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Expert group meeting on information and communication  
technologies for disaster risk management in the Caribbean  
16 September 2013  
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**REPORT OF THE EXPERT GROUP MEETING ON  
INFORMATION AND COMMUNICATION TECHNOLOGIES  
FOR DISASTER RISK MANAGEMENT IN THE CARIBBEAN**

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## A. DECISIONS AND RECOMMENDATIONS

1. It was agreed that information and communication technologies (ICT) have an important role to play as an enabler of disaster risk management (DRM). Specifically, there is much value to be gleaned from the use of Geographic Information System (GIS) in the area of risk mapping and planning, in the use of mobile phone-based technologies, in the area of early warning systems and post-disaster response coordination, and in web-based systems for cross-organizational coordination.
2. Lack of human resource capacity was cited as the major factor holding back the adoption of ICTs in DRM. In many cases, disaster management offices lack dedicated ICT staff and are reliant on ICT support from outside the organization. However, even non-ICT staff can benefit from ICT skills; it was therefore recommended that development of programs for increasing the ICT capacity of DRM staff should be a matter of priority. Organizations should perform assessments of ICT capabilities so that gaps can be identified and relevant training can be targeted to improve operational capacity.
3. Data sharing was identified as another limiting factor in ICT usage, both within governments, and between DRM offices and other organizations. Barriers can exist between different ministries that make government entities reluctant or unable to share information with disaster offices and regional organizations; these problems can include issues of security, privacy, and difficulties related to data standards for information exchange. Cooperation from telecom operators was also cited as a limiting factor.
4. Improved governance was also identified as an important issue. Even with systems in place, issues exist beyond the technological level, which require the creation, implementation and maintenance of formalized governance policies regarding information sharing and utilization. The purpose of these policies should be to ensure that disaster risk reduction plans are implemented in advance of a disaster and that support structures for disaster response management will be made available in a post-disaster scenario.
5. It was agreed that improved ICT governance should not be treated as merely an internal need, nor should it be limited to specific DRM agencies, but should embrace wider networks at the national level and beyond. In particular, national ICT policies should be updated to reflect the need to support disaster offices in the event of an emergency. These policies should not only provide for the availability of a national government's ICT resources, but also those of non-governmental organizations, organizations in the private sector and resources available at a regional and national level. Telecom operators, specifically, need to be brought into formalized agreements with regard to providing emergency support for disaster response and recovery operations.
6. It was also recommended that governance policies with regard to use of social media be put into place at disaster management offices, given the facility that social media channels offer in reaching the public. In light of the reputational importance that can be attached to social media communications, these governance policies should include determination of who is responsible for the release of information through social channels and should establish standard procedures for ensuring that these messages are appropriately vetted. In addition, these policies should cover both how social media is used on a day-to-day basis, as well as how social media tools are to be used in early warning situations, and in communicating information to the public in the hours, days and weeks following a disaster.
7. Finally, it was agreed that follow-up on this meeting was important for the purpose of building cooperation and engagement with this issue in the region. It was suggested that the recommendations of the associated study on ICT and DRM be presented to the Conference on Comprehensive Disaster Management, which will be held in December in Jamaica.

## **B. ATTENDANCE AND ORGANIZATION OF WORK**

### **1. Place and date of the session**

8. The Expert group meeting on information and communication technologies for disaster risk management was held on 16 September 2013 at the Economic Commission for Latin America and the Caribbean (ECLAC) subregional headquarters for the Caribbean in Port of Spain, Trinidad and Tobago.

### **2. Attendance**

9. The meeting was attended by the directors of disaster management offices in four Caribbean States - Antigua and Barbuda, Barbados, Montserrat and Jamaica. Representatives from the following organizations also attended the meeting: the Caribbean Association of National Telecommunications Organizations (CANTO) and the Caribbean Disaster Emergency Management Agency (CDEMA), which is the Caribbean Community's (CARICOM) regional agency for the coordination of disaster management efforts. A representative of the Office of Disaster Preparedness and Management in Trinidad and Tobago had been scheduled to attend, however the representative was otherwise detained in connection with ongoing flooding events in Trinidad.

