EXPLORATORY SURVEY ON ENVIRONMENTALLY SUSTAINABLE ICT USE IN THE ICT FOR DEVELOPMENT (ICTD) SECTOR

Latin America, Asia, Africa, North America and Europe

January-March 2011

This survey was developed as part of the International Development and Research Centre (IDRC) funded:

Building research and communications capacity for an open, fair and sustainable networked society: The APC Action Network 2010-12

Contents

1. Background to survey

This report is based on the results of an exploratory online survey of civil society organisations in five regions: Africa, Latin America and the Caribbean (LAC), Asia, North America and Europe. The survey aimed to better understand awareness, current practices, demand and barriers to environmentally sustainable information and communications technology (ICT) use in the ICT for development (ICTD) sector. It was conducted by Colnodo and GreenNet, with the assistance of the following organisations: CIPESA (Africa); RDS Colombia (Latin America and the Caribbean, excluding Mexico); Bytes for All (Asia); and Alternatives (Canada).

The survey and this report are part of a newly-created programme by the Association for Progressive Communications (APC) in the field of ICTs and environmental sustainability. It accompanies an inventory of sustainable tools and practices, and policy research in ICTs and environmental sustainability in five countries: India, Bangladesh, Egypt, Costa Rica and Mexico.

This research and other activities in the APC programme area can be downloaded off the organisation's website: www.apc.org

2. Methodology

Within the broad field of ICTs and environmental sustainability, the survey focused on e-waste and climate change. As the questionnaire in Appendix 6 shows, respondents were asked questions that looked to determine their general awareness of these two areas, in-house policies such as waste practices, technology replacement cycles and energy consumption habits, demand for green technologies and practices, as well as barriers that prevent the greener use of ICTs.

In each surveyed region research partners assisted Colnodo and GreenNet in collecting the primary data, which involved inviting respondents to complete an online questionnaire. The research partners used their own criteria to identify and contact organisations.

The primary target of this survey was non-profit ICTD organisations. However, as the results show, some donors, internet service providers (ISPs), and organisations categorised as 'other' (e.g. educational or academic organisations) also responded.

Data collection was conducted from January to February 2011.

3. Overview of respondents

The following table gives a breakdown of the number and type of respondents who completed the survey.

Number of responses	Types of organisations surveyed	% of respondents
368	ICTD non-profit organisation/civil society organisations	60
	International non-profits (e.g. Greenpeace)	16
	Other*	15
	ISPs	6
	Donors	3

** Most commonly 'other' refers to organisations from the educational or academic sectors, with some social enterprise and research institutions responding, along with non-ICTD focused non-profits and institutions.*

43 different countries are represented by this survey, with the majority of respondents located in Latin America and the Caribbean, followed by Asia, Africa, Europe and North America.

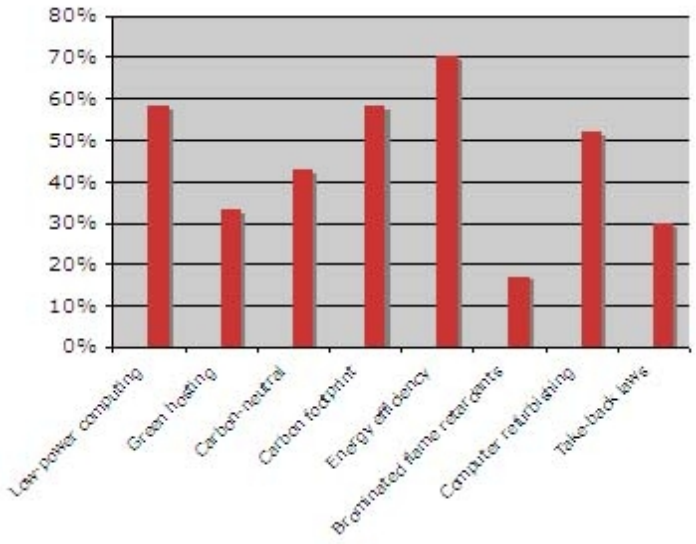
Because the survey was long and demanding, only 117 (31.8%) fully completed questionnaires were received. However, partial responses have also been considered in the summary of the findings below.

4. Findings

4.1. Level of awareness

Respondents were asked to rate their level of knowledge of both climate change and e-waste. Most organisations surveyed rated their general knowledge of climate change as high. However, the majority of organisations claimed to have a little or moderate understanding of e-waste. This is surprising given the levels of media attention on e-waste globally.

