

THE NATIONAL INVENTORY OF E-WASTES IN SAMOA



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EXECUTIVE SUMMARY

This national inventory aims to provide a snap shot of the current situation in Samoa with the generation of electrical and electronic wastes, and the management practices involved to safely store, collect, refurbish, recycle and dispose of the generated wastes.

The gathered information and data have mirrored the present situation of e-wastes in Samoa as characterized by the rapid increasing of computers, printers, air conditions and other offices equipment at government organizations. It reflects the nature of these organizations and their great reliance on these equipment for the implementation of their works. The households e-wastes generation on the other hand strongly suggest a rapid increase in the future of wastes from cellular phones particularly, while the generation of refrigerators, televisions and other households e-wastes are off set by their uses by families for other purposes as highlighted in this study.

The study reveals the lack of national legislations and regulatory framework in place to effectively coordinate and promote the national implementation of the Basel Convention in Samoa. The appropriate supporting measures and mechanisms to promote waste minimization at source and generate funding for the implementation of sustainable recycling operations do not exist. The existing Customs Import and Export Recording System require some amendments to effectively track down the importation and exportation of e-wastes. There is also a lack of appropriate facilities and infrastructure to safely store, collect, refurbish, recycle and dispose of e-wastes in accordance with the acceptable practices. The expertise available in implementing appropriate e-waste management operations with special emphasis on materials recovery and recycling is lacking.

The overall findings of this study strongly suggest that Samoa is not in a position to carry out its obligations in line with the Basel Convention. It is therefore very important to consider the findings and recommendations of this study for future appropriate actions.

NATIONAL INVENTORY ON ELECTRONIC AND ELECTRICAL WASTE IN SAMOA

1.0. INTRODUCTION

1.1. Background

This national inventory report presents the findings of investigations made to study the generation of e-wastes¹ in Samoa and the management practices involved in the storing, collection, refurbishing, recycling and disposing of the generated e-wastes. This important work is part of a larger survey within the Asia-Pacific region initiated by the Basel Convention and coordinated by the South Pacific Regional Environment Program (SPREP) for the Pacific Islands. Samoa as a party to the Basel Convention has international obligations to the management of these wastes under Article 4:

- Subparagraph 2(b); *“Ensuring the availability of adequate disposal facilities for the environmentally sound management² of hazardous or other wastes that shall be located, to the extent possible, within it, whatever the place of their disposal.”*
- Subparagraph 2(c); *“Ensuring that persons involved in the management of hazardous wastes or other wastes within it take such steps as are necessary to prevent pollution due to hazardous wastes and other wastes arising from such management and, if such pollution occurs, to minimize the consequences thereof for human health and the environment.”*

The outcome of this national inventory provides crucial information to understand the true nature of e-wastes generation in Samoa and its position in the management of the generated e-wastes in accordance with the appropriate environmentally sound management practices.

1.2. Objectives of the E-waste National Inventory.

The national inventory intends to provide an overview of the e-waste generation in Samoa, and the management practices in place with special emphasis on:

- The Nature of e-waste generation (main sources and generators; types of e-wastes and quantities generated).
- Information on e-waste imported and exported for reuse, refurbish, recycling and disposal purposes.
- Existing e-waste storage, collection, refurbishing, recycling and disposal facilities and infrastructure.
- Customs information recording system

¹ End of life Electrical and electronic equipment

² Taking all practicable steps to ensure that hazardous wastes are managed in a manner which will protect human health and the environment from these wastes negative effects.

1.3. Scope of Inventory Works

This study is directed at electrical and electronic wastes (e-wastes) identified hazardous under the Basel Convention with particular focus on the following important categories of e-wastes. It studies the main sources and generators of e-wastes in Samoa, and the different processes and course of actions involved in the management of these generated wastes from their point of generation to final disposal.

- Televisions
- Refrigerators
- Air Conditions
- Computers
- Printers
- Telephones / Mobile phones

1.4. Methodology and Approach

Desk Survey

A thorough desk study was carried out to analyze existing relevant information from previous national inventories, studies and records from appropriate organizations, businesses and stakeholders. Hard and electronic copies of relevant national records, surveys and studies were obtained for the purpose of this study. A review of existing national legislations, policies and government waste services was also conducted.

Interviews & Questionnaires

Designed questionnaires were also given to identified businesses and operators of refurbishing, materials recovery and recycling facilities. Responsible staff of key government agencies were also interviewed.

Field Visits and Investigations

Follow up field visits and investigations were also made to observe the existing government e-waste storage facility, and e-wastes refurbishing, material recovery, and recycling facilities. Regular visits were also made to the existing waste landfills

1.5. State of Limitation

a). The lack of responses from many identified businesses and companies has clearly reflected the:

- Unwillingness of some businesses and companies to disclose their sales information, the actual quantities of their generated waste and the ways they manage their e-wastes at their premises.
- Lack of proper recording and information system in place, which has resulted in the absence of good quantitative estimates and detailed information as required for the purpose of this study.

b).The Government Assets Register which records the generated write off electrical equipment from all government organizations and agencies was not up

to date at the time of this investigation. This is in accordance with the explanation from the responsible government staff³. The electronic copy of this government assets write off register which was kindly made available for the purpose of this study clearly reflects this.

