



Taro Integrated Solid Waste Management Workshop 31st March – 1st April 2015 Taro, Choiseul Province



Prepared by: Environment Unit
Environment and Conservation Division
Ministry of Environment Climate Change Disaster Management and Meteorology
P.O.Box 21 , Honiara
Vavaya Ridge road (Gesob Building)

Table of Contents

1. Introduction	3
2. Training Objectives.....	4
3. Methodology.....	4
4. Discussion of Issues.....	Error! Bookmark not defined.
5. Photographs of Workshop Program	6
6. Group Presentations Summary	9
7. Conclusion and Recommendation.....	10

List of Annexes

Annex 1. List of Workshop Meeting Participants	11
Annex 2: List of Workshop Participants : Wednesday 1 st April 2015	13
Annex 2: List of Workshop Participants: Wednesday 1 st April 2015.....	Error! Bookmark not defined.
Annex 3. Workshop Participants Evaluation.....	17
Annex 4. Presentation 1_ Overview of MECDM and Program Outline.....	20
Annex 5. Presentation 2_ Functional Elements and Components of Integrated Solid Waste Management.....	24
Annex 6. Presentation 3_ Health and Solid Waste Management.....	28
Annex 7: Presentation 4_ Functional Elements and Components of Integrated Solid Waste Management.....	31
Annex 8: Presentation 5_ Key Steps in Implementing Integrated Solid Waste Management.....	34
Annex 9: Presentation 6_ Case Studies in Integrated Solid Waste Management.....	36
Annex 10 : Presentation 7_ Importance of Waste Characterization Survey	39

1. Introduction

The population of Taro is rapidly growing from 440 people in 1999 to 810 people in 2009 census. Taro has approximately more than 40 households and hosts several accommodations, offices, banks, schools, market, airport and a jetty. Taro Island is approximately 1.5 square kilometres surrounded by fringing coral reef. Almost two thirds of the Island is occupied by the Taro Airstrip and an enclosed lake.

A Locally Managed Marine protected area is located close to Taro near Supizae Island north of Taro Island. Most of the residents and incoming visitors to Taro not only depend on locally grown food from the garden and fresh produce marine products but also on imported food products and items that are brought in from overseas. There is a high trend of imported manufactured products and goods from overseas and Honiara that is brought into rural areas and provincial urban centres such as in Taro with no end of life treatment facility or proper disposal site.

An Integrated Solid Waste Management Training was successfully undertaken on Tuesday 31st March to Wednesday 1st April, 2015 for Government officers, Non-Governmental Organizations, Private sectors and Community Representatives within Taro, Choiseul Province. A total of 26 participants attended the training with approximately 20% are women participants. The training was facilitated by two resource persons from the Environment and Conservation Division under the Ministry of Environment, Climate change, Disaster Management and Meteorology and assisted by the Provincial Project Coordinator under UNDP SWOCK Project. The training includes PowerPoint Presentations, Group discussions and two practical demonstrations on composting and how to conduct a waste characterisation survey.

On day one, the Provincial Secretary of the Choiseul Provincial Government officially opened the workshop with a few remarks followed by several presentations by the two resource persons. After the presentations on day one and two of the program, the participants were divided into groups given the opportunity to discuss issues of solid waste management in their communities. The groups were also asked to discuss the major issues and possible solutions to the address the waste management issues within their community.

The program was implemented through collaborative support from the Ministry of Environment Climate Change Disaster Management and Meteorology, Ministry of Forestry and Research , Choiseul Provincial Government, Secretariat of the Pacific Regional Environment Programme (SPREP) under Ecosystem Based Adaptation (EbA) and Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management (J-PRISM) Projects.

2. Training Objectives

The main objective of the Integrated Solid Waste Management Workshop is as follows;

1. To introduce to stakeholders what is the solid waste management and its basic concepts.
2. Enhancing the capacity of Taro Provincial staff and community leaders to be better equipped with the waste management skills
3. To advocate on better waste management Practises at home, office and community.
4. To demonstrate to stakeholders method of composting and waste characterization survey which was conducted over 8 days period from 1st of April to 8th April, 2015?

The main purpose of the waste characterization survey and audit is to gather information and data on the types of wastes and sources of waste generation in the commercial and domestic sectors for future strategic planning of Taro town and consideration in the future expansion of Taro on the mainland.

3. Methodology

The methodology in which the training activities are implemented includes;

- i. A two days' workshop which includes the official opening program on the first day of the workshop. This was followed by several PowerPoint presentations.
- ii. The second day of the training program includes additional presentations on the concepts of the integrated solid waste management and practical hands on demonstration exercise on how to conduct a waste characterization study and composting with the workshop participants.
- iii. Group discussion was organized on the second day of the workshop which provides an opportunity for participants to discuss issues, needs and solutions which will support any plans for waste management in Taro.
- iv. The second part of the program which continued after the two days training program was a week-long waste characterization study that involves 20 households and 5 business houses in Taro, Choiseul Province.
- v. Mapping of sampled households and business houses

4. Technical Session: Presentation

a. Program Outline and Overview of Ministry of Environment, Climate Change Disaster Management & Meteorology

Chief Environment Officer from the Environment and Conservation Division, Ministry of Environment, Climate Change, Disaster Management and Meteorology gave a presentation on the program outline and what is expected during the two days workshop. She also briefly outline an overview of the main functions of the Environment department mandated by the Environment Act, Wildlife Protection and Management Act as well as the Protected Areas Act including some of the relevant policies which relates to the Solid Waste Management as awareness for participants (Annex 4).