In order to verify the perceptions of the respondents' assessment of their own knowledge of climate change and e-waste, they were asked if they were familiar with particular terms and concepts. The results from these questions are represented in the graph below.



Graph 1: Familiarity with terms and concepts

Responses to this question suggest general, non-specific knowledge of the topic of ICTs and their impact on the environment. As the graph shows, most organisations surveyed understood concepts such as 'low-power computing' and 'carbon footprint', but do not appear to be familiar with legal or technical concepts. This finding was confirmed by questions focusing on the recycling of monitor screens and mobile phones, as well as the use of coltan in manufacturing. Respondents suggested a low level of awareness of these challenges.

While not being familiar with specific words like "coltan", most respondents did however state that they were aware of conflicts that had started over resources used in the

production of technologies such as computers and cellphones (the impact of so called "conflict minerals"). This reflected the political awareness of the organisations surveyed; an awareness which is likely to be higher than that found in other sectors, such as the for-profit sector.

The survey also suggested the politicisation of the new-versus-refurbished computer debate, which is also a key sector-specific concern. One comment received stands out here as an example of how the political importance of refurbished computers has been internalised by organisations: "It is important to not permit the import of obsolete equipment to countries of Latin America and Africa, as many companies dispose of their e-waste in the form of 'donations' to countries where the standards or laws don't exist."

The findings therefore suggest a relatively low level of knowledge about the technical and legal aspects of ICTs and environmental sustainability, and an unfamiliarity with some technical terms, but an awareness of and willingness to engage in the political considerations to do with the environment.

4.2. In-house policies

More than half the respondents said they do not have adequate in-house e-waste policies. This is reflected in questions about the final destination of obsolete computers, with many respondents saying they simply gave old computers away or stockpiled them.

Similar responses were found when it came to recycling conventional batteries for radios and other electronic devices, as well as recycling mobile phone batteries. "I don't know what to do with them" or "throw them away with the rest of the rubbish" were frequent responses to the question addressing this issue of mobile phone battery recycling.

According to respondents, companies that produce mobile phones play a more active role in the recycling of their equipment than companies that produce other types of hardware. For instance, in contrast to conventional battery producers, the companies that produce mobile phone batteries are felt to be more active in attending to the problem in that many have programmes for the collection and management of spent batteries. Nevertheless, this awareness is not backed up by practical action. Respondents as a whole did not appear to know details about these programmes, projects, campaigns or sites that do the collection.

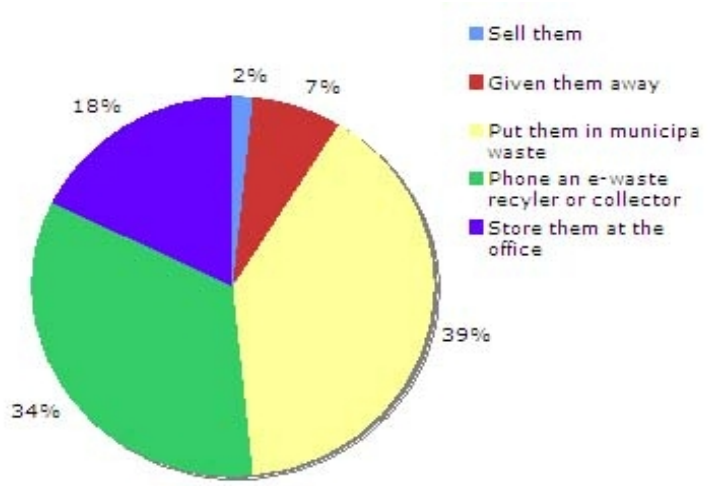


Chart 1: Disposal of batteries

One out of every four respondents claimed to not know if specialised e-waste recycling companies exist. In 37% of the responses respondents stated there are no recycling company in their area. For example, there is reported to be only one recycling company in Uganda.

However, many of the organisations interviewed said they would use recyclers as the final destination for their e–waste if they existed. Responses also suggested that these recyclers would have to adopt environmentally friendly methods of recycling or else they would not be used. Respondents also said it would be useful if recyclers refurbished equipment.

4.2.1. Use of second-hand ICTs

Three quarters of the respondents claim to have no internal policies for the acquisition or use of second-hand equipment. However, 54% of respondents claimed to use refurbished equipment in their daily work. Respondents typically did not budget for the management of obsolete equipment, which often prevented them from disposing of the equipment in line with the laws in place in some countries. Some respondents also said they reused parts of old machines in new equipment, suggesting that some level of in-house recycling occurs.

