



National Toxics Network Inc.

working towards pollution reduction, protection of environmental health and environmental justice for all

National Toxics Network & Island Sustainability Alliance C.I.

E-waste in the Pacific: The Rising Tide Fiji and Samoa



May 2008

Introduction

In March 2008 members of the National Toxics Network (NTN) and the Island Sustainability Alliance C.I (ISA CI) undertook a joint project to assess the state of e-waste management in the Pacific Islands of Fiji and Samoa. The project team had four representatives: Dr Mariann Lloyd–Smith, John Wickens and Lee Bell of the National Toxics Network and, Imogen Ingram of the Island Sustainability Alliance. The project involved two weeks of consultation with NGO's, industry representatives, government agencies and academics, as well as inspections of waste disposal and recycling centres in both countries.

The objective of the project was to ascertain the degree of awareness of e-waste impacts among all stakeholders and to determine the level of management of e-waste, if any, that exists and to what degree this may be representative of other Pacific countries.

The following report briefly outlines the activities undertaken by members of ISA CI and NTN and their findings in relation to waste and recycling infrastructure generally and e-waste management, specifically in the Pacific countries.



Figure 1. Tidal rubbish at the Marine Reserve, Apia, Samoa.

E-waste: The Rising Global Tide

Electronic waste, in the form of discarded electronic appliances such as televisions, computers, mobile phones, electronic toys and air conditioners, is one of the most rapidly growing waste streams in the world.

In Australia it is estimated that over 9 million computers, 5.3 millions printers and 2.1 million scanners are currently in use and that all of them will be replaced in the next couple of years.¹ Similar trends are to be seen throughout the developed world. As information technology uptake continues in the developing world and countries with economies in transition, we can reasonably expect proportional increases in the e-waste stream for those countries.

European studies estimate that the e-waste stream is growing at 3-5% per annum which is nearly 3 times the rate at which household (municipal waste) is growing.² In the US experts estimate that between 1997 and 2007 the US generated more than 500 million obsolete computers and the majority of these will be destined for e-waste³.

Much of this e-waste has been exported from the US and Europe to 'recycling' operations in China, South-East Asia and Africa. Most of these recyclers are small scale operators who extract valuable metals from the e-waste by stripping and burning it or by using acid to extract precious metals from circuit boards. This low tech activity has been the cause of significant environmental impacts and health problems among those workers handling the hazardous components of e-waste.

The Basel Ban⁴ prohibits the export of e-waste to developing countries from developed countries to prevent dumping. However, many grey areas exist as to what constitutes e-waste. Exporting used but working computers to developing countries is not prevented by the Basel Convention, even though those computers may be close to the end of their life, incompatible with modern software or otherwise obsolete. At the end of their journey they effectively become e-waste in a developing country.

¹ Australian Bureau of Statistics, *Australia's Environment: Issues and Trends, 2006*, November 2006 available at <http://www.abs.gov.au>

² Basel Action Network (2002) Exporting Harm: The High Tech Trashing of Asia. P.5 available at <http://www.ban.org/#ToOrderExportingHarmTheVideo>

³ SILICON VALLEY TOXICS COALITION, ET AL., *Poison PCs and Toxic TVs: California's Biggest Environmental Crisis That You've Never Heard Of*, June 19, 2001, <http://www.svtc.org/cleancc/pubs/poisonpc.htm>.

⁴ Basel Convention on Control of the Transboundary Movements of Hazardous Wastes and their disposal (1989) ("Basel Convention") For a description of the Basel convention and Basel Ban, which Australia does not acknowledge, see <http://www.ntn.org.au/cchandbook>

As the mountain of e-waste continues to grow around the world, those countries with more advanced resource recovery infrastructure for municipal waste will be better positioned to tackle the waves of e-waste to come. That is to say those countries that have significant experience with waste collection and disposal, recycling and resource recovery will be better positioned to adapt to this new and complex waste stream. Countries who struggle to provide basic municipal waste services will be most at risk and will have to develop innovative strategies to manage e-waste.

It is well documented⁵ that landfill and incineration of e-waste is dangerous and unsustainable. The focus of any programme to manage e-waste should avoid end of pipe solutions. Instead, the focus must be upstream and target the designers and manufacturers of electronic goods to minimize or eliminate hazardous substances from the products and to design electronic goods for longer lives and for maximum ease of recycling. If this is not achieved the major problems being experienced with recovering resources from electronic goods will persist indefinitely and the impacts on the environment and human health will intensify.

For the Pacific Islands, a combination of resource recovery and export appears to be the most appropriate approach for managing e-waste. Waste collection services are intermittent and disposal sites are rudimentary. Land is strictly limited and the construction of landfills is not possible in many islands. Some recycling of metals and other materials are conducted, but the complexity of e-waste and economies of scale in the Pacific all but rule out major local e-waste recycling operations at this point.

