International Symposium
"ICTs and Climate Change"
Quito, Ecuador 8-10 July 2009

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(CITIC)

Meeting Summary

Comments can be sent to: **climate@itu.int**

The Quito symposium was chaired by Ing. Jorge Glas Espinel, President Fondo de Solidaridad del Ecuador, with approximately 450 participants from 20 countries, plus a further 60 participating remotely, drawn from a wide range of organizations including the private sector, research institutes, international organizations and governments. It was the third ITU organized Symposium on ICTs and Climate Change and the first held in a developing country and the first in the Americas.

Opening ceremony

Participants were welcomed by **Dr. Zoila RAMOS**, Director CITIC, who spoke about the importance of this symposium, and thanked ITU for choosing Ecuador and CITIC as host for this event. She underlined the need to take action and stated that the survival of our planet is at stake. The impact of climate change is changing our lives and thus this event is very timely.

Mr. Manuel BRAVO, Vice-Minister of the Ministry of Environment, Ecuador pointed out that Ecuador is committed to the fight against climate change and is becoming a leader in adaptation and mitigation of the effects of climate change. He went on to state that the Ministry of Environment of Ecuador is very active in developing policies and strategies for adaptation to climate change, deforestation as well as investing in alternative energy sources. The Ecuadorian strategy on climate change is aimed at strengthening the national research and aimed at improving Ecuador's institutional capacity. Ecuador has taken unilateral measures such as using resources for sustainable development and raising awareness on energy efficiency.

Mr. Clovis BAPTISTA, Executive Secretary, CITEL – OAS thanked Ecuador and ITU for inviting CITEL to this symposium.

Mr. Malcolm JOHNSON, Director of TSB, ITU thanked the host country for the hospitality and recalled that he moderated a session during the WSIS Forum in May 2009 where H.E. Ambassador Montalvo reported on Ecuador activities to fight climate change. He pointed out that global standards for common reporting formats and a methodology to measure the impact of ICTs on climate change, which are being developed by ITU-T, are required for agreement to be reached during the UN negotiations which will take place in December 2009. He went on by underlining that WTSA adopted the first Resolution on climate change and that we are all called to work together to meet the goals of the United Nations Convention Framework. ITU is working to reduce its carbon footprint and ITU is organizing the first Virtual Symposium which will be held in Korea on 23 September 2009. He said that the Quito symposium was unique in that it was the first event on climate change held in Latin America. He recalled that at the recent UN negotiations in Bonn on a new global agreement, countries from Latin America were at the forefront of the debate. For instance, Mexico proposed a new funding mechanism to pay for climate change mitigation and adaption programs. Ecuador, Bolivia and other countries in the region emphasized the importance of protecting indigenous peoples. Costa Rica has made a public commitment to make the entire country climate neutral and has already increased its forest cover from 21% in 1986 to 51% in 2006. He pointed out that in order to make the best use of ICTs to combat climate change, developing countries must make every effort to expand their infrastructure to provide affordable access to communications for all citizens and to increase broadband levels. He concluded by stating that financing the cost of combating climate changes is also a key issue for the region, as well as projects under the clean development mechanism.

To address those issues, the program for the Symposium has been significantly changed and the ITU background report was revised to address these important topics. The background report also describes ITU's activities on climate change.

Ing. Jaime GUERRERO, President CONATEL , Ecuador, underlined that Ecuador is concerned by climate change and the special location of Ecuador makes it especially vulnerable to its effects. He went on to state that the topic of ICTs and climate change is very important for Ecuador and concluded his remarks by inviting participants and speakers to share ideas and best practices in order to accomplish the goal of combating climate change.

Mr. Antonio GARCIA REYES, President of CONARTEL, Ecuador, emphasized that radio and TV are mass communication media tools that have an enormous potential to raise awareness in the fight against climate change. ICTs are fundamental in the fight against climate change and he noted that countries' policies should be aligned in order to best fight this plague. He concluded by stating that he hopes that the resources shared at this symposium be disseminated as widely as possible so that others may benefit from this important event.

H.E. Amb. Mauricio MONTALVO, Ambassador, Permanent Mission of Ecuador to the United Nations Office at Geneva thanked CITIC and ITU for their efforts and dedication to organize this event and went on that he wishes every success to this important symposium and reiterate Ecuador's commitment within the UN process to combat the effects of climate change.

Ing. Jorge GLAS ESPINEL, President Fondo de Solidaridad del Ecuador, the overall chairman of the symposium welcomed ITU and the other speakers and hoped that this symposium will become one of many events that will be held in the future where it will be possible to continue to discuss climate change issues. He mentioned that ICTs can help to mitigate the effects of climate change, can serve to monitor climate change and ICTs can also help other sectors to reduce CO2 emissions. He stated that Ecuador is working to provide universal access to all Ecuadorian people. He explained that Internet is the promise for education for all, therefore it is necessary to begin to talk about the environmental gap as well as the digital gap. He concluded by stating that he hoped that this symposium would address this important issue

and would propose mechanisms to fill the environmental gap, especially in developing countries.

Dr. Zoila RAMOS concluded the opening ceremony and opened the symposium by expressing her gratitude to all sponsors, national institutions, universities and to all participants who helped to make this event successful. She concluded her remarks by stating that there is a need for concrete action to follow quickly and in this respect she mentioned that Ecuador is asking for economic compensation to fight climate change.

The Symposium was organized into nine sessions: "ICT Policy Framework – part 1 and part 2", "Mitigation 1a: Reducing the Carbon Footprint of the ICT Sector", "Mitigation 2: Using ICTs to reduce emissions in other Sectors", "Adaptation and Deforestation", "ICTs and Emergencies", "Climate Monitoring", "Cost - Effect New Technologies and Climate Change", "Mitigation 1b: Green Technologies to Reduce Carbon Footprint" and "Financing Solutions to Climate Change".
This Meeting Summary presents the main points of all the speakers. Copies of all presentations can be found online at the event website at http://www.itu.int/ITU-T/worksem/climatechange/200907/index.html

Session 1: ICT Policy Framework – Part 1

Global, regional and national policies play a key role in efforts to combat climate change. The world community expects to adopt a successor treaty to the Kyoto Protocol in Copenhagen in December 2009. At the national and regional level, ICT regulators, producers and telecommunication operators increasingly need to reduce GHG emissions and energy consumption. Session 1 provided an overview of:

- *National and regional policies on ICTs to address climate change.*
- *Key policy issues in Latin America.*
- *Status of UN negotiations on a new Climate Change Agreement and the ITU's contribution to this process*
- *Ongoing work in ITU on climate change*

This session was moderated by **Dr. Mauro FLÓREZ CALDERÓN**, President CITIC, Ecuador, who introduced the speakers and emphasized the need to reach an agreement in Copenhagen, Denmark, in order for countries to be able to take the necessary action in the fight against climate change.

