WSIS FORUM 19-23 MARCH 2018 Geneva | Switzerland

WSIS Forum 2018 OUTCOME DOCUMENT

Template for Submission of Executive Summaries for

Thematic/Country Workshop/ Action Line Facilitation Meetings/ Interactive Sessions/ High Level Dialogues/Publication Releases/Briefings

Deadline: Thursday 22 March, 2018

Exception: For sessions on Friday 23 March, please send at the latest 2 hours after the session

Please note that the WSIS Forum 2018 Outcome Document will be released on the ***23rd of March***

(the last day of the Forum)

1) **Title of your session**

   Digital Equity and Inclusion for ICT in Disaster Risk Reduction

2) **Name of Organization/s organizing the session**

   International Federation for Information Processing (IFIP)

3) **Relevance with the WSIS Action Lines – please specify the Action lines C1 to C11**

   According to the detail description of the WSIS Action Lines[1], the term, "disaster" is found in two action line entries of C7, "ICT applications: benefits in all aspects of life" as follows: C7-E-health and E-environment.

   On the other hand, we have looked through the list of the action lines [1] and came to conclusion that all the action lines from C1 through C11 are related to disaster in one way or another. Accordingly we tried and rewrote the action lines in terms of disaster risk reduction; please see Appendix A for them.

   Our workshop theme this time is related fully with: C2, C3, C4, C7(E-learning, E-health, E-employment, and E-environment) and C11. While the other action lines are related to disaster risk reduction, they will be looked at in our future workshops.

   The relevance to our workshop theme is described in detail as follows:

   C1. The role of governments and all stakeholders in the promotion of ICTs for development

   C1 is concerned with National e-strategies and cooperation among stakeholders. These aspects in terms of disaster risk reduction, could be related of the prevention and preparation pha ses of the disaster management cycle as in Fig.1. This time our workshop could not come to this point but will need to do so in future.

Fig.1 Disaster Management Cycle produced based on [5]

C2. Information and communication infrastructure: an essential foundation for an inclusive information society

C2 is concerned with accessibility, affordability and inclusive issues, it is related to our workshop theme directly. The issues in the action line C2 includes infrastructure as well as education so that it is related to the preparation phase as well as emergency response phases just after the disaster.

C3. Access to information and knowledge

This action line is concerned with access to knowledge and information in public domain and is related to our workshop theme directly. C3 could be concerned with all the phases of the disaster management cycle. It is related to preparation phase before a disaster as well as some information access for situation awareness just after disaster as well so that it is also include the issues in the emergency response phase after disaster; some may review on what happened at disaster at the recovery phase.

C4. Capacity building

This action line is concerned with education and training both inside and outside formal education. This is concerned with digital equity for disaster risk reduction and is fully related to our workshop theme. It is related to the prevention and preparation phases before the disaster in the disaster management cycle.

C5. Building confidence and security in the use of ICTs

This action line is related to our workshop theme in an interesting way that while availability of information is more important than privacy and security at the disaster response phase of the disaster management cycle, privacy and security issues would be more important when victims are settled and returned into normal way of life at the recovery phase and later. This course of changing requirements according with phases is a challengeable research topic in terms of security and privacy. This time we have not looked into this issue but will need to do so in future.

Moreover, trust is related to our workshop theme as it is one of keywords for disaster communications between supporters with heterogeneous backgrounds. Another important aspect of trust is the trustworthiness of information itself. At disaster, we may have correct and reliable information while we may get misinformation as well; the question is who would judge whether information is trustworthy or not. We may well leave this issue for the next WSIS workshop in 2019.

C6. Enabling environment

This action line is concerned with diverse issues including domain name management, Internet governance, Legal, regulatory and policy environment and so on. They are

mostly related to the preparation phase of the disaster management cycle, but some of them are directly related to the emergency response phase after disaster; such as one may wish to preserve frequencies for disaster communications between supporters if possible as well as to provide sustainable e-commerce at the disaster response and recovery phases. A business model for emergency situations would be yet to be researched. This action line would be related to our workshop in future.

C7. ICT applications: benefits in all aspects of life

E-government is concerned with strategies as well as efficient allocation of resources and international cooperation initiatives in order to enhance transparency, accountability and efficiency at all levels of government in case of disaster and emergency. This aspect would be related to our workshop in future.

E-learning is described in C4 and related closely to our workshop theme.

E-health is concerned directly with disaster victims and related closely to our workshop theme. It would strengthen and expand ICT-based initiatives for providing medical and humanitarian assistance in disasters and emergencies and related to the emergency response phase as well as the preparation phase for education and training.

E-employment is also requited at disaster. Local government who lost officers by disaster may well need more supporters or employers outside the disaster area such as information provision and processing so that they can telework at the emergency response and recovery. Victims who lost jobs need to get back to work possibly by telework for a company outside the disaster area. Women with ICT knowledge were very helpful at temporary housing at the recovery phase in Japan seven years ago. Such a digital equity aspect is related closely to our workshop theme.

E-environment provides monitoring systems, using ICTs, to forecast and monitor the impact of natural and man-made disasters at the prevention and preparation phases of the disaster management cycle. This aspect is related closely to our workshop theme.

E-agriculture ensures the dissemination of information using ICTs on agriculture in order to provide ready access to knowledge and information as well as to improve production (quantity and quality) even at the disaster response and recovery phases. This aspect should be considered by our workshop in future.

E-science promotes Internet connection for all universities and research institutions to support their role in information and knowledge production, education and training, and to support the establishment of partnerships, cooperation and networking between these institutions even at disaster response and recovery phases. It also promotes electronic publishing and open access initiatives to make scientific information accessible in all countries on an equitable basis and promotes principles and metadata

standards to facilitate cooperation and effective use of collected scientific information and data as appropriate to conduct scientific research on disaster for the prevention and preparation phases of the disaster management cycle. This aspect would be related to our workshop in future.