The recent national inventory and information available to determine households e-waste generation is the National Population and Households Census in 2006. This is not up to date and thus may possibly do not reflect the current situation given the latest developments to telecommunication, television and other services.

³ Senior Staff of the Ministry of Finance

2.0. RESULTS AND FINDINGS

2.1. National Policies and Legislations

Samoa does not have the sound and up to date legislations and regulations to promote the national implementation of the Basel Convention for the management of e-wastes, with special emphasis on the transboundary movements of hazardous wastes and their management in accordance with the accepted guidelines and practices. While there is some emphasis at the policy level, the supporting legal provisions are not there to effect national actions.

- **The Lands, Surveys and Environment Act 1989** provides the main legal framework for the management of wastes in Samoa. It needs review to effectively promote the national implementation of the Basel Convention in Samoa.
- **National Waste Management Policy 2001** supports the management of hazardous wastes but requires legislative and regulatory support to effect its national implementation.
- At present, the Ministry of Natural Resources and Environment is reviewing a **Waste Management Bill**, which will provide adequate legal provisions to support and promote national implementation of the Basel Convention, Stockholm Convention and other waste related multilateral agreements.
- The Ministry of Natural Resources and Environment is also in the process of finalizing a **National Solid Waste Management Strategy** which forms the platform for future actions towards the sustainable management of solid waste including e-wastes. The findings of this national inventory are also incorporated in this national strategy for national actions to address the highlighted issues.

2.2. Economic

There are no appropriate economic instruments in place to promote incentives for waste minimization at source, and to encourage producers and importers to take more responsibility in the production and importation of their goods to minimize the amount of wastes they generate and import, and more importantly manage and recycle any generated wastes. The management of e-wastes will require additional government funds and commitments to support future appropriate programs and activities. However, it is unlikely that the government will have sufficient funds to support this. The government of Samoa for the last four years has continued to support an annual budget of more than ST\$2 million (US\$800,000) to fund the collection of solid wastes throughout Samoa as well as the on going maintenance of its waste landfills designed and constructed using the anaerobic landfill structure. While the introduction of the user and polluter pays principles seems to be the future direction for waste management in Samoa, the government is investing its money not only to provide the required waste services to the public but to promote public awareness and understanding on the appropriate waste management practices. It gives the time for the government to develop these services to a standard that is acceptable to the public and the business communities. This promotes public support, participation and appreciation, which is good for any future plans to introduce waste charges to these provided waste services. Past researches showed that the public do not

mind paying any fees as long as the provided services are cheap, consistent and convenience.

2.3. National Public Awareness

The awareness of the public on e-wastes particularly is generally very limited despite some public understanding of hazardous wastes. While past awareness programs implemented under the POPS Project had raised nationally the profile of hazardous substances like PCBs in most e-wastes, there is limited awareness on the presence of hazardous substances in most of the households' electronic goods and products. The majority of the identified electrical goods are both commercial and households goods, and thus the impacts to the public is great given people's close association with these items on a daily basis. It is important to raise people's awareness on the impacts to public health and the environment. This will help people to better manage these goods in the future to prolong their lifespan and avoid early damages. This is also important in influencing public choices when purchasing these items to avoid used and reconditioning equipment which are cheaper but will not last. Similarly, this will provide some awareness to the local operators and the workers of refurbishing and recycling services in Samoa. The government organizations as the leading generator of e-wastes in Samoa must also be aware of the e-wastes issues for good decision makings when purchasing these equipment, and more importantly when these equipment are out of order and destined for disposal .

2.4. E-Waste Generation and Information.

2.4.1. Imported E-wastes

The analysis of import records from Customs does not indicate any importation of e-wastes in the period 2004 -2007. If there were some e-wastes imported, the current HS Coding System would not be able to track it as the current system does not have specific codes to differentiate used equipment and waste from the general electrical and electronic equipment. While the importation of unknown used and recondition equipment such as laptops, computers and others had happened, chances of any e-wastes to be imported to Samoa would be less. Possible reasons are the absence of good e-waste refurbishment or repair facilities and appropriate recycling and disposal facilities in Samoa. Secondly, it is uneconomical to import to Samoa e-wastes for re-exportation. Some past negotiations had been made between the Governments of Tokelau and Samoa regarding the importing of Tokelau's recyclable waste materials and possibly including e-waste to Samoa. However, there had been no much development on this proposal.

