to its powers under the *Bangladesh Telecommunication Regulations Act 2001, as amended,* the Bangladesh Telecommunication Regulatory Commission makes special provision for the use of satellite phones in cases of humanitarian disasters.[55]

Japan – Specific Emergency Provision

Radio Law no. 131 of 1950, as amended by Law 21 of 2005, in Article 52, allows for the operation of radio stations beyond the scope of an existing license in situations of emergency, urgency or distress.[56]

Kyrgyzstan – Specific Emergency Provision

The *Regulation on Issuing Permission to Use Radiofrequencies* provides that in the event of emergencies ,natural disasters case of emergency or natural disaster, or the supply of security measures during State events, the authorized Regulator may authorize use of radio frequencies without following the proper procedure.

The Philippines – Specific Emergency Provisions

The Philippines has a number of emergency provisions. Nevertheless, for the purposes of this report, the *Memorandum Circular No. 05-06-2003* will be the only provision examined here due to its specific mention of UN agencies:

> "Provided that specialized bodies of the United Nations (UN) and other international governmental organizations accredited to the Government of the Republic of the Philippines may be allowed direct access to any international fixed and/or mobile satellite systems subject to compliance to all of the following conditions:
>
> a. The equipment in the Philippines is used to access the global network of said UN body or of the international governmental organization;
>
> b. The UN body/international governmental organization shall not provide commercial satellite access to the public;
>
> c. The service is not being provided by existing duly authorized Philippine public telecommunications entity;
>
> d. The space segment capacity requirements cannot be served by existing Philippine satellite system operators; and
>
> e. The Department of Foreign Affairs attests to the affiliations of the agency to the UN or international governmental organization and endorses its application."[57]

Vietnam – Specific Emergency Provision

Article 23 of *Decree No 24 (detailing number of articles of Ordinance on Radio Frequencies) of 2004* provides that individuals may temporarily use unlicensed radio frequencies and transmitters in

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[54]   For further information, see: https://www.legislation.gov.au/Details/C2009C00036
[55]   For further information, see: http://www.btrc.gov.bd/sites/default/files/instructions_for_the_usage_of_satellite _phone_in_bangladesh.pdf
[56]   For further information, see: http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/Resources/laws/2003RL.pdf
[57]   For further information, see: http://region7.ntc.gov.ph/images/LawsRulesAndRegulations/MC/WDN/MC_05-06-2003 .PDF

emergency cases. However, notification should be submitted immediately to the Radio Frequency Department under the Ministry of Post and Telematics when conditions permit.[58]

United Arab Emirates

The International Humanitarian City (IHC) logistics base that is located in Dubai is one of the largest equipment stores in the world, covering 120 000 square meters.

IHC is a secure, state-of-the art and cost-efficient space, serving as a warehouse and providing office space as well as meeting, conference and training facilities accommodating up to 300 individuals.

IHC services many humanitarian and international organizations, including members of the ETC such as the World Food Programme, the International Federation of Red Cross and Red Crescent, UN OCHA, and UNHCR among others.[59]

2.2   Key Messages

From the above, it is essential that policy-makers adopt these best practice regulatory measures to provide rapid response when disaster strikes. There are a few key messages that can help regulators ensure an easy deployment of emergency communications in the event of a disaster.

2.2.1   Pre-Existing Telecommunications Infrastructure

ICTs should not just be a priority in times of need but should also factor into a country's socio-economic development strategy. The establishment of domestic telecommunications infrastructure policy will ensure that a country is not over-reliant on equipment coming from abroad.

National Broadband Plan

- A National Broadband Plan (NBP) can be a catalyst for cross-ministry and cross-sectoral collaboration that is crucial not only for the development of broadband, but also for an effective disaster relief strategy.

Technology diversification

- The NBP should ensure that the number of communications media is diversified in the case that one sort of technology is out of use. For example, satellite can be used if terrestrial systems are destroyed in the event of an earthquake.

Network scale

- Deployment of >20 systems should be envisaged. The new consumer class terminals are 3rd generation, and are robust and offer high performance with speeds often in excess of 50Mb/s down and 10Mb/s return.

Granular redundant network

- With the use of multiple low-cost consumer terminals, then the disaster response network has built-in redundancy and offers multiple points for external communications for the population and disaster-relief workers.

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[58]   For further information, see: http://www.moj.gov.vn/vbpq/en/lists/vn%20bn%20php%20lut/view_detail.aspx?itemid= 8161
[59]   For further information, see: http://www.ihc.ae/

2.2.2 Pre-Existing and Holistic Disaster Communications Plan

Countries are encouraged to establish a pre-planned solution for communications deployment and emergency communications equipment importation in case of an emergency*.* This plan should include identifying lead authorized agencies, expedited procedures and processes in cases of emergencies, and the circumstances under which agencies would be empowered to enact such facilitation steps. The plan should also encourage simulations, exercises and rehearsals, both for use of pre-positioned equipment and for the inter-agency and administration action to be undertaken, thereby strengthening vulnerable communities' resilience to disasters.

Re-tasking existing networks

- Part of disaster planning should be to create a clear and expedited regulatory environment for satellite communications networks that would support emergency communications. These VSAT networks can be independent of local power and are easily re-tasked at times of disaster, adding resilience.

- Through their membership, the GVF will establish a database that will list existing satellite communications resources in countries where their members operate. The database will then be made available to ETC members. This will enable emergency workers to have quick in-country access to both resources and expertise.

Pre-positioned Equipment

- Having pre-planned solutions and pre-positioned equipment combined would greatly increase the reactiveness of any solution. A study of the UN logistics network would allow us to create a basic network of equipment caches ready for deployment. Examples of the depots, some of which have already been mentioned above, are:

  - Panama

  - Dubai

  - Pacific region (several storage locations)

End-to-end ownership

- There should be one entity responsible for each satellite communications system. Local area network (LAN) systems such as Wi-Fi should be the responsibility of the humanitarian team on site. Every system deployed in emergencies must be complete, simple and intuitive so the installation and activation is independent of external issues.

Easy to deploy systems

- The use of "consumer" terminals provides a good compromise in disaster communications. These terminals are typically easy to transport and often small (measuring <1m in diameter). They can be easily installed without any formal training or expertise. For example, 50 per cent of Eutelsat's Tooway satellite terminals across Europe are installed by the end client after watching a 20-minute YouTube video. The terminals can often be installed within one hour. Examples include the Newtec Tooway systems used in the Ebola crisis and the current European refugee crisis. The majority of mobile satellite terminals are also easy to carry, deploy and use.

- Recommendation ITU-T L.392[60] introduces an approach to improve network resilience against disasters and to assist network recovery after disasters by physically mobilizing units and facilities that package movable and instantaneously-deployable resources for ICT. The movable and deployable ICT resource unit (MDRU) which is referred to ITU-T L.392 is a collection of ICT resources that are packaged as an identifiable physical unit, movable by any of multiple

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[60] https://www.itu.int/itu-t/recommendations/rec.aspx?rec=12837

transportation modalities, act as a stand-in (substitute) for damaged network facilities, and reproduce and extends their functionalities.

2.2.3   Ideal Practices

Below are recommended best practices that when implemented across the globe would enable robust disaster response and development networks.

- Providing for blanket licensing for satellite user terminals. The ability to obtain a single authorization for technically identical user terminals has reduced the time and administrative efforts associated with licensing multiple user devices, bringing services to users more rapidly.

- Cost-based administrative fees. Adoption of administrative-based fees has resulted in lower costs to consumers.

- Regulations that are technology neutral. Technology neutral regulatory regimes, including for spectrum, have ensured in many countries that the services that are needed by consumers are readily available on a cost-effective basis.

- Universal service funding that is technology and competitively neutral. Competitively and technology neutral universal service regimes have been able to ensure that consumers, even in the most remote locations, have available broadband services.

- Temporary authorizations to meet emergency requirements. In order to address emergencies, countries have successfully created quick and simplified mechanisms to enable satellite service during emergencies.

- Access to adequate spectrum.

- No foreign ownership restrictions to land satellite traffic. In order to have sufficient capacity to meet user needs, governments with competitive satellite services markets have not imposed foreign ownership limits as a requirement to land traffic.

- Ensuring that satellite services are protected from interference from existing and new services that share frequency bands. In order to protect important satellite services, regulators have successfully adopted appropriate protection criteria that ensure both existing and new services can operate.

3.   THE TOOLKIT CHECKLIST

Building upon the Overview contained within Section 1 and the Best Practices identified in Section 2, this toolkit includes a checklist intended to assist administrations in facilitating the smooth trans-border movement of telecommunications equipment into countries affected by an emergency through assessing their current readiness and identifying new processes and regulatory measures to be established. This checklist functions as a starting point, and should be used to evaluate the types of specific practices that should be developed pursuant to the needs of each administration.

