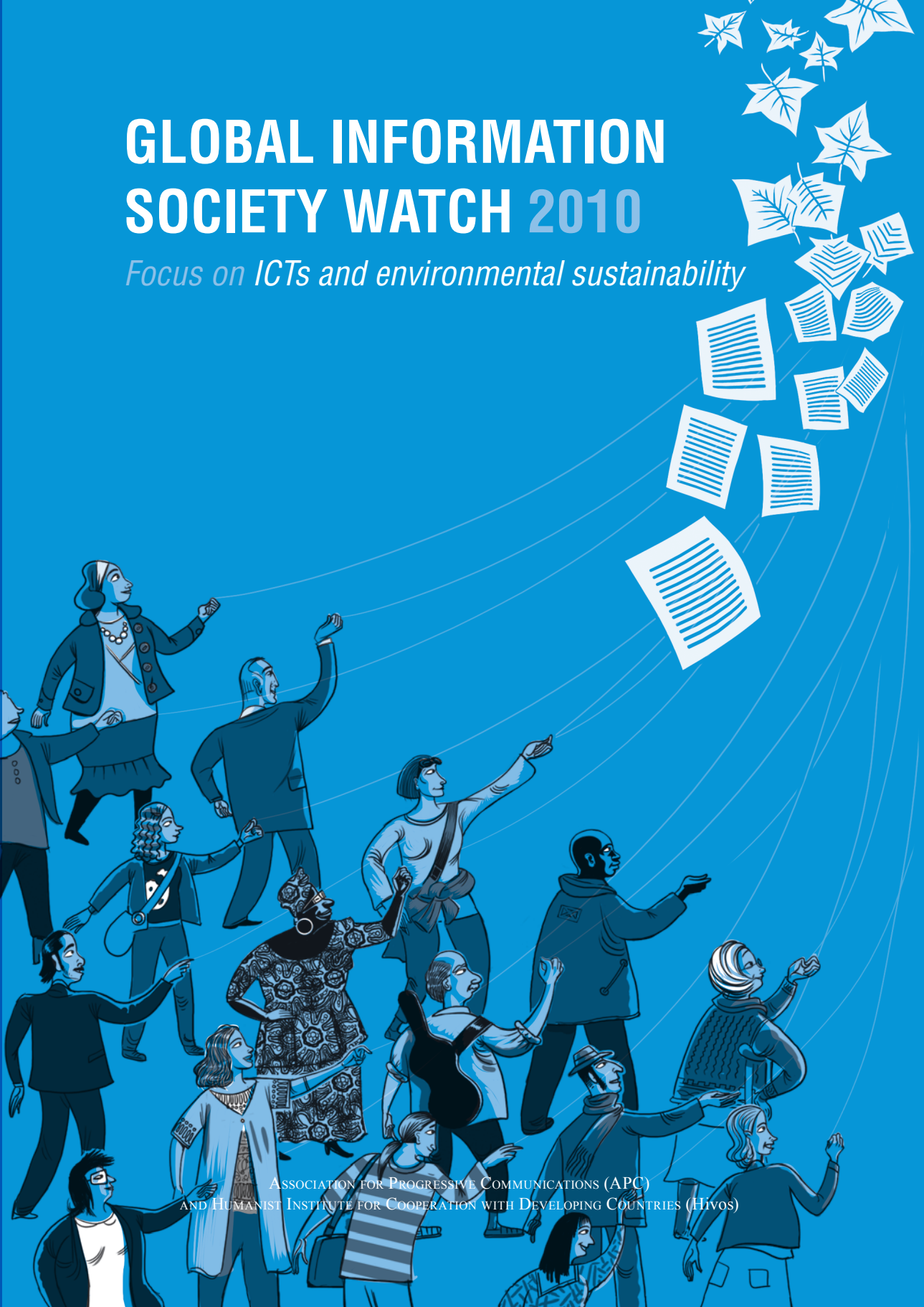
GLOBAL INFORMATION SOCIETY WATCH 2010

Focus on ICTs and environmental sustainability



Association for Progressive Communications (APC)
and Humanist Institute for Cooperation with Developing Countries (Hivos)

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Tackling e-waste

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Introduction

The 20th century was marked by the impact of information and communications technology (ICT) on social and economic development. The digital revolution, started in the late 1970s, led to explosive production and extensive use of electronic and electrical equipment – one reason that has made the information society affordable. However, this has also meant that ICTs have become commodities, and have over time been designed to reach their end of life sooner. This is creating a massive amount of electronic waste (e-waste) globally, and has presented the challenge of dealing with toxic materials in ICTs that harm lives and the environment.