2.4.2. Exported E- wastes

Similarly, the exportation of e-wastes for recycling and disposal purposes overseas was not discovered by Custom despite a number of containers being exported in the past by some local companies. The Yazaki EDS Co.Ltd as part of its obligations under International Standard Organization (ISO), had exported an average number of four 20ft containers of hazardous wastes including some e-

wastes to New Zealand until 2006. Following a number of meetings between the Ministry of Natural Resources and Environment and Yazaki in 2006, some measures were then introduced to minimize the generated wastes. These measures were effective in reducing the number of containers down to one every year. Because of the hazardous nature of these wastes which can be managed locally, Yazaki has no longer exported any waste overseas but diverted to an area set aside at the Tafaigata waste landfill for storage using sealed containers. The Digicel Samoa Ltd is believed to have some sort of similar arrangement for the disposal of their generated cellular phones and some electronic wastes overseas, but it has not been confirmed.

2.4.3. Customs Information System

The review of the existing Customs HS coding use reveals the fact that there are no special codes to differentiate used goods and e-wastes from the general electronic and electrical imported goods. This creates problem in tracking down any imported e-wastes or post consumer electrical and electrical goods. Similarly, it will cause similar problems to any exported e-wastes for recycling and disposal purposes overseas. This affects Samoa's obligation in regulating and controlling the transboundary movement of hazardous wastes in line with the Waigani and Basel Conventions. .

2.5. E-waste Generation and information

2.5.1. Households E-wastes

- **Generation at Source**

Table 1 presents information of the generated e-wastes by the total number of 23,759 households in Samoa. Most of these indicated out of order electrical equipment if not in storage by now at people's basements and closets as usual, had eventually ended up at the waste landfills through the government collection service. With the continuing push from the Ministry of Natural Resources and Environment to collect wastes from villages under the government free collection

| Main Category | Working | Out of Order |
|-----------------|---------|--------------|
| Radios | 21,167 | 176 |
| Televisions | 14,702 | 346 |
| Refrigerator | 14,069 | 353 |
| Cellular Phones | 11,372 | 203 |
| Fixed Phones | 10,177 | 479 |
| Computers | 2,299 | 174 |
| Play Stations | 2,876 | 130 |

Source: Population and Household Census, 2006

program, many families are using this program to remove their out of order equipment from their premises at no cost. Based on the information presented, more than 98% of households in Samoa had radios, 61.8% had televisions, 59.1% had refrigerators, 47.8% had cellular phones, 42.8% had fixed phones, 12.1% had play stations and 9.6% had computers. The actual figures for the current available electronic equipments are not known but in line with the recent improvements within the last two years in the area of telecommunication and television coverage, the estimates for both the electronic goods and the

generated e-wastes would be much higher. For instance, the recent sales estimates suggest that more than 100,000 cellular phones are now available in the country. With the average lifespan of one to three years, most of these phones will become e-wastes in two to three years time. Similar forecasts can be established for other categories of household goods by considering their average lifespan.

- **Storage of Household E-waste**

There is a tendency among the population to keep some materials in service for a longer period or even after its useful life with them without disposal. This is obvious as noticed with a number of families especially in the rural areas still having in possession some out of order televisions, radios, refrigerators and others. Sometime refrigerators and ovens are used by some families to store household items such as coconuts, agricultural crops and others in the kitchen area

- **Collection and Disposal of Household E-waste.**

The government free collection program has provisions for the collection of e-wastes from families and businesses three times a year. This service also covers

| Main Category | Annual Units |
|-----------------|--------------|
| Televisions | 30 |
| Refrigerator | 28 |
| Cellular Phones | N.A |
| Fixed Phones | N.A |
| Computers | 35 |
| Play Stations | N.B |
| Radio | 48 |

other wastes of large magnitude which are not covered under the weekly collection services. All the collected wastes under the government collection service are destined for disposal at the government wastes landfills. The existing waste landfills do not have special facilities for the disposal of e-wastes. E-wastes and other bulky wastes are disposed of together at assigned sections within the disposal site. Table 2,

presents the estimated number of units collected and disposed of at the dumpsite on an annual basis for the last three years from the government collection services.

Slides: E-wastes placed for the collection service



2.5.2. Government Organizations E-wastes

Table 2 provides some information on the nature of institutional e-wastes generation. The information indicates the quantities of write off electrical equipments from government ministries since 2005. At the time of this investigation, most of the write off entries filled by government ministries and agencies have not been entered. Thus, the actual quantities of the generated e-wastes from write off electrical and electronic equipments would be much higher

| Item | Units |
|-------------------|-------|
| Computer Monitors | 166 |
| Computer C.P.U | 216 |
| Computer UPS | 155 |
| Laptop | 54 |
| Laptop battery | 30 |
| Printers | 79 |
| Photocopiers | 48 |
| Air Conditions | 160 |
| Refrigerators | 29 |
| Televisions | 20 |
| Oven | 17 |

Source: Ministry of Finance, 2008

if the Government Assets Register was up to date. This information is useful in providing some indicative estimates and information on the generated e-waste from other similar organizations. E.g. Samoa Water Authority, Samoa Land Corporation, Samoa Housing Commission, Samoa Tourism Authority and others.

