7.0 FINDINGS

7.1 Summary

The fact that the various telecommunications companies have such a strong influence on the development of telecommunications infrastructure throughout the region and that governments invariably have shares in the telecommunication companies, places telecommunication companies in a strategic position to influence the development of telecommunication policy. As a result of this, the telecommunication policy that government develops should make greater provision for telecommunication requirements for disaster situations. Thus, the need arises for governments to pay closer attention to the importance of telecommunication in the development of the region.

7.2 Introduction

This section is intended to provide a condensed description of the information gathered through the review of pertinent documents and the various interviews. It is sub-divided according to the main groups of actors involved in disaster management. They include the National Disaster Organisations (NDOs), Government Telecommunications Departments, Telecommunications Services providers, Broadcast Media, Regional and International Agencies.

7.3 National Disaster Organizations (NDO)

In general, the NDOs interviewed use telephone and fax for daily communications with other agencies locally and abroad. Locally, a VHF radio network is utilized for communications with other emergency personnel. In addition, computers equipped with modems are being used but mainly for the preparation of documents.

An Inmarsat standard C unit is available at the Office of Disaster Preparedness (ODP) but it is not used daily. This unit proved to be extremely useful during Regional Rap' 94.

The NDOs visited have the capability to receive weather information directly from satellite. The St. Lucia NDO is currently in the process of taking this a little further by the setting up of a computer based Bulletin Board to provide dial-in weather information to the public.

None of the NDOs have cellular phones in their possession or make use of them on a daily basis. The NDO in Barbados and ODP have no arrangement or agreement on the availability of cellular phone to disaster management personnel during a disaster. The NDOs in St. Lucia and Antigua have written agreements with Boatphone for making these phones available during a disaster. The National Emergency Management Agency (NEMA) does not have any agreement but since Telecommunications Services of Trinidad and Tobago (TSTT) is partly owned by the Trinidad Government and its communications task group comprise of TSTT officials, no problems are envisaged in an emergency.

St. Lucia's NDO has direct telephone links to the radio stations. Likewise, Antigua's NDO has a formal agreement to use the facilities of a number of broadcast stations on the island. The Jamaican Government has started an exercise to provide an override facility to the radio stations to allow direct access to the radio stations by the Prime Minister or his designate.

7.4 Government Telecommunications Departments

(a) Jamaica

A new Telecommunications bill is being considered for passage into law. This telecommunications Act 1994 is expected to replace the current Telephone Act of 1893.

This new bill has become necessary for two main reasons. Firstly, the current Act only covered wire transmission of sound. Recent advancements in telecommunications technology have made other modes of wireless transmission possible. Secondly, modern telecommunications systems permit the transmission of information in voice, video and other signal formats.

Like its predecessor, the bill mandates that telecommunications service providers apply to Government for a license to operate on the island. Further, the two telephone entities, namely Telecommunications of Jamaica (TOJ) and Jamaica International Telecommunications Ltd. (JAMINTEL) would be able to apply for a single license. In the past each entity had a separate license agreement.

Provision will be made for the exemption from the licensing requirement for telecommunications systems in specified circumstances. In addition, special licenses will be provided for the supply of telecommunications services to the government for purposes of national security. These provisions will no doubt encompass telecommunications services for disaster management and would ensure that there will not be any legal hindrances should a telecommunications system be established for disaster.

A portion of the FM band has been reserved for community type, non-profit broadcast.

(b) Trinidad & Tobago

As is the case with Jamaica, a new Telecommunications Act is awaiting approval. Unfortunately, no details were obtained on this new bill. However, it is expected that similar changes are being sought.

Nonetheless, the government has been slowly pulling out of the telecommunications industry and allowing for the privatization of these entities. This could result in greater competition and hopefully lower prices for services.

In the area of telecommunications training a problem exist. Due to the stringent screening process for the identification and selection of training candidates, Trinidad has not taken full advantage of the telecommunications training opportunities available in the region and internationally.

No license is required by the telephone company because it is partly owned by government.