E-waste, e-scrap or waste electrical and electronic equipment (WEEE) refers to discarded, outdated, obsolete or broken electrical or electronic devices.[1] Many environmental groups claim that developed countries use developing countries or emerging economies as "dumping grounds"[2] for e-waste. These groups often state that growing consumerism and fast improvements in technology are leading to an increase in the amount of dangerous e-waste being dumped on the world's poorest nations.[3]

How much e-waste is generated?

E-waste is one of the fastest growing waste streams today and it is growing at three times the rate of municipal waste globally.[4] As per current estimates, the ICT industry is expected to generate 53 million tonnes of e-waste by 2012.[5] Only 13% of this waste is reported to be recycled with or without adequate safety procedures. This, however, excludes illegal dumping. In the European Union alone, 9.3 million tonnes[6] of electronic equipment was put on the market in 2005. In the United States (US), about 18% of TVs and IT products (a total of 26 million TVs and 205.5 million IT products, including peripherals) and 10% of mobile phones (a total 140.3 million units) were recycled in 2007.[7]

In 2008, over 280 million[8] mobile handsets were sold worldwide in just the first quarter, which suggests a sale of a billion handsets in that year. With limited access to e-waste data in developing countries like India and China, estimated figures are linked to sales figures for consumer electronics. Greenpeace estimates that four million PCs are discarded each year in China alone. In 2009, investigative reports[9] by United Kingdom (UK) media houses from dumping sites in Ghana and Nigeria tracked electronic devices that belonged to the UK's leading public institutions including councils, the police department and health services.

E-waste and human health

Modern electronics can contain up to 60 different elements. These devices are manufactured from human-made and natural materials. Many are valuable, some are hazardous and some are both. The most complex mix of substances is usually present in the printed wiring boards. When toxics are exposed, potential human impacts include – but are not limited to – lung cancer and damage to the heart, liver and spleen. Some could also lead to brain swelling and muscle weakness. Chromium VI and lead may also cause DNA damage. Substances like mercury can cause brain and liver damage if ingested or inhaled. The burning of e-waste is very common in developing countries and it can leave high levels of lead present in soils and the water.

Recycling as a way of avoiding resource depletion

A 2009 report from the United Nations Environment Programme (UNEP), *Recycling – From E-waste to Resources*, offers several considerations of the hidden environmental impact of electronic devices.

Besides the impact on people's lives, one important reason to encourage the proper recycling of technology is the impact that the production of ICTs from scratch has on the environment and on crucial resources. Mining plays the most important role in the supply of metals for electrical and electronic equipment, since supply from recycling is very limited and it cannot meet the industry's demand. Vast lands are used for extracting natural resources for ICTs, which also use up other precious resources such as water and energy in production, resulting in tonnes of CO_2 emissions. For example, to produce one tonne of gold, palladium or platinum, CO_2 emissions of about 10,000 tonnes on average are generated.

1 Adapted from Wikipedia's entry on e-waste: en.wikipedia.org/wiki/Electronic_waste

2 See Greenpeace's mapping of e-waste: www.greenpeace.org/international/en/campaigns/toxics/electronics/the-e-waste-problem/where-does-e-waste-end-up

3 Osborne, H. (2006) Rich nations accused of dumping e-waste on Africa, *The Guardian*, 27 November. www.guardian.co.uk/technology/2006/nov/27/news.waste

4 Sinha, S. (2010) *Sustainable E-waste Management*. www.toxicslink.org/artview.php?id=134

5 Ibid.

6 Husman, J. et al. (2008) *Review of Directive 2002/96 on Waste Electrical and Electronic Equipment (WEEE)*, UN University, Bonn.

7 www.computertakeback.com/Tools/Facts_and_Figures.pdf

8 Geyer, R. and Doctori Blass, V. (2010) The economics of cell phone reuse and recycling, *International Journal for Advanced Manufacturing Technology*, 47 (5-8), p. 515-525.

