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ICT and environment

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Newsletter
eLAC nº 14
March
2011

Technological waste: A social and environmental issue

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These days, innovation growth, technological development and consumption seem to be endless. Every day thousands of electronic parts and devices are manufactured that make our life easier and we are living in an era of new versions, new models and new technological functions, with no regard for the environmental and social repercussions. However, the disproportionate increase in technological waste is creating an environmental conflict.

Despite the undeniable benefits of technology, the situation is becoming alarming considering the sheer quantity of technological waste discarded each year throughout the world and given that this waste has repercussions not only in environmental but also in social terms, since hundreds of communities in various countries around the world are working in electronic waste recycling every day without regulation and in hazardous and unhealthy conditions. All countries must therefore work together to find regional and global strategies, mechanisms and solutions to ensure the sustainable and efficient management of this waste.

At the regional level, there are just a few isolated initiatives, projects and policies related to the responsible management of electronic waste. To address this issue, within the framework of the Third Ministerial Conference on the Information Society in Latin America and the Caribbean, held in Lima, the member country representatives declared their conviction that they must move forward in developing public policies that support the establishment of clear guidelines on the use of environmentally sound technologies and proper management of technological waste. Furthermore, the Plan of Action for the Information and Knowledge Society in Latin America and the Caribbean (eLAC2015) establishes as a line of action "promoting the use of ICTs to mitigate the impact of climate change and broadening the use of technologies for natural disaster and emergency prevention, mitigation and response" and, within that line of action, it establishes as goal 11 to formulate public policies to encourage the integrated management of waste generated by ICTs and their use.

With a view to facilitating the achievement of that goal, the member countries agreed to establish a Working Group on Technological Waste. Ecuador —through its Ministry of Telecommunications and the Information Society (MINTEL)— has been appointed coordinator of the Working Group. To meet the challenge set, the Working Group will work with the region's countries to devise strategic actions and policies to enable achievement of the five operational objectives set in the context of goal 11 of eLAC2015.

The plan of work for the Working Group on Technological Waste includes the following actions proposed by Ecuador:

- Carry out a regional assessment and diagnosis of the management of technological waste to obtain information that can serve as the basis for establishing policies and replicating best practices in this field.
- Create a Web portal for the exchange of technical, scientific and legal information relating to technological waste and environmental policies that includes a virtual forum intended to strengthen the mechanisms for dialogue and information exchange among countries in the region.
- Create a repository of technical information that can be consulted for scientific information relating to the formal treatment and sustainable management of electronic waste, the use of contaminating compounds in electronic parts, the transformation and reuse of electronic components, the treatment and transfer of technological waste, environmental problems related to technological waste and other related issues, which will require the cooperation of member countries.
- Prepare a regional guide to best practices, policies, actions, plans and projects for the management of technological waste and the mitigation of its impact on the environment.
- Publicize and promote initiatives aimed at training businesses in member countries in the adoption of best practices in the management of technological waste.

All the actions proposed require the immediate, active and collaborative participation of member countries, since responsibility for environmental conservation is not an issue of local or national interest. On the contrary, it is an obligation that involves us all and is one that should become a priority challenge at the global level.

How ICTs can help tackle climate change

Mr Malcolm Johnson
Director of the Telecommunication Standardization Bureau of the International Telecommunication Union (ITU)

Today, a world without information and communication technologies (ICTs) is almost unthinkable. While the increasingly widespread use of ICTs has changed many people's lives and boosted economic growth, ICTs are a growing contributor to greenhouse-gas (GHG) emissions. However, they also provide one of the most significant opportunities to reduce emissions of GHG, especially in industries that are major emitters, including energy generation, waste disposal, building construction and transport.

ICTs also reduce manufacturing needs by replacing material goods with virtual products, such as online music downloads. They provide the means for virtual meetings (to replace or reduce travelling), and intelligent transport systems to cut emissions and traffic congestion. ICTs are part of smart electricity grids that help distribute and use power more efficiently and to integrate renewable sources. They underpin e-governance, e-health and e-education projects that reach many more members of the community. ICTs are widely employed for environment and climate monitoring including weather forecasting, and are crucial in early-warning and disaster relief communications.