C8. Cultural diversity and identity, linguistic diversity and local content

Cultural and linguistic diversity, while stimulating respect for cultural identity, traditions and religions is very important for a disaster management information system as well. Seven years ago in Japan, we could not make it fully to use the Sahana system [3], partly due to the localization with Japanese language [4]. Moreover main disaster managers are local government officers who had a culture (not in the sense of culture in the nation) that it is familiar for them to use a certain software, Excel. That sort of local cultural aspect is important with information systems at disaster. Moreover the aspect of culture is important to have sustainable archives of disaster history. Accordingly, this action line is important in our future workshop to consider.

C9. Media

This action line is important to disseminate information and may well include the SNS systems as well. Use of SNS would be slightly different from traditional mass media in terms of trustworthiness of information. This action line would be included in our future workshop.

C10. Ethical dimensions the Information Society

The Information Society should be subject to universally held values and promote the common good and to prevent abusive uses of ICTs even at disaster as well. This action line is important at disaster such as at somewhat chaotic state in the emergency response phase of the disaster management cycle. Our workshop did not look at this issue this time but we can look at this as another security issue in future.

C11. International and regional cooperation

International cooperation among all stakeholders is vital in implementation of this plan of action and needs to be strengthened with a view to promoting universal access and bridging the digital divide, inter alia, by provision of means of implementation. C11 is related fully to our workshop theme in terms of inclusive and digital equity.

4) Key achievements, announcements, launches, agreements, and commitments (these will be reflected in the press release and Outcomes Document of the WSIS Forum 2018)

a) We identified the requirements in ICT from the experiences of the Great East Japan Earthquake and Tsunami on March 11th, 2011 [2].

b) We introduced the inclusive issues in disaster risk reduction.

c) We identified the issues of digital equity in disaster risk reduction and recovery including the work done at UN Women and UNESCO.
d) We showed the media literacy programme and its expansion adding the concepts of groups and institutions at UNESCO MIL Programme.
e) Accountability issues at the disaster response was introduced by audience, Ms. Martinez from Dept. of Finance, Government of Mexico.
f) For situation awareness, Open Property Map project in the U.S., Maryland Department of Planning was introduced by the audience, Bob Bishop at International Centre for Earth Simulation (ICES).

5) Main outcomes highlighting the following:

I. Debated Issues

- Please capture highlights of the main issues debated and interactions with audience

1. Accountability asked by Ms. Martinez from Mexico Ministry of Finance, according to her experience with the earthquake in September 2017.
2. After that they set up the platform Mexico which concentrated information mainly on finance from different ministries. According to her another important aspect of inclusion is accountability which was missing in our presentations.
3. In Mexico, what happened was there were a lot of data made available through SNS and by other means by volunteers without any standard format with disaster hash tags and the government was interested in making use of them. Her question was whether there are any tool or best practice to use such data.
    - The answer to this question was that in Japan seven years ago, disaster managers had a problem to get information for situation awareness. At that time, SNS was not so popular as now. If we had the same situation now, we could make use of SNS.
    - At the workshop we did not realise, however, seven years ago, we had two sources on safety information (i.e. whether people are alive or dead): one was from Police and the other was from a broadcast company which digitized what was broadcast, in which people at shelters declared their names and where they are. The problem was that those two sources were provided in different formats, so that we needed to take time to integrate to provide safety information on a cellular phone.

It takes a lot of work to integrate information in different sources and we need the common standard format on this.

4. Another question raised by her was at the recent earthquake in Mexico, the government needed to get the information on buildings and households which are not used anymore. There was no sanction at that time on contractors, which there will. According to her, Speed, Rhythm and Trust presented in our workshop were needed indeed. She would like to know any experience or tool to collect such information.
    - An answer came up from the floor that there is a project on global Open Building Map over Open Street Map (OSM) and that could be of use (suggested by Bob Bishop from ICES.) It would be of use to understand the future vulnerability of a city or village. In particular, medical and schooling facilities should be immediately captured. Such a project is in progress. Moreover with the help of crowd sourcing, we can get camera images to understand the situations.

      Together with other information such as what time people would be in a particular building, what soil underneath, and all that, we can have a scenario planning; scientifically we can deduce the future vulnerability. Accordingly a city manager can understand to what extent a disaster could hit the city. ICES as well as U.S. Geological Survey (USGS).
5. From the remote audience, there was a question on a link to encouraging communication networks and rebuilding digital economy.
    - Alton Grizzle answered that it is a matter of encouraging community networks as well as rebuilding digital economy. Those two components are issues to be dealt with. Community networks may not be available and then we need some other traditional communication tools such as community radios. We need to make use of what is available for local communities at disaster to communicate each other. On the other hand, digital economy is a big issue as well and we cannot link so easily from community network view point.
    - It could be a matter of the business continuity and need another workshop discussing on this topic.