4.2.2. Training of employees

80% of the organisations interviewed claimed not to have any concrete plans for training or awareness-raising about sustainable practices in the use and consumption of ICTs. Amongst those that have some sort of training scheme, the concrete experiences of the Socialisation Workshop of the Electronic Waste Report in Bolivia, which is based on the

annual publication called Global Information Society Watch (GISWatch, www.giswatch.org),[1] stand out; as do training conducted in Uganda and Malta through the Diplo Foundation.

4.3. In-house practice

4.3.1. Replacement of equipment

The majority of the respondents said that in their respective organisations staff buy new mobile phones or computers, whether off-the-shelf or second-hand, at an average rate of one every three to six years. It is interesting to note that mobile phones are replaced with greater frequency than computers: 40% of the respondents said they replaced their phones every 1-3 years.

4.3.2. Factors affecting purchasing decisions

Respondents suggested that the three decisive factors affecting purchasing decisions are the lifetime of the equipment, the company or brand that produces them, and budget. The responses also highlight that the cost-benefit relationship (in this case, the best technical performance of the equipment at the best price) plays a very important role in decision-making. Other factors such as energy consumption or the environmental and social ethics of the manufacturing process only have a moderate impact on purchasing decisions.

Perhaps surprisingly, the majority of respondents assumed that name-brand refurbished computers will last longer than new, cheap computers. This trend may suggest a high level of confidence in the hardware manufacturing of company brands. This finding is, however, also in line with research that has suggested that cheaper, new computers frequently break down in the initial years of ownership and consequently have a short life span.

[1]GISWatch 2010 focused on ICTs and environmental sustainability. It is published by APC and Hivos.

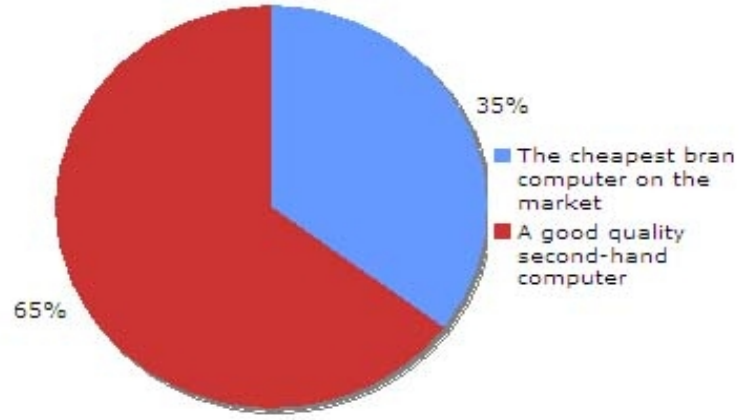


Chart 2: Which computer will last the longest?

4.3.3. Electrical power consumption

A high percentage of organisations surveyed claimed to switch off computers and printers after using them for the day, as well as closing down applications that are not being used at any given time. A similar habit was apparent with regard to the use of office lighting outside of work hours. However, our survey did not test whether this energy-consciousness was related to eco-awareness or financial considerations.

4.3.4. Using paper for printing

Even though organisations do not have formally established policies for paper used for printing, the responses suggested that a 'zero paper' culture – one that ensures the printing of e-mails, documents, graphics etc. is reduced to the minimum possible – does exist. The most common practice, beyond the use of recycled paper, is reuse, meaning respondents tend to print on both sides of a piece of paper.

The response to the reuse of print cartridges was equally high. Again, this may be due to the high cost of new cartridges, rather than a specific environmental concern. It may also be attributed to the prevalence of cartridge recycling schemes found in many countries.

4.3.5. Monitoring carbon footprints

The organisations surveyed do not measure or monitor their carbon footprint. As may be expected, more than 80% say they lack a practical way to do this, which represents a great challenge as well as an opportunity for developing easy-to-use methodologies in this

regard. Of the few organisations that claim to have a way of monitoring environmental impacts, the methods that stand out are the use of automated services to calculate impact using carbon calculators such as: Con-Ed; www.ecotropics.org; and the Siemens water footprint calculator. However, there was also evidence of the rudimentary monitoring of energy use, and subsequent behavioural change, by simply comparing monthly electricity bills.

4.4. Donors

Donor organisations surveyed confirm that they would be willing to finance the acquisition of more expensive computers as long as they had a more efficient management of energy consumption. 74% claim to demand an e-waste disposal plan from grantees.

4.5. Demand

As mentioned earlier, the production process of ICT equipment is not a factor affecting purchasing decisions, largely because of a lack of awareness about production processes – just over half of the respondents claim to have no knowledge about how the electronic products they use are manufactured. However, respondents stated that if they did have the knowledge it would be an important factor in purchasing decisions.