> **"ICTs are cross-cutting technologies that can drive the deep transformation needed in the global effort to combat climate change. This is all about opportunity: forward-thinking leaders already recognize the need to move forward and look to ICTs as a key enabler of a new model of social and economic development."**
>
> Dr Hamadoun I. Touré
> Secretary-General of the International Telecommunication Union (ITU)

ICTs are key in helping countries adapt and prepare

Adaptation to climate change involves taking action to mitigate its effects and plan for the future. As well as providing education and information through broadcasting, the Internet and other means, a very important part is played by remote monitoring of Earth by satellite and by sensors on the ground and in the ocean. This monitoring can give data on deforestation, for instance, or on crop patterns that indicate possible food shortages. And ICTs are literally vital when it comes to warning of natural disasters that can arise from climate change, as well as in dealing with their consequences by providing ways for humanitarian teams to respond.

ITU's role and activities

Developing countries are often at most risk of natural disaster, and at most need of modern early-warning and mitigation systems. At its Plenipotentiary Conference in Guadalajara, Mexico, in 2010, ITU adopted a Resolution on the role of telecommunications and ICTs in tackling climate change and protecting the environment. It identifies the need to help developing countries use ICTs for this purpose, and it commits ITU to work with other stakeholders to develop tools to support this aim. ITU has also conducted five symposia on ICTs, the environment and climate change, which form part of ITU's vision for pervasive action on this issue. In addition, ITU advises governments on the development of relevant policy and legal frameworks, and can help to design national emergency telecommunication plans. Also, advice is offered on integrating general plans for a country's communication system into national plans for adapting to climate change. One of the most powerful technologies for tackling climate change is broadband access to the Internet. In May 2010, ITU, together with UNESCO, established the Broadband Commission for Digital Development. This has a membership of very high-level leaders and has the aim of promoting the spread of broadband in every country. The Broadband Commission has several working groups on specific topics, including one on climate change.

Standards and measurement

ITU has an important role in limiting GHG emissions through its development of technical standards to limit and reduce the power requirements of ICT equipment and services and to ensure the interoperability of vital ICT equipment and networks. One example adopted by ITU is the global standard for an energy-efficient universal mobile phone charger potentially saving the need to make up to 82,000 tonnes of redundant chargers a year and at least 13.6 millions tonnes of annual CO2 emissions.

In 2010, Study Group 5 of ITU's Standardization Sector began the approval process of a new standard that sets out a framework for evaluating the environmental effects of ICTs and outlines methodologies to assess these impacts in terms of goods, networks and services, as well as the use of ICTs in organizations, cities, and even whole countries. These methodologies are developed in close cooperation with UNFCCC. In future, it should be possible to use these transparent methodologies to make valuable comparisons of ICT-related emissions to combat climate change. This may facilitate the inclusion of ICT projects under the clean development mechanism (CDM) or its successor.

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ICTs gain prominence as tools for environmental sustainability

Photo: Dreamstime.com

Concern for the environment is not a fad or the sole preserve of environmentalists. Nowadays, caring for the planet is a particularly relevant issue for citizens, civil society and Governments. This global trend has not gone unnoticed in Latin America and the Caribbean, which is beginning to introduce tools to combat climate change.

Information and communications technologies (ICTs) are fundamental in all areas of society today, including in caring for the environment and providing assistance in the wake of natural disasters. Indeed, ICTs have proved to be essential in this regard; a fact that has been recognized by Governments and civil society worldwide.

This fact is also documented in Global Information Society Watch 2010: Focus on ICTs and Environmental Sustainability (GISWatch 2010). GISWatch 2010 describes the events that have been organized on this issue worldwide and highlights the International Telecommunication Union (ITU) Symposium on ICTs and Climate Change held in Ecuador in 2009 as the most outstanding event in the region. The symposium brought together various sectors of society to stimulate actions aimed at confronting the effects of climate change.

The importance that the issue of climate change has gained in the region, as well as the search for solutions to minimize its environmental impact through ICT, is highly relevant, given that Latin America and the Caribbean faces the constant danger of events such as floods, hurricanes and droughts as a result of climate change, according to the report. The report also states that a more efficient and effective use of ICTs could help to reduce total global greenhouse gas emissions by approximately 15% by 2020, through initiatives such as video conferences, e-commerce, e-government services and smart buildings.

Another relevant initiative for reducing the polluting impact of ICTs is correct electronic waste (e-waste) management. The rapid evolution of new technologies generates a large amount of e-waste, which can be either totally or partially recycled or reused.