### **3. Agenda**

1. Opening remarks
2. Introduction
3. Information communication technologies options to support disaster risk management and Caribbean development
4. Analysis of information communication technologies for disaster risk management in the Caribbean
5. Evaluation of conclusions and recommendations from the study
6. Recommendations for modifying the ECLAC paper
7. Closing remarks

## **C. SUMMARY OF PROCEEDINGS**

### **1. Opening of meeting**

10. Opening remarks were made by the Deputy Director a.i. of ECLAC subregional headquarters for the Caribbean. He explained that DRM is a focus of the Caribbean region due to its vulnerability to a range of hazards, often exacerbated by geology, tectonic setting, location and topology. He mentioned that ECLAC has been in the forefront of damage and loss assessment in response to many unfortunate events in the region.

11. He indicated that the meeting will examine a report on the state of DRM and ways in which it can be managed through the use of ICT in the region. He emphasized that ICT offers a powerful framework for DRM; information systems that disseminate credible information in a timely fashion can reduce risks enormously. Many of the challenges are also manmade and go beyond information technology, to the root of political and social processes. He noted that much collaboration occurs within DRM community, but not so much between the DRM and the ICT community. This meeting

therefore represented an opportunity to move the collaboration of these fields forward, in hopes of getting to a state where ICT can be fully harnessed in all stages of disaster management.

## 2. Introduction of participants

12. Members of the group were invited to introduce themselves and to give an overview of, and share their perspectives on the status of ICT and DRM in their organization. Each member of the group spoke in turn.

13. The Director of the Disaster Management Coordination Agency in Montserrat said that their organization has a lot of opportunities available for the use of ICT, but has not been able to transition into what is needed. Montserrat has specific needs due to the presence of an active volcano on the island and therefore has opportunities to use early warning and messaging systems. However, in spite of having ICT platforms, the office frequently lacks the expertise to use them properly.

14. The Secretary-General of CANTO said that the organization has 120 members, mostly Caribbean telecommunications operators and their local and international suppliers. She said the organization has recently established a Disaster Recovery Planning Committee and has placed a staff member in charge of assisting the Committee in the work that they do. She said she is seeking opportunities to collaborate with other agencies.

15. The ICT Manager at CDEMA said that the agency is in the process of rolling out a 10-year strategy which will be unveiled at the DRM Conference in Jamaica in December. He felt that an important consideration is that most of the States are not at the same level of capability in DRM. Part of the upcoming plan is to define three different levels of capability. The priority is to get all member States to level one, and then push more with ICT solutions.

16. The Director of the National Office of Disaster Services (NODS) in Antigua and Barbuda said that there have been many changes during his time working in DRM. The Disaster Office went from having a single radio for coordination with police, to a point where it has developed its own network where there is coordination with key agencies at the national level. They have migrated from telephones to fax machines and e-filing systems and most recently, they have been experimenting with ultra-high frequency-based internet communications systems. NODS is also working on implementing GIS for disaster related mapping; however they have run into problems related to the difficulty of information sharing between offices. He reported that, at times, there is a reluctance to share data under the aegis of national security, even where there are no security issues attached.

17. The Director of the Department of Emergency Management in Barbados noted that her Department has a strong telecommunications network infrastructure which links the Emergency Operating Centre to all forces in Barbados, as well as with CDEMA. She reported, however, they were struggling with linking their telecommunications with information technology systems. In Barbados, a previous government had set targets for implementation of e-government initiatives, but with a change in government came a change of priorities. The Department is therefore still waiting on an ICT policy rollout at the national level. As an example of the challenge presented, she noted that e-mail is still not recognized as a "legitimate" form of communication and all official e-mail messages must be accompanied by a memo.