Additionally, this checklist focuses exclusively on promoting efficient trans-border movement of telecommunications equipment, which is only one aspect of an overall emergency preparedness strategy. For information on other aspects of national emergency preparedness, administrations are encouraged to refer to the Emergency Communications Checklist contained within the Final Report of ITU-D Study Group Question 5/2 for the 2014-2017 Study Period,[61] which is included as an annex to this report.

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[61]   http://handle.itu.int/11.1002/pub/80ec6eea-en

The checklist is divided into four categories:

1) **Preparedness** – Putting a plan and policy in place prior to emergency/disaster situations

2) **Policy Guidelines and Tools** – Establishing regulatory procedures and policies to promote an efficient response

3) **Communication** – Ensuring all involved entities are informed and coordinated

4) **Pre-positioning and Training** – Have equipment in country and provide regular training

3.1 Preparedness

Success during and after an emergency can be ensured by adequate preparation before the emergency. This involves both deployment of adequate and robust facilities, institutions, and capabilities to meet daily needs, and development of a comprehensive disaster communications plan.

In the first instance, administrations should be planning for and building communications infrastructures designed to meet the needs of their population and to withstand expected environment conditions. Additionally, to promote rapid importation, deployment and operation of communications equipment following a disaster, administrations should put procedures in place prior to anything happening in order to fast-track or waive licensing, type approval and importation requirements that might otherwise cause delay.

Each country should have one clearly defined lead organization assigned primary responsibility for coordinating communication among various federal and local government agencies and relief organizations. Information about special conditions and procedures should be communicated among all involved agencies prior to an emergency or disaster striking. For instance, a waiver for type approval and licensing requirements by the national ICT regulator needs to be communicated to the authority for importation so that they do not require these as a pre-requisite for importation.

Guiding Questions:

a) Does your administration have a national broadband or ICT modernization plan in place?

b) Does your country have an ICT disaster preparedness plan in place?

c) Has your administration identified a lead office or agency to coordinate disaster communications and emergency response?

d) Does the lead office or agency have the necessary legal authorities to perform its designated function?

e) Does the ICT disaster preparedness plan foresee rules and policies to allow for a fast-track or waiver of licensing, type approval and importation requirements?

f) Has the ICT disaster preparedness plan been communicated to all relevant agencies?

g) Is there a process in place for review and updating of the ICT disaster preparedness plan, both on a regular basis and on an extraordinary basis after a disaster?

3.2 Policy Guidelines and Tools

A set of special rules and regulations should be considered, which would be put into place prior to a disaster/emergency situation, and activated once an emergency situation has occurred.

These rules and regulations should be aimed at making the process of importation, trans-border movement and operation of equipment both time-efficient and minimally burdensome.

3.2.1   Licensing and Type Approval

As indicated in Section 1.3.1 of Part III, licensing and type approval can be obstacles to moving ICT equipment quickly and efficiently into the area affected by an emergency. Local standardization and certification requirements, which may have important consumer benefits in normal times, can slow down or prevent vital equipment from entering a country. Additionally, spectrum should be readily available for service providers, relief agencies, and others coming to lend assistance during emergencies.

The reason for radiocommunication licenses is foremost to prevent interference among spectrum users. While this is critical during times of normal operation, during emergencies, critical communications may rely on service beyond those used on a daily basis. Assuming that frequencies have been allocated according to a regional table of allocations, and that the lead agency has reliable information about which communications networks are operational in the country, the risk of interference will be very small.

Many countries may have licensing requirements that could slow down deployment of equipment to aid emergency relief efforts. For example, countries may require VSAT terminals to be individually licensed or to be covered by a blanket license held by a locally-registered entity. Additionally, type approval and equipment certification requirements could delay the use of new models of communications equipment at critical times. Therefore, it is advisable to either waive licensing requirements or put a fast-track procedure in place to obtain frequencies.

Guiding Questions:

a)   Has your administration created frequency allocations, in conformance with the international table of allocations, for critical satellite communications frequency bands, including in the L, C, Ku, and Ka bands?

b)   Does your administration's national broadband plan or ICT development strategy incorporate disaster risk reduction and disaster communications considerations?

    a.   Does the plan includes steps taken to ensure sufficient access to emergency broadcast services?

    b.   Does the plan include review of this checklist as a component in composing a roadmap to improve national emergency preparedness?

c)   Has the administration considered reduction of regulatory barriers as contemplated under Article 9(3) of the Tampere Convention, including:

    o   Exempting specified telecommunication resources from application of regulations during the use of such resources for disaster mitigation and relief?

    o   Pre-clearance of telecommunications resources for use in disaster mitigation and relief?

    o   Recognition of foreign type-approval of telecommunication equipment and/or operating licenses?

    o   Expedited review of telecommunication resources of use in disaster mitigation and relief?

    o   Temporary waiver of regulations for use of telecommunications resources for disaster mitigation and relief?

d)   Is there a special fast-track or waiver of licensing procedure in place in your country for telecommunications equipment for disaster relief efforts? (Section 1.2 of this Regulatory Toolkit and Guidelines details several existing tools and mechanisms that administrations might consider adopting.)

o   Does the licensing procedure for short-term or emergency use include elimination of local incorporation and capitalization requirements and performance bonds as a condition for issuance of a license?

o   Does the licensing procedure include license-exempt regulations for ICT services for disaster response, including satellite dishes and handsets operating in accordance with the relevant ITU-R Resolutions or Recommendations?

3.2.2   Import and Export Issues

In Section 1 of this report, customs issues, including delays, restrictions and duties were cited as some of the most common reasons for delays in international disaster response.

Complaints about importation issues include the amount of paperwork needed to move equipment across borders and a seemingly disorganized and disjointed process, which result in critical delays. One of the underlying problems seems to be a lack of cross-sectoral collaboration between the agencies involved (e.g. between the Ministry of Communications and the Ministry/Agency responsible for import and export).

In order to make the importation and trans-border movement of ICT equipment as efficient and speedy as possible, it is critical to have fast-track procedures in place and to have proper coordination amongst various agencies.

Guiding questions:

a)   What types of licenses are required for importation of ICT equipment?

o   What is the usual processing time for ICT equipment to be moved into the country?

o   Which entities are involved in the importation of ICT equipment?

o   Is there a process for communication/cooperation amongst the various agencies?

o   Is the importation process transparent and publicly available?

o   Are there special restrictions on equipment using encryption?

b)   Is there a fast-track process in times of emergency?

o   What is the process for importation during an emergency?

-   Waiver

-   Simplified/fast-track license?

o   Which entity declares the state of emergency and informs all involved agencies of the fast-track importation process?

o   What is the importation time under the fast-track process?

o   Is this fast-track importation process transparent and publicly available?

c)   Are there any licensing requirements to return the ICT equipment outside of the country following its usage during the emergency?

o   Are there special restrictions on exporting technology that uses encryption?

3.3   Communication

As detailed in previous sections of this report, there is a wide range of international and regional stakeholders involved in relief efforts. Administrations should evaluate each of these organizations and establish channels of communication with relevant organizations in advance of a specific emergency. Established lines of communications, with appropriate redundancies built-in, will help ensure

that responders are bringing the right equipment into the country, that they have a means to seek assistance with any challenges they encounter, and that the equipment is being deployed to the right locations and organizations on the ground.

Robust channels of communications should be established in advance with all organizations that will be relevant to bringing needed telecommunications equipment into a country to support disaster response. These channels of communication should, at a minimum, connect the national agency identified as the lead for emergency response communications with an appropriate point of contact within each relevant organization. To ensure the reliability and effectiveness of communications, multiple methods of communication should be established (e.g. e-mail, phone, and physical). Backup points of contact should be identified, in case of coordination challenges during a disaster. Additionally, these communications channels should be reviewed and reconfirmed regularly to ensure continued effectiveness. This could be done as a component of regular training and drills.

Communications channels internal to an administration are just as essential as external communications. When a lead agency for coordination of disaster communications and emergency response is identified, as recommended above, it is critical that this designation be communicated clearly through the government. All agencies that are relevant to emergency response—including departments responsible for transportation, customs, foreign affairs, and telecom regulation, among others—must be made aware in advance of the need to coordinate through the lead agency. Additionally, the responsibilities and authority of that lead agency should be clearly defined and communicated throughout the government.