During the Third Ministerial Conference on the Information Society in Latin America and the Caribbean, held in Lima, Peru, in November 2010, the countries of the region adopted the eLac2015 Plan of Action, which included a line of action on “promoting the use of ICT to mitigate the impact of climate change and broadening the use of technologies for natural disaster and emergency prevention, mitigation and response” because ICTs can help with monitoring, mitigating and adapting to the adverse impacts of climate change.

This regional plan of action also maintains that, from the perspective of sustainability, the regional approach must involve comprehensive policies on electric and electronic waste management, based on a positive relationship with stakeholders and the development of mechanisms of coordination between the public, private and decentralized sectors and civil society. At the same time, according to the Plan of Action, the scientific and operational use of ICTs contributes to understanding and detection of natural phenomena that cause risk and natural disasters. Accordingly, ICTs should be used to deploy preventive and response measures and establish early warning systems.

This is reflected in two goals relating to the line of action: "formulate public policies to encourage the integrated management of waste generated by ICT and their use" and "promote cooperation and policymaking in the region for the use of ICT in natural disasters, and for prevention of and response to climate change and emergencies, based on common standards and best practices, since natural disasters transcend the national sphere".

Initiatives in the region

Governments and other stakeholders are already implementing various initiatives on minimizing the impact of climate change through ICTs, and other initiatives – indeed, the majority – on the management and recycling of e-waste. Some of the actions taken in this regard by countries in the region are outlined below.

Plurinational State of Bolivia

In the Plurinational State of Bolivia, the Environmental Information System of the National Chamber of Industry contains centralized digital environmental information about the country in a single system, with alphanumeric and cartographical content. A new Telecommunications Act is being drafted by the Office of the Deputy Minister for Telecommunications, which focuses on five areas, one of which is the environment. Attention is therefore being paid to issues such as the proper disposal of electronic and telecommunications apparatus, electromagnetic emissions, the installation of base stations for radio or other forms of communication in protected areas, and the drafting of an environmental assessment for each civil engineering project relating to telecommunications. Studies have been carried out in the Plurinational State of Bolivia by non-governmental organizations (NGOs), such as the Swiss Foundation for Technical Cooperation (Swisscontact) and the Quipus Foundation, to examine the possible environmental impact of electronic appliances and the waste they generate. In addition, the Networks and Development Foundation (FUNREDES) represented the country in the working group on e-waste for the Plan of Action for the Information Society in Latin America and the Caribbean (eLAC2010). Some municipalities have been carrying out e-waste collection initiatives since the mid-2000s.

Argentina

In response to the problem of technological waste, the "Seminar on the sustainable management of electrical and electronic waste" has been held since 2008, with a view to addressing the problem and fostering an e-waste management programme that promotes the collection, sorting, dismantling and valuation of parts and materials that could be reused or recycled through a new industrial process, or the donation of the devices. "National parks and interactive schools" is a programme that provides computer equipment, satellite Internet access, and classroom and online training, with a view to reducing the digital divide in the communities involved, while promoting the conservation of water, fauna and flora, and fostering sustainable development through education. The programme promotes environmental education through ICTs, and furthermore places schools, by connecting them to the Internet, at the heart of various activities of an educational, as well as social, cultural and recreational, nature.

Brazil

In May 2010, the Ministry of Environment of Brazil and the NGO Cempre signed an agreement for the creation of the first inventory of e-waste production, collection and recycling in the country. The aim of the agreement is to measure the e-waste that is generated in Brazil and monitor where it ends up. It is expected to help further develop public policies on e-waste and identify the main bottlenecks in the recycling chain. Initiatives have been put in place for the recycling of electronics, for example, the University of São Paulo opened an e-waste recovery and processing centre in 2009. The Computers for Inclusion Project, set up in 2004, is a national network for recycling discarded ICT equipment, which is refurbished and then donated to telecentres, schools and libraries. In addition, the International Fair of Technology for the Environment (FIEMA) has been held since 2004. Since 2007, it has been held under the auspices of the Proamb Foundation, an organization with 20 years of experience in environmental issues. The fair seeks to bring together a growing number of national and international companies and organizations dedicated to generating technology, solutions and services focused on the environment and sustainable development. Of the different sectors that participate in FIEMA, some exhibitors are involved in introducing ICT as a solution to environmental problems, including in relation to the disposal and recycling of ICT equipment.

