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**Abstract**

**ANALYSIS OF THE SOCIAL IMPACTS OF THE TRANSFER OF USED COMPUTER  
EQUIPMENT**

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## EXTENDED EXECUTIVE SUMMARY

This research project is based on successful experiences in the region that allow for the development of a study based on social variables in the comprehensive process of transferring computers from developed countries (DCs) to countries in Latin America and the Caribbean (LAC) and reconditioning computers that have been donated locally.

The organizations that recycle computers in the region vary a great deal in terms of their size, funding sources, duration, participants, and social impact. This study is based on analyses of successful cases and allows the reader to identify procedures and effective and problematic aspects of transfer experiences in the region. Special attention is paid to the programs' social impact.

The first step of the project involved identifying organizations that recycle computers in LAC through Internet searches, requests for information in electronic fora on ICTs and development, and individual contacts. We then contacted the organizations and invited them to participate in the exercise. Those that answered affirmatively received an electronic questionnaire that addressed a series of specific indicators. A total of twelve organizations completed the questionnaire. While this does not represent a massive sample, it does allow us to extract key concepts that can be used for future computer recycling projects. The organizations included in the study have recycled a total of 63,000 units.

### **A) WORKFLOW OF THE PROCESS OF TRANSFERRING EQUIPMENT**

This study begins with an analysis of the complete process (workflow) needed to successfully send equipment to ICT projects in LAC, placing special emphasis on social aspects. The process involves variables such as the type of equipment that should be sent; the organizations in DCs that collect, store and send the equipment to countries in LAC; social and political variables in the selection of beneficiary projects; and evaluation. The authors also considered variables such as government policies regarding the transfer of equipment, the logic of the organizations in DCs that collect and send the equipment to countries in LAC, and perceptions held by participants that play a role in these processes both in DCs and in LAC (according to a specific set of indicators) in order to evaluate the social impact of the deliveries and future monitoring of the same, with a strong emphasis on the social component.

### **B) LESSONS LEARNED**

#### **Donating and Receiving Computer Equipment**

All equipment can be reused if its operating system matches its technical capabilities. The factors that most frequently prevent donation are a lack of awareness on the part of organizations that can recycle computers and the bureaucracy related to donating such items.

Organizations and individuals in countries in which computers are recycled are not encouraged to donate unused computer equipment. It is likely that the amount of donations would increase if an appropriate fiscal policy were passed, bureaucratic

procedures were reduced, and campaigns designed to raise awareness about the social and environmental benefits of donating equipment were developed.

There is a need to manage donations in order to ensure that many types of organizations donate unused equipment and that the equipment is in good condition. Furthermore, a logistical and legal framework must be designed regarding the reception of donations, the information that is offered to possible donors, documentation of the origin and value of donations, packing and storage of equipment prior to recycling, and informing the media of the donations that are made.

While it is true that any equipment can be donated, it is not cost-effective to transport or recycle obsolete or damaged items or inflexible models. The following conditions should be considered when analyzing the feasibility of a donation: a) the unit's remaining useful life and b) the cost of transporting and reconditioning the unit as compared to its remaining useful life.

The great majority of organizations that receive equipment recondition units donated by public and private organizations and private citizens from the same city or country.

According to statistics submitted by the organizations, they recycle 50-70% of the equipment received.

### **Factors for Success**

*Advising and Transfer of Knowledge on Best Practices Nationally and Internationally.* Advising allows for a notable economy of time and resources given that it is implemented from the moment a proven model is implemented and allows for said model to be improved on the basis of experience.

*Strong Governmental Support.* Governments can provide financial support and work with public agencies and private companies to facilitate donations. They can also take on a proactive role in the recycling process as it relates to the education sector by committing human resources and can work with the media to ensure that the experience is publicized.

*Publicizing the Recycling Experience* through seminars, events, the press (radio, television, newspapers, etc.), and the Internet is a key factor in the projects' success.

*The type of software installed in recycled equipment is a key component in the reconditioning process* –and this includes training human resources. While companies like Microsoft frequently donate software licenses, there also is a need to work with free software.

### **Social Impacts**

The recycling process allows beneficiary organizations to become more efficient, improve the circulation of internal information, and boost their response capacity.

Fifty percent of the organizations surveyed stated that the recycling process had a positive impact on relationships with the community because of increased opportunities to provide recycled electronic equipment to schools and community organizations. Communication between donor companies and beneficiary organizations has increased as a result of efforts to publicize recycling activities.

Training for volunteers through recycling workshops is key, as these are fora for learning skills related to software and hardware that allow participants to gain skills that will improve their viability on the job market.