18. The Director-General a.i. of the Office of Disaster Preparedness and Emergency Management (ODPEM) in Jamaica said that the main focus of the agency is building disaster resilient communities. He said that ICT capabilities in Jamaica were fairly decent and that there is a strong telecommunications section with a strong manager of telecommunications. ODPEM has integrated GIS into vulnerability mapping and also has an emergency GIS unit. In case of any major event, GIS specialists are pulled in from across government to form an emergency team to do data analysis. ODPEM has also undertaken significant work in software development for disaster risk management, damage assessment and message handling systems. They are working with telecommunications operators to develop systems for mass notification across the island.

19. The Operations Manager at CANTO said that these are challenging but exciting times for disaster preparedness and mentioned Waze, a smartphone-based traffic guidance system, as an example of a social ICT system that may have potential applications to DRM. She encouraged the group to think of ways that young people can contribute to disaster management awareness.

20. The Deputy Director a.i. of ECLAC informed the meeting that, in 2012, the organization completed the creation of a General Equilibrium Model to incorporate climate change impacts into economic analysis of developing countries. However, this model does not yet incorporate extreme events, which he felt would be a valuable addition to the model. This model has been elaborated in collaboration with the University of Guyana and is a work in progress. It will be placed on the web so that individuals can use the model to run simulations.

21. The Consultant from Tonga indicated that, for the following two days, he will be leading a training course in ICT for DRM for technical staff of the various represented DRM agencies. The course model was developed by the Economic Commission for Asia and the Pacific, and its use in the Caribbean represents an example of collaboration between United Nations sister organizations.

22. The ECLAC Consultant said that he has worked on developing a baseline study on ICT for DRM in the Caribbean, which the group will be discussing at length, later in the meeting.

23. The Chief of the Caribbean Knowledge Management Centre at ECLAC subregional headquarters for the Caribbean said that DRM has been a focus of the Centre this year and that he welcomed contributions from all the experts in the group on the draft of the study.

### **3. Introduction to information communications technology for disaster risk management in the Caribbean**

24. The ECLAC Consultant introduced the study on ICT for DRM to the group, with the goal of visiting the various topics discussed in the study, without necessarily reviewing the study itself. The discussion began by reviewing the costs of disasters in the Caribbean region. The point was made that damage caused by disasters has repeatedly had the effect of reversing hard-earned gains in development. By way of example, the meeting recalled Hurricane Gilbert, which hit Jamaica in 1988 at an economic cost of US\$4 billion. Since that time, the pace of recovery of both infrastructure and the economy has been slow. The meeting pondered whether the experience would be any different if a similar disaster were to occur today.

25. The vulnerability of the Caribbean to disaster was discussed at length. The meeting noted that in Barbados, for example, 90 per cent of all infrastructures are on the coast, making it vulnerable to hydrometeorological events. Such events have serious impact on tourism and agriculture. The reputation of the government and other institutions can also be damaged. The possibility of a disaster related to an oil rig off the coast of Trinidad was mentioned. It was noted that such a disaster would affect other islands nearby; raising the possibility that it would become a regional issue beyond the obvious national problem. A concern was raised regarding the importance of enforcing disaster resilience as part of development and the negative effect of increasing apathy as more time goes by since the last disaster.

26. The topic of knowledge management was presented, with a discussion on the hierarchical importance of data, information, knowledge, and wisdom. Processed data which has relevance becomes information, and when information is processed and prepared for decision-making, it becomes knowledge. Wisdom comes out of knowledge and is considered to be at the “top of the pyramid”.

27. The Consultant explained that DRM is an important application of knowledge management, because of the critical importance of managing a disaster, the serious consequence in making a wrong decision, and the difficulties related to dealing with an overload of information during hazard events. He noted that knowledge management integrates the practice of learning from past experiences so that

performance can be improved in future situations. In past times, knowledge management occurred through paper, but ICTs are an increasingly viable channel for knowledge management as the cost goes down while capabilities increase.