Chile

Chilenter is a Chilean foundation whose mission is to contribute to the social use of technology. It has established itself as an environmentally sustainable agent, incorporating into its work the main guidelines recommended at the international and national level for e-waste management. Chilenter is the main actor at the national level in relation to the reuse of obsolete technology and has the capacity to refurbish approximately 15,000 computers per year. The refurbishment process consists of fitting out equipment that has been written off using exhaustive technical and administrative processes, including diagnosis, selection of components and parts, assembly of the computers, installation and configuration of the operating system and quality control of the equipment. The Committee for the Democratization of Information Technology in Chile (CDI), through its "Donate your computer" campaign, collects computers that are no longer in use, refurbishes them and donates them to schools and telecentres. Furthermore, Chile has a National Environmental Information System (SINIA) web portal, managed by the Ministry of Environment, which uses a series of databases, equipment, programmes and procedures to manage information on the country's environment and natural resources in a comprehensive and interpretable manner. Access to the various information systems that make up SINIA is available through this portal.

Colombia

It is estimated that Colombia could accumulate between 80,000 and 140,000 tonnes of e-waste in the form of disused computers by 2013, according to GISWatch 2010. The National Centre for E-Waste (CENARE) is working to reduce these figures, while also promoting the use of ICTs in schools. Of the 211,000 computers donated to the centre, 130,000 were given to schools and the rest were treated as waste. CENARE runs an educational robotics and automation project that seeks to involve children from public schools in science and technology by building robots with the disused parts of the dismantled computers. Colombia's e-waste management programme was commended by the United Nations Educational, Scientific and Cultural Organization (UNESCO), which cited the country as an example of good practice in this field. In addition, since 2001 Colombia has provided a tax exemption to encourage the use of technologies that benefit the environment and health. E-waste collection campaigns are carried out periodically, focusing in particular on mobile telephones and computers.

Costa Rica

In response to the damaging effects that ICTs can have on the environment, in 2009 the Scotiabank Centre for Information Systems and the Technological Research Club of Costa Rica began to develop a way of measuring how environmentally friendly ICTs are. The aim of this initiative is to measure the impact of ICTs on the environment and to promote the generation of comparable information by different organizations in order to encourage a change in behaviour and reduce that impact. Underpinning the measure is the idea that ICTs must be environmentally friendly in order to improve organizations' efficiency and quality of life for all. The organization Costa Rica Neutral has on its website a simple online calculator to estimate the emissions of a house, office or shop. The National Emergency Commission (CNE) has a communication system a communication to minimize the impact of natural disasters of natural disasters. Its early warning system uses the radio, Internet and satellites to keep the community and the CNE aware of possible natural threats. Furthermore, the Volcanological and Seismological Observatory sends text messages to keep the community informed.

Ecuador

According to GISWatch 2010, in Ecuador there have been many initiatives by private enterprises, especially mobile telephony companies, to recycle electronic devices. The Superintendency of Telecommunications (SUPERTEL) has recommended establishing regulations for smart devices in terms of energy conversion, types of plugs used and the reuse of devices. SUPERTEL also seeks to promote integrated technologies for services and develop capacity for the recycling and safe disposal of technological waste. Since the end of 2009, an initiative for the comprehensive management and recycling of electrical and electronic wastes in Quito has been periodically carried out through the Vertmonde company. In the first half of 2011, this initiative will be carried out again in Quito and Guayaquil. In addition, those involved in the commercialization of technological devices will participate in a forthcoming recycling campaign, which will entail the collection of the waste generated by wholesalers and their distribution chain. By the end of 2011, it is hoped that more than 90% of the waste generated or stockpiled by this group will be collected, and that a baseline in terms of the quantity and type of waste generated by this sector will be established with a view to rolling out the model nationwide.

Cuba

En la lucha contra el cambio climático y la necesidad de cuidar el medio ambiente es fundamental la información. Es por eso que en Cuba, ésta se ha centralizado en sitios web destinados a entregar datos sobre el medio ambiente, los cuales ofrecen estadísticas ambientales, publicaciones referentes al tema, links a sitios relacionados, indicadores de consumo de energía eléctrica en los ministerios e información sobre proyectos, entre otras cosas. Uno de ellos, el Portal de Educación Ambiental de Cuba, cuenta con el apoyo de la oficina regional de la UNESCO en ese país, y busca lograr la integración de resultados, propiciar una mayor divulgación de éstos y continuar incrementando y compartiendo experiencias exitosas en el ámbito medio ambiental.