9 www.independent.co.uk/news/world/africa/dumped-in-africa-britain8217s-toxic-waste-1624869.html and www.bbc.co.uk/news/world-europe-10846395

Gold is used in computers to ensure rapid and accurate transmission of digital information through the computer. Gold meets these requirements better than any other metal. Therefore the annual demand for gold in electrical and electronic equipment is some 300 tonnes on average. This extraction alone produces 5.1 million tonnes of CO_2 (at the rate of 17,000 tonnes CO_2 per tonne of gold). Other metals like copper, cobalt, tin, indium, silver, palladium, platinum and ruthenium used in electrical and electronic equipment account for an annual CO_2 emission level of 23.4 million tonnes, almost 1/1000 of the world's CO_2 emissions. These 23.4 million tonnes do not include CO_2 emissions from metals used in electrical and electronic equipment like steel, nickel or aluminium, nor other CO_2 emissions associated with the manufacturing or use of electrical and electronic equipment.[10]

So what needs to happen? The challenge is to raise awareness among all actors – policy makers, producers, consumers and recyclers – in order to be aware of the environmental impact and realise the innovation potential that could lead to sustainable consumption.

Policy and regulatory mechanisms

E-waste is very much a subject dealt with by individual states, even though the movement (or dumping) of e-waste blurs state boundaries. In order to address the transborder issue, the United Nations (UN) introduced the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. So far 134 countries have recognised this convention. Australia, Canada, New Zealand and the US are yet to ratify it. Nevertheless, ratification of the Basel Convention has not necessarily led to policy or legislative responses.

In some countries where legislation has been developed, the success has been mixed. For instance, despite all legislative efforts to establish sustainable e-waste recycling in many developed countries such as the UK – also party to 1994 European Community convention that bans the export of hazardous waste to anywhere outside the Organisation for Economic Co-operation and Development (OECD) – these laws often lack effective implementation or regulations. Good recycling calls for efficient collection points, appropriate recycling technologies, and integrating streams of waste in a country or region with appropriate recycling infrastructures in place.

With regard to e-waste policy and regulatory mechanisms in developing countries, the situation is potentially similar by analogy to how governments handled ICT policies in the early days of ICT policy making: treating it as part of postal and telegrams policies. A recent study by UNEP analysing policy and legislation mechanisms to assess barriers for sustainable e-waste in eleven countries (South Africa, Kenya, Uganda, Morocco, Senegal, Peru, Colombia, Mexico, Brazil, India and China) showed that no country – with the exception of China with a poor record of implementation – has dedicated policy and legislative mechanisms to deal with e-waste. As a result, the legal scope and definition to recognise e-waste is in danger of morphing with hazardous waste. Such policy generalisation makes e-waste recycling unaffordable and potentially undermines the market opportunities involved in it.

A dedicated policy and legislative mechanism should be in place and offer clear guidelines and steps for collection, dismantling, pre-processing and end-processing for final metal recovery. This is important as emerging (and developing) economies will continue to generate more e-waste in the next twenty years. For example, the growth rate of mobile phone uptake in India continues to be over 80% and UNEP estimates mobile waste will be multiplied by eighteen until 2020. Lastly, policy support should exist to improve the harmonisation of waste streams nationally and regionally, including integrating waste management approaches with other sectors.

All these point out that there is an immediate need to create dialogue and spaces to develop policy and legislative mechanisms through effective stakeholder engagement involving government, industry and civil society organisations.

From voluntarism to accountability

Producers of electronic devices transcend nation-state borders. This is especially the case with mobile phones and electronic gadgets for entertainment. In the past decade, major players in electronic devices have come up with voluntary codes of practices towards sustainable use and recycling of their products. A recent report from the GSM Association, which informs its stakeholders about how the telecommunications industry is working to address its environmental responsibilities for both new and used phones, is one useful example. Similarly, members of the Global e-Sustainability Initiative (GeSI) came up with a SMART 2020 strategy to fight against climate change, which could enable emissions reductions of seven gigatonnes of CO_2 by 2020.

In the absence of strong legislative practices, voluntary actions appear to guide waste management – both at global and national levels. Where a policy mechanism exists, such as in the European Union, the implementation is weaker. Despite the common WEEE Directive, the 27-member-state European Union has more than 100 collection systems and every system

10 United Nations Environment Programme (2009) *Recycling – From E-waste to Resources*. www.unep.org/PDF/PressReleases/E-Waste_publication_screen_FINALVERSION-sml.pdf

has another weak spot.[11] A major problem here is inconsistency amongst collection systems by producers that needs serious attention by implementing agencies. Collective efforts by producers to receive, dismantle and recycle waste need policy support. Producers also lack incentives (e.g. market opportunities for recycling systems and products) and therefore it is cheaper for them to dump (often illegal) waste in developing countries.

These initiatives are important good practices but corporate or individual voluntarism alone cannot provide solutions to e-waste. Policy and legislative mechanisms should actively hold producers to account, especially in creating infrastructures and systems to collect e-waste and ensure its proper delivery to approved dismantling units. Because of the impact on human health and the environment, e-waste cannot be left to voluntarism. It should be treated as a national priority and regarded as a key consumer awareness issue.