b. Introduction to Integrated Solid Waste Management Concepts

Chief Environment Officer delivered a presentation which introduces the Integrated Solid Waste Management Concepts. Some of the tools and definitions of the term Integrated Solid Waste Management, management and solid wastes are being explained. She also presented the importance for integrated solid waste management and how it is related to the social, economic, environmental, health issues (Annex 5) .

c. Health and Solid Waste Management

Environment Officer from the Environment and Conservation Officer of the Ministry of Environment Climate Change Disaster Management and Meteorology delivered a presentation on Health and how it relates to Solid Waste Management. (Annex 6)

d. Functional Elements and Components of Integrated Solid Waste Management

Environment Officer gave a presentation on the Functional Elements of Integrated Solid Waste Management. (Annex 7)

e. Key steps in implementing an Integrated Solid Waste Management Program

Chief Environment Officer gave a presentation on the key steps in implementing an integrated Solid Waste Management program (Annex 8).

f. Cases Studies in Integrated Solid Waste Management

Environment Officer gave a presentation on cases studies in Integrated Solid Waste Management. (Annex 9)

g. Waste Characterization Survey

- a. Environment Officer delivered a presentation on how to conduct a waste characterization survey and audit. (Annex 10)

5. Photographs of Workshop Program



Caption: Courtesy Consultation meeting with Deputy Provincial Secretary of Choiseul Provincial Government



Caption: Facilitators and Participants who are part of the Integrated Solid Waste Management Workshop



Caption: John Tapeveda, Provincial Secretary of Choiseul Provincial Government officially opening the workshop



Caption: Opening of Taro ISWM Workshop in Taro



Caption: Workshop participant group discussion



Caption: Nelson Tanito presenting group 1 discussion



Caption: Participants weighing plastic bags



Caption: Participants sorting out wastes



Caption: Participants engaged in waste characterization study



Caption: SWOCK PPC Officer demonstration a composting method to participants



Caption: Composting method piloted in Taro by Silas Kere, SWOCK Provincial Project Coordinator



Caption: Reuse of old Chinese bags to grow tomatoes and slippery cabbage utilized by SWOCK Project coordinator

6. Group Presentations Summary

<u>Group</u>	<u>Strengths</u>	<u>Problems/Issues</u>	<u>Needs</u>	<u>Initial Implementation Steps</u>	<u>Key Stakeholders</u>
Group 1	<ul style="list-style-type: none"> Provincial Budget support Workshop's available Ordinance in place 	<ul style="list-style-type: none"> Disposal & Collection of rubbish Inadequate Awareness Littering 	<ul style="list-style-type: none"> Proper equipment e.g. drums Enforcement 	<ul style="list-style-type: none"> Increase manpower or outsource More awareness in communities outside of Taro Awareness on ordinance 	<ul style="list-style-type: none"> Choiseul Provincial Government MECDM Ministry of Fisheries Health Promotion Police Force
Group 2	<ul style="list-style-type: none"> Ordinance already in place 	<ul style="list-style-type: none"> Littering 	<ul style="list-style-type: none"> Enforcement and penalties 	<ul style="list-style-type: none"> Review Ordinance Awareness Empowerment Consultation with communities, institutions, Business houses & households 	<ul style="list-style-type: none"> Choiseul Provincial Government Law Enforcement NGOs MECDM
Group 3	<ul style="list-style-type: none"> Weekly collection of wastes 	<ul style="list-style-type: none"> Dump site Attitude and Behaviours 	<ul style="list-style-type: none"> Proper planning of dump site Contract workers or recruit workers Awareness to parents, schools and teachers, provincial government 	<ul style="list-style-type: none"> Establish a committee Awareness 	<ul style="list-style-type: none"> Provincial Government Stakeholders Parents Teachers

7. Conclusion and Recommendation

Solid waste is an urgent issue that needs to be addressed in Taro and surrounding communities in Choiseul Province. The two days integrated Solid Waste Management training was another milestone for the Ministry of Environment Climate Change Disaster Management and Meteorology in its efforts to address the existing issues of solid waste management as well as to disseminate information on a wider scale throughout parts of the country. Through the implementation of the program, it has established a partnership with the Ministry of Forestry and Research, Secretariat of the Pacific Regional Environment Programme (SPREP) and the Choiseul Provincial Government to further address the issue of waste and landfill site for Taro in the near future.

Following the successful implementation of the training and waste audit, below are some of the recommendations which resulted from the program as follows:

- The Ministry of Environment Climate Change Disaster Management and Meteorology to collaborate with partner stakeholders to assist the Provincial Government to implement the waste management plan and to support awareness campaigns.
- A follow-up workshop to be conducted in Taro in the near future.
- Some of the topics that participants outlined to be presented in future workshops includes: Dump site management, Collection and Recycling of solid wastes, Liquid waste composting for fertilizer , Sewage and waste water management, Waste characterization Survey and calculations, Reusing of wastes such as crafts, Waste Management handling of all sorts of wastes(organics, solid, liquid, hazardous), Waste Management for marine ecosystem, Different types of composting method and Environmental health and solid waste
- Other topics that participants requested in future workshops includes topics on mining and Environment Act and Regulation. This indicates that the Ministry need to conduct a separate awareness program on the Acts and Regulations administered by the Division for the rural communities to be aware of in the near future.