El Caribe

The Caribbean Information Platform on Renewable Energy (CIPORE) is an excellent regional initiative that involves the countries of the Caribbean. It is an information and communication system on the use of renewable energy in the region, whose aim is to bring together all the information from each country on renewable energy at a single access point. The diverse information available on the use of renewable energies on the website (http://cipore.org) can be searched by type of energy, for example, solar, geothermal, wind, nuclear, hydropower and biomass. The website contains links to the agencies, ministries and universities in each country that are concerned with renewable energies, as well as detailed information on various initiatives and projects on renewable energy in the Caribbean. Information is provided in English, French, Spanish and Dutch.

Perú

According to GISWatch 2010, in Lima there are three formal companies that collect e-waste; however, they process only 3% of the 15,000 tonnes of mobile phones and computers that reach the end of their useful life every year in Peru. The Ministry of Environment therefore supports private e-waste collection campaigns. There are also plans to replicate nationwide a pilot e-waste collection programme that was launched in the municipality of Santiago de Surco, in Lima, in June 2010, a joint project of IPES, the Ministry of Environment and the municipality. Peru has a National Environmental Information System (SINIA), a network that facilitates the systematization, distribution, use and exchange of and access to environmental information. Through the website the population can access information that includes environmental indicators, thematic maps, complete documents, reports on the state of the environment and environmental legislation.

Uruguay

The Basic Computer Connectivity for Online Learning - CEIBAL Plan, which provides one computer per child, has paid dividends in terms of education, but presents a challenge in respect of caring for the environment. Various e-waste recycling initiatives are therefore under way in the country. One of those is implemented by the logistical department of the CEIBAL Plan, which works with a logistical services company to tackle this problem. Among other activities, the department analyses the amount of e-waste that is and will be generated by the CEIBAL Plan with a view to reusing the parts that can be recycled of the laptops that are given to the children. In that way, the Plan also keeps to a minimum its purchases of specific components needed to repair the computers, which are referred to as “ceibalitas”. Enterprises, such as the Cooperative for the Recycling of Electronic Components, dismantle and recover materials and electronic components from devices. The cooperative charges companies and public entities for this service, but not those who hand over less than one cubic metre of waste.

Venezuela

Since 2007 the Government has been implementing a social and economic development plan that focuses on furthering specific public policies. Among those initiatives, the national science, technology and innovation system is being redesigned to provide support for programmes that use ICTs for the benefit of the environment, as well as those that provide education in that regard. The Bolivarian Republic of Venezuela is looking to set up national warning systems that use ICTs as tools to raise the alarm, for example, in automatic weather stations, and promote the exchange of critical information. One serious problem that the country faces as a result of climate change is the melting of the glaciers of the Sierra Nevada of Mérida. In order to monitor this phenomenon, the Mérida Bioclimatic Network uses a web-based bioclimatic information system to allow easy access to data without having to look up each weather station participating in the network and to make it possible to send data from both conventional and automatic weather stations to a central database, using a web interface. The site can be searched for climatic data by weather station, geographical location, or period of time, for example, and provides access to processed data such as graphs, maps, tables and animations.

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ICTs and the environment: a strategy to include in public agendas

Information and communication technologies (ICTs) have proven to play a key role in assisting society in mitigating and adapting to climate change, according to the Cairo Road Map on ICTs and environmental sustainability, a document produced at the fifth symposium on ICTs, the environment and climate change, organized by the International Telecommunication Union (ITU). The road map is designed to raise awareness among public policymakers and major stakeholders from the various countries of the positive role played by ICTs in protecting the environment.

According to the report, governments and businesses around the world have adopted and implemented a range of programmes and initiatives on ICTs and the environment, designed to address environmental challenges, in particular global warming. However, countries —especially developing ones— have yet to reach a clear understanding of the threat posed by climate change and the potential of ICTs in tackling that threat.

For that reason, in October 2010, the ITU Plenipotentiary Conference adopted a new resolution on the role of ICTs and the protection of the environment, which identifies the need to assist developing countries in taking advantage of ICTs to combat climate change. Based on the discussions held at the Cairo symposium that took place after the Conference, the road map was created containing the following recommendations concerning the use of ICTs for the purpose of protecting the environment:

Step 1: Share best practices and raise awareness of the benefits associated with the use of green ICTs

This step aims to encourage and, where possible, stipulate the wide sharing of best practices and exchange of information to maximize the diffusion of green ICTs and smart ICT solutions in the public and private sectors. It also aims to promote education on green ICTs and raise awareness of the environmental implications of these technologies.