Raising awareness

Currently, the data on e-waste are poor and insufficient, limiting our understanding of the issues and therefore solutions. Analysts often depend on estimations to map data at a national, regional and global level. Given the very limited data available on amounts of e-waste collected and treated through "official" e-waste channels, it is clear that the recycling of significant proportions of e-waste currently goes unreported in different parts of the world.

Awareness is also important to sensitise the public on reusing and/or recycling electronic devices. A Nokia global consumer survey showed that the majority of old mobile phones are lying in drawers at home and not being recycled.[12] At the same time, the GSM Association estimates that more than 70% of a mobile phone can be recycled.

Media reports are often on illegal dumping and its potential dangers with very little space for what needs to happen to manage e-waste. For instance, there is very little information on the need for an e-waste management system and its impact on poor labourers.

The working class in the information society

Emphasis on accountability would also mean formalising labour forces in developing countries that deal with e-waste. International media reports, activists and civil society organisations have produced evidence that the poor, informal sector in developing countries is often responsible for processing toxic e-waste.

While the "digital divide" has dominated policy debates and scholarly analysis, the emergence of a "working class"[13] in the information society is hardly recognised. Mobile phones, the internet and computers are often seen as privileges of the few and wealthy. The labour side of the information society hardly features in any policy debate. Civil society organisations should raise awareness and build public pressure about the emergence of this information society working class, so that it gets the attention of policy makers. Government and producers should create infrastructures and sustainable safety systems for dismantlers, such as managed recycling hubs in select towns. Examples like the material recovery facility, a Hewlett-Packard pilot project in Cape Town, should be explored for scaling up.

Financing e-waste

The financing of e-waste management and allocation of economic responsibilities along the downstream chain has proven to be challenging in countries with existing take-back schemes and in countries discussing potential take-back system architectures. Many models exist in different countries.

From a general perspective, three main stakeholders could bear responsibilities for managing e-waste:

- *The producers:* This is based on the producer responsibility principle. This is possible by reducing sales margins, or increasing sales prices. The current producer responsibility principle across Europe has not always been an incentive to collect more, simply because stakeholders responsible for financing have no economic benefits.
- *Government:* As e-waste is a societal problem and it has long-term environmental impact, the management system could be effectively regulated by policy mechanisms. Government also can use civil society organisations and media as watchdogs and management systems could be judiciously financed by tax.
- *The consumers:* This is an extension of the "polluter pays" principle.

Conclusion

This overview of managing e-waste within the global and national context is very broad and I have only touched on key issues that need immediate consideration. The most urgent intervention is to raise awareness among all actors, and to create a dedicated policy and legislative mechanism through stakeholder engagement. Recognition of the working class in the information society in policy mechanisms is a crucial step to formalise dismantlers who deal with e-waste. ■

11 www.bbc.co.uk/news/world-europe-10846395

12 pressbulletinboard.nokia.com/2008/07

13 For more information, see Qiu, L. J. (2009) *Working-Class Network Society: Communication Technology and the Information Have-Less in Urban China*, MIT Press, Cambridge (USA).

GLOBAL INFORMATION SOCIETY WATCH 2010

GLOBAL INFORMATION SOCIETY WATCH 2010 investigates the impact that information and communications technologies (ICTs) have on the environment – both good and bad.

Written from a civil society perspective, **GISWatch 2010** covers some 50 countries and six regions, with the key issues of ICTs and environmental sustainability, including climate change response and electronic waste (e-waste), explored in seven expert thematic reports. It also contains an institutional overview and a consideration of green indicators, as well as a mapping section offering a comparative analysis of "green" media spheres on the web.

While supporting the positive role that technology can play in sustaining the environment, many of these reports challenge the perception that ICTs will automatically be a panacea for critical issues such as climate change – and argue that for technology to really benefit everyone, consumption and production patterns have to change. In order to build a sustainable future, it cannot be "business as usual".

GISWatch 2010 is a rallying cry to electronics producers and consumers, policy makers and development organisations to pay urgent attention to the sustainability of the environment. It spells out the impact that the production, consumption and disposal of computers, mobile phones and other technology are having on the earth's natural resources, on political conflict and social rights, and the massive global carbon footprint produced.

GISWatch 2010 is the fourth in a series of yearly reports critically covering the state of the information society from the perspectives of civil society organisations across the world.

GISWatch is a joint initiative of the Association for Progressive Communications (APC) and the Humanist Institute for Cooperation with Developing Countries (Hivos).

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