Ing. Jaime GUERRERO, President CONATEL, Ecuador, provided an overview of the "ICT Policy Framework in Ecuador". He pointed out that fighting climate change became a priority for CONATEL and corporate social responsibility projects are a reality thanks to the governmental negotiation with the mobile operators which contributed around 20 million dollars for projects to bridge the digital divide and to connect vulnerable sectors of the country. He emphasized that Next Generation Networks (NGN) can reduce up to 40% of energy consumption. He mentioned the need to support a computer recycling strategy and e-waste policies. He concluded by saying that ICTs are

an important element to combat climate change and that we should work to foster virtual conferences in order to reduce travel.

Mr. Clovis BAPTISTA, Executive Secretary, CITEL – OAS, presented the "ICT Policy Framework: OAS approach". He noted that climate change is known in the UN convention as global warming and that coal is the major factor of the growth of greenhouse gasses. He pointed out that OEA committed to reduce GHG emissions and is committed to enacting policies to fight climate change. In addition, OEA is working with ITU through CITEL. He went on to emphasize the need to develop clean technologies and have zero footprints.

H.E. Amb. Mauricio MONTALVO , Permanent Representative of Ecuador to the UN Offices at Geneva preseted "An approach of the Permanent Mission of Ecuador in Geneva on ICT, climate change and the ITU". He stated that no one today is challenging the use of ICTs to fight climate change and the contribution that ITU can give in this area. Previous symposia held in Kyoto and London showed the relationship between ICTs and climate change. ICTs can be a solution to adapt and mitigate the effects of climate change. He noted that an important contribution that ITU is making, relates to monitoring, with OCHA and WMO. In addition, the methodology to calculate ICT emissions developed by the ITU Focus Group is a great step which will help other sectors to use ICTs in the fight against climate change. He went on to emphasize that the victims most affected by climate change will not be ICT users but will be people from developing countries that are fighting against poverty, who are in need of proper education and healthcare. He also pointed out that the ICTs have a crucial role to play in bridging the digital divide. He called for action and underlined that ICT should not be set aside in the global negotiations in Denmark. In this regard, he noted that ITU could play an important role. He concluded his remarks by quoting Kofi Annan who placed great importance on environmental equity and human mankind.

Ms. Silvia GUZMÁN ARAÑA, Director of Environment, Telefónica S.A. presented "General strategies of the ICT sector and Climate Change of Telefónica". She recalled the international commitments to reduce GHG emissions made by UN Secretary-General, USA President and EU Presidency. She reported on Telefónica's policies to mitigate the effects of climate change. She mentioned that part of Telefónica's strategy is based on reducing energy consumption, implementing efficiency plans, fostering the entry in the market of new products and services as well as position Telefónica as a leading ICT company in the fight against climate change using ICTs.

In addition, the company has created an office on climate change which works on operations, awareness campaigns, improving products and services and fostering new partnerships. Currently Telefónica has around 30 ongoing projects related to climate change. She pointed out that most of the challenges faced by the company in this area are related to reducing electrical consumption and improving energy efficiency as much as possible. She concluded her intervention by highlighting the several awareness raising campaigns in which Telefónica is involved such as initiatives with WWF and GeSi.

Session 1: **ICT Policy Framework – Part 2**
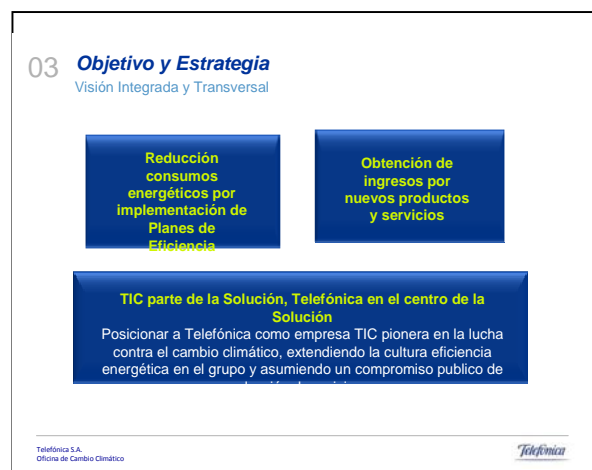
The ITU is the specialized agency of the United Nations responsible for telecommunications/ICTs and its three Sectors and the General Secretariat are focusing on such key issues as technology, climate data collection and monitoring, adaptation and mitigation. The ITU-T Focus Group on ICT & Climate Change was specifically tasked to develop methodologies to measure the impact of ICTs on climate change.

This session was moderated by **Dr. Mauro FLÓREZ CALDERÓN** President CITIC, Ecuador.

Mr. Augusto ESPINOSA, Undersecretary Información e Investigación de la Secretaría Nacional de Planificación y Desarrollo SENPLADES presented "Políticas Nacionales vinculadas a TIC's y Cambio Climático", spoke about Ecuador's competitive advantage in the field of biological Diversity and the need to take advantage of this in the development of a national strategy to adapt and mitigate the effects of climate change. He noted that there is a new proposal to create a new Ministry of ICT within Ecuador's government. He emphasized the need to develop policies and guidelines that will take into consideration the change towards promoting clean energy generation. He underlined the importance of a national information system which is essential for managing national biodiversity through the use of sectoral information, strategic info for decision makers and technical component such as access to databases.

Mr. Néstor BERSOVICH, Programa Sociedad de la Información, ECLAC presented "ICT policies in Latin America and the Caribbean, regional consultation and environmental impact". He spoke about national policies, saying that as a region, they have been implementing initiatives in the information area. He noted that problems of infrastructure and access have become an issue, along with social exclusion. He highlighted the current trend of evolving towards e-government, e-access and knowledge societies and that progress has been heterogeneous in the region.

He underlined that the countries where ICTs have diffused are those at higher development level and noted that many countries (8-9 countries) in the region have not defined a digital strategy, however some countries are currently in the process of doing so, and other countries are now working on a second generation of the strategy (e.g. Mexico, Uruguay, etc.). He concluded his intervention by highlighting the lessons learned from this process and emphasize the need for coordinating efforts and having effective and supportive political leadership.