28. ICTs were discussed as an “enabler” for DRM, to help with management, dissemination of information and the creation of knowledge. ICTs also have the capability to get information to a large number of people in a short period of time. Social media and viral content have opened up new channels for the dissemination of information.

29. ICTs also have weaknesses in a disaster situation; if redundancies are not built into systems, they can become useless in a disaster. There can also be non-disaster related reasons for the failure of ICT to perform to expectations. Of specific concern is the digital divide, which is the gap in the capabilities of an ICT system in relation to the capabilities of the people using it. This is an issue which can exist at all levels of an organization; frequently the most senior members of an organization can have limited understanding of the capabilities and limitations of the ICT systems that support their work.

30. Furthermore, communications channels need to be thought out in advance of a disaster. If one agency needs to warn another of an impending hazard, protocols must be set up to ensure that the message gets through to the appropriate personnel in a timely manner. A well-tested and implemented ICT-based knowledge management system can facilitate this process, but decisions on how it should be used should be taken in advance of an emergency.

#### **4. Introduction of the survey and study**

31. The ECLAC Consultant began discussion of the results of a survey that was completed as part of the study on ICT for DRM in the Caribbean. The purpose of the study was to ascertain the current state of ICT usage in DRM applications, and to create an understanding of the current limiting factors impeding its wider use. The purpose of this expert group meeting was to review the draft of the study and the survey results, and to contribute insights to the final version of the study.

32. The survey requested information from 24 disaster offices in the region; 16 responded. The study is based on an e-readiness framework designed to evaluate the current sophistication of ICT usage within a sector. The five categories covered in the framework are business environment, governance, human resource capacity, psychographics and infrastructure. It was expressed that, with respect to DRM, a greater emphasis should be placed on the population, and the public’s capacity to interact with ICT systems. The Consultant said that, within the context of the framework, this factor was considered part of the business environment.

#### **Discussion of business environment**

33. In regard to the business environment, the issue of information sharing was discussed at length. The representatives from one of the disaster management agencies said that this was a critical area in which performance frequently falls short of what is needed. Sometimes there are ICT-related causes for the difference in software protocols and data formats, which was highlighted. However, much of the problem is related to management issues. There is frequently a reluctance to share information even between government agencies at a national level, as well as between agencies and/or stakeholders at a regional level. The information sharing that does occur frequently happens on an informal level, as it can be difficult to obtain sign-offs. On the other hand, the representative from Barbados said that her office is aided by legislation which says that organizations which hold information pertinent to emergency planning are obligated to share it with the Department of Emergency Management.

34. Social media was discussed in relation to the sharing of information with the public. The group was concerned that, following an event, organizations can be bombarded with questions through Twitter and Facebook, and determined that policies need to be put in place to determine how



these queries should be responded to, with a clear chain of authority as far as approving the release of any messages that may have a reputational impact.

35. The use of mobile phones for disaster communications was discussed in detail in both pre- and post-disaster circumstances. It was agreed that mobile phones could be quite useful in an early warning situation. However, these systems have not been widely implemented. One concern with using SMS messaging is that, in large volumes, as would be experienced in a disaster situation, the system can be brought down through an overload of traffic.

36. Cell broadcasting was discussed as an alternative technology that can be used to disseminate messages widely without overloading the network. However this technology has yet to be implemented in any of the States represented at this meeting. The cost of cell broadcasting systems and the difficulty of working with telecom operators were cited as reasons the technology was being held back. One representative of a disaster office stated: “The telephone company is just not interested in supporting cell broadcasts, even in a limited way.” The group was reminded that support for disaster communications was mandated in many telecom licensing schemes and it was suggested that this could be used as leverage to bring telecoms on board with implementation of cell broadcast technology for early warning systems.

37. Another concern cited with regard to mobile-based systems for disaster communications is the availability of handsets among the target population. Though the Caribbean is believed to have the highest market penetration of cellular phones in the world, members of some of the most vulnerable populations may still be without handsets. These populations include poor people as well as children. Moreover, for a handset to be usable in an emergency situation it must be charged up and turned on and the user must be familiar with its messaging capabilities. In the case of cell broadcasting, the phone must be capable of receiving cell broadcasts and that feature must be enabled.