Annex 1. List of Workshop Meeting Participants

	Names	Organization	Position	Telephone/Mobile	Email
1	John Tabepuda	Choiseul Provincial Government	Provincial Secretary	63128/7515881	jtabepuda@yahoo.com
2	Nearllie Katovai	Ministry of Health & Medical Services	Nurse /Emergency	7544883	neakato52@gmail.com
3	Maurice Vaqalo	Catholic Representative	Church Leader	7661017	
4	J.W. Zinga	Choiseul Provincial Government	Government Officer	63127/7617136	
5	Hudson Lingubatu	Choiseul Provincial Government	Works Officer	7436048	
6	Alister Moroto	United Church	Pastor	47582	
7	Paul Kumakana	Taro Primary School	Head Teacher	7434764	
8	Robert Haukare	MECDM/Operations Control	Meteorology Officer	63155/7457567	rhaukare@gmail.com
9	Unity Iko	Choiseul Provincial Government	Planning Officer	63185/7586340	unityiko@yahoo.com
10	Rolland Lapo	Taro Police Station	PPC	63167/7617294	
11	Nelson Tanito Kere	Fisheries	Principal Fisheries Officer	63150/7617348	ntkere@gmail.com
12	Cleophas Rooney	Private Sector (Moren Motel)	Manager	63176/7457771	
13	Nellie Neko	Choiseul Provincial Council of Women	Administrator	7436182	nemalyn@gmail.com
14	Joan Tanito	Choiseul Provincial Government/Womens	Women's Development officer	63156/7421285	gegetabs@gmail.com

		Development Department			
15	Roswita Nowak	Choiseul Provincial Government /Lands and Physical Planning	Physical Planner	63147/7457555	
16	Silas Kere	SWOCK-UNDP	Principal Provincial Coordinator	63152/7466009	silas.kere@undp.org
17	Simeon Daple	Youth @ Works/SPC	Coordinator	7721774	Simeon.daple@gmail.com
18	Daniel Farkas	GIZ	Advisor	7812923	daniel.farkas@giz.de
19	Mark Biloko	SPC/USAID	Coordinator	7400430	mbiloko@gmail.com
20	Andrew M		CAO	7590493	andrewloli.39@gmail.com
21	Davis Pitamana	Ministry of Education	Chief Education Officer	63173/7457695	pitamanadavis2014@gmail.com
22	Geoffrey Pakipeta	Choiseul Provincial Government	Deputy Provincial Secretary	63187/7570091	geoffreypakipeta@gmail.com
23	S.Keqa	Choiseul Province	PTR	63141/7502977	s59keqa@gmail.com
24	Wendy Beti	MECDM/ ECD	Environment Officer	26036/7552607	WBeti@mecm.gov.sb
25	Rosemary Apa	MECDM/ECD	Chief Environment Officer	26036/7473213	rosemaryapa@gmail.com
26	Myknee Sirikolo	Ministry of Forestry &Research	Director Herbarium	22184 /7512609	mykneesirikolo@gmail.com

Annex 1: List of Workshop Participants: Wednesday 1st April 2015

	Names	Organization	Position	Telephone/Mobile	Email
1	John Tabepuda	Choiseul Provincial Government	Provincial Secretary	63128/7515881	jtabepuda@yahoo.com
2	Nearllie Katovai	Ministry of Health & Medical Services	Nurse /Emergency	7544883	neakato52@gmail.com
3	Maurice Vaqalo	Catholic Representative	Church Leader	7661017	
4	J.W. Zinga	Choiseul Provincial Government	Government Officer	63127/7617136	
5	Hudson Lingubatu	Choiseul Provincial Government	Works Officer	7436048	
6	Alister Moroto	United Church	Pastor	47582	
7	Paul Kumakana	Taro Primary School	Head Teacher	7434764	
8	Robert Haukare	MECDM/Operations Control	Meteorology Officer	63155/7457567	rhaukare@gmail.com
9	Christopher Makoroi	Choiseul Provincial Government	Clerk to Assembly	7617046	cassembly11@gmail.com
10	Rolland Lapo	Taro Police Station	PPC	63167/7617294	
11	Nelson Tanito Kere	Fisheries	Principal Fisheries Officer	63150/7617348	ntkere@gmail.com
12	Cleophas Rooney	Private Sector (Moren Motel)	Manager	63176/7457771	
13	Nellie Neko	Choiseul Provincial Council of Women	Administrator	7436182	nemalyn@gmail.com

14	Joan Tanito	Choiseul Provincial Government/Women's Development Department	Women's Development officer	63156/7421285	gegetabs@gmail.com
15	Roswita Nowak	Choiseul Provincial Government /Lands and Physical Planning	Physical Planner	63147/7457555	
16	Silas Kere	SWOCK-UNDP	Principal Provincial Coordinator	63152/7466009	silas.kere@undp.org
17	Simeon Daple	Youth @ Works/SPC	Coordinator	7721774	Simeon.daple@gmail.com
18	Daniel Farkas	GIZ	Advisor	7812923	daniel.farkas@giz.de
19	Mark Biloko	SPC/USAID	Coordinator	7400430	mbiloko@gmail.com
20	Rosemary Apa	MECDM	CEO	26036	rosemaryapa@gmail.com
21	Wendy Beti	MECDM	EO	26036	wendiipolobeti@gmail.com
22	Andrew Mevaneu	Ministry of Agriculture	Chief Agriculture Officer	7590493	andrewloli.39@gmail.com