Mr. Arthur LEVIN, Head, Policy Division, ITU-TSB provided an overview of the "ITU Background Paper" which was substantially reivsed to highlights the key issues in the region, including deforestation, access to ICTs and financing. In addition, the Annex to this Report provides an inventory of work underway in ITU on climate change.

Ms. Cristina BUETI, Policy Analyst, Corporate Strategy Division, ITU-SPM provided an overview of the "ITU's activities on Climate Change" which are being carried by the three Sectors and the General Secretariat. Additional information can be found at www.itu.int/climate

Ms. Solvey Janeth PERILLA BURBANO, Universidad Nacional de Colombia presented "Diagnosis of Colombian policies to tackle climate change". Ms. Perilla Burbano provided an overview of the Columbian environmental framework and the use of ICTs to combat climate change. She highlighted that climate

ITU and Climate Change

The Challenge in the Americas

- Deforestation
  - 17-20 percent of GHG emissions
- Financing
  - Who will pay the bill for using ICTS for adaptation and mitigation
- Region includes 5 of 10 most biodiverse countries
  - At risk for large losses
- Impact of CC is costly and exceeds even though not a major source of emissions
  - Hurricane damage will increase by 10-26% for each 1 degree warming of sea

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change can be seen as a business opportunity and a potential source of revenue for Colombia. She concluded by saying that there are no ICT and climate change policies yet, but the government is working on this issue and some progress have been made in this area.

Session 2: **Mitigation 1a: Reducing the Carbon Footprint of the ICT Sector.**

Green house gas (GHG) emissions affect the climate and are increasing. The emissions of the ICT sector are estimated at 2.5- 3 per cent of total GHG emissions. As the deployment of ICT continues, the sector faces the challenge to limit and reduce its own emissions, which could be achieved by new technologies, such as New Generation Networks (NGN) and greater energy efficiency among others. This session looked at:
- *NGN to reduce carbon foot-print and mitigate climate change effects*
- *New radio technologies and greenhouse gases emissions.*
- *Future telecommunication networks.*

This session was moderated by **Mr. Alexandre VASSILIEV** Study Group Counsellor, ITU-BR.

Mr Jacques McNEILL, Green ICT Project Coordinator, Prompt, presented "Canadian initiatives in green ICT". He highlighted the opportunities that ICT can create by achieving up to 90 % of Kyoto targets as well as having the potential to decrease overall GHG emissions by 15% and save the global industry $ US 800 billion in annual energy costs by 2020 . He reported on Prompt's Green ICT Vision which is a distributed Canadian initiative devoted to the creation and commercialization of ICT technologies that reduce GHG emissions and involves universities, industries, governments and consumers in Green activities.

Mr. Alexandre VASSILIEV, Study Group Counsellor, ITU-BR presented "Radio and Reduction of Greenhouse Gas Emissions". Mr. Vassiliev provided information on the main activities carried out by ITU in this area which comprises minimizing GHG emissions from radio equipment systems, the use of radio-based devices/systems for reduction in other sectors, "dematerialization" through the use of radio equipment/systems and global monitoring carbon dioxide emissions. He presented ways in which introducing new radio technologies can help to reduce GHG emissions. He also pointed out the benefits of minimizing TV CO2 emissions through labeling, such as the Energy Star programme. He concluded by saying that without monitoring, it is not possible to control climate change.

Radio and Minimizing GHG Emissions

Main directions/activities:

Minimizing GHG emissions from radio equipment/systems - The use of advanced technologies, such as modern chips, coding and compression technic, digital modulation allowed significantly reduce power consumption per unit for almost all radio applications.

The use of radio-based devices/systems for reduction in other sectors - Wireless devices, such as mobile phones are currently the most common way of communications, which significantly reduce commuting and travelling. Radio, in many cases, is the most economically valuable solution of the "last mile" problem.

"Dematerialization" through the use of radio equipment/systems – The use of radio technologies, for example satellite systems, paves the way for Internet access from remote areas and allows to apply paperless working methods, switch from physical distribution DVDs and CDs to online delivery.

Global Monitoring Carbon Dioxide Emissions - Radio-based devices called remote sensors are the main tool for the global monitoring of GHG emissions.

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Ing. Francisco CALERO, Director, Servicios de Telecomunicaciones, Superintendencia de Telecomunicaciones del Ecuador, "Ecuador, ICTs and Climate Change". Mr. Calero provided information on the ICT sector in Ecuador and how the ICT sector is being regulated. He emphasized the need for operators to implement NGN and explained the main benefits of doing so. He pointed out that the standardization of small devices is necessary and that attention should be paid to e-waste disposals. He concluded by underlining the need to work on recommendations and norms which take into consideration climate change and that aim at reducing energy consumption.

Ms. Daniela TORRES, Head of Climate Change Office Telefónica presented "Telecommunication services for energy efficiency: Inmotics Service". Ms. Torres reported on Telefónica's activities to reduce energy consumption and pointed out that the ICT sector is working using renewable energies to provide solutions to the operators of telecommunication networks. She pointed out that the potential benefits of renewable energy are very important in Latin America and noted that Telefónica is currently using solar energy or hybrid system. She mentioned that Telefónica has two objectives: 1) reducing power consumption and 2) providing customers with services and products such as backpacks using solar energy. In this regard, she alerted the participants that if nothing will be done to improve the use of renewable energy; the network will pass from 4.0 TWh to 6.6 in 2015.

Mr. Julio PALACIOS NIÑO, Universidad de Colombia presented an "Environmental analysis on the migration from analog to digital television in Colombia". Mr. Palacio Niño spoke about the important need to properly dispose of toxic wastes found in televisions. He pointed that 92% of television physical components can be recycled. He reported on current initiatives in Columbia such as gathering old phones for recycling and providing more efficient TVs to the market that contain less toxic materials. He concluded by highlighting the need for corporate social responsibility, to improve mitigation of electronic waste, support for reforestation, and the need to promote the use of friendly technologies.
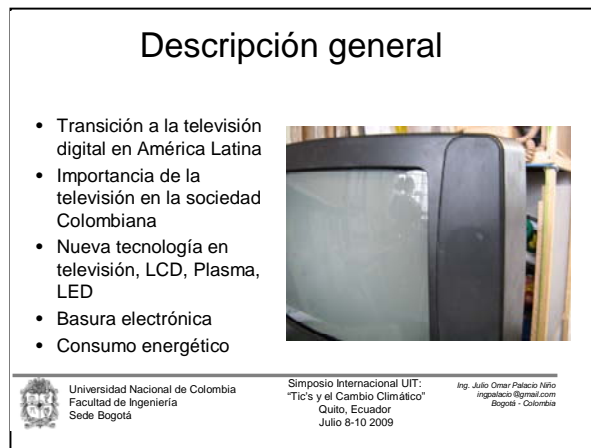
Session 3: **Mitigation 2: Using ICTs to reduce emissions in other Sectors**

It is estimated that ICTs can play a significant role in other sectors to limit and reduce GHG emissions, e.g. by promoting video conferences instead of traveling, replacing paper for bits, smart buildings and better supply chain management. This session looked at:

- *ICTs as a tool to reduce carbon-based emissions in other sectors.*
- *Measuring the impact of ICTs in other sectors.*

This session was moderated by **Mr. Arthur LEVIN**, Head, Policy Division, ITU-TSB.