- **Storage of Government Organizations E-wastes.**

All the write off equipment from 20 government ministries and organizations are collected and stored at a government storage area at Vaimea. This is a very good system of coordinating the recovery of government write off assets from many organizations. However, the storage area space is limited and not sufficient enough to provide shelter for these equipment preventing them from the rain. As observed during a number of site visits, most of these equipment are placed outside in an open environment including expose computers and other equipment printed circuit boards. The following table presents the number of units assessed at this government storage facility in September 2008. Based on the Ministry of Finance, this is the average situation every six months with the generated e-wastes from government organizations.

Table 4: Average generated E-wastes on a Six months Period

| Items | Average Units / 6 months |
|-----------------------------------|--------------------------|
| Computer Monitors | 115 |
| Computer Central Processing Units | 83 |
| Computer UPS | 75 |
| Printers | 61 |
| Air Conditions | 59 |
| Refrigerators | 24 |
| Washing Machines | 13 |
| Ovens | 10 |
| Telephones/Fax machines | 40 |
| Photocopiers | 22 |
| Scanners | 17 |
| Televisions | 7 |

Slides: Government Storage Facility



Exposed printed circuit boards of electronic equipments

Table 5: Government Ministries Registered Write-Off Electrical Equipment

| MINISTRIES | Computers | | | | | Printer | Photo Copier | TV | Ovens | Refrigerators | Air Condition |
|-----------------|------------|------------|-----------|----------|------------|-----------|--------------|-----------|-----------|---------------|---------------|
| | Monitor | CPU | Laptop | Battery | UPS | | | | | | |
| AGRICULTURE | 9 | 8 | 1 | | 5 | 5 | 2 | | | | 1 |
| LEGISLATIVE | 4 | 6 | | | 2 | 1 | 1 | | | | 15 |
| ATTORNEY | 2 | 2 | | | | | | | | | |
| AUDIT OFFICE | 2 | 2 | | | 5 | | | | | | |
| COMMERCE | 1 | 4 | 3 | | 3 | 2 | 1 | | | | |
| COMMUNICATION | 1 | 1 | 5 | 1 | 15 | 2 | 2 | | | | |
| FOREIGN AFFAIRS | 3 | 4 | 1 | 6 | 6 | 1 | 1 | | | | |
| EDUCATION | 29 | 26 | 2 | | 18 | 12 | 5 | | | 1 | 24 |
| MoHEALTH | 18 | 8 | 4 | | 26 | 7 | 7 | 4 | 2 | 16 | 49 |
| FINANCE | 27 | 79 | 1 | 1 | 17 | 11 | 1 | | | | 2 |
| NATIONAL HEALTH | 7 | 4 | | | 2 | 1 | 2 | | | 3 | 13 |
| MNRE | 11 | 19 | 1 | | 2 | 10 | 4 | | | | 11 |
| PM | 6 | 5 | | | 2 | 4 | | | | | 3 |
| POLICE | | | | | | 1 | | | | | 2 |
| PSC | 18 | 17 | | | 7 | 1 | | | | | 1 |
| REVENUE | 13 | 12 | | | 18 | 2 | 1 | | | | 8 |
| WORKS | 5 | 7 | | | 4 | 7 | 2 | | 15 | 9 | 17 |
| WOMEN | 4 | 3 | | | 6 | 4 | 2 | 6 | | | 1 |
| OBUDMAND | 2 | 2 | 2 | | | | | | | | |
| JUSTICE | 4 | 7 | | | 17 | 8 | 5 | | | | 12 |
| FIRE STATION | | | | | | | | | | | 1 |
| TOTAL | 166 | 216 | 20 | 8 | 155 | 79 | 36 | 10 | 17 | 29 | 160 |

The current government assets register coordinated by the Ministry of Finance is a very good system in obtaining relevant information relating to the generated e-wastes from the government ministries and organizations. Having such a central organized system is more effective than for the individual government ministries to deal with their own generated e-wastes. However, there is a need to make appropriate arrangement to divert these collected e-wastes to the existing licensed e-wastes materials recovery operators rather than directly delivering to the Tafaigata Waste Landfill for disposal.

- **Collection and Disposal**

The collected write off government assets including end of life electrical equipments are destined for public auction. Any remaining equipment are delivered to the waste landfill for disposal. Refurbishing operators normally use the government assets public auctions for getting some of the used or end of life equipment. Some families also use this important opportunity to purchase a low cost used refrigerator and other equipment. Based on the information from the Ministry of Finance, there is always a large quantities of remaining equipment to be disposed of at the landfill.