- Please highlight key achievements and challenges shared by the audience and/ or panelists

1. Inclusive aspect in disaster risk reduction were introduced well in the following sites (YouTube videos):
    - Leave no one behind with Disability Inclusive DRR https://www.youtube.com/watch?v=CbLTPQsF1AQ
    - "Barrier-free" - Including people with disabilities in disaster https://www.youtube.com/watch?v=uzSKfx2sbdY
2. We share what is required for ICT in disaster management.
    - Key elements in disaster management at the emergency response phase is: speed, rhythm and trust. We need to deal with emergency speedy no matter how perfect the solution could be. If we had a problem, solution could be coming if we keep contact with as many people as possible and that is called rhythm. Finally we need to try and construct trust when one communicate to the others from heterogeneous backgrounds at disaster.
    - We have to understand the nature of disaster communications between supporters during the emergency response phase ---i.e. first three months after disaster.
    - Required IT supports were presented as follows:
        - Need a standard format to exchange information
        - Open Source: e.g. Sahana[3]
        - Need a well-known interface
        - Killer Application for Cloud Computing!
3. Special attention can be paid to certain groups of the population, including women, children, youth and persons with disabilities, when promoting digital equity and inclusion for ICT. UN Women introduced that the innovation and ICT can be leveraged to provide education and vocational skills for women in crisis settings. Also UNESCO is helping women as well as youth to be educated in terms of IT.
4. The UNESCO Media and Information Literacy (MIL) Programme was introduced with its expansion adding the concepts of group and community and models.
5. Inclusive aspects need discussion on accountability. Accountability is yet another good aspect of DRR and includes issues of situation awareness at the beginning phase of disaster to grasp the size of the damage as well as to estimate the cost for recovery in case of the damage of the buildings.
6. Community networking is important for recovery of digital economy.

II. Quotes

- Please provide two important quotes from the session and the names & organization of the person you are quoting
  - The Gender Inequality of Risks in DRR and ICT by Toshihisa Nakamura with UN Women
    - "Digital equity and inclusion for ICT, in conjunction with the empowerment of women, can support reducing the gender inequality of risks to disasters. "
  - Priorities needed for DRR needs for individuals: Tim Francis with UNESCO
    - Improve Digital Equity
    - Support Traditional Media
    - Strengthen Media Pluralism
  - Media and Information Literacy (MIL) is expanded with the concepts of group and community: Alton Grizzle with UNESCO
  - "Accountability to be required at disaster": by an audience from Mexico Ministry of Finance.
  - As an answer to the accountability, "use of crowd source: i.e. open building/property map " by Bob Bishop with International Centre for Earth Simulation

III. Overall outcomes of the session highlighting

- main conclusions reached during the discussion
  - In disaster management with ICT, we need: Speed, Rhythm and Trust.
  - Special attention can be paid to certain groups of the population, including women, children, youth and persons with disabilities, when promoting digital equity and inclusion for ICT. UN Women introduced that the innovation and ICT can be leveraged to provide education and vocational skills for women in crisis settings.
  - Media and Information Literacy (MIL) is strengthened adding the concepts of group and community.
  - Accountability should be considered with inclusion. Use of crowd source and come up with an open building map could be a solution.
  - Digital economy and its recovery should be considered.
- the vision for implementation of WSIS Action lines beyond 2015
  - Disaster risk reduction aspects go easily with all the current action lines not only a few with "disaster" as a keyword. On the other hand, it is hard to include all the issues to be dealt with in one workshop.

- In future version of action lines should include **accountability of disaster damages**, **use of crowd source** as well as **trustworthiness** of information.
- This workshop included the issues of action lines: C2, C3, C4, C7(E-learning, E-health, E-employment, and E-environment) and C11. Future workshops could deal with more strategic issues with the other action lines.

IV. Main linkages with the Sustainable Development Goals

Disaster Management (Fig.1) could be related to SDG as follows:

- ✓ Alert: alarm, information dissemination for evacuation, dependable communication systems (SDG 3)
  - life and health/access to information/
- ✓ Rescue: information on situation awareness/resource management (SDGs3)
  - life and health/ access to information
- ✓ Immediate response: food and goods distribution, shelter information management(SDG 1-3,5-11,13)
  - an adequate standard of living/adequate housing/adequate food/ safe drinking water/
  - sanitation/elimination of violence against women and girls/equality and nondiscrimination/privacy/
  - access to information
- ✓ Sustained response: restore functionality of critical systems (SDG 1,7,9-17)
  - an adequate standard of living/adequate housing/access to information
- ✓ Recovery: Scenario update, Socio-economic and environmental impact assessment (SDG7-9,17)
  - work and to just and favourable conditions of work/ an adequate standard of living//privacy/
  - adequate housing/access to information
- ✓ Awareness and Prevention: risk assessment and risk communications (SDG 3-5,7-17)
  - life and health/ access to information/education
- ✓ Preparation: monitoring and warning, education, training, planning (SDG 3-5,7-17)
  - education/life and health/access to information

V. Emerging Trends related to WSIS Action Lines identified during the meeting

- The current action lines are all applicable to disaster risk reduction in different phases of the disaster management cycle. On the other hand, for disaster, future action lines should include **accountability of disaster damages**, **use of crowd source** as well as **trustworthiness** of information.

VI. Suggestions for Thematic Aspects that might be included in the WSIS Forum 2019

This time we did not have enough time for discuss fully on digital equity and inclusive issues so that we shall have the one next year as well. Apart from that disaster risk reduction includes such vast amount of ICT issues and we shall keep having such workshops in future. We might need the following ones:

i. disaster strategic and policy issues,
ii. technological issues including software and hardware tools (including robotics)
iii. trust issues including trustworthiness of information as well as trust among supporters
iv. disaster psychology issues including
v. disaster economy

ICT issues should include the above so that they are more useful in the information society.