E-waste in Fiji

In Fiji we met with a range of NGO's, academics, industry representatives and government agencies with a view to sharing information on the state of e-waste in Fiji. Only limited information has been published on e-waste in the Pacific Islands, which points to growing problems with its management. In 2004, The University of South Pacific (USP) published a detailed analysis of solid waste management and recycling in the Fijian Islands.⁶ The USP report highlights a number of issues of concern that are consistent with our findings.

⁵ For example see Widner et al., 2005 Global perspective on e-waste. *Environmental Impact Assessment Review* 25: 436-458

⁶ The University of South Pacific.(2004) Pacific Centre for Environment and Sustainable Development. Solid Waste Management and Recycling in the Fiji Islands. Preliminary Analysis of the situation in the Western region of Fiji and the handling of some difficult solid waste Final Report to JICA. March 2004

These include:

- Most e-waste in Fiji is currently landfilled.
- Forecasts to 2020 based on modeling of current electronics imports and use indicate e-waste is and will continue to be a growing problem in Fiji.
- Any recycling of e-waste in Fiji will not be the same as in Europe or Japan due to limitations of scale and technology.
- Use of electronic goods in Fiji is growing at a rate equal to or greater than that of developed countries.

The USP research concluded that there is an urgent need for further studies, policy-making, pilot projects, capacity building of recyclers and awareness actions in relation to e-waste in Fiji.

The USP research pointed to other studies such as Gangaiya et al (2001)⁷ and Chandra (2002)⁸, which identified elevated heavy metals at the Lami landfill and migration of heavy metals to the near shore environment. Disposal of e-waste was considered to be a contributor to the heavy metal pollution at the Lami landfill site but the need for further research on the issue was identified.

As part of a separate study, Vincent Lal, a University of South Pacific PhD student together with Professor Bill Aalbersberg, conducted soil sampling across a range of land uses (including 'remote' sites) and identified elevated levels of Deca- BDE – a common flame retardant in electronics goods - at all sites sampled. While the results have not yet been published it suggests that transboundary movement and deposition of PBDE's has been occurring as no production of PBDE's takes place in Fiji.

Fiji - NTN/ISA CI Consultation (3-7 March 2008)

While in Fiji our team met with a variety of academics, NGO's, officials and individuals who have areas of interest that intersect with our concerns over electronic waste. (A full list is available in Annex 1) Most of these discussions were extremely productive and mutually informative. Key topics of discussion were the state of electronic waste recycling in Fiji and networks that may be able to assist with public awareness and capacity building to tackle the e-waste problem. We would particularly like to thank the following people for their valuable time and contributions;

Dr Alan Resture – Lecturer, Institute of Marine Resources, University of the South Pacific

⁷ Gangaiya, P., Tabudravu, J., South, R., Sotheeswaran, S., *Heavy metal contamination of the Lami coastal environment, Fiji*. The South Pacific Journal of Natural Science, 2001. 19: p. 24-29.

⁸ Chandra, S., *Investigations into the Lami municipal dump as a source of heavy metal contamination*, in Department of Chemistry. 2002, The University of the South Pacific: Suva (Fiji), MSc Thesis. 164p.

Dr Bill Aalbersberg & Dr Waisea Votadroka, Institute of Applied Science,
University of the South Pacific

Ms Felori Nainoca, Partners in Community Development Fiji (“PCDF”)
Mrs Tupou Vere & Ms Ema Tagicakibau, Pacific Concerns Resource Centre

Mr Rodney Lui, START (Systems for Analysis Research & Training) Oceania,
Centre for Environment & Sustainable Development, University of the South
Pacific

Dr Padma Lal – Pacific Islands Forum Secretariat (“PIFS”)

Mr Inoke Ratukalou & Ms Marita Manley, Secretariat of the Pacific Community
 (“SPC”)

Alex & Morea at Live & Learn (Environmental NGO)

Pepe Clarke, International Union for the Conservation of Nature.



Figure 2 Imogen Ingram (left) with Dr Mariann Lloyd-Smith at PCDF

Field Trips

Our team conducted a number of informal and opportunistic site visits to waste handling and disposal sites during our time in Fiji.

These included a brief visit to the site of the old Lami landfill (near Suva Prison) where some rehabilitation had occurred but where studies continue into heavy metal leaching to the coastline.

Our team also inspected a new landfill facility at a site north-east of Suva where electronic waste was clearly visible among the municipal waste. This landfill was recently established with funding from Japanese International Cooperation Agency (JICA).