Mr. Richard LABELLE, Director Aylmer Group, Canada presented "ICTs for reducing C emissions: a development perspective". His presentation focused on the opportunities for using ICTs for adaptation and mitigation as well as some of the challenges, especially for developing countries. Mr. Labelle also presented the ITU e-environmental toolkit which identifies factors that influence the readiness of countries to use ICTs as a tool for fighting environmental change in general and climate change in particular.
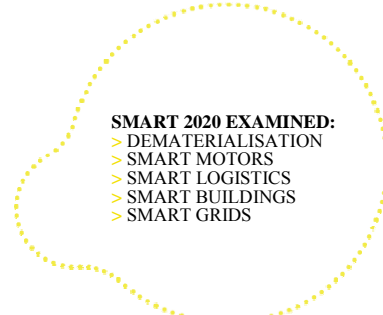

Implications for developing countries

- All countries can respond to climate change by a process of *adaptation* to its impacts and by reducing GHG emissions (*mitigation*), thereby reducing the rate and magnitude of climate change
- The capacity to adapt and mitigate is dependent on socio-economic and environmental circumstances and availability of ICTs
- Many countries have limited capacity to make beneficial use of ICTs for environmental action:
  - Limited access to affordable infrastructure & internet
  - Limited human capacity to analyze & interpret climate change data
  - Limited capacity to integrate scientific data into decision- and policy-making
  - Limited capacity to undertake adaptation, mitigation, R & D
  - Little political will
  - But popular demand for environmental action is increasing

Mr. Arthur LEVIN on behalf of **Mr. Luis NEVES**, Chairperson of GESI, the Global e-Sustainable Initiative presented "Resource efficiency through ICT-applications - Smarter Networks: Collaborating to Reducing CO2 Emissions". The Reprot esitamtes that ICTs can reduce GHG emissions by about 15% across all sectors. The Smart2020 Report is now available in Spanish, thanks to Telefonica. The key areas in the report focus on how ICTs can reduce emissions through smart grids, smart buildings, dematerialization and supply chain management.

Ms. Daniela TORRES, Head of Climate Change Office Telefónica presented "Servicio de Inmótica para la Eficiencia Energética". Ms. Torres highlighted the positive benefits of using Domotica and energy efficiency. She presented INMOTICA, Telefónica's new service that provides a remote way of controlling energy consumption. She explained that in order to expand this service it is necessary to develop alliances in strategic sectors and to develop the necessary regulatory framework for these kinds of technologies.

THE ENABLING EFFECT

SMART 2020 EXAMINED:
> DEMATERIALISATION
> SMART MOTORS
> SMART LOGISTICS
> SMART BUILDINGS
> SMART GRIDS

Ms. Maria de FATIMA ROSOLEN, CPqD, Brazil presented the "Potential of Using Renewable Energy in Telecom Stations". Ms. Rosolen pointed out that today people are more conscious about the environment. She presented the pros and cons of Solar Photovoltaic (PV), Wind Energy, Storage Systems - Fuel Cell and Hybrid Systems. She concluded by saying that in Brazil the use of renewable energy in telecommunications companies is still in a development stage and as this type of energy is expensive, it is necessary to foster incentive programs.

Session 4: **Adaptation and Deforestation**

Adaptation refers to measures to address changes already occurring as a result of global warming. These changes have a negative impact on ecosystems and on human habitat affecting access to natural resources such as drinking water and farming. Moreover, it is expected that the global effects of climate change, including deforestation, which affects many countries in Latin America, could increase the likelihood of floods and droughts caused by severe atmospheric and oceanic disturbances. The effects and the ability to deal with these issues vary from one country to another, in particular the most

vulnerable developing countries often do not have the necessary technological, human, financial and governance resources to adapt to climate change. Developed countries using their satellite remote sensing equipment could help in providing data for monitoring deforestation. ICTs can contribute to avoid further tropical deforestation, thus reducing emissions for climate change prevention. This session looked at:

- *Reducing CO2 emissions caused by deforestation and forest degradation.*
- *Governmental initiatives addressing deforestation issues.*
- *ICTs to predict identify and measure the extent of the problem of climate change.*
- *Effective response strategies to mitigate negative effects of climate change.*
- *Technological paths to sustainability.*
- *Alternative Energies sources.*

This session was moderated by **Mr. Clovis BAPTISTA**, Executive Secretary CITEL - OEA

Mr. Richard LABELLE, Director Aylmer Group, Canada presented "ICTs for e-Environment: adapting to climate change and resource depletion". He spoke about resource management strategies and defined e-environment as using ICT for environmental protection and sustainable use of natural resources. He emphasized the need for developing countries to develop guidelines on using ICTs to manage and protect the environment. He underlined the need to mitigate environmental impact and to make best use of massive amounts of digital data, better modeling, web-based services.

Mr. Roque GARCIA ZANABRIA, Escuela Politécnica Superior de Chimborazo – ESPOCH, presented "Training program for farmers, work experience and awareness of its participants on climate change and the use of ICTs". Mr. Garcia Zanabria explained that this programme is an educational and pedagogical programme which aims at reaching people with low level of literacy. He pointed out that this programme aims at preparing people to adapt and mitigate the effects of climate change. Agroforestry promotion is used to encourage the sustainable management of natural resources in local communities as well as various distance learning programs and support of local groups and organizations.