References

[1] ITU: Document WSIS-03/GENEVA/DOC/5-E Plan of Actions, Dec. 2003 http://www.itu.int/net/wsis/docs/geneva/official/poa.html

[2] Murayama, Y. et al.: "Trust Issues in Disaster Communication", Proceedings of the 46th Hawaiian International Conference on System Sciences (HICSS-46), pp.335-342, 2013

[3] Currion, P., Silva, C. and Van de Walle, B: "Open source software for disaster management", Comm. of the ACM, 50, 3, pp.61-65, 2007

[4] Yoshino, T. et al.: "Operation and evaluation of a disaster relief information sharing system", Sahana at the Great East Japan Earthquake, Journal of digital practices, IPSJ, 3(3), 2012, pp177-183, *in Japanese*, 2012

[5] Van de Walle, B., Turoff, M. and Hiltz, S.R. eds: "Information systems for emergency management", M.E. Sharpe, 2009

Please complete this document and send to Matthew L. Greenspan, Matthew.Greenspan@itu.int AND Gitanjali Sah, Gitanjali.Sah@itu.int

Appendix A

Action Lines related to C1 to C11 in terms of Disaster Risk Reduction based on ITU: Document WSIS-03/GENEVA/DOC/5-E Plan of Actions, Dec. 2003
http://www.itu.int/net/wsis/docs/geneva/official/poa.html

C1. The effective participation of governments and all stakeholders is vital in developing the Information Society requiring cooperation and partnerships among all of them

a) We may well need development of national e-strategies for disaster, including the necessary human capacity building, taking into account different national circumstances. It could be added as a part of national e-strategies.

b) Initiate at the national level a structured dialogue involving all relevant stakeholders, including through public/private partnerships, in devising e-strategies for the Information Society at disaster and for the exchange of best practices.

c) In developing and implementing national e-strategies for disaster, stakeholders should take into consideration local, regional and national needs and concerns. To maximize the benefits of initiatives undertaken, these should include the concept of sustainability as well as accountability in face of disaster. The private and public sectors should be engaged altogether in concrete projects to develop the Information Society at disaster at local, regional and national levels.

d) Identify mechanisms, at the national, regional and international levels, for the initiation and promotion of partnerships among stakeholders of the Information Society at disaster.

e) Explore the viability of establishing multi-stakeholder portals together with the local governments as well as indigenous peoples at the national level.

f) Relevant international/national organizations and financial institutions should develop their own strategies for the use of ICTs for sustainable recovery and development, including sustainable production and consumption patterns at disaster and as an effective instrument to help achieve the sustainable development goals(SDGs).

g) International organizations should publish, in their areas of competence, including on their website, reliable information submitted by relevant stakeholders on successful experiences of mainstreaming ICTs for disaster.

h) Encourage a series of related measures, including, among other things: incubator and facilitator schemes for disaster information processing, new business models for disaster recovery (national and international), resource investment promotion strategies, open software support activities, support of research and development networks and software parks.

C2. Information and communication infrastructure: an essential foundation for the Information Society

Infrastructure for disaster risk reduction has been central in achieving the goal of digital inclusion, enabling universal, sustainable, ubiquitous and affordable access to ICTs by all, taking into account relevant solutions already in place in developing countries and countries with economies in transition, to provide sustainable connectivity and access to remote and marginalized areas at national and regional levels. On the other hand, at disaster response and recovery, infrastructure would be not quite central due to the fact that recovery would be dealt with in a distributed manner by local sectors such as local governments.

a) Governments should take action, in the framework of national disaster risk reduction policies, in order to support an enabling and competitive environment for the necessary investment in ICT infrastructure and for the development of new services.

b) In the context of national e-strategies for disaster, devise appropriate universal access policies and strategies, and their means of implementation, in line with the indicative targets, and develop ICT connectivity indicators.

c) In the context of national e-strategies for disaster, provide and improve ICT connectivity for all schools, universities, health institutions, libraries, post offices, community centres, museums and other institutions accessible to the public, in line with the indicative targets. In particular at disaster, for the sake of situation awareness, inputs from individuals and private sectors through the other channels such as SNS would be of use.

d) Develop and strengthen national, regional and international broadband network infrastructure with flexibility in case of disaster, including delivery by satellite and other systems, to help in providing the capacity to match the needs of countries and their citizens in disaster. Support technical, regulatory and operational studies by the International Telecommunication Union (ITU) and, as appropriate, other relevant international organizations in order to:

   i. broaden access to orbital resources, global frequency harmonization and global systems standardization to help out the disaster area;

   ii. encourage public/private partnership to help out the disaster area;

   iii. promote the provision of global sustainable telecommunication services for disaster areas;

   iv. explore other systems that can provide connectivity in disaster area.

e) In the context of national e-strategies for disaster, address the special requirements of older people, persons with disabilities, children, especially marginalized children and other disadvantaged and vulnerable groups, including by appropriate educational

administrative and legislative measures to ensure their full inclusion in the Information Society.

f) Encourage the design and production of ICT equipment and services to be used at disaster so that everyone, has easy and affordable access to them including older people, persons with disabilities, children, especially marginalized children, and other disadvantaged and vulnerable groups, and promote the development of technologies, applications, and content suited to their needs, guided by the Universal Design Principle and further enhanced by the use of assistive technologies.

g) In order to alleviate the challenges of illiteracy, develop affordable technologies and non-text based computer interfaces to facilitate people's access to ICT at disaster.

h) Undertake international research and development efforts aimed at making available adequate and affordable ICT equipment at disaster for end users.

i) Encourage the use of unused wireless capacity, including satellite, in developed countries and in particular in developing countries, to provide access in remote areas, especially in developing countries and countries with disaster, and to improve sustainable connectivity in developing countries. Special concern should be given to the Least Developed Countries in their efforts in establishing telecommunication infrastructure.

j) Optimize connectivity among major information networks at disaster by encouraging the creation and development of regional ICT backbones and Internet exchange points, to avoid disconnection and without network access at disaster.

k) Develop strategies for increasing affordable and sustainable global connectivity, thereby facilitating sustainable access. Commercially negotiated Internet transit and interconnection costs should be oriented towards objective, transparent and non-discriminatory parameters, taking into account ongoing work on this subject.

l) Encourage and promote joint use of traditional media and new technologies in particular in case of disaster.