(c) Antigua

A telecommunications bill is being considered by the Government of Antigua which would ban the use of *call-back* services. This bill has generated substantial debate within legislative circles. In fact, it has served to draw the attention of the political directorate of the country to the importance of telecommunications in the development of the country.

The telecommunications Officer has just returned from a preparatory meeting in preparation for the International Telecommunications Union (ITU) Plenipotentiary Conference. This meeting mandated resolution to be tabled at the ITU Conference calling for developed countries to provide Equipment and Technical assistance for use during a disaster. This will also include the waiver of all usage charges associated with such equipment.

7.5 Telecommunication service providers

(a) Jamaica

Local telecommunications services are provided by Jamaica Telephones Co. Ltd. (JTC) , while International services are provided by Jamaica International Telecommunications Ltd. (JAMINTEL).

Cellular phone service is available island wide but no formal arrangement has been worked out for the availability of the service to ODP. However, JAMINTEL officials are prepared to discuss the use of such services and appropriate costs with ODP officials.

One International exchange is currently being used. This is co-located with a local exchange. Plans are on the way for the installation of a second international exchange by next year. This will provide a level of redundancy between the two international exchanges.

From the existing exchange, access to the rest of the world is via Fibre Optic cable and satellite.

All domestic cabling is underground resulting in greater protection from hurricane damage.

Two Inmarsat Standard - "A" terminals are available should there be a complete disruption of service. This is a satellite communications terminal which provide real-time voice and data capabilities.

X.25 Packet Switching is available and is widely used. However, Jamaica is not included in the preliminary phases of the Cable & Wireless Caribnet X.25 Network. Jamaica is scheduled to be included in the next phase.

JAMINTEL has applied for an Internet node. It is expected that this node should be available within three months. Its cost should be anywhere between US$ 20-30 per month.

(b) Trinidad

Unlike Jamaica, domestic and International Telecommunications services are provided by Telecommunications Services of Trinidad and Tobago (TSTT). It is jointly owned by the Government of Trinidad and Tobago (51%) and Cable & Wireless (49%).

Coincident with the visit to that country, TSTT announced the introduction of its Americas-1 System. It provides Fibre Optic links between Trinidad and Tobago and Brazil, Venezuela, St. Thomas and Florida.

Americas-1 System will offer ISDN-like services to Trinidad, that is voice, video and data services. In addition, it can act as a gateway to networks in the USA and other countries World wide. A separate Fibre Optic Cable System refered to as the Eastern Caribbean Fibre System (ECFS) spans the chain of island in the Eastern Caribbean from Trinidad to St.

Thomas.[4] This as a result will provide necessary connectivity between the countries on the Americas-1 system and the rest of the Eastern Caribbean.

No costing information for the use of Americas-1 system was provided at the time of the interview, however, the TSTT team expressed their willingness to discuss any requirements that the disaster regime in the region may have and an appropriate tariff structure for these services.

TSTT has also embarked on a project to install three ring Data Networks in Trinidad. One ring will span the north of the Island, the second will span the central regions and the third will span the south of the Island. There will also be some overlap between adjacent rings. They will provide digital telecommunications facilities to the several business places on the ring such as banks etc.

(c) Antigua

Domestic telephone service is provided by the Antigua Public Utilities Authority (APUA) which is wholly government owned. International telecommunications services are provided by Cable & Wireless. Cellular phone service is provided by Boatphone, a subsidiary of Cable & Wireless.

Like the other countries where Cable & Wireless is present, an Inmarsat terminal is available for emergency purposes. This can be made available to the disaster personnel during a disaster.

Cable & Wireless has embarked on the installation of an X.25 Network in the Caribbean called Caribnet[5]. It will replace the old International Data Access System (IDAS) and is expected to be completed by the second half of next year.

Caribnet will have hubs located in Antigua, Barbados and Bermuda. Each hub will be connected via satellite links to the other countries, thus allowing the routing of traffic between the islands. The Bermuda hub will provide a gateway into Cable & Wireless' Global Data Network which span the entire Globe.