Guiding questions:

a) Has your country identified the stakeholders and points of contact at the local, regional, and international levels that will assist in emergency response?

b) Specifically, has the administration established channels of communications with international organizations, including:

   o The Emergency Telecommunications Cluster and participating organizations such as the International Telecommunication Union, World Food Programme, and UN Office for the Coordination of Humanitarian Affairs;

   o The International Federation of Red Cross and Red Crescent;

   o Télécoms Sans Frontières;

   o NetHope;

   o Team Rubicon.

c) Has the administration identified any relevant regional organizations and established channels of communications with appropriate relief or emergency communications efforts within those organizations? These organizations might include, among others:

   o Association of Southeast Asian Nations (ASEAN)

   o European Commission

   o Arab League

   o Coordination Center for the Prevention of Natural Disasters in Central America (CEPREDENAC)

   o Caribbean Community

   o African Union

   o Commonwealth of Independent States

d) Has the administration identified relevant national agencies or other domestic administrative units that will be involved in bringing telecommunications equipment into the country? These might include, among others:

- o Telecommunications Regulatory Authorities
- o Customs Authorities
- o Ministries of Foreign Affairs
- o Domestic Relief or Emergency Management Agencies
- o Ministries of Transportation

e) Has the administration communicated the details of the national disaster recovery plan to each of the relevant national ministries, agencies and other domestic administrative units, ensuring that each understands its respective role and responsibility?

f) Has the administration identified other national administrations that may be interested in partnership or have established emergency response assistance programmes (e.g. emergency. lu)?

g) Has the administration identified relevant network operators and service providers, including domestic telecommunications providers and international satellite operators, who may be involved in providing emergency communications services?

3.4 Pre-positioning and Training

3.4.1 Pre-positioning of ICT Equipment

Pre-planning and pre-positioning of ICT equipment in the field are one of the most effective steps in enabling a fast response time following a disaster. This avoids delays in importation and transportation. Ideally, ICT equipment is strategically placed throughout a country and first responders are trained and equipped to use it. Rather than having ICT equipment being idle during normal times, it would be beneficial to use it for other socio-economic uses, like school networks for example.

Guiding Questions:

a) Has the administration outlined a plan for pre-positioning of ICT equipment for disaster recovery operations?

- o Does the pre-positioning plan foresee placement of ICT equipment in strategic areas throughout the country?
- o Is ICT equipment already pre-positioned in the country today and if not, what is the expected time-frame for doing so?
- o Does the ICT equipment have an alternate (socio-economic) purpose during non-disaster times? If so, which one?
- o Can any of the existing ICT equipment in the country be utilized for disaster response purposes in case of a disaster?
- o Which entity is responsible for the plan for pre-positioning of ICT equipment and for its implementation?

b) Do first responders know where the pre-positioned equipment is located or where imported ICT equipment can be picked up?

- o How is the pre-positioning plan being communicated? Do first responders have access to this information?

o   Who ensures that the equipment is well-maintained, any batteries are fully charged, and the ICT equipment is ready to be used?

o   Is there a process in place for regular tests of the pre-positioned equipment to ensure its functionality?

3.4.2   Training of First Responders on Usage of ICT Equipment

While the availability of ICT equipment is crucial for fast disaster response, the equipment will only be of use if first responders and others who will operate the equipment are trained and familiar with the usage of the equipment and if it is well-maintained and fully charged.

Guiding Questions:

a)   Does the administration organize trainings for usage of the pre-positioned or foreseen ICT equipment?

o   Are local staff and officials that might be called upon to set up and operate equipment immediately after an emergency trained on the use of the equipment?

o   Does training take place in regulator intervals?

b)   Does the administration conduct drills/simulations to ensure first responders and others understand their roles and responsibilities during disaster response?

o   Are drills conducted on a national level, with the involvement of the lead agency for disaster communications, to simulate major disasters and the necessary coordination?

o   Are drills conducted on a local/regional level to ensure that local first responders are appropriately trained and prepared?

o   Are drills conducted within individual bureaus, offices, or buildings to promote awareness and preparation among individual citizens?

ANNEX

Emergency Communications Checklist contained within the Final Report of ITU-D Study Group Question 5/2 for the 2014-2017 Study Period.

PART 2 – Emergency Communications Checklist

The Emergency Communications Checklist outlines the types of activities and expected decision points that could be considered for inclusion in a National Disaster Communications Plan.[1]

I.	Preparedness

a) Administration and responsibility setting

Establishment and clarification of roles and responsibilities within a government and with stakeholders is one of the most basic – but critical – parts of developing a disaster communications management plan. Points of contact should be identified within the various agencies, and decision-making authority and responsibilities in key areas should be clarified. In cases where there may be overlapping expertise or responsibility within an agency, or across multiple agencies, governments should work in advance to clearly determine leads and lines of responsibility to save time and improve the overall response when disaster strikes.

Government roles and responsibilities

☐ What government agency/ministry is responsible for disaster management and response overall in the country?

☐ What other ministries are involved/should be involved in disaster preparedness and response? What are their respective roles or mandates? What is the role of the communications regulator and ministry? Is the Communications Ministry or Regulator a participant in the activities of the National Disaster Management Authority?

o What authorities (legislation or mandates) enable each ministry/agency to respond to certain aspects of disaster response that will help guide identification of leads and roles and responsibilities?

☐ Who leads on particular aspects of response in each of those agencies in the event of a disaster? Does that lead vary depending on the type of disaster? How is disaster response coordinated within a ministry and organization? Who are the backup points of contact in case the disaster impacts the lead person? What authority/decision-making ability does each point of contact have and in what area/subject matter?

☐ How does the lead disaster management ministry coordinate with other relevant ministries across government? How frequent does the core contact group coordinate, meet or conduct drills/exercises between disasters? Who maintains the point of contact list, and how often is it updated? Does it contain all possible contacts both for home and work?

☐ How is telecommunications/ICT prioritized or addressed within the country's disaster management framework?

☐ How is disaster response management responsibility or authority managed between central government and local or provincial/state governments?

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[1]   SOURCE: ITU-D Study Group 2 Question 5/2 report on "Utilization of telecommunications/ICTs for disaster preparedness, mitigation and response", 2017: http://handle.itu.int/11.1002/pub/80ec6eea-en
CONTACT: Information about the ITU-D Study Groups can be found at www.itu.int/itu-d/study-groups (e-mail: devsg@itu.int, +41 22 730 5999 (hotline)).

I. Preparedness

b) External coordination

Disaster response involves many actors/stakeholders such as the central government, local communities, state/provincial authorities, public safety officials, the private sector, relief and technology organizations, hospitals, citizen groups and civil society organizations, UN, and foreign governments. In order to support an effective and coordinated response, a disaster communications plan should incorporate these external actors (stakeholders), and they should be actively involved in preparedness activities.

☐ Ensure coordination processes, define partnerships, and establish points of contact with external organizations. These may include:

- Private telecommunication entities (carriers and equipment)
- Other ministries
- Local and state/provincial government agencies
- NGO relief and response organizations; hospitals
- United Nations/ ITU
- Foreign governments/military
- Volunteer technical communities
- Amateur radio
- Citizen and community groups; civil society organizations

☐ Who are the actors in your country that have been involved in or could improve/enable disaster response? Which foreign/international actors could support the response? How are citizens and local communities involved in disaster response planning; how are citizens informed about disaster response plans?

☐ Who are the points of contact in each organization and how will the government engage/exchange information with those organizations before, during and after a disaster? What types of information or situational awareness can be shared by these stakeholders? What types of information or situational awareness can be provided to these stakeholders to facilitate a response?

☐ How will you coordinate with these actors/stakeholders when developing a disaster response plan? How will you coordinate with these actors in any preparedness activities? How frequent will those communications or interactions be? What is your stakeholder engagement strategy or plan? Does your government have any requirements or legislation governing stakeholder engagement, public outreach or advisory committees?

☐ Do external international actors require credentialing to enter the affected areas or visas to enter into the country when a disaster occurs? Have expedited processes been established in advance for both the entry of experts and communications equipment in times of disaster?

☐ How are persons with disabilities and specific needs included in preparedness activities; how are these specific needs taken into account in planning?

c) Training and exercises

Once roles and responsibilities are defined, exercises are the best way to prepare teams to respond effectively to an emergency. Exercises should be designed to engage team members and get them working together to manage the response to a hypothetical incident. Exercises enhance knowledge of plans, allow members to improve their own performance and identify opportunities to improve capabilities to respond to real events with further training and education.

I. Preparedness

Exercises are a great method to:

- Evaluate a preparedness programme;

- Identify planning and procedural deficiencies;

- Test or validate recently changed procedures or plans;

- Clarify roles and responsibilities;

- Obtain participant feedback and recommendations for programme improvement;

- Measure improvement compared to performance objectives;

- Improve coordination between internal and external teams, organizations and entities;

- Validate training and education;

- Increase awareness and understanding of hazards and the potential impacts of hazards;

- Assess the capabilities of existing resources and identify needed resources.*

Some considerations are provided below:

☐ Is training or certification mandatory for officials designated to support a response effort? Consideration should be given to what type of training or certification may be needed for each type of personnel, and how regularly it should take place.