Ms. Carolina ZAMBRANO, Director Climate Change, Ministry of Environment, Ecuador presented "Forests and climate change: the role of ICTs in adaptation and mitigation". Ms. Zambrano presented the strategy that Ecuador put in place to fight the effects of climate change, in particular with regards to deforestation. Ecuador has the greatest rate of deforestation in Latin America. She reported that a map has been developed according to the priority areas and monthly statistics in real time which are available on the website. She also pointed out that Ecuador is very active in the UN negotiations process and The Ministry of the Environment of Ecuador is moving quickly to implement the REDD agreements and is using ICTs for this purpose. She concluded by highlighting the need for tools that can be used for monitoring and the need to adapt these tools to the local realities and this can happen as a result of technology transfer.

Ing. Daniel CHIES Forest Manager, Madem SA, Brazil, presented "Forest products and ICT equipment: Impact on climate change". Mr. Chies spoke about the use of renewable forest products for

packing and transportation; bales and reels. The use of forest products can lessen need for fossil fuels and can act as a highly effective carbon sponge. He noted that this initiative has led to better use of forests and less need to expand exploited area of forest. He concluded by noting that forest products are the cheapest way to reduce fossil fuels.

Session 5: **ICTs and Emergencies**

ICTs are essential in the detection of disasters, early warning of general public and mitigating the negative consequences of disasters around the world. Telecommunication networks are used for early warning, damage assessment and planning relief operations including the vital relief assistance such as food aid convoys, aircraft and medical teams to reach those who need them the most. To improve the effectiveness and speed at which critical communications networks are established in the aftermath of a crisis, ITU efforts focus on the development and standardization of ICT solutions used in these situations. This session examined:
- *ICTs as a tool for early warning and providing assistance during emergencies.*
- *Setting up telecommunications during emergencies – ITU practical assistance.*
- *Improving effectiveness of ICTs in situations of crisis.*
- *Effective Strategies in emergency situations.*

This session was moderated by **Mr. Paolo ROSA,** Head of Workshops and Promotion Division, ITU-TSB.

Mr. Hugo YEPES, Instituto Geofísico. Ecuador presented "ICTs as tools to detect natural disasters". Mr. Yepes spoke about real time monitoring using arrays of sensors. He defined emergencies and provided an overview of Ecuador's volcano early detection, warning, risk assessment and prevention. He highlighted the need for real time data for emergency preparation to help determine the real impact and the need to be able to integrate this for real time management, as well as the need to link this with a service such as a 911 call centre. He reported on a national database of seismic and volcanic data which is available online. He concluded by stating that there is a need to take the next steps to bridge digital divide provide better communication to signal one another and develop common standards.

CONTROL REMOTO Y AREAS EN RIESGO
EJEMPLO DE LAS ERUPCIONES VOLCANICAS

- LA ANTICIPACION A Y LA DETECCION DE ERUPCIONES VOLCANICAS ES UN PROBLEMA COMPLEJO
- MUCHAS TECNOLOGIAS
- TIEMPO REAL
- DATA FUSION

VOLCANIC ERUPTIONS: MONITORING, DETECTION AND IDENTIFICATION CAPABILITIES

Mr. Alexandre VASSILIEV, Study Group Counsellor, ITU-BR presented "ITU Activities on Emergency Telecommunications (including disaster detection, early warning and relief)". Mr. Vassiliev reported on ITU's role in emergency telecommunications and recent activities. He provided an overview of the relevant documents of all ITU Sectors related to the development of: legal basis for Emergency Telecommunications; technical basis; organizational basis and practical assistance to administrations. He also provided information concerning recent ITU standardization and spectrum management activities in the area of emergency telecommunications, disaster prediction, detection and mitigation. Mr. Vassilliev pointed out that sometimes national laws and regulations can hamper or even prohibit the transport and use of telecommunication equipment at disaster scenes and therefore ITU helps and assists countries when requested. He underlined that ITU global standards (ITU term Recommendations) play a vital role in

ensuring an effective emergency response in times of crisis and that ITU has historically played an important role in telecommunications/ICTs for disaster prediction, detection, relief and emergency telecommunications. In cooperation with the Member States and the key players in industry, ITU is very active in defining technical standards applicable for emergency telecommunications. ITU also provides support on demand to the ITU Member States in emergency situations.
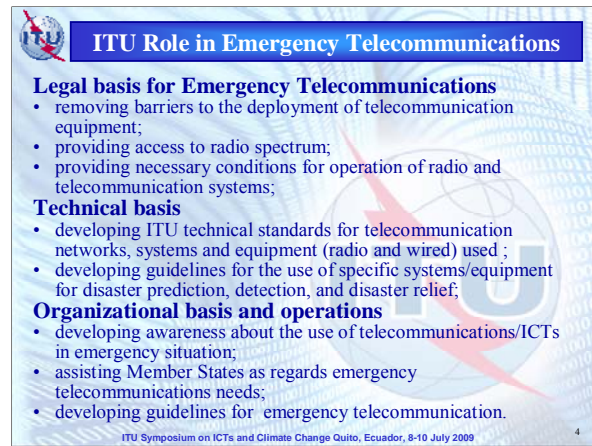
Mr. Oswaldo SALAZAR, Coordinator of Disaster Response, Secretaría Técnica de Gestión de Riesgo presented the activities carried out by the Secretaría, Técnica de Gestión de Riesgo in Ecuador which is the technical secretariat for Risk Management for the Government of Ecuador. He presented Ecuador's national risk management information system. He concluded by stressing the need to have effective strategies in order in order to be able to react promptly.

Session 6: Climate Monitoring

A key element in addressing global warming and the impact of natural disasters is the effort to improve global climate monitoring. The use of accurate climate change indicators increases the possibilities of mitigating climate change and helping countries to adapt to extreme weather events. ICTs are a key to monitoring systems for weather forecasting, climate monitoring, and predicting, detecting and mitigating the effects of natural disasters. Adapting to extreme weather events, such as hurricanes, is a critical issue in Latin America. This session examined the following:

- *Use of ICTs to monitor climate change and predict climate change related natural disasters.*
- *ICTs and detection and mitigation of natural disaster*
- *Data Collection and Simulation Modeling*

This session was moderated by **Mr. Alexandre VASSILIEV**, Study Group Counsellor, ITU-BR.