Step 2: Demonstrate success and feasibility

Promote the development of methodologies and indicators to measure and monitor environmental impacts throughout the life cycle of ICT devices and services, including measures of greenhouse gas emissions. In addition, use pilot and flagship projects to help diffuse the most promising smart ICT solutions in sectors such as construction, transportation and energy.

Step 3: Engage the private sector, civil society and the academic community

These sectors play a major role in the protection of the environment through innovation and the proper use of ICTs to tackle climate change. The aims of this step therefore include promoting environmentally-friendly and socially-responsible research and development.

Step 4: Promote national, regional and international cooperation

Cooperation at these levels is essential to encourage the move towards sustainable low-carbon economies, green investment and the sustainable management of natural resources, as well as the development and diffusion of clean technologies. In addition, this step aims to encourage developed countries to support developing countries in their efforts to include and adopt political reforms in favour of green growth.

Step 5: Integrate ICT, climate change, environment and energy policies

This step concerns the need to bridge the gap between ICT, environment and energy experts and policymakers to allow the integration of ICTs into environment and energy policies. It also aims to integrate the use of ICTs in national adaptation plans to make use of ICTs as an enabling tool to address the effects of climate change and minimize the environmental impact of public administration through ICT policies, applications and services. Finally, it promotes the establishment of transparent policy objectives to improve government strategies, including monitoring and evaluating the enforcement of policies.

Step 6: Develop and implement a national pro-growth green ICT strategy

A strategy is needed at the national, municipal and community levels, as well as at the individual organization level. The green ICT strategy should be seen as a component of the national development strategy and the use of ICTs in support of environmental management should touch on all sectors of the economy and all levels of society. Technical support should be provided to countries that need it, especially developing countries, to assist them in formulating and implementing green ICT strategies.

The role of ICTs in natural disaster managements

The earthquakes in Haiti and Chile and other natural disasters in the region have demonstrated the considerable potential of technological tools in facilitating communication and coordination in regions affected by this type of disaster, as well as in emergency situations.

IFloods, earthquakes, hurricanes and tsunamis are some of the natural disasters that affect Latin America and the Caribbean from time to time. In such situations, communication is vital, both during the disaster, for transmitting important information, and in the aftermath, for coordinating reconstruction efforts.

The earthquakes that struck Haiti in January 2010 and Chile in February of the same year highlighted the importance of ICTs in emergency situations.

The earthquake in Haiti caused the loss and collapse of its telecommunications networks which in turn hindered the emergency response. It damaged the only submarine fibre-optic cable connecting the island with the rest of the world, but since most of the operators have satellite connections, the consequences were not severe. In Chile, the mobile networks close to the epicentre were operating at around 20% of their capacity three days after the event and were almost fully restored within less than a month, according to the *Monitoring of the Plan of Action eLAC2010: Advances and challenges of the information society in Latin America and the Caribbean*, published by ECLAC.

Following these natural disasters, the Internet played a key role in helping to locate victims, manage information and reconstruct damaged areas. Social networks in particular —most notably Facebook and Twitter— emerged as communication tools that facilitated the dissemination of information and contact among people through groups and hashtags referring to the disasters.

In addition, websites quickly sprang up containing information about missing persons, people found, the state of the roads, sources of fuel and food and more. Internet users worked together to circulate information through social networks and collaborative portals. Google even launched a page to find people missing after the two earthquakes, called Google Person Finder Haiti and Chile, which enabled people to search for friends and family. People also showed their generosity through the Internet as social network groups and webpages were quickly set up calling for donations to help those affected by the natural disasters.

In this context, public places with Internet access, such as telecentres, infocentres and libraries, played a key role in enabling the community to access the services provided by social networks and the information contained on webpages. "People came together on these sites," explains María Angélica Celedón, Executive Director of the

Association of Active Telecentres of Chile (ATACH), who argues that it is essential that the government subsidizes these centres given the vital role that they play in such circumstances. She adds that in Chile telecentres played a key role in circulating information and even supported town councils and the emergency services that had no other means of contact. Furthermore, the Committee for the Democratization of Information Technology (CDI Chile) devised an initiative to create a mobile telecentre that travelled around the country helping those communities most affected by the earthquake.