C3. Access to information and knowledge

ICTs allow people, anywhere in the world, to access information and knowledge almost instantaneously. Individuals, organizations and communities should benefit from access to knowledge and information. It is important in particular in case of disaster.

a) Develop policy guidelines for the development and promotion of public domain information at disaster as an important international instrument promoting public access to information.

b) Governments are encouraged to provide adequate access through various communication resources, notably the Internet, to public official information. Establishing legislation on access to information and the preservation of public data, notably in the

area of the new technologies, is encouraged bearing in mind that availability of information is more important at disaster.

c) Promote research and development to facilitate accessibility of ICTs for all, including disadvantaged, marginalized and vulnerable groups in particular in case of disaster.

d) Governments, and other stakeholders, should establish sustainable multi-purpose community public access points, providing affordable or free-of-charge access for their citizens to the various communication resources, notably the Internet. These access points should, to the extent possible, have sufficient capacity to provide assistance to users, in libraries, educational institutions, public administrations, post offices or other public places, with special emphasis on rural and underserved areas, while respecting intellectual property rights (IPRs) and encouraging the use of information and sharing of knowledge in particular in case of disaster.

e) Encourage research and promote awareness among all stakeholders of the possibilities offered by different software models, and the means of their creation, including proprietary, open-source and free software, in order to increase competition, freedom of choice and affordability, and to enable all stakeholders to evaluate which solution best meets their requirements. For disaster, different tools are required for disaster information processing in different disaster situations.

f) Governments should actively promote the use of ICTs as a fundamental working tool by their citizens and local authorities. In this respect, the international community and other stakeholders should support capacity building for local authorities in the widespread use of ICTs as a means of improving local governance.

g) Encourage research on the Information Society, including on innovative forms of networking, adaptation of ICT infrastructure, tools and applications that facilitate accessibility of ICTs for all, and disadvantaged groups in particular.

h) Support the creation and development of a digital public library and archive services, adapted to the Information Society, including reviewing national library strategies and legislation, developing a global understanding of the need for "hybrid libraries", and fostering worldwide cooperation between libraries. This aspect would be useful for one to learn past disaster at the preparation phase of the disaster management cycle.

i) Encourage initiatives to facilitate access, including free and affordable access to open access journals and books, and open archives for scientific information as well as the archive document on the past disasters.

j) Support research and development of the design of useful instruments for all stakeholders to foster increased awareness, assessment, and evaluation of different software models and licenses, so as to ensure an optimal choice of appropriate software

that will best contribute to achieving development goals within local conditions. These tools could have a different mode to operate in case of disaster so that the interface to the system is familiar to the users.

C4. Capacity building

Everyone should have the necessary skills to benefit fully from the Information Society. Therefore capacity building and ICT literacy are essential. ICTs can contribute to achieving universal education worldwide, through delivery of education and training of teachers, and offering improved conditions for lifelong learning, encompassing people that are outside the formal education process, and improving professional skills. This aspect is important at disaster as well.

a) Develop domestic policies to ensure that ICTs are fully integrated in education and training at all levels, including in curriculum development, teacher training, institutional administration and management, and in support of the concept of lifelong learning. We need to develop an education scheme for disaster risk reduction.
b) Develop and promote programmes to eradicate illiteracy using ICTs at national, regional and international levels. We need this for women and the elderly in particular for disaster preparation.
c) Promote e-literacy skills for all, for example by designing and offering courses for public administration, taking advantage of existing facilities such as libraries, multipurpose community centres, public access points and by establishing local ICT training centres with the cooperation of all stakeholders. Special attention should be paid to disadvantaged and vulnerable groups. This is important to let the public know how to deal with emergency situations in terms of disaster risk reduction such as to let the people learn to ran and go up to the higher place in case of Tsunami.
d) In the context of national educational policies, and taking into account the need to eradicate adult illiteracy, ensure that young people are equipped with knowledge and skills to use ICTs, including the capacity to analyse and treat information in creative and innovative ways, share their expertise and participate fully in the Information Society in particular in case of disaster.
e) Governments, in cooperation with other stakeholders, should create programmes for capacity building with an emphasis on creating a critical mass of qualified and skilled ICT professionals and experts to provide tools for disaster information processing when required.
f) Develop pilot projects to demonstrate the impact of ICT-based alternative educational delivery systems, notably for achieving Education for All targets, including basic literacy targets. That is important at disaster to collect required information for women and the elderly as well as youths.

g) Work on removing the gender barriers to ICT education and training and promoting equal training opportunities in ICT-related fields for women and girls. Early intervention programmes in science and technology should target young girls with the aim of increasing the number of women in ICT careers. Promote the exchange of best practices on the integration of gender perspectives in ICT education for disaster preparation.

h) Empower local communities, especially those in rural and underserved areas, in ICT use and promote the production of useful and socially meaningful content for the benefit of all in particular in case of disaster.

i) Launch education and training programmes, where possible using information networks of traditional nomadic and indigenous peoples, which provide opportunities to fully participate in the Information Society. It is important at disaster all can get required information such as the one for evacuation equally.

j) Design and implement regional and international cooperation activities to enhance the capacity, notably, of leaders and operational staff in developing countries and LDCs, to apply ICTs effectively in the whole range of educational activities. This should include delivery of education outside the educational structure, such as the workplace and at home. This aspect is important in case of disaster.

k) Design specific training programmes in the use of ICTs in order to meet the educational needs of information professionals, such as archivists, librarians, museum professionals, scientists, teachers, journalists, postal workers and other relevant professional groups including disaster managers. Training of information professionals should focus not only on new methods and techniques for the development and provision of information and communication services, but also on relevant management skills to ensure the best use of technologies and integration in case of disaster. Training of teachers should focus on the technical aspects of ICTs, on development of content, and on the potential possibilities and challenges of ICTs.