Figure 3 JICA-sponsored new landfill at near Suva

Findings

As a result of our consultation, field trips and observations we conclude:

- Fiji has a growing problem with the management of e-waste.
- E-waste is almost entirely landfilled or burned in Fiji.
- Waste burning at household level is ubiquitous and frequent.
- Community awareness about the impacts of e-waste on human health and the environment is very low in Fiji.
- There are currently no collection points or formal recycling of e-waste in Fiji.

- Data on electronic imports to Fiji shows a sharp trend upwards- particularly for mobile phones.
- There are virtually no government policies or programmes in place to tackle e-waste at a local or regional level.
- The cost of recycling of e-waste should be included in the purchase price as funds for all forms of waste management in Fiji are very limited.
- There are positive signs that Fijian commercial enterprises are willing to participate in e-waste recycling if a clear government policy framework is developed.

Recommendations

As a result of our consultation, field trips and observations we recommend:

- Raising community awareness about the impacts of e-waste in Fiji is urgently needed.
- Implementing appropriate e-waste management strategies for both village and urban settings, which take into consideration the challenges of collection and infrastructure development in rural areas.
- Consulting with stakeholders and developing an e-waste strategy for Fiji based around storage, collection, disassembly, packaging and then export to manufacturer (EPR) or country of origin.
- Developing a consumer take-back scheme based on a deposit at point of purchase which would be hypothecated into a dedicated e-waste recycling fund. The funds would be used to provide a cash back refund for customers returning old electronic equipment, while also providing additional funds to pack and export e-waste. Virtually all stakeholders agreed that this fund would need to be kept separate from consolidated government revenue.

Waste Management in Samoa

In many respects the management of domestic waste (including e-waste) in Samoa is little different from the management of waste in Fiji. The main difference is that there are larger more densely populated waste generating cities in Fiji such as Suva and Nandi.

Again, the principle methods of dealing with waste in Samoa are landfill or open burning, or a combination of both. In the more densely populated cities such as Apia and surrounding suburbs there are collection systems for household wastes, although frequency of collection can be unreliable. Most households place waste on a platform to keep vermin and dogs from disturbing the waste until collection trucks arrive.



Figure 4 Typical waste platform with e-waste.

Upon collection waste is taken to landfill sites. Our team visited a relatively new landfill site (Tafaigata landfill) that operates with an aerobic design and a number of innovative leachate scrubbing techniques.



Figure 5 Taifagata Landfill - Samoa

E-waste was present at this site as at other landfills. It was apparent that some parts of the site had been set alight and black smoke from burning plastics was clearly visible as we arrived.

A private recycling operation next to the landfill had been collecting some e-waste and vehicle parts (such as batteries) but it appeared that the business was no longer in operation and that the stored e-waste was exposed to the elements.

Figure 6 Exposed e-waste at Taifagata



A basic medical waste incinerator was also co-located within the landfill site. Dark smoke from the small stack and the small size of the incinerator suggested that pollution control equipment was minimal.



Figure 7 Ministry of Health - Medical Waste Incinerator

E-waste in Samoa

The same trends that were identified in Fiji, that is the rapid uptake of electronic appliances such as computers and mobile phones, were also present in Samoa and are reflected in the limited trade data that we have been able to access. Not surprisingly, we also identified the same outcomes for electronic waste with the vast majority being sent to landfill where it is buried and/or burned.

Among NGO's it was clear that little information had been made available on the impacts of e-waste but there was a clear willingness to obtain and disseminate any material on the issue that we could provide. At public level the awareness of the impacts of e-waste was minimal.

It was clear however, that government officers with waste management responsibility had become aware of the e-waste problem and were establishing committees to develop policy on the issue. While this was encouraging it was clear that funding and collection infrastructure and inadequate government policy development remain significant obstacles.

NTN/ISA CI Consultation – Samoa 10 – 15th March 2008

Lee Bell of NTN and Imogen Ingram of ISA CI conducted the consultation phase of this project in Samoa between the 10th and 15th March 2008. We arranged to meet with a diverse group of stakeholders with an interest in e-waste issues (A full list is available in Annex 1), including representatives of statutory bodies, NGO's, and community groups. Our work with NGO groups focused on strategies and methods for increasing community awareness of the environmental impacts of e-waste. As Samoa is the headquarters of the South Pacific Regional Environmental Programme (SPREP) we took the opportunity to meet with SPREP staff involved with waste management and discuss their views on e-waste management in the Pacific. We would particularly like to thank the following people for their valuable time and contributions.