The same conclusion can be seen with regard to the choice of ISPs. The factors influencing the decision of which one to use are based more on reliability, price and speed than on the environmental impact of the ISPs.

70% of respondents claimed to have no knowledge of incentives for the use of renewable energy. However, those that did said that these related to incentives for the user of solar energy, especially in South Africa. It was also noted by one respondent how these incentives have decreased given that financing has been re-allocated to climate change disaster management and recovery.

Respondents felt that sourcing 'sustainable' or 'green' products or services can save them money. A similar perception is apparent with regard to the use of companies contracted to collect e-waste, in regions where such companies exist. This appears to present an opportunity for business development, as demand exists for information or for organisational services that can advise respondents on how to implement the sustainable use of ICTs.

4.6. Barriers

The survey suggests that barriers to the implementation of sustainable strategies or policies for the use of ICTs include a lack of awareness and information (mentioned by 59% of respondents), skills, and the initial cost of implementing sustainable technologies

(stated by 66% of respondents).

4.7. Suggestions and recommendations of those surveyed

In general, the recommendations received from respondents regarding improving the environmentally aware use of ICTs, centre on the importance of first raising awareness and then training users of technology. This training should start at the level of basic primary education. Training current internet users through distance learning platforms was also recommended.

Respondents also suggested avoiding software that consumes large quantities of electricity, especially when it is not being used. The unnecessary purchasing of equipment should be avoided, and, where possible, old equipment upgraded. As one respondent put it: "Use things as much as possible, repair them when they are broken and recycle them when they can no longer be fixed".

As consumers, respondents felt that we should reward those companies that incorporate environmental sustainability and longer life spans for technology as design criteria. However, as this survey shows, this recommendation is not necessarily borne out in practice.

5. Conclusion

The survey suggests the following broad observations:

- There is a clear need for training and awareness-raising interventions on the topic of ICTs and environmental sustainability amongst most organisations surveyed.
- In general, there appears to be little awareness of the more technical aspects concerning the environmentally sustainable use of ICTs. These aspects include: legal considerations, production processes and what they entail, and recycling processes. However, respondents showed a general awareness of issues such as e-waste and climate change, and appeared aware of political issues specific to their sector.
- In the absence of a more detailed awareness of the above, price and performance, rather than environmental considerations, are key deciding factors when purchasing technology.
- Respondents showed a willingness to engage in more environmentally sound and aware ICT practices if they had more information, and if products and services were available. However, cost remains a barrier to the adoption of environmentally sustainable practices.
- Donors suggested that they would support environmentally conscious choices by organisations even if these choices would cost them more.

6. Appendices

6.1 Survey: ICTs and environmental sustainability: awareness, practices, and demand amongst ICTD organisations

Email

- Address
- First Name
- LastName
- Organisation name (this will be anonymous in the final survey report)
- Kind of organization
    - ICTD Non-profit organisation/civil society organisation
    - ISP
    - Donor
    - International non-profit
    - Other: please describe
- Country where your organisation is based

AWARENESS

- How would you rate your organisation's general knowledge about climate change?
    - Low
    - Medium
    - High
- Do you believe that the climate is changing, and that something urgent needs to be done about it?
    - Yes
    - No
    - Not sure

- How would you rate your organisation's knowledge of e-waste?
    - Low
    - Medium
    - High
- Which of the following terms are familiar to you:
    - Low-power computing
    - Green hosting
    - Carbon-neutral
    - Carbon footprint
    - Energy efficiency
    - Power management
    - Brominated flame retardants
    - Obsolescence
    - Computer refurbishing
    - Take-back Laws
- Which computer do you think will last your organisation longer?
    - The cheapest brand new computer on the market
    - A second-hand high standard computer (e.g. top level Dell) that is three-years old
- Do you think the plastic casing used in your computers and cellphones can be recycled easily?
    - Yes
    - No
    - Not sure
- Is it potentially hazardous to dispose of your old computer monitor at your local waste landfill?
    - Yes
    - No

    - Not sure
- Have you ever heard of coltan?
    - Yes
    - No
- Do you believe there are limits to the natural resources currently used to produce technology such as computers and cellphones?
    - Yes
    - No
    - Not sure
- Are you aware of any conflicts (local, national, regional) that have started over resources used in the production of technologies such as computers and cellphones?
    - Yes
    - No