2.5.3. Refurbishing Operations & Facilities

| Table 5: Local Repair Services for Electrical and Electronic Equipments | |
|---|---|
| ITEM | LOCAL OPERATOR |
| Air Condition | Kooline Samoa Ltd, Matautu Uta Samatic Co.Samoa Ltd, Matautu Uta Meki Electronics Co.Ltd, Nafanua Climate Air Condition, Taufusi Supercool Refrigeration, Vaitele |
| Refrigerator | Samatic Co Samoa Ltd, Matauta Uta Supercool Refrigeration, Vaitele Meki Refrigeration, Vailima Climate Air Condition, Taufusi, |
| Computer | Ultratech Electronics & Computer Computer Services Ltd Datec Samoa Ltd, Fugalei CompTech, Lagoon Computers Ltd, Papauta |
| Television | Samoa Budget TV Services, Fugalei HJF Electronics, Motootua Pacific Communication Ltd, Vaimoso |
| Cellular Phone | HJF Electronics, Motootua Digicel Samoa Ltd SamoaTel Co.Ltd |

Table 5 presents a list of 15 identified operators who are involved with some sorts of refurbishing operations involving the end of life electrical and electronic equipments. These facilities are mostly small scale operations and can only handle and repair few units on a daily basis through the use of few technicians available. The reuse of recovered parts and materials from out of order equipments is mostly limited to separable parts and components of most electronic goods. These separable parts do not require special dismantling operations.

Based on the information provided, **an average of 150 - 220 air conditions, 80 -100 refrigerators, 150 - 200 computers, 50 - 70 televisions, ovens, washing machines,** printers and others were reported being brought to these facilities for repair works on **an annual basis.**

Most of these equipments were fixed and returned while some with severe damages were returned to their owners unless the owners cannot meet the costs especially when new parts are involved in the refurbishing works .Under the normal practice, if the owners fail to turn up within one to three months of notice, these companies can either deliver these equipments to the waste landfill for disposal or repair it and resell them at a cheaper costs.

- ***E-waste Generation***

The main generated wastes at these facilities come from the removed worn parts and components of the serviced equipments, as well as the unclaimed equipments as highlighted above. Before any equipment is delivered to the waste landfill for disposal, its separable parts are removed for future repair works. Refrigerators bodies are usually taken by some farmers for water storage at their cattle farms and plantations, thus reducing the quantities to be disposed of at the waste landfill.

- ***Storage of E-waste***

Most of the refurbishing facilities are small and do not have sufficient spaces to store many electrical and electronic equipments. When there is no space available, the storage area extends to outside of the premises. To avoid this from happening, most operators remove the large white goods casings such as the refrigerators, washing machines, electric ovens, air conditions and others of the similar magnitude by delivering them to the waste landfill for disposal

Slides: Refurbishing Facilities in Samoa



Table 6: Generated E-wastes at Refurbishing Facilities

| Company | Details of Generated E-waste | Estimated Annual Quantities |
|--|--|-----------------------------|
| 1. Kooline Samoa Ltd, Matautu Uta: Sale, Installation and Repair Services for Air conditions only | Steel casings of air conditions. Has experienced technicians that can reuse most of the worn air conditions parts for repair works. | 1 full pick up load |
| 2. Samatic Co.Samoa Ltd, Matautu Uta: Sale, Installation and Repair Services for air conditions, refrigerators, washing machines, electric ovens and etc | Worn refrigerators, air conditions, washing machines, ovens and other appliances. This company replaces worn parts with new parts. Not so much reuse of old parts. | 1 full large truck load |
| 3. Climate Air Condition, Taufusi Sale, Installation and Repair Services for air conditions & standing refrigerators in shops only | Air conditions cables, some steel casings, worn parts and etc. | 1 full pick up load |
| 4. SL Refrigeration, Vaitele: Sale, Installation and Repair Services for refrigerators and air conditions only | Refrigerators & air conditions casing bodies, wires and cables, worn parts and others | 1 full truck load |
| 5. Meki Electronics Co.Ltd, Nafanua: Installation and repair services only for refrigerators and air conditions. | Air conditions and refrigerators casing bodies | 1 full large truck load |
| 6. Ultratech Electronics & Computer: Sale, installation and repair services for computers, printers, photocopiers, scanners and other offices appliances | Old computer casings, printers, photocopies, worn separable parts, wires and etc. | 1 pick up load |
| 7. Computer Services Ltd: Sale, installation and repair services for computers, printers, photocopiers, scanners and other offices appliances | Old computer casings, printers, photocopies, worn separable parts, wires and etc | N.A. |
| 8. Datec Samoa Ltd, Fugalei: Sale, installation and repair services for computers, printers, photocopiers, scanners and other offices appliances: | Old computer casings, printers, photocopies, worn separable parts, wires and etc | N.A |
| 9. CompTech, | Old computer casings, printers, photocopies | N.A |
| 10. Samoa Budget TV Services, Fugalei | Television worn parts, wires and casings and display screens | 1 dyna load |
| 11. HJF Electronics, Motootua | Televisions and mobile phones plastic casings, and worn parts | 1 pick up load |
| 12. Digicel Samoa Ltd & Digicel Samoa Ltd | N.A | N.A |