Mr. Jean PLA , CNES, France - "Monitoring of climate change and microwave satellite remote sensing". Mr. Pla mentioned that a variety of satellites and ground systems are already in place: meteorological, telecommunication, navigation and Earth Observation. Space has become an increasingly important source of information and an essential data-relaying infrastructure. A number of scientific discoveries about climate change have also been made thanks to space based data. In particular his presentation focused on presenting mission TOPEX/JASON in space altimetry: rise of the mean sea level, ocean circulation (El niño events) and future satellites to be launched: SMOS (Soil moisture, Sea salinity) and MEGHA-TROPIQUES (cyclones, tropical rainfall). He concluded by underlining the need of global data sets, coordinate climate analysis, modeling and predictions, of establishing the correct climate state and to create powerful modeling tools for climate prediction. In addition, he pointed out that Satellite Earth observation data from space plays a crucial role in understanding the current state of the climate and how it may evolve and he emphasized the need for global information on key indicators of climate as well as the need to protect, on a long term basis, essential microwave frequencies.

Commander Ronnie NADER, EXA: Agencia Espacial Civil Ecuatoriana presented "Hyperion - Cost effective system for monitoring UV radiation from land and space". The HIPERION Reactive Alert Network is the set of online systems built by the Ecuadorian Civilian Space Agency that provides Ecuadorian citizens protection against elevated levels of UV radiation by the means of accurate and timely information. The system comprises the National Radiation Monitor (http://uv.exa.ec) which sends real time UV levels information to cell phones and computers. The Real Time Climate Report system (http://clima.exa.ec) and the Real Time Satellite Imaging Center (http://cistr.exa.ec) archive all the information which is used online by local and foreign institutions interested in this data.

La Red de Alerta Reactiva HIPERIÓN
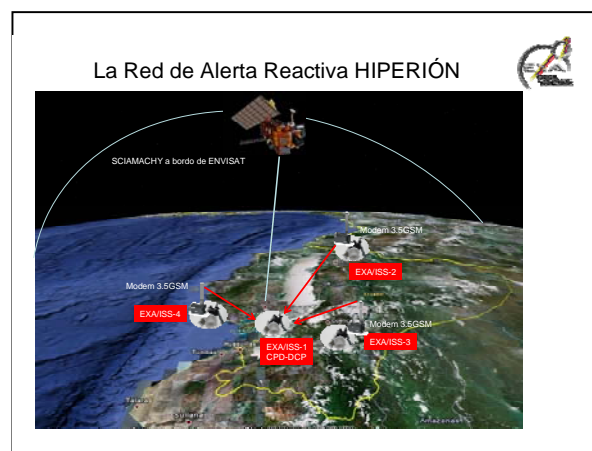
Mr. Juan José NIETO LÓPEZ Representative of CIFEN (Convenio de Cooperación Telefónica Ecuador) presented "Monitoring climate conditions in Ecuador, Early Warning System" . The presentation focused on the institutional cooperation agreement between the National Meteorological Institute of Ecuador and the cell phone company Telefonica Movistar, in order to reduce the impacts of extreme climate events. The cooperation agreement consisted of free cell phone messages for early warnings of floods sent to a number of key users in the most vulnerable locations. As a conclusion, Mr. Lopez mentioned the necessity to incorporate private enterprise and ICTs in national efforts for natural disaster reduction.

Ms. Lilian CHAMORRO ROJAS, Universidad Nacional de Colombia presented "Tools to support the Municipal Environmental Management System in Colombia". Ms. Chamorro Rojas explained that in Colombia the Ministry of Environment and Territorial Development promoted the use of systems which categorize environmental information and help develop key indicators. One of these systems is the Sistema de Información Básico Municipal (SisBIM) which registers and follows-up on environmental information from the different municipalities in Colombia. The SisBIM is based on a set of indicators which facilitate the registration of the information through variables measuring and through a model of georeferencing which allows to visualize the geographical information associated with the indicators.

Session 7: Cost - Effective New Technologies and Climate Change

The use of ICTs to mitigate GHG emissions in other sectors of the economy will heighten the need for broadband deployment and improved access to affordable ICTs. This issue is of direct concern to Latin America, which has approximately half the penetration rate of the global average. However, the rollout of broadband presents opportunities to introduce new "clean" technologies such as mobile broadband connection in remote areas. This session examined:
   - *The role of broadband in mitigation of GHG emissions.*
   - *Current level of broadband deployment in Latin America.*
   - *Challenges in deploying Broadband in the Latin America Region.*
   - *Impact of broadband in other economic sectors.*

This session was moderated by **Ing. Jaime GUERRERO**, President CONATEL – Ecuador.

Mr. Sergio SCARABINO, Head ITU Office Chile presented "Effective New Technologies and Climate Change". He spoke about how statistics show a positive increase in mobile phones and Internet penetration in the Americas, however there are notable differences between sub regions. Broadband penetration is still to be work out with some countries showing levels below 0.5% of the population connected to broadband.

ITU is gathering and organizing data in the ICT Eye website where it shows updated statistics at national, sub regional and regional levels. The World Bank identified Latin America as the developing region of the world with the most resources available. Considering the impact of developing broadband and Internet connections in the Gross Domestic Product of a country, opportunities should flourish in this region. Mr. Scarabino pointed out that the immediate challenge for local governments is to promote infrastructure projects attracting the interest of the private sector while at the same time paying attention to the needs of people living in rural and not cost-effective areas. He concluded by saying that any development in the region should help to build an inclusive Information Society in order to include those groups that are not yet ready to afford the monetary costs associated with this transformation.

Dr. Zoila RAMOS, Director CITIC - Ecuador presented the "Impact of Regulatory Matters on Climate Change". Dr. Ramos highlighted the fact that different categories of services require different policies. She stressed that the network does not define the service or message and the regulatory structure must reflect new services and products. She concluded her intervention by stating that special consideration should be given to those services that are best for the poor, especially mobile phones.
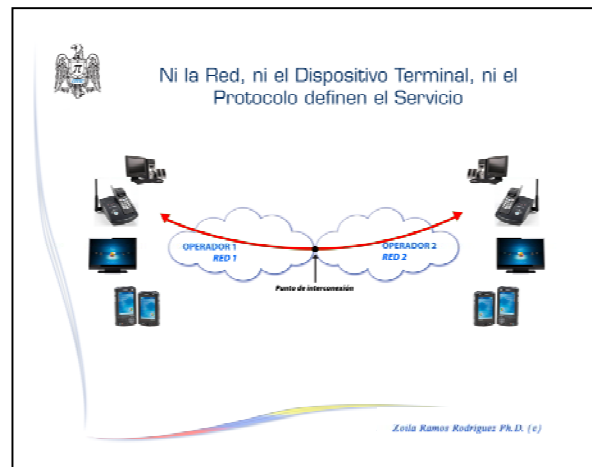
Mr. Johny LAUREANO, Latin American Federation of Internet Users (FLUI) presented "ICTs and Climate Change: Proposals". Mr. Lauriano provided an overview of FLUI which is a new group being formed and that aims at addressing issues such as providing equal opportunity for disabled and protecting children in cyberspace. He mentioned that as demand for broadband increases, providers should pay particular attention to climate change and the increase of energy used to provide such a service. He stressed the users should be involved in the decision-making process, along with governments and companies. He concluded his presentation by proposing that funding should go to local entities to help their communities.