☐ Do exercises include both internal stakeholders and external, non-government partners? Consideration should be given to how regularly exercises take place among various stakeholders. Are drills conducted to ensure that the public is aware of disaster response plans and can recognize and react to a warning (for example, how to respond if an early warning alarm is triggered?).

☐ Are telecommunications/ICT exercises conducted separately and/or as part of more comprehensive national disaster exercises; how do national disaster exercises incorporate the role and priority of addressing telecommunications/ICTs?

☐ Which communications exercises are held? (E.g. early warning system testing, or regional/national outage responses and restoration.)

☐ Are exercises tailored to the types of disasters known to your country? I.e. extreme weather, flood, earthquake, wildfires, humanitarian responses or cyber-attack?

☐ Which agencies or ministries oversee and participate in communications-related exercises or drills? What are their roles? What is the role of local communities or governments?

☐ How are stakeholders, such as communications operators and suppliers, and technology focused organizations/associations engaged in disaster response or disaster communications exercises? Are they part of the exercise planning process?

☐ Are outage reporting requirements of carriers exercised? Do carriers follow a uniform reporting process, and know which contacts to report outages to and how?

☐ Is online training available for stakeholders prior to exercises?

☐ How is feedback collected after an exercise to help improve procedures or performance? Which stakeholders would you request feedback from? Is an "after action" report done, and is it circulated to participants?

d) Infrastructure and technology

Telecommunications/ICTs are a critical tool facilitating disaster early warning, relief and response. One objective of a disaster communications plan is to help ensure the continuity or restoration of communications in the event of a disaster. Below are some considerations related to infrastructure and technology when developing and implementing a disaster communications management plan during the preparedness phase.

I. Preparedness

☐ Technology Inventory or Assessment. A wide range of technologies and services can and should be used to support disaster communications response. When developing a plan, it is helpful to take stock of the technologies used by stakeholders (government, responders, citizens) to communicate on a daily basis, and which are often used in times of emergency. Such technologies could include emergency dispatch services, amateur radio, first responder systems including radio and public safety broadband, television and radio broadcasting, terrestrial mobile networks, wireline voice networks, broadband networks, satellite networks, and social media.

☐ Redundancy and resiliency planning; ensuring operational continuity and preparing for continuity and restoration of primary communications channels to minimize outages.

☐ Power. Available and pre-positioned power sources (for infrastructure and individuals); what backup power resources are available (for operators? For governments? Responders? Citizens?) and how are these resources prioritized for restorations? Are processes in place to expedite or facilitate fuel delivery for communications network generators? Are there guidelines in place for critical facilities to have backup power supplies?

☐ Identification and Training of key public and private personnel; regular training should take place for those personnel who will need to use and maintain/test emergency communications equipment. Local communities and local staff should also be considered for training in the use and maintenance of such equipment.

☐ Identifying critical sites/priority sites for restoration; what mechanisms are in place to prioritize critical sites for restoration efforts? How are these priority sites communicated to, and discussed with operators?

☐ Establish situational awareness and reporting mechanisms (public/private sector cooperation), such as a communications-focused advisory committee. How is information about business continuity plans exchanged with government officials?

☐ Spectrum and frequency planning; licensing/authorizations, including expedited frequency and type approvals, emergency spectrum management and authorization, expedited licensing approvals and possible temporary/emergency authorities. Has there been an assessment of any regulatory or policy barriers to entry or operation of needed equipment for disaster relief or restoration of networks?

☐ Priority and expedited customs procedures for approved/authorized incoming communications equipment.

☐ Consideration of emergency and network resilience/redundancy needs/requirements in national telecommunications development plans (e.g. broadband or infrastructure development plans).

I.   Preparedness

☐   Human Factors: preparedness plans should take account that many personnel or their families may be directly impacted by a disaster and will be operating under stressful circumstances.

☐   "Harmonized" outage reporting: to increase situational awareness and more rapidly identify needed resources for telecom/ICT restorations or to provide appropriate information to the public, authorities can identify terminology and a common format for reporting of outages to ensure a common understanding of status and requirements.

☐   Use of "Big Data" analytics to support disaster prediction and forecasting or projecting possible impact or risk; and to support decision-making and allocation of resources. What data sets are available for government or public use to aid in disaster response and risk reduction planning? What policies are in place to ensure that data can be shared by operators with responders in a way that protects individual privacy, while enabling response? What collaboration or public-private partnerships could support improved use of data in support of disaster preparedness?

☐   Establishing Emergency Alerting Systems:

1)   Mechanisms and technologies (broadcast, mobile, M2M/sensor networks; remote sensing technologies; big data; integration of delivery mechanisms, social media). What technologies and applications are best suited for the environment, geography, type of disasters and method of communication needed by citizens? Are multiple platforms used to ensure information gets to those affected? How should existing alert systems adapt to new technologies while also ensuring the broadest delivery of alerts? How to incorporate social media platforms?

2)   Alert content (language, CAP, accessibility considerations). What officials are empowered to authorize the sending of an alert? What consideration is given to ensuring citizens are informed, while avoiding "alert fatigue"? What information is placed in an alert and what standard is used to avoid confusion?

3)   Enabling policies – expectations of carriers or broadcasters, policies and procedures for preparing, approving, and disseminating messaging.

4)   Regular/ongoing national and regional alerting exercises and system testing. Who is involved in testing? How often will tests take place?

5)   Public education: working with local communities and civil society to recognize early warnings and act on them.

6)   How do alerts and early warning systems take account of those most vulnerable to disasters such as persons with disabilities including radio and television announcements or alerts and information distributed through SMS, emails, etc.

☐   Accessibility Considerations

1)   How are members of vulnerable populations consulted regarding their needs? How are capacities of vulnerable populations developed for example through awareness-raising programmes or trainings? Are information materials, including websites or apps, accessible?

2)   Are accessibility and usability of ICTs considered in projects? What strategies and mechanisms are used to promote accessible ICTs including legislation, policy, regulations, license requirements, codes of conduct, and monetary or other incentives?

3)   Are information materials provided targeting vulnerable populations? Are public awareness campaigns conducted in multiple accessible formats in different languages along with sensitized resource persons to impart the contents of these packs to persons with disabilities and other vulnerable groups?

4)   Following a disaster, are disaster response efforts reviewed to assess challenges for vulnerable groups, discuss lessons learned, and undertake efforts to fix any issues in ICT-based disaster management services?

* United States Department of Homeland Security (https://www.ready.gov/business/testing/exercises)

II. Response, Relief and Restoration

a) Communications Channels and Information Sharing

Telecommunications/ICTs are tools to support exchange of critical information between those affected by a disaster, including citizens and those participating in response, relief and restoration activities. While operational continuity or ongoing availability of the underlying technologies is important, when developing a response plan it is also important to understand the channels of communication and types of information that need to be shared. Flexibility is important as needs quickly evolve during a disaster.

- □ What Information is being communicated? What types of information are needed (and could be provided) by certain parties? (E.g. network outage status, safety and location of family members or key personnel, meteorological and seismic information, the location of shelters, damage and infrastructure assessments (including status of roads or transportation systems to allow for movement of supplies or personnel); rules and regulations associated with emergency equipment approvals and operation; response coordination, including what supplies or personnel are needed to support relief and restoration efforts and who are able to provide support?)

- □ Who is communicating? What are the channels of communication? Who has priority to communicate?
- • Intra-governmental communications;
- • Government to UN or non-governmental organizations (NGOs) that provide relief and response;
- • Interactions between Government and UN/NGO responders and private sector (telecom/ICT providers);
- • Government to public; UN/NGOs to public;
- • Public to government/UN/NGO community;
- • Private sector to public;
- • Private sector to private sector;
- • Citizen to citizen.

- □ Are backup or diverse/redundant means of communication in place in case of outages? Has consideration been given to whether a disaster may render a planned communication tool un-usable and what redundant means of communication might be used? (E.g., if the expectation is to communicate via conference call, how will accommodation be made if phone networks are down?) Are portable communication units available to establish temporary connectivity?

- □ Ensuring accuracy of data/verifying information. Consideration should be given to how to verify and report/disseminate information before acting upon it to ensure the most efficient use of resources and improve coordination and decision-making.

- □ Understanding cultural norms and behaviors. Different cultural groups may communicate in different ways, or trust information from different types of sources. Consideration should be given to linguistic and cultural behaviors and how they affect communication.

- □ Social Media: How can social media be used as a tool for collecting data and sharing information for two-way communications? How do relief and response authorities respond to requests for help received via social media? What partnerships can be established to best use social media tools? How do citizens use social media for information gathering and exchange during a disaster as compared to other tools?