Annex 2: Workshop Program Outline

Time	Activities	Person-in-Charge
Day I		
8:30-9:00am	Registration of workshop participants	All
9:00-9:05am	Opening Prayer	Community /Church leader
9:05-9:15am	Welcome – PS Choiseul Province	PS
9:15-9:35am	Introduction of Participants	All
9:35-9:45am	Outline Training Objectives and Program	
9:45-10:00am	Presentation 1: Overview of MECDM	Resource Person
	Group Photo	
10:00-10:15am	Tea and Coffee Break	All
10:15-12:00pm	Presentation 1 : Introduction to Solid Waste Management Concepts	Resource person
	Presentation 2: Environment Health and Solid Waste Management	
12:00-1:00pm	Lunch	All
1:00-1:30pm	Presentation 3: Functional Elements and Components of an ISWM Program	Resource Person
1:30-2:45pm	Presentation 4: Key Steps in Implementing an ISWM Program	
2:45-3:00pm	Presentation 5: Case Studies in ISWM	
3:00-3:10pm	Wrap Up and Update for next day's activities	Resource Person
3:10-3:30pm	Tea or Coffee Break .	

Day 2		
9:00-9:15am	Opening and recap previous day	Resource Person
9:15-10:15am	Group work: Facilitated discussion on issues and actions to address SWM	All
10:15-10:45am	Morning tea break	Resource person
10:45-12:00pm	Presentation of Group Work	Groups
12:00-1:00pm	Lunch	All
1:00 – 1:15pm	Presentation 6: Importance of Waste Characterization Study	Resource person
1:15-1:30pm	Presentation 7: Composting	Resource person
1:30 – 2:00pm	Activity: Composting Demonstration	All
2:00pm-2:30pm	Activity: Practical Demonstration on how to conduct waste characterization in field	All
2:30 - 2:45pm	Way Forward	
2:45 – 3:00pm	Tea- Break	All

Annex 3. Workshop Participants Evaluation

1.0	Total Participants Gender	Workshop Day 1- Male (19) Female (7)
		Workshop Day 2- Male (15) Female (6)
Total Participants Response received		21 participants out of 26 participants
Understanding of Solid Waste Management Concepts & Tools		
1.1	Did the presentations provide useful information?	Yes (20) No (0) No Answer(1)
1.2	Were the presenters clear in disseminating the information as per workshop objectives?	Yes (20) No (0) No Answer(1)
1.3	Is the presentation easy to follow and understand?	Yes (20) No (0) No Answer (1)
1.4	Do you now understand the Solid waste management concept?	Yes (20) No (0) No Answer (1)
1.5	Do you now understand the waste management tools and functional elements?	Yes (19) No (0) No Answer (2)
1.6	Were the case studies helpful to you understanding how a Solid waste management program can be implemented in your town/community/school?	Yes (19) No (0) No Answer (2)
1.7	Can you now relate how health is influenced by wastes?	Yes(20) No (0) No Answer (1)
Demonstrations and Activities		
2.1	Were the demonstrations clear and helpful?	Yes (19) No (0) No Answer (2)
2.2	Were the demonstration activities appropriate to workshop objectives and outcomes?	Yes (19) No (0) No Answer (2)
2.3	Is the time-frame of workshop activities and demonstrations appropriate?	Yes (17) No (2) No Answer (2)
2.4	Do you think the demonstration and activities organized is enough?	Yes (16) No (3) No Answer (2)

General Comments

3.0. Any general comments or about the workshop program?

It was pointed out by participants that the workshop program was timely, informative and clear to understand and follow. Additionally, it was highlighted that the program has enable participants to understand the different concepts on solid waste management as it is an urgent problem in Taro. Participants also commented that more similarly workshop program should be conducted and to engage communities and schools from the different villages in Choiseul.

It was also commented by a participant that because Solid Waste Management is an urgent issue especially with littering is due to the growing population on Taro and there is the need for a proper dumpsite. Moreover, participants have learnt new skills and attain new knowledge from the practical demonstrations which will be helpful for the future planning of the township for the future expansion of the town to the mainland. However, it was recommended that the program should be improved in future to identify the different stakeholders and advance notification of program.

4.0. Any comments about the composting presentations/ demonstration?

Participants commented that the demonstration activity was well presented and demonstrated. It was suggested that composting should be encouraged as part of the strategy to address waste reduction and as part of the waste management plan in Taro. The composting method demonstrated was said to be well explained and an eye opener for most of the participants. However, it was also commented that different types of composting methods are demonstrated to participants. Other demonstrations from the private sectors should also be engaged in future workshops. Participants request that future demonstrations to provide detail information on the composition or value of all the waste components used for the composting method.

It was also commented that the subject was valuable especially for an island like Taro as it enable the residents to reduce wastes at source as a means to control improper waste disposal and in reusing the waste to produce healthy food from their backyard garden.

5.0. Any comments about the waste characterization demonstration?

Participants commented that the presentation and demonstration on the waste characterization was clear and well presented. It was also commented that the presentation and demonstration was vital as it illustrates to participants the need to value the importance of wastes as a resource rather than as wastes. It was highlighted by a participant that although the subject are very practical, it was suggested to be provided more time for participants to be involved in the process. Another participant commented that the Provincial Government should take action to set up a proper dump site and to establish a system to manage the wastes.