2.5.4. Materials Recover and Recycling Operations

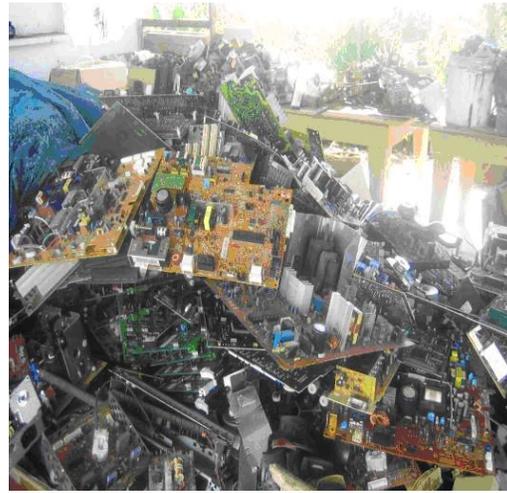
There are no facilities in place that principally deal with the actual recycling of e-wastes in Samoa. The existing operations are more involved with the recovery of reusable and recyclable e-waste materials for recycling purposes overseas. There are only two licensed operators but there is only one operator with the expertise to carry out such an operation at the moment in line with the environmentally sound management of e-wastes. The materials recovery operations by scavengers at the Tafaigata waste landfill is a major concern because of the associated health risks occurring from the use of inappropriate practices like burning to dismantle and recover the valuable materials.

Table 7: E-waste Materials Recovery & Recycling Operators

| Local Operators | Targeted E-wastes | Quantities |
|---|--|--|
| <p>RCN / Samoa Observer Joint Venture, Vaitele</p> <p>Its service is advertised on the Observer Newspaper on a daily basis. People are encouraged to bring their e-wastes to the drop-off center at Vaitele free of cost. Does not have a collection service in place.</p> | <p>Computers, Televisions, Printers, Photocopiers and others.</p> <p>The processed e-wastes will be exported to New Zealand.</p> | <p>200 Computers CRTs processed 90 TVs CRTs processed 100 C.P.R Units processed</p> <p>Need more to fill a container for export</p> |
| <p>Pacific Recycler Co.Ltd, Tafaigata.</p> <p>A scrap metals business but also accept e-wastes, tyres, and other plastic items. Has a collection service for scrap metals and car bodies, and a drop off center for old tyres.</p> | <p>Refrigerators, air conditions, washing machines and others</p> | <p>302.3 tonnes - collected in 2008 203.7 tonnes - Collected in 2007</p> <p>Existing piles will be processed and packed for export. Market is not known.</p> |
| <p>Scavengers</p> <p>More than 20 organized scavengers-driven materials recovery operations at the Tafaigata Waste Landfill</p> | <p>All e-wastes that arrive at the Tafaigata waste landfills</p> | <p>Recovered materials are sold to existing scrap metals businesses.</p> <p>Quantities : Not Available</p> |

Both recycling companies do not have sufficient spaces to operate if more e-wastes are diverted to these operations in the future. The Pacific Recycler Co.Ltd's collected e-wastes are currently piled outside while the RCN company uses empty containers to store their collected e-wastes.

Slides: RCN / Observer Newspapers Recycling Center, Vaitele



CRTs from computers monitors and televisions have been disassembled and ready for packing. The valuable components from printed circuit boards, and marketable chips for reuse, as well as substantial quantities of copper, gold, silver and palladium can be recovered in New Zealand at an appropriate recycling facilities.

Slides: Pacific Recycler Co.Ltd Recycling Center, Tafaigata



The piles of e-wastes within the company's compound are directly exposed to rains. The facility does not have sufficient roofing at the moment to provide shelter for the collected e-wastes. Some e-wastes had been collected in the past 5 months but have not been processed until to date. This company is making some negotiation with some overseas companies for the exportation of these collected e-wastes.

Slides: Scavengers Materials Recovery Operations, Tafaigata Landfill



The scavengers normal operation at the Tafaigata waste landfills. E-wastes are burnt for the easier recovery of the valuable metals particularly the large white goods because of the higher composition of pressed steels used in their structures and some coppers. All the scavengers involved in these recovery operations do not wear any safety gears.

2.5.5. E-waste Disposal in Samoa

The current waste landfills in Samoa do not have proper storage and disposal facilities for the safe disposal of the generated e-wastes in accordance with the environmentally sound management of e-wastes. The collected e-wastes from households, businesses, government write-off equipments storage facility, and the e-waste residues from refurbishing and recycling operations are all dumped at the designated sections for bulky wastes. .

Plans are in the pipe line for the relocation of e-waste disposal area to a special (refer Tafaigata Waste Disposal Site). The total waste disposal area is 100 acres and about 7 acres has been located for the disposal of hazardous waste including e-wastes. This area will be developed further to allow for the development of a temporary storage facility to collect and safely store all the generated e-wastes in Samoa for recycling purposes and as a center for getting spare parts for computers and other equipment.

The government of Samoa has set aside about 20 acres of the current Tafaigata disposal site for recycling operations to establish. This is an incentive to promote private recycling operations in partnership with the government.