- □ Establishing mechanisms for communicating across and with (CwC) diverse groups; sharing information/situational awareness/reporting.

b) Infrastructure and Technology

In evaluation of damage and reestablishment of networks, communication must happen rapidly between those assessing the damage, determining priority of restoration efforts and directing assistance, and those providing emergency communications services. Determinations should be made in advance, whenever possible, about points of contact for functions such as technical coordination and sharing of network outage information. In addition, there should be backup (redundant) networks in place for government and first responder use in order to facilitate restoration efforts, such as dedicated government communications networks.

II. Response, Relief and Restoration

Evaluation of damage / ICT assessment

☐ What is the role of the communications ministry/regulator regarding reporting damage or outages to public or commercial telecommunications networks and enabling continuity and restoration and how is that role defined (through a license, etc.)?

☐ Who will be the designated ministry/regulator or point of contact to collect, analyse, and react to/report/release information regarding damage to networks? What information and analysis from operators should be obtained and utilized? How will these information needs be communicated in advance to operators?

☐ For those networks that are commercial or public, are there reporting requirements already in place that would establish a process, format, and timeline for submitting evaluations? If not, can government set up a coordinating mechanism by which to establish expectations and receive information?

☐ Will initial damage assessments be connected to award of disaster recovery funding?

☐ For government networks, which inter-agency coordination and information-sharing processes will need to be established? Will public or private networks be more suitable/reliable for this purpose?

☐ Are there policies in place that consider communications network status, needs, conditions and requests, and that enable the maintenance and restoration of the following communications capabilities? What process is followed to determine the priority of each restoration?

• Local agency land mobile radio systems;

• Emergency dispatch services;

• Status of terrestrial systems/public mobile systems;

• Broadcast radio/TV stations;

• Amateur radio services;

• In-country VSAT provider availability;

• Pre-positioned emergency MSS equipment;

• Internet services.

Establishment of emergency connectivity

☐ Which emergency telecommunication partners will be contacted in the event of a disaster? What information will be provided to them, and how will they be contacted?

☐ How will offers of assistance from foreign governments, humanitarian organizations or the private sector be received and processed?

☐ Who are points of contact for authorization of incoming equipment or to allocate requested frequencies? Is there a mechanism to ensure timely coordination with local operators to avoid interference?

☐ Which emergency ICT resources will be pre-positioned and at which priority locations, and by whom? Who has authorization to activate or distribute? How will these pre-positioned resources be maintained and tested? What consideration is given to fuel supplies for power generators and restoration of telecommunication networks?

☐ Ensure coordination between telecommunications teams and the central disaster management institutions to meet needs. Consider which networks and communications technologies are most used by first responders (e.g. land mobile radio vs. mobile data services), or by the public to reach emergency services, and could therefore prioritized for immediate restoration or additional maintenance support. How can government agencies facilitate private sector restoration of networks?

☐ Where will emergency connectivity be first established? Consider whether there are previously determined disaster recovery sites that will require immediate connectivity, or whether connectivity will be required for mobile disaster recovery centers.

Smart Sustainable Development Model (SSDM)

II.   Response, Relief and Restoration

Maintenance and reestablishment of networks

☐ Is there a source of expert advice and assistance for government agencies with respect to restoring government networks and telecommunication infrastructures? In cases where government uses private networks, will restoration be carried out by government or private sector technicians? Consider whether there are commercial networks in place to use as backup for closed government networks in the event of disruption. Does government have mechanisms or emergency procedures in place to facilitate customs clearance or import of equipment needed for restoration of critical networks or to facilitate entry of any external expert personnel needed to restore and rebuild networks?

☐ Is there a process in place to routinely test networks designed for emergency communication?

☐ Are commercial or public network operators encouraged to have a business continuity plan in place? How frequently are restoration plans exercised and updated?

☐ Is there a plan for reporting on progress of network restoration? How frequently are these plans exercised?

☐ Is information related to network outages and restoration activity safeguarded and classified appropriately to mitigate security concerns?

☐ What is the single government point of contact for sharing communications outage and restoration information with other stakeholders? Having one point of contact can prevent duplication of effort on the operators' part.

☐ Has a forum for operators to share information and coordinate possible assistance been established? Consider the group's mandate, operational procedures or guidelines, and ways in which to utilize this forum.

☐ Consider whether a procedure could be put in place to allow the government to share sensitive threat information with network operators.

☐ What procedure is in place to assist operators with critical items such as physical access and expedited fuel deliveries?

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SSDM ADVISORY BOARD MEMBERS – 2018

Chairman of the Advisory Board
Hon. John Nasasira

Hon. John Nasasira is the current Chair of the Advisory Board for Smart Sustainable Development Model (SSDM) Initiative.

He has been in active politics for many decades. He was first elected to Parliament in February 1989 and served continuously as Member of Parliament until he retired in May 2016.

Prior to joining politics, Hon. Nasasira worked with several international firms of consulting engineers engaged in the design and supervision of buildings, water, airports, roads and bridges projects in Eastern African and Middle East (June 1976-February 1989).

Between 1989 and 1991, he served as Deputy Minister of Works. From 1991 until 1992, he served as the Presidential Advisor on Public Works. In 1992, he was appointed Deputy Minister of Works, Transportation and Communications, serving in that capacity until 1994.

From 1995 until June 1996, he served as Minister of Agriculture, Animal Industry and Fisheries. In this same period, he was one of the delegates to the Constituent Assembly that drew up the 1995 Uganda Constitution.

In June 1996, he was appointed Minister of Works, Transport, Housing and Communications and served in that position for 15 years. Between May 2011 and May 2013, he served as the Government Chief Whip and later as Minister of Gender, Labor and Social Development. From June 2013, he served as Minister of Information and Communications Technology until June 2016 when he retired.

Hon. Nasasira holds a BSc (Hons) Degree in Civil Engineering from the University of Nairobi. He became a Chartered Engineer (UK) in 1985 and for many years, he was member of engineering institutions in UK, USA and Kenya. He is a Fellow of Uganda Institution of Professional Engineers and served as its patron for 21 years.

H.E. Salim M Alozainah

H.E. Salim M Alozainah
Chairman and Chief Executive Officer
Kuwait Communication and Information Technology Regulatory Authority (CITRA)

Mr. Salim Alozainah is the Chairman and Chief Executive Officer of the first Kuwaiti Communication and Information Technology Regulatory Authority (CITRA). The State of Kuwait leadership trust in Mr. Alozainah and his keenness on developing the ICT sector in Kuwait has earned him a key leading position in the Communications Regulatory Committee that was entrusted to put the ground work for establishing that authority. His efforts in the Regulatory Committee, among the other members, has been crowned by the establishment of CITRA on November 2014. His appointment as the Chairman & CEO of CITRA came as a clear endorsement of his leadership and his capacity to take such a challenging mandate.

Between 2011 and 2014, Mr. Alozainah has been assigned many ministerial positions and served as the Minister of Communications; Minister for Electricity & Water; Minister of Housing Affairs; and Minister of Municipal Affairs, where he has shown strong leadership and clear progressive and development agenda.

Before his appointment to lead CITRA on November 2014, Mr. Alozainah has participated and chaired many prestigious national Kuwaiti committees such as the International Telecommunication Union (ITU) Plenipotentiary Conference Committee; the International Cable Network Committee; the Telecom Companies Supervisory Committee; and the national Emergency Committee.

In the corporate world, apart from his governmental and political posts, Mr. Salim Alozainah is a respected and well-seasoned veteran of the telecom industry and among other positions, he has worked as a key member of the establishing committee of company GBI, in its submarine telecom cable infrastructure project.

Mr. Alozainah holds an electronic Engineering degree from Wentworth Institute of Technology in the USA and has attended many senior leadership programs around the world.

The dedication, hard work and determination, synonymous of Mr. Alozainah; coupled with his international perspective, give him a strong drive to lead CITRA in achieving its regulatory objectives and contributing to a diversified Kuwaiti economy beyond the carbon era; and establishing CITRA's institutional presences in a country well-known of its strong institutions like the State of Kuwait.

Mr Flavien Bachabi

Chairman, ARCEP-BENIN

Flavien Bachabi has been chairing the Board of the Regulatory Authority of Benin (Arcep-Benin) since January 2017. In this capacity his responsibility includes providing needed leadership to regulate the domestic and international communications in Benin, ensuring fair and competitive market rules and encouraging the highest and best use of the spectrum. Prior to taking up this part-time regulatory assignment he was the Managing Director of Africa Broadcast Satellite (Pty) Ltd (ABS), looking after the African market for ABS. Prior to that, Mr. Bachabi served as Chairman and Chief Executive Officer of Intelsat Operations S.A., as well as Vice President of Business Operations and Intergovernmental Initiatives at Intelsat S.A., and head of Intelsat's corporate headquarters in Luxembourg, between January 2011 and September 2014. In this capacity, his responsibilities included oversight of all major business operations, joint venture agreements and regulatory filings. He was responsible for managing new business activities with intergovernmental entities and development banks. His prior positions included: Regional Vice President for Africa and Head of Intelsat Africa (Pty) Ltd., where he was responsible for building Intelsat's leading position in Africa with the Continent's premier service providers, Regional Vice President for Africa and Middle East and Group Director, Africa sales. Prior to joining Intelsat in 1996, he spent more than 15 years in senior management roles with the Benin Telecommunications administration, where he led both domestic network and international services. He also has served on the Board of Directors of the Multinational School of Telecommunications of Dakar (ESMT), the African Telecommunications Union (ATU), and the Regional African Satellite Communications Organization (RASCOM). Since 2013 Mr. Bachabi has been a member of the Board of Directors of the Smart Sustainable Development Model initiative of BDT/ITU.