Mobile telephones also provided assistance. Although the possibility of communicating orally was a remote one given that the telephone lines were saturated, SMS text messages kept people in touch and were a source of information for people who were unable to communicate by telephone or Internet.

Although ICTs have proven to be of major importance following a natural disaster, they can also be used to prevent catastrophes caused by natural disasters. According to experts, earthquakes and tsunamis are impossible to predict but with basic knowledge about what to do in such situations and in the event of other natural disasters, the number of victims can be reduced. Preventive campaigns are therefore essential and numerous initiatives have now been launched to that end, including the Microsoft Mexico Programme for natural disaster prevention and response, which aims to promote collaboration among various public sector bodies in Mexico and worldwide and the sharing of technology, knowledge, solutions and best practices that enable ICT solutions to be adopted to ensure a rapid response to natural disasters.

Another initiative led to the creation of online games aimed at children and young persons on this issue. The United Nations International Strategy for Disaster Reduction (UNISDR) launched a video game in 2007 designed to teach players how to reduce the impact of natural disasters. The Monitoring of the Plan of Action eLAC2010 noted that national and regional portals are an application that helps in the management and prevention of emergency situations and the provision of information. Some portals of organizations responsible for emergency and disaster response are at the stage at which they simply provide information, while others have progressed to providing information in real time, as well as offering training in disaster issues related to prevention and to warning the population of impending events.

The document further notes that the following play roles in regional initiatives for cooperation on issues relating to disasters: the Caribbean Disaster Response Agency (CDRA), the Network of Social Studies in the Prevention of Disasters in Latin America (La Red), the Coordination Center for the Prevention of Natural Disasters in Central America (CEPREDENAC), the Programme for Natural Disaster Prevention in Central America (PREVAC), the Regional Disaster Information Centre for Latin America and the Caribbean (CRID) and the International Strategy for Disaster Reduction (ISDR) as it applies to the Americas.

The Regional Plan of Action eLAC2015 approved at the Third Ministerial Conference on the Information Society in Latin America and the Caribbean states, in turn, that scientific and operational use of ICTs contributes to the scientific understanding and detection of natural phenomena that cause risk and natural disasters and that ICTs should therefore be used to deploy preventive and response measures and establish early warning systems. It therefore sets the goal to “promote cooperation and policymaking in the region for the use of ICTs in natural disasters, and for prevention of and response to climate change and emergencies, based on common standards and best practices, since natural disasters transcend the national sphere”.

Study to analyse the role of telecentres in the Chile earthquake

Communications proved vital following the earthquake in Chile on 27 February 2010. One of the means of contact was the Internet and telecentres therefore played a key role. To analyse this issue thoroughly, the Association of Active Telecentres of Chile (ATACH) is carrying out a study in collaboration with the University of Washington to identify, describe, classify and draw lessons from the cases studied, which represent the different types of public communication experiences using the Internet access points established. According to Angélica Celedón, Executive Director of ATACH, it is hoped that the outcomes of the study will include a guide to the effective use of ICTs in the event of a natural disaster, as well as a distance-learning module on the same subject organized by the ATACH Academy.

Cloud computing: an alternative for protecting the environment

Photo: Free-pictures-photos.com

Businesses can consume large quantities of energy and produce high levels of carbon gas emissions, both of which are putting the environment at risk. However, cloud computing could change that.

Cloud computing is defined by the National Institute of Standards and Technology (NIST) as "a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction".

Since 2008, businesses, especially large ones, have tended to adopt computing solutions as a tool for improving business management, in terms of both efficiency and management, boosting productivity, cutting costs and streamlining product management.

Furthermore, according to a study commissioned by Microsoft and conducted by Accenture and WSP Environment & Energy, cloud computing also has environmental benefits and can help businesses to cut their energy consumption and carbon emissions by around 30%. The report points out that large data centres like those run by Microsoft and Google benefit from economies of scale and operational efficiencies. Small businesses with approximately 100 employees that switch from on-site servers to the cloud could reduce their energy consumption and carbon emissions by up to 90%, according to researchers. For medium-sized companies with around a thousand employees the savings range from 60% to 90%.