38. The meeting indicated that there is a tendency for the effectiveness of technology to be assessed by persons who actually have access to ICT. There is typically a positive response from that section of the population who are more tech-savvy and who use technologies. The data on mobile and internet penetration can be misleading and do not necessarily reflect the situation on the ground. Mobile phone penetration figures tend to be a source of contention with the International Telecommunication Union since the percentages seem to suggest that the entire population has access to one or more phones. The reality though is quite different, and in many cases the uptake of subscriber identity module (SIM) cards or mobile phones is measured as high because one person may own more than one phone or tourists may purchase SIM cards and then leave the area. This results in figures that suggest the market penetration of mobile phones is well over 100 per cent, when the reality is quite different. However, new approaches to measuring phone penetration – counting active SIM cards, rather than all SIM cards – may result in reduced over-counting of mobile phone users. Moreover, this was identified as an opportunity for ICT; information systems could be used to determine which demographics are not served by mobile phones and a means of reaching these populations could be developed.

39. More traditional systems, such as siren systems and radio, were suggested as means of reaching endangered populations. The Consultant stated that any one channel would not reach the entire population, so a multichannel approach is needed. Members of the public will be more responsive to alarms if messages are transmitted simultaneously through different media.

### **Discussion of governance**

40. The results of the survey on governance were reviewed. Survey responses indicated that there is a high level of non-compliance with national DRM plans and policies, and in many cases DRM policies and guidelines are in draft form and are not reflected in recent legislation. Thus, agencies are not bound to follow these guidelines and monitoring is limited.

41. One representative questioned the soundness of the survey’s open question on national DRM plans, noting that there is a distinction between a disaster risk reduction plan and disaster management

plan. Disaster management plan focuses on response, whereas disaster risk management embraces mitigation and prevention and thus entails something other than emergency services and the existence of a warden system. Consequently, an affirmative response to the question may be misleading.

42. The relevancy of having current legislation was also called into question and a representative said that legislation that is 15 years old is not necessarily outdated, since planning is typically done on a 10 to 15 year horizon. However, legislation that is 30 years old cannot be considered “current”.

43. It was stated that most disaster legislation in the region simply establishes the national mechanism and framework. It does not address policy; instead it outlines the roles and responsibility of the Director of the office and provides cursory authority for monitoring and regulation. It gives the Director a mandate to do the disaster planning. However, it was speculated that the existing legislation may not be up to date and as such does not take into account the capabilities of current ICT systems. It was considered that it would be useful to have criteria to assess how current legislation is.

44. The Consultant introduced a further issue that national ICT policies do not account for the importance of DRM. Though they may cover the issue from a business continuity perspective, these policies do not reflect the need to prioritize support for disaster management offices in the event of an emergency.

45. It is important that these national ICT policies reflect support for DRM, not only for a national government’s ICT resources, but also those of organizations in the private sector and at the regional level as well. Telecom operators, in particular, need to be brought into formalized agreements with regard to supporting disaster response and recovery operations when the need arises.

46. The representative from CDEMA noted that his organization had considered this issue and will be examining public and private partnerships, particularly the roles of corporate entities and telecom providers such as Digicel and Lime, to help formulate a way forward.

47. It was stated that a level of support structure does exist, particularly on the DRM side, and that this needs to be extended to ensure that ICT systems are well supported. In particular, data sharing on a regional level is limited by the tendency of member States to treat data as highly proprietary, in spite of CARICOM agreement to share data. Telecom operators are also reluctant to share data due to the risk of exposing that information to their competitors. While there are frequently categories of data that telecoms are required to share with their regulator as a requirement for keeping their operating license; this requirement is not necessarily enforced, the accuracy of the data can be suspect and the data shared with telecom regulators is not necessarily passed on to the disaster management offices.