Ms. Valeria BETANCOURT, Coordinator, Latin American ICT Policy Programme, Association for Progressive Communications, APC presented the "Challenges for access to broadband in the Andean region". Ms. Betancourt explained that 15 years after the introduction of telecom reform policy and regulation in countries on the Andean region in Latin America in the early 1990s, a fundamental deficit in universal affordable access to telecom infrastructure continues. This deficit severely limits the possibility of information and communication technologies from being used effectively as one of the building blocks to enable social and economic development. This problem persists despite the phenomenal increase in access to mobile telecom networks and massively inhibits access to information and knowledge through the internet which still requires broadband connectivity. Despite the fact that in Latin America and the Caribbean the number of internet users and internet penetration have a continued increase, sub regions like the Andean is still presenting low growth rates and they have slowed down, particularly when referring to broadband access. The Andean Region is still far from being part of the global information and

communications network on which the global economy is running and falling further behind in terms of social and economic development. Ms. Betancourt said that as a contribution to identify current challenges for universal affordable broadband access, the APC, in the framework of the project "Communication for influence - Linking advocacy, dissemination and research by building an ICTD network in the Andean Region, Latin America. (CILAC – Andean Region)", has conducted research in Bolivia, Colombia, Ecuador, Peru and Venezuela. The research provides policy analysis from civil society perspectives around the impact of the telecom reform process on the provision of access to broadband infrastructure from the lens of a specific national context. The research reports are available at: http://www.apc.org/es/node/8867. She concluded her presentation by stressing the need to formulate a comprehensive policy framework to orientate the development of broadband in the Andean region. Assuring universal affordable access to broadband networks and services based in sustainable models and low environment impact is the main current challenge for democratic telecommunications policies.

Mr. Eduardo CADENA, Consultant, Corporación Nacional de Telecomunicaciones presented "Impact of broadband in other sectors – Wireless for rural areas". Mr. Cadena provided an overview of the "Proyecto Rural Inalámbrico de CNT". He spoke about the objectives of the telecommunication sector in Ecuador which are aimed at enhancing access and service quality while at the same time, protecting the environment and described the CDMA 450 technology, its implementation and the social benefits that may arise from this technology. In particular he emphasized that this technology provides good coverage with the need for less base stations. In addition this technology can cover many areas with less equipment and provides fast reliable voice and data services to people, schools, etc. Another benefit is that this technology integrates with NGN platforms. He concluded by providing an overview of the use of fixed and wireless access in rural sectors and how they may contribute to the community and the environment.

Mr. Roderick SANATAN, University of the West Indies, Jamaica presented "Climate Change: some Caribbean challenges". Mr. Sanatan pointed out that the Caribbean is facing unique challenges in the area of climate change particularly due to the rich biodiversity of the region. He highlighted specific threats to the flora and fauna and to the ecosystems rich cultural and ethnic diversity, which includes many indigenous people in Belize, Guyana, Suriname, Belize, Jamaica and St. Vincent. He stressed that one of the challenges of the WSIS is social inclusion and preservation of ethnicities, cultures and peoples. He explained that the opportunities for broadband are many: high fiber optic connectivity around the region, DSL achievement being enhanced, new radio technologies being dispersed, and the introduction of mesh technology to do the roll out for communities and for access to government services. He highlighted some of the responses to climate change policy and applications management such as the Seismic monitoring and measurement centre in Trinidad, at the UWI, to monitor and assess earthquakes and volcanic action by remote and computer systems and the Disaster emergency mechanism, situated in Barbados, to coordinate and dispatch services against disasters like hurricanes. These systems use advanced radio and satellite technologies. He pointed out that there is also national policy agency infrastructure via Environment Management Authorities to establish actions for state interventions. He stressed that 70 % of the Caribbean production is in internationally tradable services, and these require various e-transaction arrangements and facilities. He concluded by saying that ICTs via broadband are an enabler of climate change effectiveness, however, government is a key driver of policy and advocacy.

Session 8: Mitigation 1b: Green Technologies to Reduce Carbon Footprint

As the deployment of ICT continues, the amount of waste from the sector increases. The ICT sector faces the challenge to manage e-waste, e.g. the disposal of mobile phones. Planning and action in such areas as collection system, e-disposal, life-cycle analysis, and recycling is needed. This session looked at:
- *Eco-friendly Technology materials.*
- *Sustainable Development and ICT E-waste management.*
- *Technologies and Life-Cycle analysis.*

This session was moderated by **Mr. Richard LABELLE**, Director Aylmer Group, Canada

Ms. Irma SUAREZ, Ministry of the Environment, Ecuador, presented the "Management of e-waste". Ms. Suarez stressed the need to recover degraded lands and avoid deforestation, and properly dispose of waste while avoiding aquifers and mangroves, etc. She mentioned that in Ecuador: waste is defined as solid, liquid or gas waste from process of transformation which contains any compound with reactive, flammable, infective, or toxic features. She highlighted the need to learn how to consume and address the challenge of the environmental fingerprint and mentioned that in Ecuador, they are working on addressing these issues. In particular she mentioned that according to the unified text of the secondary legislation and draft proposals related, the central and decentralized governments are going to adopt policies to allow regulation of urban development and the establishment of green zones and in addition municipalities will prepare plans for rationale use of resources and disposal of waste. The Ministry of the Environment is the competent authority for rational management of hazardous waste and is promoting the minimization of the generation of such waste to the maximum extent possible. She concluded by mentioning that mitigation, consumption and adaptation units have been created in the Ministry of the Environment and several policies have been put into place.

Ms. Margarita ROMERO, Climate Change Office CITIC, presented "Actions to be taken to face Climate Change – A case study in the private Sector". Ms. Romero's presentation focused on commercial forests and related products and services in Colombia. She highlighted that deforestation has become a major concern due to the fact that more than 70 % of the nation's forests have been deforested. In this respect, she underlined that forestation companies contribute to restore degraded lands by reforestation and she mentioned that is possible to use Google Earth locate their projects.
She invited institutions to carry out research in this area in order to reach the level of quality required to qualify projects for CDM. She explained that in the case of Colombia, there is a need for commitment from forestry institutions for action on mitigation, in addition, appropriate policies and laws should be developed. She concluded that ICTs have been very important and played a major role.