6.0. Any other topics you would like to know about in any future workshop or during the next follow-up workshop?

Some of the topics that participants outlined to be presented in future workshops includes:

- Dump site management
- Collection and Recycling of solid wastes
- Liquid waste composting for fertilizer
- Sewage and waste water management

- Waste characterization Survey and calculations
- Reusing of wastes such as crafts
- Waste Management handling of all sorts of wastes(organics, solid, liquid, hazardous)
- Waste Management for marine ecosystem
- Different types of composting method
- Environmental health and solid waste

Other topics that participants request in future workshops includes topics on mining and Environment Act and Regulation.

DRAFT

Annex 4. Presentation 1_Overview of MECDM and Program Outline



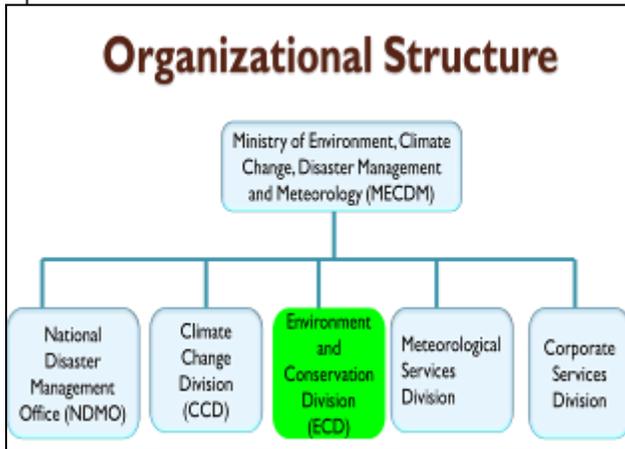
Overview of the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM)

Integrated Solid Waste Management Training
31st March -1st April 2015
Taro, Choiseul Province

Prepared by Environment Unit
Environment and Conservation
Ministry of environment , climate change , disaster management & meteorology

Outline

- Brief Overview of MECDM
- Functions of ECD
- SWM Policy and Regulatory Frameworks

Mandate

- The Ministry is responsible for **promoting and safeguarding the sustainable use of natural resources for the benefit of the peoples of Solomon Islands,**

Environment & Conservation Division (ECD)

Function

- To protect, restore and enhance the quality of the environment of Solomon Islands, having regard to the need to promote sustainable development.

Forests and Terrestrial Environment



Biodiversity – biodiversity protection involve single and multiple species will need to consider an ecosystem approach . Consideration need to be given in both marine and terrestrial biodiversity



Freshwater Ecosystem



Coastal and Marine Environment - Mangroves and Reefs ecosystems are breeding grounds for commercially important species of fish and shellfish located on shallow coastal waters.



It does this through

- Environment Act 1998 and Environment Regulation 2008
- Wildlife Protection and Management Act 1998; Wildlife Protection and Management Regulation 2008
- Protected Areas Act 2010 and Protected Areas Regulations 2012

Acts and Regulations

1. Environment Act 1998

Function of Environment Act 1998 is to protect, restore and enhance the quality of environment of Solomon Islands

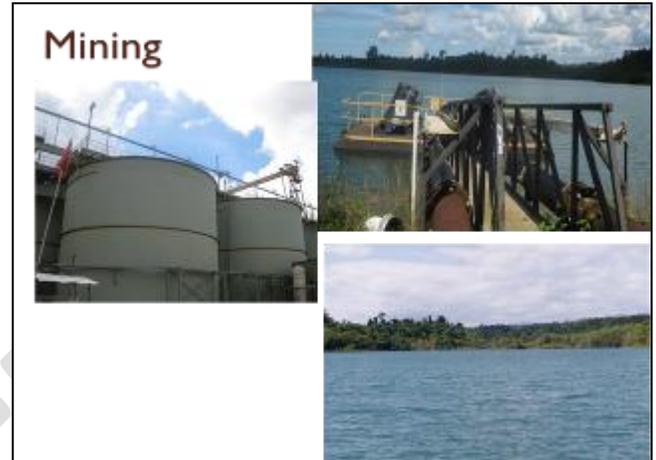
2 main parts;

- **Development control** and Environment Impact Assessment (EIA)
- **Pollution control** to be exercised in the management of wastes

DEVELOPMENT CONTROL

Urban Development





Acts and Regulations (CONT'D)

2. Wildlife Protection and Management Act 1998 and Wildlife Protection and Management Regulation 2008

- To regulate the **international trade** including birds, reptiles, amphibians, mammals, insects, plants and marine organisms



Acts and Regulations (CONT'D)

3. Protected Areas Act 2010 and Protected Areas Regulations 2012

- Act for declaration and management of Protected Areas



Legal & Policy Frameworks

- Democratic Coalition for Change (DCC) Government Policy Statement
 - Section 4.2.5.3 © Improve waste management and disposal in the country
- National Development Strategy (NDS) 2012-2020
 - Objective 7: Effectively Respond to Climate Change and Manage the Environment and Risks of Natural Disasters
- To control solid waste disposal and protect both health and the environment, enforce existing legislation and develop and implement additional measures based on the principles of reduction, re-use and recycling of solid wastes