#### **Discussion of human resources capacity**

48. The survey results revealed that over 50 per cent of responding organizations do not have the ability to cope with the inundation of information that takes place post-disaster. Additionally, 70 per cent of responding organizations feel that the quality of the ICT technical staff may be a constraint in advancing strategic rehabilitation initiatives. The members of the expert group had some concern over the wording of this second question; they felt that the phrase “strategic rehabilitation” was not clear, and may include some activities which fall outside the scope of disaster management.

49. In general, it was felt that human resources capacity was a limiting factor in the implementation of ICT for DRM. It was cited that disaster offices in general do not have dedicated ICT staff, although these functions may be available in the overall disaster management organization of which the disaster office is a coordinating mechanism. Even when ICT staff are in place or available to a disaster organization, it was questioned if enough staff are available to manage the amount of work required. The issue of quantity of ICT staff is an issue, as is quality.

50. It was felt that DRM was not being prioritized by ICT organizations. While there are many opportunities for ICT staff to be used to improve DRM functions, those ICT resources that exist are

stretched among many functions. Moreover, it is felt that they are not highly paid in their roles, as compared to opportunities that may exist for them in the private sector.

51. A slide illustrated that less than half of respondents felt that senior management has a strategic understanding of how ICT fits into the disaster preparation activities for their country. However, the group felt that the wording on this question was ambiguous, as senior management was not defined as a term, and depending on who was responding, could refer either to higher level staff within a DRM office or to government ministers.

#### **Discussion of psychographics**

52. Psychographics was explained as the mindset and disposition of an organization, specifically within the leadership, with regard to ICT. It is impacted greatly by leadership's awareness of available ICT tools and awareness of the consequences of not using them.

53. It was said that elected officials can be caught in a traditional mindset, and frequently see disaster management as an issue of "biscuits, blankets and plastic sheeting", and do not consider the ICT needs and ramifications of disaster management operations. Though governments are willing to talk about building disaster resilience into the development process, "that is where the discussion ends." Governments turn over too quickly and do not have time to get their programs on the ground.

#### **Discussion of infrastructure**

54. One representative of a DRM agency stated that infrastructure investment for ICT programs in DRM are frequently reliant on donor funding and it was agreed that this represents a problem with sustainability of the operations. The representative said, "the more [donor funding] you get, the more your budget gets cut." As a result, basic ICT equipment – computers in the disaster office – can be obsolete and may take many years to replace.

55. The representative from Jamaica was asked to elaborate on a news story in which he was featured, regarding a request to the government for a 200 per cent increase in funding to the ODPEM. The representative made reference to the Caribbean Catastrophe Risk Insurance Facility, which would cover some costs in the event of a need for a large amount of post-disaster emergency funding. However, that money would come only after a disaster and is therefore of no help in funding disaster preparedness and risk mitigation. The representative felt that the payoff from the insurance fund would be inadequate to cover much of the hypothetical reconstruction costs, but that investing a smaller amount of money up front could result in a significantly reduced cost of disaster-related damages.

56. An issue the survey revealed was a broad lack of awareness of the latest ICT tools available for disaster preparedness, though 61 per cent of the DRM officials who responded said that they were comfortable with their existing practices and methodologies for disaster management.

57. The Consultant presented a list of ICT tools that, according to survey responses, are currently being used by DRM organizations in information exchange with collaborators. E-mail was listed most commonly by several responders, with the Web Emergency Operations Centre (WebEOC) in second place. WebEOC is a software package that is widely used as a central hub for emergency operations management and the coordination of interagency incident response.

### **5. Discussion of conclusions of the study**

58. The Consultant asked the meeting participants to suggest possible recommendations based on the day's discussion and their experience.

59. Members of the group discussed the need for increased buy-in to ICT for DRM projects from several stakeholders, including government ministers, telecom operators and within government, ICT organizations.