Mr. Julio Cesar FONSECA, Anatel, Brazil, presented by **Ms. Maria de FATIMA ROSOLEN** in his absence, CPqD, Brazil, presented "Evaluation of environmental aspects of sustainability". Ms. Rosolen from ANATEL explained that sustainability development is built over three columns "interrelated and common supported "pillars: economic development; social development and environmental protection. Sustainability is currently widely applied to all human activities. She presented the advantages of sustainability and the challenges for companies.
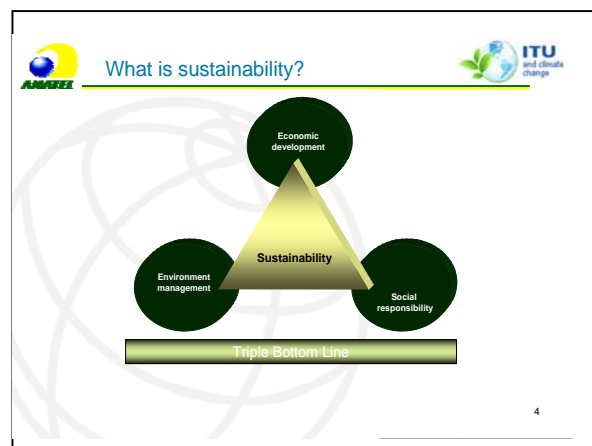
She suggested that companies should create conditions and establish an Environmental Management System with appropriate procedures for waste disposal, targeting product recycling and consumption, processing in order to reduce potential environmental impacts. She recommended the development and implementation of recycling procedures by the manufacturers of equipment, combined with LCA studies and the eco-design of each product. She concluded her presentation by presenting a case study on Optical Fiber Cable.

Mr. Luis Carlos ARIZA GORDILLO , Universidad Nacional de Colombia presented the "Technological Waste Produced by the Implementation of Digital Terrestrial Television in Colombia". Mr. Ariza Gordillo explained the technical waste produced by the transition to digital television in Colombia. He provided an overview of the current situation and the ecological impact. He presented some alternative solutions with regards to Life Cycle Assessment (LCA) of televisions, explaining that televisions may be collected in specific dump sites for recycling or can be restored where possible. He also proposed to create a company/authority which should collect all televisions and mobile phones. In this process, the support of several parties such as government agencies and companies is essential. He concluded by saying that it is necessary to implement a process of registration for televisions in order to get companies to comply with this procedure and it is crucial to raise awareness about this issue.

Session 9: Financing Solutions to Climate Change

Obtaining adequate financing and investment is a key part of national strategies to address climate change, and this is a critical issue in the current global negotiations. The Kyoto Protocol contains mechanisms for carbon trading by which projects in developing countries can be used to offset emissions. This include projects relating to adaptation; technology transfer and capacity building; energy, transport, industry, agriculture, and forestry and waste management. This session looked at the:
- *Financial requirements of developing countries and economies in transition to adapt and mitigate climate change effects.*
- *Financial Mechanism and funds for developing countries.*
- *Setting government priorities*

This session was moderated by **Mr. Sergio SCARABINO**, Head ITU Area Office, Chile.

Ing. Fabián SAENZ ENDERICA, Director General, FODETEL: Fondo para el Desarrollo de las Telecomunicaciones, presented "Financing solutions to climate change". He spoke about the EUROSOLAR Program, which is a program that brings electrical power to the rural areas located in protected areas through alternative clean energy sources.

Dr. Mauro FLÓREZ CALDERÓN, President, CITIC Ecuador, presented "Financing solutions". Mr. Florez started his presentation by presenting some of the implications of climate change to developing countries and in particular to Latin America. He pointed out that there is an asymmetry amongst responsibilities on climate change between developing and developed countries. He suggested that countries that affect the planet with GHG emissions should pay for those emissions. He also pointed out that developed countries have not recognized the cost of the externalities of climate change for developing countries. He suggested using ICTs to mitigate the effects of climate change by developing NGN, using teleconference systems which avoid travels and concluded by stressing the need to raise awareness on the implications of climate change especially for developing countries.

Mr. Pedro MONTALVO, National Secretary, SENACYT: Secretaría Nacional de Ciencia y tecnología del Ecuador, presented "Financial solutions to climate change". Mr. Montalvo informed the participants that Ecuador has provided several incentives and has supported programmes and projects related to

environment (for instance there were 15 programs and projects on environment of 4 million USD in 2007). In 2010 it is expected to invest 61 $ millions in different fields and projects. Some projects were related to natural resources and agriculture and energy area such as the use of geothermal power. SENACYT is raising awareness, is promoting the training of professionals and has developed a series of research networks for mitigation as well as a scholarship program. He concluded by saying that there is a proposal to create a regional platform for technological initiatives in each province in Ecuador.

Mr. Ruben DÍAZ, Adviser Fondo de Solidaridad, Yasuní Project presented "Cancelling the Digital Divide against the Environmental Divide". Mr. Diaz highlighted the need to define the environmental gap and link it to digital gap with a new mechanism. He spoke about environmental gap and how it affects trade and natural resources. He mentioned that the price of most natural resources is declining for countries like Ecuador with oil being the exception to this trend. He pointed out the contrast between countries with environmental gaps and technical laggards who have bio-capacity surplus and developed countries who have the technologies but they have a lck of natural resources. He said that ICTs could be a solution to this problem and could contribute to bridge the digital and environmental divide. However, for this solution to be effective more funds are needed. He concluded by presenting the **Yasuni ITT Project** which is a natural park reserve in Ecuador and invited ITU to help developing countries to bridge the digital divide in exchange of helping the developed countries to bridge their environmental gap.

Mr. Carlos Andrés ECHEVERRY RESTREPO, Universidad Tecnológica de Pereira, Colombia, presented "Climatic effects of the global economic recession".

Close of meeting

The closing session was chaired by the Symposium Chairman, Ing. Jorge Glas Espinel. Each of the moderators presented the key messages from their Sessions. The Conclusions of the Quito Symposium were presented by the Chairman and endorsed. He mentioned that the Report of the Symposium would be posted on the ITU website for comments.

Closing remarks were made by Dr. Zoila RAMOS Director CITIC, Mr. Malcolm JOHNSON, Director of TSB and Chairman GLAS.