TAFaIGATA CONCEPT LAND USE PLAN

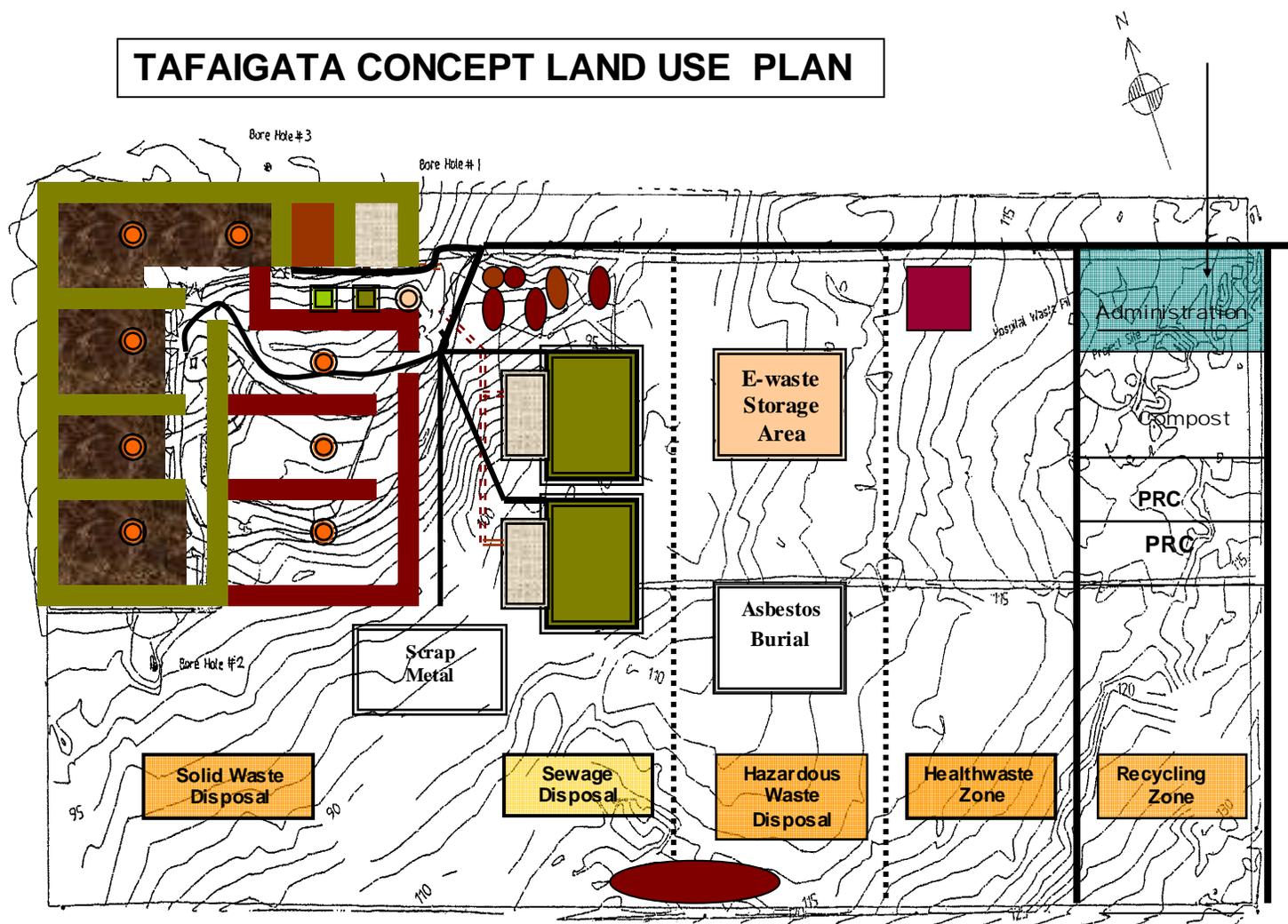


Fig.1 General Layout of Tafaiyata Area

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3.0. CONCLUSIONS

3.1. Waste Generations & Information

- The Government sector is the leading generator and source of e-wastes generation in Samoa. The existing information system despite being out of date provides a good source of information to monitor and study the generation of e-wastes from the government sector.
- The generation of e-wastes at household is generally low but need follow up surveys to accurately determine households e-wastes generation. Improving the collection of information from the next population and housing census is important in getting good data regarding households e-waste generation.
- The generation of e-wastes from existing refurbishing and recycling operators is generally low based on the information provided. Keeping good records of incoming and outgoing equipment is not well done at almost all the operators. The information from these operators are useful in determining the overall e-waste generation in the future and thus a good system must be in place to ensure that these operators maintain their records and release for government survey purposes.
- The Custom HS Coding System does not work in tracking the amounts of imported and exported e-wastes, and thus affects Samoa's capacity to effectively coordinate the national implementation of the Basel Convention

3.2. Policy and Legislations.

- There are no sound national legislations and regulations in place to control and prohibit the importation and exportation of e-wastes.
- The Draft Waste Management Act which is under review will provide good legal provisions to effect the national implementation of the Basel Convention and other waste related multilateral agreements. Some of the important aspects to be covered:
 - a) Licensing of E-waste Refurbishing and Recycling Operators
 - b) Records and Provision of information when required.
 - c) User and Polluter Pays Principles.
 - d) Imports of used and reconditioned electronic goods
- A Draft Waste Management Solid Waste Strategy has been developed with the findings of this report being incorporated for future actions.