l) Develop distance learning, training and other forms of education and training as part of capacity building programmes. Give special attention to developing countries and especially LDCs in different levels of human resources development in particular for the preparation phase of disaster.

m) Promote international and regional cooperation in the field of capacity building, including country programmes developed by the United Nations and its Specialized Agencies in particular for disaster preparation.

n) Launch pilot projects to design new forms of ICT-based networking, linking education, training and research institutions between and among developed and developing countries and countries with economies in transition as well as for disaster management.

o) Volunteering, if conducted in harmony with national policies and local cultures, can be a valuable asset for raising human capacity to make productive use of ICT tools and build a more inclusive Information Society in particular for disaster preparation. Activate volunteer programmes to provide capacity building on ICT for development, particularly in developing countries at disaster.

p) Design programmes to train users to develop self-learning and self-development capacities for use at disaster and emergent situations.

C5. Building confidence and security in the use of ICTs

Confidence and security are among the main pillars of the Information Society. We also need to understand that availability of information is more required at disaster.

a) Promote cooperation among the governments at the United Nations and with all stakeholders at other appropriate fora to enhance user confidence, build trust, and protect both data and network integrity; consider existing and potential threats to ICTs; and address other information security and network security issues. We also need to understand that availability of information might be more required at disaster.

b) Governments, in cooperation with the private sector, should prevent, detect and respond to cyber-crime and misuse of ICTs by: developing guidelines that take into account ongoing efforts in these areas; considering legislation that allows for effective investigation and prosecution of misuse; promoting effective mutual assistance efforts; strengthening institutional support at the international level for preventing, detecting and recovering from such incidents; and encouraging education and raising awareness. This is also applicable for disaster situations.

c) Governments, and other stakeholders, should actively promote user education and awareness about online privacy and the means of protecting privacy. Also they need to understand that availability of information might be more required at disaster.

d) Encourage the domestic assessment of national law with a view to overcoming any obstacles to the effective use of electronic documents and transactions including electronic means of authentication.

e) Further strengthen the trust and security framework with complementary and mutually reinforcing initiatives in the fields of security in the use of ICTs, with initiatives or guidelines with respect to rights to privacy, data and consumer protection.

f) Share good practices in the field of information security and network security and encourage their use by all parties concerned.

g) Encourage further development of secure and reliable applications to facilitate online transactions.

h) Encourage interested countries to contribute actively to the ongoing United Nations activities to build confidence and security in the use of ICTs in case of disaster as well.

C6. Enabling environment

Confidence and security are among the main pillars of the Information Society. Some aspects are important for disaster as well.

a) Governments should foster a supportive, transparent, pro-competitive and predictable policy, legal and regulatory framework, which provides the appropriate incentives to investment and community development in the Information Society. This aspect is important for disaster risk reduction as well.

b) We ask the Secretary General of the United Nations to set up a working group on Internet governance, in an open and inclusive process that ensures a mechanism for the full and active participation of governments, the private sector and civil society from both developing and developed countries, involving relevant intergovernmental and international organizations and forums, to investigate and make proposals for action, as appropriate, on the governance of Internet by 2005. The group should, inter alia:

i. develop a working definition of Internet governance including disaster response and recovery;

ii. identify the public policy issues that are relevant to Internet governance including disaster response and recovery;

iii. develop a common understanding of the respective roles and responsibilities of governments including disaster response and recovery, existing intergovernmental and international organisations and other forums as well as the private sector and civil society from both developing and developed countries;

iv. prepare a report on the results of this activity to be presented for consideration and appropriate action for the second phase of WSIS in Tunis in 2005.

c) Governments are invited to:

i. facilitate the establishment of national and regional Internet Exchange Centres with care of disaster response and recovery;

ii. manage or supervise, as appropriate, their respective country code top-level domain name (ccTLD);

iii. promote awareness of the Internet.

d) Governments should continue to update their domestic consumer protection laws to respond to the new requirements of the Information Society even at disaster.

e) Promote effective participation by developing countries and countries with economies in transition in international ICT forums and create opportunities for exchange of experience in particular for disaster response.

f) Governments need to formulate national strategies, which include e-government strategies, to make public administration more transparent, efficient and democratic. This aspect is important for disaster risk reduction as well.

g) Develop a framework for the secure storage and archival of documents and other electronic records of information. This is important for recording disaster reports.

h) Governments and stakeholders should actively promote user education and awareness about online privacy and the means of protecting privacy even in case of disaster.

i) Invite stakeholders to ensure that practices designed to facilitate electronic commerce also permit consumers to have a choice as to whether or not to use electronic communication. The emergency situations should be considered as well.

j) Encourage the ongoing work in the area of effective dispute settlement systems, notably alternative dispute resolution (ADR), which can promote settlement of disputes. This might be of use at disaster management.

k) Governments, in collaboration with stakeholders, are encouraged to formulate conducive ICT policies that foster entrepreneurship, innovation and investment, and with particular reference to the promotion of participation by women. It would be useful for disaster response and management.

l) Recognising the economic potential of ICTs for Small and Medium-Sized Enterprises (SMEs), they should be assisted in increasing their competitiveness by streamlining administrative procedures, facilitating their access to capital and enhancing their capacity to participate in ICT-related projects even at disaster response and recovery.

m) Governments should act as model users and early adopters of e-commerce in accordance with their level of socio-economic development even at disaster response and recovery.

n) Governments, in cooperation with other stakeholders, should raise awareness of the importance of international interoperability standards for global e-commerce even at disaster response and recovery.

o) Governments, in cooperation with other stakeholders, should promote the development and use of open, interoperable, non-discriminatory and demand-driven standards. It would be useful for disaster response and management.

p) ITU, pursuant to its treaty capacity, coordinates and allocates frequencies with the goal of facilitating ubiquitous and affordable access in case of disaster as well.

q) Additional steps should be taken in ITU and other regional organisations to ensure rational, efficient and economical use of, and equitable access to, the radio-frequency spectrum by all countries, based on relevant international agreements. It would be useful to have one for disaster communications.