Legal & Policy Frameworks

- Environment Act 1998 and Environment Regulations 2008
 - Part 2: Pollution Control
- Environmental Health Act 1996
- SI National Solid Waste Management Strategy and Action Plan 2009-2014
- SI National Biodiversity Strategic Action Plan 2009
 - Theme II: Waste Management

Legal & Policy Frameworks

- Climate Change Adaptation Plan Choiseul Bay Township
 - Waste Management Facility at Mosquito Creek, Taro Island

MECDM Contact Details

- Office Location
 - Corporate Division – Hyundai Building Opposite the SSEC Central Church
 - ECD, CCD, NDMO, MET Service – Vavaya Ridge
- Phone Contacts:
 - MECDM Head Quarter– 23031/31
 - ECD – 26036, Director – 26026
 - CCD- ????
 - NDMO – 27836, 27937, 27062 , 955
 - MET Service – 24212, 24219/8 , 20332, 933

Annex 5. Presentation 2_Introduction to Integrated Solid Waste Management



Introduction to SWM Concepts and Tools

Integrated Solid Waste Management Training
31st March – 1st April 2015
Taro, Choiseul Province

Prepared by Environment Unit
Environment and Conservation
Ministry of environment, climate change, disaster management & meteorology

Presentation Outline

- What is Solid Waste?
- ISWM Concept
- What is ISWM?
- ISWM Tools

Definition: Solid waste management

- Solid Waste- includes all items that has no value or use to the owner, which they either intend to get rid of or dispose.
- Solid Waste Management- An appropriate process of dealing with waste

What is Municipal Solid Waste

- MSW is composed of food waste and rubbish from residential areas, street sweepings, commercial and institutional waste, as well as construction and demolition debris.

Common solid wastes

<p>Inorganic</p> <ul style="list-style-type: none"> • Empty tins • Empty containers • Plastics • Old car batteries • Old building materials e.g. contain asbestos • Used tyres • Furniture and toys • Discarded appliances & vehicles 	<p>Organic</p> <ul style="list-style-type: none"> • Kitchen waste- e.g. peelings • Green waste- i.e. leaves and wood
--	---

Common Practices



- Indiscriminate dumping
- Burning of waste esp. plastics : produces dioxin & Furans

Why is solid waste management a challenge?

- Waste generation increases with population increase and economic development
- Increase in costs associated with waste management
- Inadequate collection services
- Improperly managed solid waste poses a risk to human health and the environment.
- Crude dumping of waste along the beaches, rivers drains etc

Impacts

Environment

- Waste causes pollution to land, water and sea
- Plastic bags kills marine species e.g turtles
- Waste that end up in the sea cover and suffocate coral reefs



Economy

- Littering causes a visual problem and can discourage tourism development.
- Costly clean up campaigns
- Littering and improper disposal of waste requires regular clean up

Health

- Burning of plastics and other hazardous wastes causes cancer and heart problems.
- Water pollution can results in water-borne diseases (skin disease, diarrhoea)
- Tins and plastics hold stagnant water with breeding condition for mosquitoes that causes Malaria, dengue fever
- Heaps of waste attracts flies and encourages diarrhoea



ISWM Concept

The many challenges and complexities of solid waste management has led to the concept of ISWM

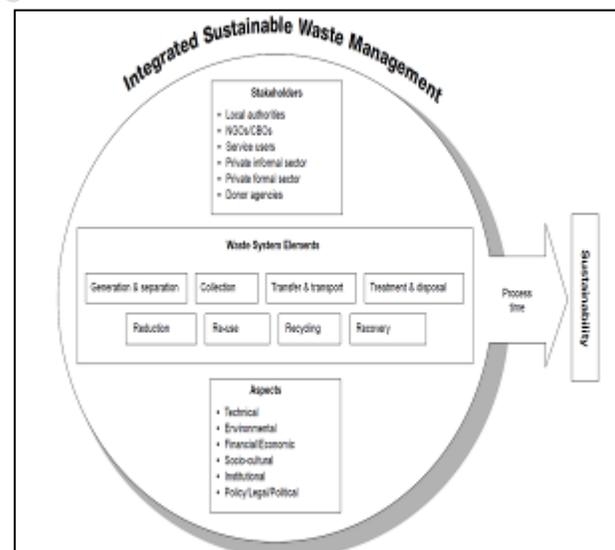
- It is based on the concept that all aspects of a waste management system should be analysed together, since they are in fact interrelated and developments in one area frequently affect practices or activities in another area.

What is ISWM?

- a system of solid waste management that encompass all types of solid wastes.
- involves the entire life-cycle process from generation to disposal, of varied waste streams
- effective ISWM system considers how to prevent, recycle, and manage solid waste in ways that most effectively protect human health and the environment.

- ISWM recognises three important dimensions in waste management:

- Stakeholders
- Waste system elements
- Sustainability aspects.



ISWM Tools

- Most important tool in ISWM is waste reduction through 3R concept
- 3R means- Reduce, Reuse, Recycle

What is 3R?



It is always important to "reduce the items we consume, not to generate waste". Then we can think of "reuse before throwing waste". The last resort/means will be "recycle to reduce the waste going to the landfill".

We should remember that the process of recycling still needs energy and cost.