Caribnet will provide speeds of up to 9.6Kbits/s to users[6].

Due to the Topology of the Network, should the link between any two hubs go down, traffic will automatically be routed through the other two hubs. This has obvious implications for disaster communications. The cost for the use of Caribnet X.25 Network was not disclosed. Perhaps it has not been worked out completely by the company.

An agreement is in place for the provision of eight (8) cellular phone units to the Disaster Preparedness Organisation.

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[4]See Exhibit V
[5]See Exhibit IV
[6]See Exhibits VI, VII

Provisions have been made for the use of the St. Kitts *cells* should the *cells* in Antigua become unserviceable particularly during a disaster.

(d) St. Lucia

Both domestic and International telecommunications services are provided by Cable & Wireless.

The same general comments on its System apply for St. Lucia. In addition, a Fibre Optic communications network is in operation island wide.

In fact, the island's state of preparedness was recently tested during the passage of tropical storm Debbie on the 10th September, 1994. In particular, the telecommunications infrastructure was tested and proved to be extremely good.

This experience demonstrated the merits of using underground Fibre Optic Cables. However, it also highlighted the fact that although the underground cables guarded against hurricanes, it was not as resilient to flooding and landslides.

The Fibre optic cables were placed in PVC conduits which were then installed on a sand base. The conduits were subsequently buried with gravel. This was normally placed along the side of the road or highway. The rushing water washed away the gravel and sand leaving the PVC conduits exposed. In the areas of heavy landslides, the moving soil was able to bend the conduits. It is quite possible that the cables may have broken. Resulting in the disruption of telephone service to the Dennery area which was cut off from the rest of the island.

There were also reports of flooding and loss of power at a number of the exchange sites. However, these reports could not be confirmed.

(e) Barbados

The Barbados External Telecommunications Ltd. (BET), as the name suggests, provides external communications services to the island. While the Barbados Telephone Company Ltd. (BARTEL) provides domestic telecommunications services.

Both companies are 85% owned by Cable & Wireless. BET offers a range of telecommunications services including Caribbean On-line Information Services. This service provides computer access to a range of Regional and International databases, as well as E-mail and computer conferencing services.

Caribnet X.25 services will also be available in Barbados as a hub will be located there.

The Cable & Wireless Regional Services (CRS) is also located there. This division will, among other things, manage the Marketing and Maintenance of the Caribnet Network.

A questionnaire was sent to CRS but to date no response has been received.

7.6 Broadcast Media

(a) Voice of Barbados (VOB)

As one of the several broadcast stations in Barbados, VOB broadcasts on both the AM and FM frequency bands. Internal communications is through a VHF radio telephone system which covers 80-85% of the island. The company also uses six (6) cellular phones.

Standby power facilities are available at the transmitter site and the head office.

One antenna tower is being used at present, but an emergency tower should be available by year end. It is hoped that an additional two towers will be acquired by the end of next year.

The station is equipped with a satellite receiver system. No uplink equipment is available.

(b) Caribbean News agency (CANA)

The Caribbean News Agency Limited (CANA) compiles and disseminates news and current affairs information to its affiliated broadcast stations throughout the region. The distribution of news is currently being done through the telephone (wire service).

To improve the quality of the service provided by CANA, it has embarked on a project funded by UNDP called NewsSystem 4. This system will utilize satellite technology for the transmission of news and other information to CANA's affiliated radio and television stations throughout the region .[7]

NewsSystem 4 will be a simplex or a one-way communications system but will provide two (2) voice channels and one (1) data channel. All broadcasted news will originate from the CANA's Headquarters while incoming news will be compiled from the existing telephone wire service. The data channel will be used to transmit non-voice news feed.

The appropriate receive system (located at the affiliated station) will consist of a satellite dish, a satellite receiver, a computer, software and a printer. The computer with the appropriate Wire Capture Software will *capture* the news items and make them available for printing.

At present, CANA only requires one voice channel, therefore, the additional channel will be accessible for future expansion. This voice channel may be made available for disaster management. It would be ideally suited for the broadcast of verbal information such as weather bulletins to the wider Caribbean through the CANA affiliates.