3.3. Economic

- The Government of Samoa funding for the provision of waste management services is about US\$800,000
- There are no incentives to promote waste minimization at sources and to sustainably implement e-waste management services.
- The user and polluter pays principles will likely to be introduced in the future for the sustainable funding of waste management services.

3.4. National Public Awareness.

- Public awareness on e-wastes issues is limited.
- Ministry of Natural Resources and Environment has been conducting a number of public awareness on hazardous waste in the past under the POPS Project.
- Need follow up public awareness program using professional designed advertisement to be aired on television and radio during prime times.

3.5. Storage and Collection of E-wastes

- Proper storage facilities for e-waste in Samoa do not exist. The generated e-wastes are mostly exposed to rains.
- The Government storage facility at Vaimea does not have the capacity to shelter all the government write off electrical equipment. There is a high risk involved with the continuing exposure of workers to loose and open equipments around the compound.
- The majority of the collected e-wastes were destined for disposal at the waste landfill but this has changed with the existence of two e-wastes materials recovery operators.
- There is a national collection service for households e-waste three times a year but mixed with other bulky wastes from construction materials and car parts.
- Most of the households e-wastes are in storage at their basements or closets. Refrigerators and ovens are normally used for other purposes either for water storage at farms and others.

3.6. Refurbishing, Materials Recovery & Recycling Operations

- Most of the existing operators are principally involved with refurbishing operations for refrigerators, air conditions and computers. There are few with the expertise to repair televisions
- Most of the refurbishing facilities are small and does not have the capacity to repair large quantities of units.
- Existing facilities are not equipped with the appropriate equipment and tools to implement safe materials recovery and recycling operations in Samoa. Most rely on the use of worker to carry out disassembling and dismantling operations.

- With appropriate capacity building programs in the future, the existing operators can form up a pool of operators with the capacity to refurbish and recover valuable materials for export.
- The materials recovery operations at the Tafaigata waste landfill by scavengers are seriously not safe and must be stopped. Scavengers are an important part of the recycling system in Samoa because of their roles but this must be carried out in a proper manner in line with the appropriate e-waste materials recovery and recycling practices.

3.7. Disposal of E-wastes

- There is no proper waste disposal facility for e-waste in Samoa. All the collected e-wastes are disposed of at designated sections within the waste disposal site.
- An area has been designated for the construction of a proper storage facility in the future if funding allows.
- An area is also designated within the Tafaigata Disposal Site for the setting up of recycling operations

4.0. RECOMMENDATIONS.

- For the Ministry of Revenues to consider making some amendments in their Custom HS Coding System for easier tracking down of imported used equipment and e-wastes as well as the exporting of e-waste. Need to introduce special supporting codes for used equipments and e-wastes.
- For the Ministry of Natural Resources and Environment to liaise with the Ministry of Finance to divert all the write off equipments to a central location:
 - (i). Vaimea with an upgraded Storing Facility to accommodate for the fast generating e-wastes OR,
 - ii).Tafaigata if a proper storing facility is in place OR,
 - iii).Direct to a licensed and approved recycling company to safely handle these e-wastes

During public auction, an arrangement must be put in place to ensure that the used or end of life equipment can only be sold to licensed refurbishing and recycling operators to avoid these equipment from eventually ending up at the unlicensed and environmental polluting practices carried out by some individuals and families.

- To introduce an appropriate regulation to license all the operators that are involved with the handling of e-wastes
 - i). Refurbishment (if a large quantities of e-wastes are dismantled for the recovery of spare parts).
 - ii).Materials Recovery Operations.
 - iii).Recycling Operations.
 - iii).Collection and Disposal Operations.
- To incorporate recommendations and findings of this study in the Draft Waste Management Act and the Draft National Solid Waste Management Strategy to reflect areas of main concern.
- To put an end on the environmental polluting and unsafe practices involved with the e-wastes materials recovery operations performed at the Tafaigata Waste Landfill.
- To carry out local capacity training programs in Samoa on the appropriate practices of refurbishing, recycling and recovering valuable materials from e-wastes based on the Basel Conventions Guidelines.
- To conduct public awareness programs focusing on promoting the profile of e-wastes for the full awareness and understanding of the public by using short and quick advertisement aired on television and radio during prime times.

- Introduce a special collection of e-waste as a national pilot project using the existing conditions under the current solid waste collection program. Under the government current collection service, there are three collection services every year for bulky wastes. Two of the three collection services can be used to demonstrate a national collection of e-waste to avoid mixing with other bulky waste. E-wastes are hazardous waste and should be treated differently from other bulky wastes.
- For the Ministry of Natural Resources and Environment to closely work together with the existing recycling operations particularly the RCN-Observer Newspaper Recycling to put into good use their available service in managing these generated e-wastes.
- For MNRE to produce a list of existing local operators and their services to promote for the awareness of the public to minimize e-waste generation by prolonging the lifespan of households, businesses and organizations electrical equipment.

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