REDUCE

❖ To prevent or reduce waste generation at source by buying fewer items or longer lasting products

- Say No to plastic bags take your own cloth bag/basket when go shopping
- Use less and throw away less
- Reduce rubbish by buying less packaged goods/items

- Do not use disposal items such as plates, cups spoons, take away plates etc
- Write or print on both sides of papers
- Waste segregation to reduce waste going to the landfill/dumpsite



REUSE

❖ To extend the life cycle of an item by using it again or in another way

- reuse again
- earn cash for waste by returning bottles and cans where possible
- Find creative uses for glass, plastic containers, PET bottles, and other items
- compost your vegetable/ kitchen waste

- Reuse organic waste through composting!
- Reuse Plastic bottles for storage container
- Reuse used tyres for planting flowers
- Reuse Plastic Bags for Home decoration



RETURN (RECYCLE)

❖ To reprocess used materials in order to produce new products

- ❑ bottles, aluminum cans and batteries can be recycled
- ❑ Find out what else can be recycled and encourage your family, neighbors and community to do the same

• Recycling /Return

- Aluminium cans
- Sol-brew Bottles
- Scrap metals



• Disposal

- Construct a simple waste pit (household or community)

This should be used to manage waste that cannot be prevented or recycled.



3R Practises in Taro



Annex 6. Presentation 3_Health and Solid Waste Management



Health and Solid Waste Management

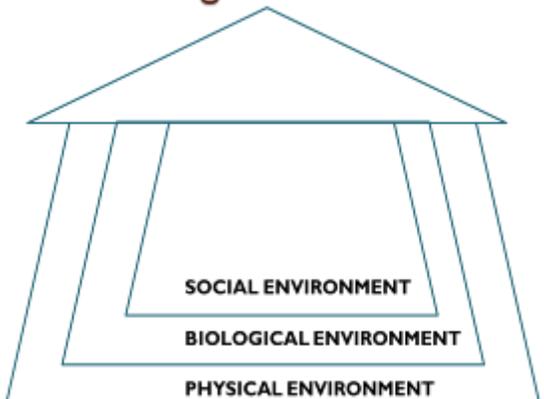
Integrated Solid Waste Management Training
31st March - 1st April 2015
Taro, Choiseul Province

Prepared by Environmental Health Division
Ministry of Health and Medical Services

Aim

- To understand the health issues associated with Solid Waste Management

Understanding our environment



SOCIAL ENVIRONMENT
BIOLOGICAL ENVIRONMENT
PHYSICAL ENVIRONMENT

WHAT IS KNOWN



MAN ENVIRONMENT

PHYSICAL ENVIRONMENT

- Man polluting the environment
- This is known, studied and documented

WHAT IS UNKNOWN



MAN ENVIRONMENT

PHYSICAL ENVIRONMENT

- Some known, most unknown
- Economy take priority over health

Waste management & Health?



Man Environment

Remember:... It will come back!



Public Health reasons for proper solid waste management

1. Offensive odors
 - Decomposition of organic constituents
2. Pathogenic organisms
 - Direct infection
3. Disease vectors
 - Mosquitoes, flies, rats, ec...

Public Health Reasons for proper waste management



Cont...

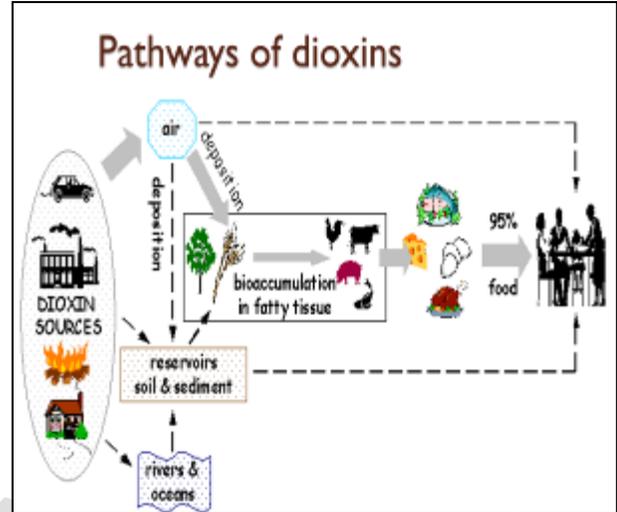
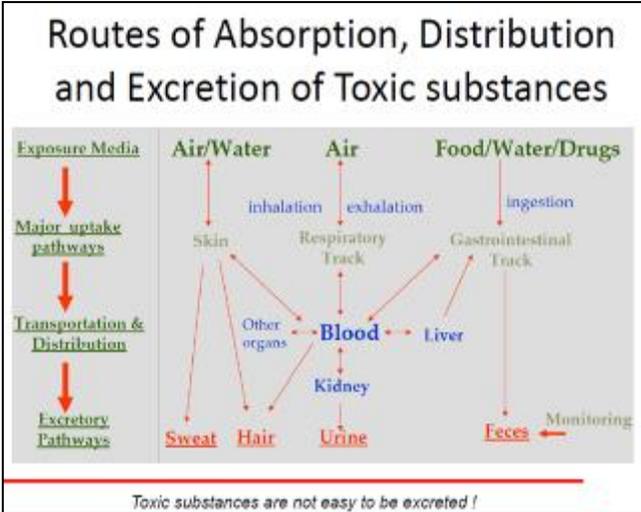
3. Contamination/ pollution of ground & surface waters
4. Air pollution
 - Poor air quality
 - Increase in toxic substances- burning
5. Physical risks
 - Injuries and poisoning

Health effects

- Dumps produce gases that cause
 - Head aches, eye irritation, and sore throat
 - Asthma
 - Respiratory disorder
 - Disturbance of lung function and growth
- Dumps produce leachate
 - Contamination of water sources
- Fish, shellfish & other marine food sources can be possible for contamination

Route of exposure

- Inhalation- breathing
- Ingestion- eating and drinking
- Absorption- through skin surface



- ### Toxic effects on reproductive systems
- Miscarriage
 - Low birth weight
 - Deformity and abnormality of fetuses
 - Infertility
 - ...