There are a number of factors which would limit its usefulness to disaster communications. They include the following;

- No portable equipment will be available, it will be unsuitable for communications from the disaster affected area.

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[7]See Exhibit X for CANA's Satellite Radio Coverage

- The system is dependent on the telephone infrastructure for the compilation of news items, therefore, its effectiveness in a disaster depends on the availability of the telephone system. The overall reliability of the system can be substantially enhanced if this dependency on the local phone system is eliminated.

- The system will be configured as one-way. Uplink equipment may be obtained at a cost of US$7,000.

- Due to current license agreement between the Barbados government and BET, CANA cannot sell any data services which would be perceived as in direct competition with BET. For example, it cannot rent the data channel to CDERA. Nonetheless, the governments have the power to override any legal barriers for purposes of national security.

One major advantage of the system is that it will necessitate the broadcast of disaster and emergency information beyond the range offered by traditional commercial AM and FM systems. Thus, it will ensure the greater penetration of disaster and emergency information.

(c) Caribbean Broadcasting Union (CBU)

The Caribbean Broadcasting Union (CBU) utilizes satellite technology for disseminating video material to its member television stations throughout the region. Like CANA's NewsSystem 4, CBU system is one-way. Video material comes in via courier, it is processed and then transmitted via satellite to all the member stations.

This is another good system for the dissemination of video information but has a number of drawbacks. They are:

(i) The system is one-way so rapid video exchange is not possible. It should be noted, however, that one of the member stations in St. Lucia is equipped with uplink equipment.

(ii) The uplink equipment is expensive and as a result, it is difficult to justify.

(iii) The system is completely analog and so it is not possible to take full advantage of the limited bandwidth and modern compression techniques. Further, changing to a fully digital system would involve a substantial amount of capital investment since the equipment in all the affiliated stations will have to be changed.

(iv) The system provides no audio or sound.

This system can prove useful to disaster management personnel for the broadcast of situation reports, visual and other written information to the wider Caribbean. In addition, the issue of wider penetration also apply. It can also complement the CANA's NewsSystem 4 by providing video information while CANA's System provide audio information.

CBU is currently looking into the possibility of using an INMARSAT standard A system to provide portable facilities, however, video transmission is only possible in a store and forward mode. They currently have a microwave link to BET.

7.7 International Agencies

(a) United Nations Development Programme (UNDP)

UNDP's projects for the English and Dutch speaking countries of the Caribbean are managed through its field offices in Barbados, Guyana, Trinidad and Jamaica. These offices have collaborated on a number of initiatives and projects which if implemented will significantly impact the telecommunications facilities available for disaster communications. The three relevant studies are :

(i)   Caribbean Communication Study - July 1993.
(ii)   SIDSNET Feasibility Study - August 1994.
(iii)   DERMS Project.

(i) Caribbean Communication Study

The objective of this study was to assess the technical and financial feasibility of establishing a regional voice and data network for the Caribbean, and direct LAN-to-LAN connections between the UNDP Headquarters LAN and one or more of the field offices' respective LANS. In addition, a direct link between the Guyana field office and the Caricom Secretariat LAN was assessed.

The recommendations relevant to this current exercise are;

- Each field office should have adequate emergency communications facilities and ensure that they are used regularly. A packet radio system with AMTOR/SITOR capabilities should be adequate for this purpose. It is estimated to cost US$8200 and include;

        Transceiver
        Antenna
        Power supply
        Modem
        Lap Top Computer

- Division of Management Information Services (DMIS) should pursue the UN Network Project[8] and solicit the Caribbean Divisions participation in the project at an early stage.

The field offices in Barbados and Guyana each has an Inmarsat Standard-A terminal available for emergency communications.

The implications of the LAN-to-LAN exchange to disaster management is that disaster agencies and personnel may have access through the UNDP network to facilities in the USA and Worldwide. This is of course, providing some arrangement can be worked out with UNDP.

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[8]See Exhibit XII for the network Topology