Mr. Bachabi has over 30 years of experience with communication and technology companies, and he earned degrees in Mathematics and Physics from the University of Benin, as well as a Master of Science Degree in Telecommunications Engineering from the Technical Institute of Electronics and Telecommunications of St. Petersburg (LEIS).

Eng. Khalid Ahmed Balkheyour

President and CEO of ARABSAT

A graduate of California State Polytechnic University Pomona, obtaining his Master Degree in Electrical Engineering in 1981.

Mr. Balkheyour has over 35 years of experience in the Telecommunication field starting with the Saudi Ministry of PTT later known as Saudi Telecommunication Company (STC). He was the Vice President of Operations and Maintenance.

He held the position of Executive Vice President for Marketing and Sales in Lucent Technologies, formerly known as AT&T, from 1999 to 2003.

In May 2003 he was selected to head the Arab Satellite Communications Organization (ARABSAT). He is also the Chairman of Hellas-Sat Board. Also, he is the Vice Chairman of Thuraya satellite company. Mr. Balkheyour is also member of many other Board and advisory Board.

Mr Jean-François Cazenave

Chairman and Co-founder of Télécoms Sans Frontières (TSF)

Télécoms Sans Frontières' Chairman co-founded the NGO in 1998 with Monique Lanne-Petit, TSF's Executive Director.

Before dedicating his life to TSF, Jean-François had already founded two other 'traditional' humanitarian organisations. He participated in interventions in Iraq (Kurdistan) in 1991, during the war in Croatia the same year, and more than 50 times in Bosnia Herzegovina between 1992 and 1996, then in Albania in 1997 and 1998. With TSF, Jean-François Cazenave led humanitarian calling operations and telecom support activities to the benefit of the NGOs and the United Nations agencies in Kosovo and Turkey (1999), in El Salvador, Peru, India and Afghanistan (2001) and in Syria and Iraq (2003) and from 2003 to 2013, in all major humanitarian emergencies (Syria, Mali, The Philippines, Thailand, Sri Lanka, Lebanon, Nicaragua, Haiti, Kyrgyzstan, Libya, Madagascar to name but a few).

Jean-François Cazenave has managed TSF's emergency actions in over 70 countries worldwide, assisting more than 800 NGOs, UN agencies, rescue teams and hundreds of thousands of affected civilians, offering them free calls. TSF teams deploy on average 350 days per year.

On April 4th 2010, Jean-François Cazenave was decorated *Chevalier de La Légion d'Honneur*, by decree of the President of France, for his decades of work in humanitarian relief. Appointment to the *Légion d'Honneur* is the highest decoration in France.

Mr. Cazenave held positions as a civil servant and senior executive at the French public administration of postal services and telecommunications (PTT). From 1995 to 2001 he was city Councilor of Pau.

Ms Patricia Cooper

Vice President, Satellite Government Affairs
Space Exploration Technologies Corp.

Patricia Cooper leads SpaceX's regulatory, policy and licensing activities in the U.S. and overseas to support the company's development of a space-based broadband constellation.

Prior to joining SpaceX in 2015, Patricia served as Vice President of Government Affairs & Policy at Intelsat, heading up the company's U.S. and international government affairs and lobbying activities. For the previous seven years, she led the Satellite Industry Association (SIA) as its President, directing policy and advocacy efforts for the trade association in regulatory, export control and national security arenas. She has held senior positions in the International Bureau of the U.S. Federal Communications Commission (FCC), including as Senior Satellite Competition Advisor and Chief, Regional and Bilateral Affairs Branch. Patricia had developed international market strategy and practices for two startups, Internet infrastructure company Core Express Corporation and PanAmSat Corporation, a disruptor in the early satellite services market. She began her career at the U.S. Department of Commerce as an International Trade Specialist focused on the satellite industry and Latin America.

Patricia earned a Master's Degree in International Economics from the School of Advanced International Studies at John Hopkins University and graduated from Kansas State University with Bachelor's Degrees in Political Science and German.

Mr Gonzalo de Dios

Associate General Counsel, Intelsat

Gonzalo de Dios is an Associate General Counsel at Intelsat and is responsible for legal and regulatory matters affecting the company's satellite operations, including foreign authorizations and permits, international regulatory activities affecting the company's spectrum holdings, international government relations, as well as legal support for operational, corporate, contractual, business development, strategic acquisitions and other matters. Mr. de Dios has extensive experience and knowledge in the telecommunications arena.

Mr. Timothy S. Ellam

President
International Amateur Radio Union

Timothy St. John Ellam QC, FCIArb is a partner at McCarthy Tetrault LLP and co-chairs the firm's International Arbitration Practice Group. Mr. Ellam advises clients over disputes relating to intellectual property, related commercial matters and with international arbitrations. He has appeared as senior litigation counsel in patent, licensing, copyright and technology related trials, arbitrations and hearings. Recent cases where he was lead counsel are recognized in *Chambers Global* (2011-2016) and *Lexpert* (2010). He has also been recognized by *Benchmark* and *Acritas* as a Litigation Star. He frequently works with the Firm's London office on significant international arbitration matters and on litigation proceedings in the High Court of Justice (Commercial Court).

Mr. Ellam is also a Solicitor Advocate (Higher Courts – Civil) in the Law Society of England and Wales and holds Rights of Audience in the Higher Courts in that jurisdiction. He is an IBA Fellow in International Legal Practice; a distinction granted by the International Bar Association and the College of Law of England and Wales in 2005, becoming the first lawyer in Canada to be awarded this designation. In 2014, he was appointed Queen's Counsel.

Mr. Ellam is the co-author of *Dispute Resolution in the Telecommunications Sector*, published by the International Telecommunications Union and the World Bank. He is a recognized speaker in a number of areas relating to intellectual property including privacy and data protection and been a speaker and moderator at a number of ITU Telecoms. Mr Ellam is also President of the International Amateur Radio Union (IARU), a sector member of the ITU. Created in Paris, France, in 1925 the IARU has been the watchdog and spokesman for the world Amateur Radio community since 1925. Currently located in Newington, CT USA, the IARU is an UN recognized NGO consisting of over 160 national amateur radio societies around the world. He has represented the IARU at a number of ITU meetings since 2001.

Mr Simon Gray

Senior Vice-President for Humanitarian Affairs
Eutelsat

Simon Gray is the Vice President of Humanitarian Affairs for Eutelsat and he is also a member of the ITU Advisory board for developing disaster comms strategy world-wide. He has been elected by the other 8 satellite fleet operators to coordinate the Satellite charter with the UN for the satellite industry. Simon coordinates the ESOA and GVF humanitarian working groups. Simon has been elected a Director of the GVF, for over 7 years . He has worked in the satellite industry for over 20 years and while at Eutelsat has been responsible for the largest training program ever undertaken by a satellite operator. His role in Eutelsat has also encompassed developing a new class of satellite terminal, equipment approval, mobile Apps, training courses & training tools.

Mr Christian Hyde

Director, Hyde & Associates

Christian Hyde is a Canadian-trained lawyer based in Paris, France. In over 20 years of practice, he has specialized in regulatory and commercial issues in telecommunications law worldwide. Mr Hyde heads the firm of Hyde & Associates, with offices in Tallinn (Estonia) and Paris (France). The firm is a pioneer in addressing practical regulatory issues, with unparalleled experience in field work in challenging jurisdictions. The firm today represents global users and suppliers of telecommunications, with a strong focus on the humanitarian sector and has represented United Nations agencies, global NGOs, international agencies and diplomatic missions for close to two decades. Mr. Hyde is a member of the bars of Ontario (common law) and Quebec (civil law). He is fluent in seven languages.

Ms Areewan Haorangsi

Secretary General of the Asia-Pacific Telecommunity (APT)

Ms. Areewan Haorangsi has taken up her post as Secretary General of the Asia-Pacific Telecommunity (APT) on 9 February 2015 after being elected by the General Assembly of the APT in 2014. She was re-elected in 2017 to continue her second term from 9 February 2018 for the next three-year term.