Mr Frank Wickham of SPREP Sustainable Land Management

Mr Mark Ricketts, Solid Waste Officer, SPREP

Mr Peter Murgatroyd, SPREP Library

Ms Roina Faatauvaava-Vavatau, SUNGO

Mr Raymond Voigt, past-president SUNGO

Ms Adi Tafunai and Ms Karen Mapusua, Women in Business

Ms Francella Strickland (MFAT), Ms Fuatino Leota (MNRE) &

Mr Faafetai Sagapolutele (PUMA)

Va'asili Mrs Moelagi Jackson, President, SUNGO

Dr Hans Thulstrup, Science Advisor, UNESCO



Figure 8 Imogen Ingram (left) with a SUNGO representative

Field trip to Taifagata Landfill

Mr Mark Ricketts from SPREP took us on a tour of the Taifagata Landfill which partially operates on an experimental passive aerobic system to reduce leachate generation and decrease methane emissions. While at the Administration offices adjacent to the landfill we also met Mr Faafetai Sagapolutele (Public Utility Management Authority - PUMA) and Ms Fuatino Leota (Ministry of Natural Resources & Environment – MNRE).

The site visit was informative and the staff we met with outlined their forward plan for e-waste policy development including a workshop that was planned for the following week. The officers responsible for waste management had a clear understanding of the imminent problems with e-waste management in Samoa and were prepared to tackle it. They were also aware of the need to engage the community on this issue, but were already experiencing resource constraints for general waste management that would impact on their ability to implement community awareness raising campaigns on e-waste.



Clockwise: Tafaigata landfill tipping face, plastics burning, leachate filter and leachate pond. March 2008

Findings

As a result of our consultation, field trips and observations we conclude:

- Samoa currently lacks policy and infrastructure for the management of e-waste.
- E-waste is almost entirely landfilled or burned in Samoa.
- Waste burning at household level is common.
- Community awareness about the impacts of e-waste on human health and the environment is very low in Samoa.
- There are currently no collection points or formal recycling of e-waste although a site is available for small scale storage near the Taifagata landfill.
- Data on electronic imports to Samoa shows a sharp trend upwards- particularly for mobile phones.

- Government policies and programmes to tackle e-waste are at a very early stage of development.
- There was broad support for a form of deposit/refund system for used electronic equipment to help fund e-waste recycling and export.

Recommendations

As a result of our consultation, field trips and observations we recommend:

- Raising community awareness about the impacts of e-waste in Samoa is urgently needed.
- The cost of recycling of e-waste should be incorporated into the purchase price of electronic goods as funds for all forms of waste management in Samoa are very limited.
- Consulting with stakeholders and developing an e-waste strategy for Fiji based around storage, collection, disassembly, packaging and then export to manufacturer (EPR) or country of origin.
- While strategies to tackle e-waste in Samoa are being developed by government waste managers based around storage and collection, more support is required from the Samoan Government and SPREP to provide a framework for e-waste disassembly, packaging and then export to manufacturer (EPR) or country of origin.
- Developing a consumer take-back scheme based on a deposit at point of purchase, which would be hypothecated into a dedicated e-waste recycling fund. The funds would be used to provide a cash back refund for customers returning old electronic equipment, while also providing additional funds to pack and export e-waste. Virtually all stakeholders agreed that this fund would need to be kept separate from consolidated government revenue.

Issues for further consideration

Management of e-waste in the Pacific Islands needs to be addressed through a number of different strategies that target a range of sectors such as;

- Recyclers
- Domestic electronic consumers
- Commercial and Government electronics consumers
- Government policy makers
- Electronics importers
- Customs officials
- Landfill operators and other waste management operators.

While the scoping work carried out by NTN/ISACI focused upon current community awareness of e-waste and strategies for raising awareness, it

became evident that raising awareness in isolation may be counterproductive. Communities need to be aware of the hazards of e-waste but they also need to know how they can safely deal with the electronic waste that they may currently bury, burn or send to landfill through domestic waste collection services.

Without any formal infrastructure for collection and recycling of e-waste in Fiji and Samoa at this point in time, NTN/ISACI believe it is important that communities are given advice of the hazards present in e-waste and methods to safely store existing stockpiles in domestic and commercial scenarios.

If e-waste is protected from environmental exposure (e.g. storage in sheds or under cover) and access by vulnerable groups such as children is restricted then immediate risks may be reduced. The exercise of providing information about hazards and safe storage will improve community understanding and prepare the way for better cooperation with collection and recycling services and policies as they emerge.

Broader community awareness of the e-waste issue should assist in driving government policy-making and infrastructure provision for e-waste recycling in a realistic timeframe.

It is also clear that benefits of an environmental, social and economic nature can result from the development of modest e-waste recycling industries in Fiji and Samoa with a view to exporting of segregated and packaged e-waste.

ANNEX 1

Meetings were held with the following.

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