60. There was extended discussion of the role of telecoms in ICT. Because much of ICT emerged out of the telecommunications world, a lot of telecommunications has been rebranded as ICT. But there is still a division between telecommunications infrastructure and information technology tools and infrastructure. Telecommunications tools were seen as fairly mature in their implementation, while IT tools are being underutilized.

61. Members of the group expressed concern over the lack of data sharing on a regional level. Organizations were looking at open data systems, but anticipated problems with reaching agreement on what data can be shared, what must be protected and how. The Consultant referred to the Global Positioning System as an example of an open data platform that could perhaps be used as a template in other initiatives.

62. However, regardless of physical technology, one representative said that we need to look at the human capacity for who is going to use the technology within the offices.

63. The Consultant then shared some of his conclusions and recommendations. He first noted that the vulnerability to and impact of disasters is high in Caribbean States and that the DRM function is closely related to the function of information management. He said that leveraging ICTs is critical to the success of DRM in the subregion.

64. The Consultant recommended that the DRM and ICT communities build greater connections with policy makers and other communities of practice to build support for modernization of DRM infrastructure. He also suggested implementing strategic ICT efforts at a subregional level; for example, the cost of data centre operations to governments could be greatly reduced by providing information hosting services through regional cooperation. He said that ICT governance and interoperability guidelines need to be improved and that the development of programs for human capacity development in ICT should be a matter of priority. Organizational assessment should be done so that gaps can be identified and relevant training can be targeted to reach organizations.

65. The representative from CDEMA shared that the organization was currently rolling out a new strategy that incorporated many of the issues covered in the study. The Consultant agreed there was a need to build greater connection between communities, not just regionally but internationally as well.

66. Representatives enquired of the role that ECLAC could play in assisting with the standardization of the regional agencies in disaster management operations. It was suggested that ECLAC present this study at the Conference on Comprehensive Disaster Management, which will convene in December, as a way of encouraging synergies through the national focal points. It was also suggested that a follow-up discussion session occur at this Conference that would cover the recommendations of the study, as well conclusions from the upcoming Forum on the role of telecommunications and information and communication technologies in disaster risk management and climate change, to be held in Barbados from 18 to 20 September. It was recommended that ECLAC coordinate with CDEMA to bring this issue to the attention of the organizers of the Conference on Comprehensive Disaster Management.

67. The susceptibility of ICT infrastructure to disaster was brought up by a member of the group. He stated that countries should design back-up systems, and wherever possible find alternative storage locations for their information. The Consultant highlighted that an increase in ICT integration into DRM would translate into a greater reliance on technology. As an example, he brought up the concern that the main telecommunications circuit in the Caribbean region is hosted in Miami, Florida, United States of America. There are serious implications associated with such a situation, for example in the event of a disaster in Miami, regional communication within the Caribbean could be cut off as non-domestic loads would be the first to be shed under disaster conditions. Therefore it would be strategically advantageous to develop regional support infrastructure for these systems, but there are telecom and ICT issues that need to be considered.

## **6. Presentation of the Asian and Pacific Training Centre for Information and Communication Technology for Development Academy**

68. The Consultant from Tonga, spoke briefly about the “Academy of ICT Essentials for Government Leaders Programme” from the Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT), which is a part of the Economic and Social Commission for Asia and the Pacific. The APCICT Academy programme offers a series of training modules that are designed to equip policymakers and other government officials with the knowledge and skills they need to leverage ICT in the pursuit of national development goals. The Academy currently offers 11 modules on various themes related to ICT and development. The Module 9, “ICT for Disaster Risk Management” was to be offered as a two-day course, immediately following the expert group meeting, to be presented to selected technical staff members of the attending DRM agencies.

## **7. Closing remarks**

69. The Chief of the Caribbean Knowledge Management Centre thanked all of the participants for attending the meeting and expressed his appreciation on behalf of the organization for their contributions to the discussions that would richly enhance the study. He also thanked all of the internal staff members for their assistance in ensuring the successful hosting of the meeting on ICT for DRM management.

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