Before joining APT, Ms. Haorangsi was the Deputy Permanent Secretary of the Ministry of Information and Communication Technology of Thailand (MICT). Her long tenure with MICT included responsibilities for a variety of portfolios, i.e. Principal Adviser for Foreign Affairs, Executive Director of Policy and Strategy Bureau, Acting Principal Adviser for Communications, and Executive Director of International Affairs Bureau. She began her career in the Ministry of Transport and Communications (MOTC), Thailand in 1981 as a Technical Transport Officer. She was the Head of International Transport Group before joining MICT in 2003.

Ms. Haorangsi brings to her post over three decades of extensive experience both in national and international stage in MOTC and MICT. Her international experience included serving as Vice-Chairman of the Management Committee of the APT, Chairman of a Working Group under ASEAN Telecommunication and IT Senior Officials' Meeting, and Chairman of Telecommunication and IT Sectoral Working Group under the ASEAN Coordinating Committee on Services. She had been Head of Thai Delegation to various international meetings under ASEAN, APEC, APT, ITU, etc.

Born in 1959 in Thailand, Ms. Haorangsi holds a Bachelor of Arts in Political Science (International Relations), Chulalongkorn University, Thailand and a Master of Business Administration (Management of Technology), Asian Institute of Technology, Thailand.

Ms Candace Jonhson

International telecommunications expert and entrepreneur

Candace Johnson is an international telecommunications expert and entrepreneur. Currently, she is Vice President, NeuStar, Inc. She is co-initiator of the Astra satellite system and SES Global, one of the world's largest satellite systems in the world. She is also founding President of Europe Online, the world's first and largest independent Satellite Broadband Network, and founder of Loral Cyberstar-Teleport Europe, Europe's first independent private trans-border satellite communications network. Ms. Johnson is also founding President of the VATM, the Association of Private Telecom Operators in Germany and founding President of the Global Telecom Women's Network (GTWN). She has continued to be a long-time Member of the Board of Directors of all of these companies and organizations at various times throughout the years.

Ms. Johnson is also President of Johnson Paradigm Ventures (JPV). JPV is a principal founding share-holder with AXA, Caisse des Depots, Bayerische Landesbank, and the SPEF in Sophia Euro Lab, Europe's first trans-border early-stage investment company based in Sophia Antipolis. Ms. Johnson is a Founding Member of the Board of Directors of Sophia Euro Lab. JPV is also a principal founding shareholder in Ariadne Capital, "Architecting Europe.net" based in London as well as a founding Member and Member of the Board of the Sophia Business Angels in Sophia Antipolis France.

In her personal capacity, Ms. Johnson is a minority owner of FMN, a German telephone manufac-turing company, and a member of their Supervisory Council. She is also a minority owner of Alpha Com, a wireless data manufacturing company. Ms. Johnson is also a member of the Advisory Board of numerous European and US ventures as well as being a Member of the Board of Governors of Theseus MBA Institute, the University of Haifa, Sabanci University, and a Senior Enterprise Fellow for the University of Essex.

Ms. Johnson was also Vice President Worldwide of Iridium and brought it into the GSM MoU, the ITU and ETSI. She also was Director of Marketing for the German manufacturing company Fuba.

Ms. Johnson has been featured in articles in Time Magazine, the Financial Times, the Economist, Le Monde, WirtschaftsWoche, and Manager Magazin, to name a few. She has been decorated as an Officer of the Bundesverdienst Kreuz and the Couronne de la Chene respectively by the German and Luxembourg governments for her work in deregulating and privatizing telecommunications and media across Europe. She is also the second recipient ever of the United Nations-sponsored World Teleport Associations' "Founders Award" and has been named by Time and Fortune Magazine as one of the 50 most powerful women in Europe. Ms. Johnson has also received the "Lifetime Achievement Award" along with Vinton Cerf and Tim Berners Lee from the World Communication Awards, the prestigious global telecoms organization 2002. Ms. Johnson holds Masters Degrees with Honors from the Sorbonne and Stanford Universities and a Bachelors Degree from Vassar College.

Ms Christine Leurquin

Vice President Institutional Relations and Communications, SES S.A

Christine Leurquin is VP, Institutional Relations and Communications at SES S.A. Positioning the Company at high level within the EU and other European institutions, such as European Union, EEAS, EDA, ITU, ESA, African Union, ACP Secretariat or OECD. She regards policies and regulations, provides political support, and engages in setting-up R&D and institutional projects. She follows the European Institutions' political issues and debates of interest to her company, especially those concerning defence and security, space, crisis management, development cooperation, satellite broadband and 5G. She is also the key institutional person in the company as regards the GNSS projects such as Galileo and EGNOS. She has 30+ years of experience in the satellite telecommunications field in Europe. She was instrumental in the creation of ESOA, the EMEA Satellite Operators Association in 2002. She holds positions in a variety of trade associations and is today Vice-Chair of the 5GIA, the European 5G Infrastructure Association.

Ms Donna Bethea-Murphy

Senior Vice President, Global Regulatory Policy and Development, Inmarsat

Donna Bethea-Murphy is Senior Vice President of Global Regulatory Policy and Development for Inmarsat. In this capacity she leads the company's domestic and international regulatory policy activities. She has been appointed to the Federal Communication Commission's **Communications Security, Reliability and Interoperability Council** and National Telecommunications and Information Administration's **Commerce Spectrum Management Advisory Committee and National Telecommunications Information Admiration's CSMAC**. Donna also serves as Vice Chair and Founding Member of the ITU Smart Sustainable Development Board and Focal Point on the ITU/ UNESCO Broadband Commission for Sustainable Development. She was previously Chair of the USITUA Board.

Preceding Inmarsat, she was Vice President of Regulatory for Iridium where she led all of the company's global technical regulatory activities, including those related to policy, standards, licensing, International Telecommunication Union (ITU) and spectrum. She was previously Senior Director of Spectrum Policy at PanAmSat Corporation. Prior to joining PanAmSat, she was Director of Technology and Regulatory Affairs for AirTouch Communications, where she developed and implemented technical regulatory policy for terrestrial wireless services. Prior to her position at AirTouch, she was responsible for international and domestic spectrum policy at the FCC. She holds a BS in Electrical Engineering from Clemson University.

Philipp Paulwell C.D, M.P

Mr. Phillip Paulwell C.D. M.P. attorney-at-law is the former Minister of Science, Technology, Energy and Mining and is the Member of Parliament for the constituency of Kingston East and Port Royal. He is currently leader of Opposition Business in the House of Representatives and Opposition Spokesman on Mining and Energy.

Prior to his latest appointments, Mr. Paulwell served as a Government Minister in the People's National Party administration between January 1998 and September 2007 as Minister of Commerce, Science and Technology. During the past administration, 2011 - 2016, he served as Minister of Science, Technology, Energy and Mining and Leader of Government Business in the House.

His appointments to the Executive began in 1995 when he was appointed to the Upper House as a Senator where he served until 1997. He served as Minister of State in the Ministry of Industry, Investment and Commerce during the same period.

He entered the Lower House as a Member of Parliament in 1997 after winning the election in the constituency of Kingston East and Port Royal. His electoral victory in December 2011 marks the beginning of his fourth consecutive term of political representation in this populous section of the Kingston Metropolitan Area.

Among his many achievements as a Government Minister and Member of Parliament, Mr. Paulwell is credited with the liberalization of the telecommunications sector. In 2000 he was the recipient of the Gleaner Honour Award for implementing historic measures to break the 25-year telecommunications monopoly and introduce competition in the sector. He was also recognized by international organizations including the International Telecommunications Union as well as the Caribbean Telecommunications Union. In 2015, he was accorded the Order of Distinction in the Rank of Commander (CD) for over 20 years of distinguished service to Parliament.

During h.is tenure as Minister with portfolio responsibility for Energy, he has been credited with giving momentum to the diversification of Jamaica's Energy sources and the promotion and facilitation of millions of dollars of investment in wind and solar energy.

Prior to 1995, Mr. Paulwell served in very senior positions in the Government of Jamaica- Legal Officer of the Jamaica Commodity Trading Company Limited, Executive Director/ Trade Administrator of the Trade Board Limited and first Executive Director of the Fair Trading Commission.

Those appointments followed · his graduation from the University of the West Indies (LL.B Hons, 1986) and the Norman Manley Law School (Certificate in Legal Education, 1988). While pursuing his graduate studies, he also served as part time Lecturer and Tutor in Company Law at the Excelsior Community College and the College of Arts Science and Technology (now the University of Technology).

BGEN. Eliseo M. Rio, JR. (Ret.)