PRACTICE

- How do you dispose of your old computers at your workplace?
    - Sell them
    - Give them to other people
    - Store them at the offices
    - Put them in the municipal waste collection system
    - Phone an e-waste recycler/collector
    - Other, please describe.
- How do you dispose of your cellphones?
    - Sell them
    - Give them to other people
    - Store them at the offices
    - Put them in the municipal waste collection system
    - Phone an e-waste recycler/collector

- How do you dispose of your batteries for radios or cellphones?
    - Sell them
    - Give them to other people
    - Store them at the offices
    - Put them in the municipal waste collection system
    - Phone an e-waste recycler/collector
- Do you know if there is an e-waste recycler or collector in your area?
    - Yes there is
    - No there is not
    - I do not know
- If there were an e-waste recycler in your area, would you use them to dispose of your old technology?
    - Yes
    - No
    - Maybe
- Does your organisation have any internal policies to do with e-waste disposal or the use of second-hand computers and mobile phones?
    - Yes
    - No
- Does your organisation use refurbished computers?
    - Yes
    - No
- On average, how often does your organisation replace a staff member's computer?
    - 1-3 years
    - 3-6 years
    - 6-8 years

- On average how often does your organisation replace a staff member's mobile phone?
    - 1-3 years
    - 3-6 years
    - 6-8 years
- How important are these factors (please rank from 1 – 5 where 1 is less important and 5 most important) when you are buying new technology:
    - Energy consumption requirements
    - How the machine has been manufactured (e.g. you might select a specific brand because you understand it to be more environmentally sound)
    - Durability (how long it will last)
    - Reputation for performance
    - Availability of future upgrades
    - Other
- Do you turn your computer, monitor and printer off at night after working?
    - Yes
    - No
- Do you close applications on your computer when you stop using them?
    - Yes
    - No
- Does your organisation have any policies regarding printing emails and other documents from your computer?
    - Yes
    - No
- Do you turn your office lights off at night after working?
    - Yes
    - No

- Which if any of the following measures does your organisation use to reduce paper consumption?
    - Re-use printed office paper
    - Recycle office waste paper
    - Buy recycled paper
- Do you recycle your printer toner cartridges?
    - Yes
    - No
- Does your organisation have any ways of monitoring your organisation's energy consumption and/or carbon footprint?
    - Yes
    - No
- If you are a donor or an institution that supports civil society financially, would you accept a project application that has more expensive computers on the basis that they are environmentally friendly?
    - Yes
    - No
- If you are a donor or support institution do you demand that old technology is reused or disposed of in an environmentally-friendly way by project beneficiaries?
    - Yes
    - No
- Does your organisation offer its employees any training or information on sustainable ICT practices?
    - Yes
    - No
- Does your organisation use any specific environmental sustainable practices/tools in your organisation? Please list them, with a URL for more information if possible, and give some details on the benefits and drawbacks you've noticed in using them in your organisation.

- Do you have any suggestions to share with others when it comes to using technology in an environmentally sound way? Please share them in the space below.

DEMAND

- Does your organisation ever consider how technology is made before you buy it (i.e. whether or not the manufacturers follow environmentally-friendly processes, or whether they treat their workers fairly?)
    - Yes
    - No
- If you had the information, would this affect your decision?
    - Yes
    - No
- When your organisation chooses an internet service provider, what is most important to you?
    - Speed
    - Price
    - Reliability
    - The energy efficiency of that hosting service/whether they are following environmentally-sound practices
    - Friendly supportive service
- If you had information about the energy efficiency of that hosting service, would that influence your decision?
    - Yes
    - No
- Do you believe 'going green' will cost your organisation money, or save you money?
    - Cost money
    - Save money
- Is there a need for an e-waste recycler in your area?
    - Yes

    - No
- If an e-waste recycler collected your old technology, would you:
    - Give it to them for free
    - Pay them
    - Ask for a small amount of money in return
- Does your organisation use solar power for your computers, or any other kind of renewable energy source?
    - Yes
    - No
- Would you pay another organisation money to advise you on the environmentally sustainable use of ICTs, and to develop you a 'green' technology strategy for your organisation?
    - Yes
    - No
- If 'going green' cost you money, would you go green?
    - Yes
    - No

BARRIERS

- What do you think are the key barriers in your organisation that prevent it from 'going green'?
    - Lack of available economic resources
    - Lack of information
    - Lack of interest and little awareness of the issue
    - Lack of time
    - Other, please describe
- Can you name any policies or laws in your country regarding the environmental impact of ICTs?
- Are you aware of any incentives for the use of renewable energy in your country, region or city?