C7. ICT applications: benefits in all aspects of life

ICT applications can support sustainable development, in the fields of public administration, business, education and training, health, employment, environment, agriculture and science within the framework of national e-strategies. This would include actions within the following sectors at disaster:

E-government

a) Implement e-government strategies focusing on applications aimed at innovating and promoting transparency in public administrations and democratic processes, improving efficiency and strengthening relations with citizens in case of disaster and emergency.
b) Develop national e-government initiatives and services, at all levels, adapted to the needs of citizens and business, to achieve a more efficient allocation of resources and public goods in case of disaster and emergency.
c) Support international cooperation initiatives in the field of e-government, in order to enhance transparency, accountability and efficiency at all levels of government in case of disaster and emergency.

E-learning (see section C4)

E-health

a) Promote collaborative efforts of governments, planners, health professionals, and other agencies along with the participation of international organizations for creating a reliable, timely, high quality and affordable health care and health information systems and for promoting continuous medical training, education, and research through the use of ICTs, while respecting and protecting citizens' right to privacy even in case of disaster.
b) Facilitate access to the world's medical knowledge and locally-relevant content resources for strengthening public health research and prevention programmes and promoting women's and men's health, such as content on sexual and reproductive health and sexually transmitted infections, and for diseases that attract full attention of the world including HIV/AIDS, malaria and tuberculosis in case of disaster as well.
c) Alert, monitor and control the spread of communicable diseases, through the improvement of common information systems in case of disaster as well.
d) Promote the development of international standards for the exchange of health data in case of disaster as well, taking due account of privacy concerns.
e) Encourage the adoption of ICTs to improve and extend health care and health information systems to remote and underserved areas and vulnerable populations, recognising women's roles as health providers in their families and communities in case of disaster as well.

f) Strengthen and expand ICT-based initiatives for providing medical and humanitarian assistance in disasters and emergencies.

E-employment

a) Encourage the development of best practices for e-workers and e-employers built, at the national level, on principles of fairness and gender equality, respecting all relevant international norms. At disaster response, one would need to support local government as well as the victims could find remote jobs at disaster recovery.

b) Promote new ways of organizing work and business with the aim of raising productivity, growth and well-being through investment in ICTs and human resources. Even at disaster, one could find a novel way.

c) Promote teleworking to allow citizens, particularly in the developing countries, LDCs, and small economies, to live in their societies and work anywhere, and to increase employment opportunities for women, and for those with disabilities. In promoting teleworking, special attention should be given to strategies promoting job creation and the retention of the skilled working force. At disaster response, one would need to support local government as well as the victims could find remote jobs at disaster recovery.

d) Promote early intervention programmes in science and technology that should target young girls to increase the number of women in ICT carriers. Even at disaster, women's workforce is important.

E-environment

a) Governments, in cooperation with other stakeholders are encouraged to use and promote ICTs as an instrument for environmental protection and the sustainable use of natural resources even at disaster as well.

b) Establish monitoring systems, using ICTs, to forecast and monitor the impact of natural and man-made disasters, particularly in developing countries, LDCs and small economies.

E-agriculture

a) Ensure the systematic dissemination of information using ICTs on agriculture, animal husbandry, fisheries, forestry and food, in order to provide ready access to comprehensive, up-to-date and detailed knowledge and information, particularly in rural areas even at disaster as well.

b) Public-private partnerships should seek to maximize the use of ICTs as an instrument to improve production (quantity and quality) even at disaster response and recovery.

E-science

a) Promote affordable and reliable high-speed Internet connection for all universities and research institutions to support their critical role in information and knowledge production, education and training, and to support the establishment of partnerships, cooperation and networking between these institutions even at disaster response and recovery.

b) Promote electronic publishing, differential pricing and open access initiatives to make scientific information affordable and accessible in all countries on an equitable basis at disaster as well.

c) Promote the use of peer-to-peer technology to share scientific knowledge even at disaster and pre-prints and reprints written by scientific authors who have waived their right to payment.

d) Promote the long-term systematic and efficient collection, dissemination and preservation of essential scientific digital data, for example, population and meteorological data in all countries. This is important for disaster and risk management.

e) Promote principles and metadata standards to facilitate cooperation and effective use of collected scientific information and data as appropriate to conduct scientific research on disaster.

C8. Cultural diversity and identity, linguistic diversity and local content

Cultural and linguistic diversity, while stimulating respect for cultural identity, traditions and religions, is essential to the development of an Information Society based on the dialogue among cultures and regional and international cooperation. It is an important factor for sustainable development. This aspect is important for disaster management as different disaster in different region with different culture needs different needs for information processing. Moreover the aspect of culture is important to have sustainable archives of disaster history.

a) Create policies that support the respect, preservation, promotion and enhancement of cultural and linguistic diversity and cultural heritage within the Information Society, as reflected in relevant agreed United Nations documents, including UNESCO's Universal Declaration on Cultural Diversity. This includes encouraging governments to design cultural policies to promote the production of cultural, educational and scientific content and the development of local cultural industries suited to the linguistic and cultural context of the users at disaster.

b) Develop national policies and laws to ensure that libraries, archives, museums and other cultural institutions can play their full role of content - including traditional knowledge about disaster- providers in the Information Society, more particularly by providing continued access to recorded information on disaster.