The number of recycled computers in projects in LAC is not large enough to have significant social impacts. The most significant social impacts of the recycling processes are observed in two areas:

- formal education through the donation of computer equipment, assistance and monitoring, which increases technological literacy and curriculum development;
- preparation for facing the new demands of the job market; the recycling process itself serves as technical training for participants. Technicians and other individuals who participate in the process gain practical training in hardware, software and the production process in general, which they can apply in the future.

A cost-benefit analysis and evaluation of social impacts demonstrates that the recycling process is beneficial to countries in which there is a lack of computer equipment in educational institutions and institutions that could provide public access to the Internet. Computadores para Educar has verified that, considering the remaining useful life of the recycled equipment, the time and money spent, and the investment required to make the equipment operational (including the purchase of replacement parts), recycling is a better option than acquiring new equipment. It is important to note that these analyses apply to recycled equipment donated by companies, public agencies and private citizens from the same country as the beneficiary. It is quite probable that the equation would change a great deal if we were to consider equipment imported from other countries, which would involve costs related to packaging, shipping and duties.

The impact of recycling on training and education are relatively significant in only two areas: technical training, as part of the recycling process itself, and formal education using computers that are donated to schools and community organizations. The number of people who take classes on how to use the Internet as a result of recycling is not significant.

Beneficiary organizations have identified the following impacts on cultural development: increased awareness of the importance of recycling e-waste; bridging of the digital divide; increased awareness of the use of ICT in educational content; and increased awareness of corporate social responsibility regarding the protection of the environment through the recycling of e-waste.

Locally generated e-waste (that which is produced in the same city or country) has decreased through the reconditioning of unused computer equipment that would otherwise be discarded. However, no data is available on the limitations of the recycling cycle and the e-waste that it generates. There is some concern regarding the importation of used equipment and the attending increase in e-waste. With the exception of Chile, no LAC countries have organizations that focus on recycling of e-waste in order to extract useful material.

## **C) PROPOSALS**

To facilitate the process of donating computers through:

- Information for donors on the potential benefits and procedures involved
- Facilitating compliance with required procedures
- Raising awareness about the needs of schools and community organizations
- Publishing information on best practices in DCs and LAC

To promote reconditioning projects through campaigns that combine traditional media and the Internet;

To implement campaigns in order to secure donations from public institutions and private companies;

To stimulate donations by generating a rebate for donors based on the use that they have given to donated equipment;

To establish alliances and networks with the media, public opinion leaders, community leaders and the community-based media;

To create alliances and networks with various government institutions in order to obtain government support and the eventual co-financing of recycling efforts;

To regularly inform the public of the evolution of recycling projects;

To define the legal and logistical context in which donations are received, inform the donors, document the origin and value of donate equipment, pack and store the equipment prior to recycling, and inform the media of donations;

To undertake a cost-benefit analysis (including packing, transport and tax-related costs as well as environmental, social and other costs) in order to decide whether or not to seek donations from other countries or local organizations;

To establish minimum conditions for receiving donated computers in keeping with the national and local realities;

To implement donation centers for used computers in the cities with the densest computer stock in order to ensure a high number of donations;

To establish clear requirements regarding which organizations may benefit from recycled computers;

To develop a strategic plan for preparing for recycling, selecting and training volunteers and staffers, overseeing inventory, establishing which computers are to be recycled, purchasing replacement parts, requesting software licenses, producing and distributing the computers, and follow-up activities;

To generate networks of successful experiences in order to make best use of the knowledge and experience acquired and make economic use of resources;

To establish flexible comparison methods for the purchase of replacement parts and components and to purchase said items in bulk in order to secure the best prices;

To implement volunteer or internship programs for the recycling process in order to train young people in the use of technological tools –thus increasing the benefit to their communities- and secure low- or no-cost labor;

To identify additional uses for recycled equipment, such as robotic goods;

To complement the use and maintenance of the products by beneficiary organizations with training for teachers and students;

To aid schools and community organizations that benefit from the program in reconditioning classrooms, improving electric infrastructure, etc. so that they can install the recycled computers:

To provide organizational and technical support through hotlines, a website, virtual fora and online consults;

To promote public awareness regarding the environmental impacts of technological waste, including soil and water pollution due to toxic chemicals;

To promote campaigns for obtaining adequate regional, national, and local legislation regarding the disposal of technological waste;

To periodically monitor the recycling experience through consults with the beneficiary community using workshops, evaluations during and after the recycling process, and ex-post evaluations implemented a few months or one year after the experience ends in order to verify the continuity of the positive impacts.

#### **D) Indicators**

In addition to this study the authors have developed a set of indicators for evaluating the social impact of recycling computers on beneficiary organizations, the relationships between said organizations and their communities, and the beneficiary communities.