Acting Secretary, Department of Information and Communications Technology, Philippines

BGen. Eliseo M. Rio, Jr. was appointed as Acting Secretary of the Department of Information and Communications Technology (DICT) dated 10 May 2018. His office is in charge with the formulation of policies, planning, and programming of Cybersecurity and Emergency Communications and the implementation of strategic programs and projects, and regional operations. He also holds a supervisory role of the Cybercrime Investigation Coordination Center (CICC), the National Privacy Commission (NPC), and the COMELEC Advisory Council (CAC), as well as overseeing duties regarding the participation of the DICT in the activities of the NDRRMC.

Mr Yasuo Sakamoto

Mr. Yasuo Sakamoto is former Vice-Minister for Policy Coordination in Japan's Ministry of Internal Affairs and Communications (MIC), a post he held from 2014 to 2016. Now Mr. Sakamoto is Project Professor of Keio University, Japan and Adviser of Nomura Research Institute. Mr. Sakamoto held several high-level posts within MIC, including Director-General of the Global ICT Strategy Bureau, Director-General for ICT Strategic Policy Planning, and Deputy Director-General of the Information and Communications Bureau.

He joined the Ministry of Posts and Telecommunications (MPT), which in 2011 was merged with other ministries to form the MIC, in 1980.

Mr. Sakamoto was born in 1955 and graduated from the Faculty of Agriculture at the University of Tokyo.

Prof. (hon.) Jean-Louis Schlitz

Attorney, Senior partner at SCHILTZ & SCHILTZ
Avocat à la Cour

Jean-Louis Schiltz is the Senior partner at SCHILTZ & SCHILTZ and Professor (hon.) at the University of Luxembourg. Jean-Louis Schiltz is a tech law advisor, regular speaker at innovation and tech law conferences and has authored and co-authored a number of articles and reports in the field over the last years. He serves as a member of boards of companies and non-profit organizations. Among others he is the Chairman of Luxembourg's largest hospital group and of the national broadcaster.

From 2004 to 2009, Jean-Louis served as Cabinet Minister in Luxembourg. His portfolio included media, telecommunications, technology, international development and defence. Jean-Louis Schiltz holds a post graduate degree (DEA) in business law from the University of Paris I, Panthéon-Sorbonne. He has been teaching at his alma mater in the early 1990's.

Mr Shola Taylor

Secretary-General, Commonwealth Telecommunications Organisation (CTO)

A Nigerian citizen, Mr Taylor was appointed Secretary-General of the CTO in June 2015. Until then, he was Chief Executive Officer of Kemilinks International, an ICT consultancy firm based in Lagos. A tele-communications engineer by training, he brings to the CTO over 35 years of global experience in ICTs with government and the private sector. Previous positions held include regional director for Africa at Inmarsat (1994 – 1999), space technology coordinator for developing countries at the International Telecommunication Union (ITU, 1993 – 1994) and project director, also at the ITU (1987 – 1993). Twice elected as a member of the ITU's Radio Regulations Board (vice-chair in 2004, and chair in 2005), Mr Taylor has a rich inside knowledge of international organisations. Early in his career, he worked in telecommunication engineering, including as senior engineer at Nigerian Telecommunications (1981 – 1985) and spectrum engineer at Intelsat (1985 – 1987).

Mr Jose Toscano

International Government Affairs & Asset management Director, Intelsat

A telecommunications engineer by training, Mr. Toscano has more than thirty years' experience in the telecommunications sector and has held management positions in both the public and private sectors as well as in regional and international organizations in this field.

His professional experience before being appointed as Director of International Government Affairs and Asset Deployment with Intelsat includes the elected position of Director General of ITSO, the position of Director of External Relations with ITSO and executive appointments within the National Regulatory Authority (ICP-ANACOM) and the European Commission, top-level management responsibilities with the private telecommunications sector in Portugal, as well as teaching assignments at various universities in Portugal. He has also been actively involved in the definition, development and work of numerous regional and international regulatory entities in the telecommunications and satellite communications fields in particular the ITU, EC, CEPT, and the GSM MoU, and is especially knowledgeable and comfortable working in a multicultural environment.

Commissioner in the ITU/UNESCO Broadband Commission for Sustainable Development from 2010 to September 2017 and Vice President of the ITU BDT Smart Sustainable Development Model Initiative.

Acronyms

ACICIP	Advisory Committee on International Communications & Information Policy
AETRF	Afghanistan Emergency Telecom Regulatory Framework
ARAC	Amateur Radio Administrative Courses
ASEAN	Association of Southeast Asian Nations
ATRA	Afghanistan Telecoms Regulatory Authority
ATU	African Telecommunications Union
AU	African Union
BDT	Development Telecommunication Bureau
CARICOM	Caribbean Community
CBO	Community-Based Organization
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CDEMA	Caribbean Disaster Emergency Management Agency
CECIS	Common Emergency Communication and Information System
CEPREDENAC	Coordination Center for the Prevention of Natural Disasters in Central America
CEPT	Conference of Postal and Telecommunications Administrations
CERF	Central Emergency Response Fund
CHFs	Common Humanitarian Funds
CIS	Commonwealth of Independent States
CONATE	Comisión Nacional de Telecomunicaciones
CTO	Commonwealth Telecommunications Organization
DAC	Development Assistance Committee
DCD	Development Co-operation Directorate
DFID	Department for International Development
DPA	Department of Political Affairs
DREF	Disaster Relief Emergency Fund
DRIF	Disaster Recovery Insurance Facility
DRM	Disaster Risk Management
EC	European Commission
ECHO	European Commission's Humanitarian Aid and Civil Protection

ERC	European Radio Committee
ERCC	Emergency Response Coordination Centre
ERFs	Emergency Response Funds
ERU	Emergency Response Unit
ESA	European Space Agency
ESOA	EMEA Satellite Operators Association
ETC	Emergency Telecommunications Cluster
EU	European Union
FACT	Field Assessment and Coordination Team
FEMA	Federal Emergency Management Agency
FITTEST	Fast Information Technology and Telecommunications Emergency and Support Team
FSS	Fixed-Satellite System
GEF	Global Emergency Fund
GFDRR	Global Facility for Disaster Reduction and Recovery
GMPCS	Global Mobile Personal Communications by Satellite
GPRD	Global Platform for Recovery and Development
GPS	Global Positioning System
GVF	Global VSAT Forum
HF	High Frequency
IARP	International Amateur Radio Permit
IARU	International Amateur Radio Union
IASC	Inter-Agency Standing Committee
IATU	International Amateur Radio Union
ICRC	International Committee of the Red Cross
ICTs	Information and Communication Technologies
ICT4D	Information and Communication Technology for Development
ICT4DM	Information and Communication Technology for Disaster Management
IDB	Inter-American Development Bank
IDPs	Internally Displaced Persons
IDRC	International Development Research Centre

IDRL	International Disaster Response Laws, Rules and Principles
IFC	International Finance Corporation
IFCE	ITU Framework for Cooperation in Emergencies
IFRC	International Federation of the Red Cross and Red Crescent Societies
IHC	International Humanitarian City
IIV	International ICT Volunteers
INGO	International Non-governmental Organization
ITSO	International Telecommunications Satellite Organization
ITU	International Telecommunication Union
ITU-D	ITU Telecommunication Development Sector
ITU-T	ITU Telecommunication Standardization Sector
LAN	Local Area Network
M2M	Machine-to-Machine
MCIT	Ministry of Communications and Information Technology
MIC	Monitoring and Information Centre
MoU	Memorandum of Understanding
MPTF	Multi-Partner Trust Fund
MSS	Mobile-Satellite System
NBP	National Broadband Plan
NGO	Non-Governmental Organization
NIA	National Information Society Agency
OCHA	Office for the Coordination of Humanitarian Affairs
OECD	Organisation for Economic Co-operation and Development
OFDA	Office of US Foreign Disaster Assistance
PCG	Palmera Communications Group
PPP	Public-Private Partnership
SAHEL	Satellite African e-Health Validation
SDC	Swiss Agency for Development and Cooperation
SDGs	Sustainable Development Goals
SIDA	Swedish International Development Cooperation Agency
SMA	Spectrum Management Authority of Jamaica

SMTP	Spectrum Management Training Programme
SPIDER	Swedish Program for ICT in Developing Regions
SSDM	Smart Sustainable Development Model
TCP/IP	Transmission Control Protocol/Internet Protocol
TFA	Trade Facilitation Agreement
TSF	Télécoms Sans Frontières
UN	United Nations
UNDAC	United Nations Disaster Assessment and Coordination
UNHCR	United Nations High Commissioner for Refugees
USAID	United States Agency for International Development
VET	Volunteers for Emergency Telecommunications
VHF	Very High Frequency
VOAD	Voluntary Organizations Active in Disaster
VSAT	Very Small Aperture Terminal
WFP	World Food Programme
Wi-Fi	Wireless Fidelity
WCO	World Customs Organization
WSIS	World Summit on the Information Society
WTO	World Trade Organization