Focusing on Microsoft's three most commonly-used business applications for e-mail, content sharing and customer relationship management, the researchers calculated the carbon footprint of server and storage infrastructure for three different deployment sizes (100, 1000 and 10,000 users) and found that switching to the cloud instead of physical infrastructure significantly reduces carbon emissions. The researchers also calculated that emissions would be cut by 33% by transferring 50,000 e-mail users in North America and Europe from individual servers to the cloud.

According to the study, there are essentially four factors that enable cloud computing to substantially lower energy consumption and carbon emissions: dynamic provisioning, i.e. reducing wasted computing resources through better matching of server capacity with actual demand; multi-tenancy, i.e. flattening relative peak loads by serving large numbers of organizations and users on shared infrastructure; server utilization, i.e. operating servers at higher utilization rates; and data centre efficiency, i.e. utilizing advanced data centre infrastructure designs that reduce power loss through improved cooling, power conditioning, etc.

The findings of Microsoft's study support those of a study on green technologies conducted by the consulting firm Pike Research, which focus on green technologies. The study carried out by Pike Research predicts that cloud computing could help to reduce total energy spending by data centres by as much as 38% by 2020. According to the study, the benefits of cloud computing are substantial and it will have a major impact in terms of reducing not only energy consumption —which could fall from US$ 23 billion in 2010 to US$ 16 billion in 2020— but also greenhouse gas emissions. The study also emphasizes that very few clean technologies have the capability to reduce energy expenditure and greenhouse gas emissions with so little business disruption.

Newsletter
eLAC nº 14
March
2011

News in brief

An iPhone application that helps to recycle electronic waste

The recycling website Earth911.com created by the company of the same name helps people who want to recycle materials of any kind, including unused technological goods such as televisions, mobile phones and much more, to locate recycling points in the United States. With all those iPhone users in mind, the company has developed an application called iRecycle, which tells users not only where their nearest electronic waste recycling centre is but also what type of products it accepts. The application also provides information on green events taking place in the user's area and displays the latest recycling news.

Cardboard flash drives

As an eco-friendly alternative, the Russian design studio Art Lebedev has developed the "Flashkus", disposable USB flash drives inserted into sheets of cardboard. The Flashkus is available in three sizes: 4GB, 8GB and 16GB and comes in a perforated set so that each one can be torn off and used easily. The retail price has not been released yet but given that the production costs are very low they are expected to sell at a much lower price than the flash drives currently on the market.

For a Green Chile

Chile Verde ["For a Green Chile"] is an environmental project sponsored by UNESCO and other bodies which compiles and publicizes environmental initiatives and projects implemented by individuals, businesses or organizations throughout Chile. In 2010, it compiled 80 initiatives and publicized them in a book (free to download on its website), an exhibition and on the website www.porunchileverde.cl. The 80 initiatives selected by experts for inclusion in the book include two related to information and communication technologies. RECYCLA Chile is a recycling company that recycles waste in the form of electrical and electronic equipment. It has created the first e-waste recycling plant in Latin America where it voluntarily applies the environmental regulations in force in developed countries and currently recycles around 5% of Chile's electronic waste. In addition, the project promotes the rehabilitation of ex-offenders, women carrying out night prison sentences and people with disabilities. The website www.desechos.cl is, in turn, an informative site intended to promote the recycling of batteries and other materials by means of a classification system for different types of waste. The site aims to organize the way in which we dispose of waste and disseminate this information through various online discussion forums, environmental educational institutions, schools and universities. Applications are currently being accepted for the second edition of the *Chile Verde* book via the application form on its website.

Europe set to improve its electronic waste recycling

The growing quantity of electronic waste around the world is a source of concern and is largely the result of the constant upgrading of equipment such as televisions, computers and smartphones. In Europe the figures are very high: between 8.3 million and 9.1 million tons of technological waste is generated each year, a figure that increases every year, and only 22% of that waste is collected and properly treated. The Environment Committee hopes to improve on these figures and aims to ensure that by 2016, 85% of the electronic waste created in each country is collected and between 50% and 75% of products thrown away are recycled. Furthermore, in February this year, the European Parliament approved by a large majority a series of amendments to the European Commission's proposal, which updates a directive in force since 2003 and aims to prevent these discarded devices from falling into the hands of children who dismantle them for scrap and in doing so are exposed to toxic components.

The present material was prepared with financial support from the European Union. Its content is the exclusive responsibility of ECLAC and should in no case be considered to reflect the official opinion of the European Union. The opinions expressed in this publication are the responsibility of the authors and do not necessarily reflect the views of the organizations involved.

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