c) Support efforts to develop and use ICTs for the preservation of natural and, cultural heritage about disaster, keeping it accessible as a living part of today's culture. This includes developing systems for ensuring continued access to archived digital information and multimedia content about past disaster in digital repositories, and support archives, cultural collections and libraries as the memory of humankind.

d) Develop and implement policies that preserve, affirm, respect and promote diversity of cultural expression and indigenous knowledge and traditions through the creation of varied information content and the use of different methods, including the digitization of the educational, scientific and cultural heritage. This aspect is important to preserve the history of disaster.

e) Support local content development, translation and adaptation, digital archives, and diverse forms of digital and traditional media by local authorities. These activities can also strengthen local and indigenous communities. This aspect is important to preserve the history of disaster.

f) Provide content that is relevant to the cultures and languages of individuals in the Information Society, through access to traditional and digital media services for disaster archives.

g) Through public/private partnerships, foster the creation of varied local and national content, including that available in the language of users, and give recognition and support to ICT-based work in all artistic fields. Art could be a part of disaster archives.

h) Strengthen programmes focused on gender-sensitive curricula in formal and non-formal education for all and enhancing communication and media literacy for women with a view to building the capacity of girls and women to understand and to develop ICT content on disaster.

i) Nurture the local capacity for the creation and distribution of software on disaster information processing in local languages, as well as content that is relevant to different segments of population, including non-literate, persons with disabilities, disadvantaged and vulnerable groups especially in developing countries and countries with economies in transition.

j) Give support to media based in local communities and support projects combining the use of traditional media and new technologies for their role in facilitating the use of local languages, for documenting and preserving local heritage, including landscape, biological

and disaster diversity, and as a means to reach rural and isolated and nomadic communities.

k) Enhance the capacity of indigenous peoples to develop content about disaster in their own languages.

l) Cooperate with indigenous peoples and traditional communities to enable them to more effectively use and benefit from the use of their traditional knowledge about disaster in the Information Society.

m) Exchange knowledge, experiences and best practices on policies and tools designed to promote cultural and linguistic diversity at regional and sub-regional levels. This can be achieved by establishing regional, and sub-regional working groups on specific issues of this Plan of Action such as disaster management to foster integration efforts.

n) Assess at the regional level the contribution of ICT to cultural exchange and interaction, and based on the outcome of this assessment, design disaster risk reduction programmes.

o) Governments, through public/private partnerships, should promote technologies and R&D programmes in such areas as translation, iconographies, voice-assisted services and the development of necessary hardware and a variety of software models, including proprietary, open source software and free software, such as standard character sets, language codes, electronic dictionaries, terminology and thesauri, multilingual search engines, machine translation tools, internationalized domain names, content referencing as well as general and application software. This aspect is important for disaster risk reduction.

C9. Media

The media — in their various forms and with a diversity of ownership—as an actor, have an essential role in the development of the Information Society and are recognized as an important contributor to freedom of expression and plurality of information on disaster risk reduction.

a) Encourage the media - print and broadcast as well as new media - to continue to play an important role in the Information Society even in case of disaster. Information dissemination was important at any phase of the disaster management cycle.

b) Encourage the development of domestic legislation that guarantees the independence and plurality of the media at disaster as well.

c) Take appropriate measures - consistent with freedom of expression - to combat illegal and harmful content in media content even in case of disaster. Incorrect rumors could cause chaotic situation at emergency.

d) Encourage media professionals in developed countries to establish partnerships and networks with the media in developing ones, especially in the field of training. It would be important to have good reporters at disaster.

e) Promote balanced and diverse portrayals of women and men by the media. It is important to report fare(non-biased) information at disaster as well.

f) Reduce international imbalances affecting the media, particularly as regards infrastructure, technical resources and the development of human skills, taking full advantage of ICT tools in this regard. This is important for disaster situations as well.

g) Encourage traditional media to bridge the knowledge divide and to facilitate the flow of cultural content, particularly in rural areas. This is important at disaster as well.

C10. Ethical dimensions of the Information Society

The Information Society should be subject to universally held values and promote the common good and to prevent abusive uses of ICTs even at disaster as well.

a) Take steps to promote respect for peace and to uphold the fundamental values of freedom, equality, solidarity, tolerance, shared responsibility, and respect for nature even at disaster as well.

b) All stakeholders should increase their awareness of the ethical dimension of their use of ICTs even at disaster as well.

c) All actors in the Information Society should promote the common good, protect privacy and personal data and take appropriate actions and preventive measures, as determined by law, against abusive uses of ICTs such as illegal and other acts motivated by racism, racial discrimination, xenophobia, and related intolerance, hatred, violence, all forms of child abuse, including paedophilia and child pornography, and trafficking in, and exploitation of, human beings. This is important even at disaster as well.

d) Invite relevant stakeholders, especially the academia, to continue research on ethical dimensions of ICTs even for disaster as well.

C11. International and regional cooperation

International cooperation among all stakeholders is vital in implementation of this plan of action and needs to be strengthened with a view to promoting universal access and bridging the digital divide, inter alia, by provision of means of implementation. This is important at disaster as well.

a) Governments of developing countries should raise the relative priority of ICT projects in requests for international cooperation and assistance on infrastructure development projects from developed countries and international financial organizations. This is important for disaster risk reduction.

b) Within the context of the UN's Global Compact and building upon the United Nations Millennium Declaration, build on and accelerate public-private partnerships, focusing on the use of ICT in development. This is important for disaster risk reduction.

c) Invite international and regional organizations to mainstream ICTs in their work programmes and to assist all levels of developing countries, to be involved in the preparation and implementation of national action plans to support the fulfilment of the goals indicated in the declaration of principles and in this Plan of Action, taking into account the importance of regional initiatives. This is important for disaster risk reduction.