- ### Other possible health effects
- Cancer including leukemia
 - Diabetes
 - Obesity
 - Reduce body immunity
 - Nervous system disorders



Annex 7: Presentation 4_ Functional Elements and Components of Integrated Solid Waste Management



Functional Elements and Components of ISWM

Integrated Solid Waste Management Training
31st March – 1st April 2015
Taro, Choiseul Province

Prepared by Environment Unit
Environment and Conservation
Ministry of environment , climate change , disaster management & meteorology

Presentation Outline

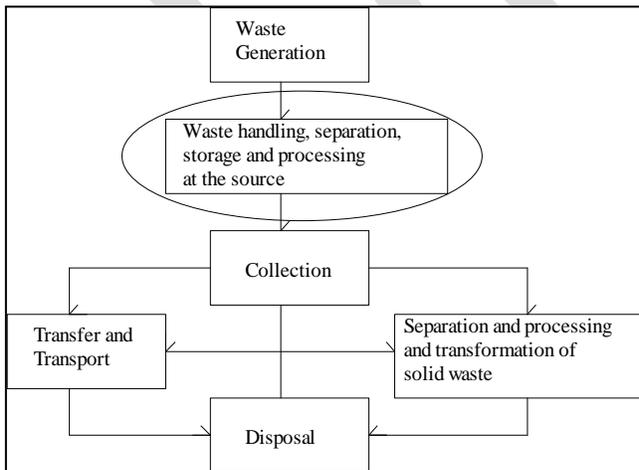
- What are the functional elements or Components of ISWM?
 - Waste Generation
 - Waste handling , separation and storage at source
 - Collection
 - Transfer and transport
 - Disposal

Definition: Solid waste management

- Solid Waste- includes all items that has no value or use to the owner, which they either intend to get rid of or dispose.
- Solid Waste Management- An appropriate process of dealing with waste

What are the functional elements or Components of ISWM?

- Waste generation
- Waste handling, separation and storage at the source.
- Collection.
- Separation, processing and resource recovery
- Transfer and transport.
- Disposal.



Waste Generation

- Volume of waste generated depends on standard of living, consumption pattern and level of institutional and commercial activities.
- Higher income lead to increase consumption and thus more waste

Waste handling, separation and storage at the source.

- Handling refers to activities associated with MSW **before** they are placed in a collection container
- May also include handling the collection container to and from the collection point
- Onsite handling is the very first step in waste management. It involves individual family members, households and communities, all of whom need to know how to handle waste properly at this level.

- Onsite storage means the temporary collection of waste at the household level. It is important that waste is stored in proper containers.
- The proper location of storage containers and the frequency and time of emptying are important factors to be considered for efficient onsite storage.
- Examples of different [types of storage containers](#)

Collection.

- In urban centres, collection is a function that has its own process and services.
- Collection includes picking up of solid wastes from various sources and hauling them to locations where collection vehicles are emptied.
- [Collection](#) is considered to be the most expensive part of the system.

Separation, processing and resource recovery

- Resource recovery means finding a way to use the waste so it becomes a valuable resource, rather than just a disposal problem.
- It includes a range of processes for recycling materials or recovering resources from the waste, including composting and energy recovery.
- It is an informal sector of waste management in Solomon islands

Separation, processing and resource recovery

- Resource recovery means finding a way to use the waste so it becomes a valuable resource, rather than just a disposal problem.
- It includes a range of processes for recycling materials or recovering resources from the waste, including composting and energy recovery.
- It is an informal sector of waste management in Solomon islands

Transfer and transport.

- This includes transfer and transport of waste after separation , processing and resource recovery.
- However in the case of Solomon Islands this component is usually undertaken together with collection .

Disposal.

- Methods of disposal can be sanitary or unsanitary. **Open field dumping** is the most unsanitary method of refuse disposal and is most likely to cause a health hazard.
- **Controlled dumping** in Honiara (Ranadi dumpsite & Gizo dumpsite)
- Mostly open dumpsites in outskirts of urban centres
- Manageable way of disposal in rural areas in SI is having a pit.

Thank You

Any Questions???

DRAFT

Annex 8: Presentation 5_Key Steps in Implementing Integrated Solid Waste Management



Key steps to implementing ISWM Program in the Community

Integrated Solid Waste Management Training
31st March - 1st April 2015
Taro, Choiseul Province

Prepared by Environment Unit
Environment and Conservation
Ministry of environment , climate change , disaster management & meteorology

Presentation Outline

- Key Steps to implement ISWM Program
- Lessons Learnt from Case Studies

Key Steps to Implement ISWM Program

Step 1 : Planning and Consultation

- Discuss & Identify goals and objectives
- Expected outcome or outputs
- Engage different stakeholders
- Identify Location for pilot program



Important Questions and Steps to Consider

Factors	Questions to Consider	Steps to take
Institutional (laws/processes)	Are existing laws and policies adequate to allow the government/province to properly implement ISWM	<ul style="list-style-type: none"> • Develop ordinance • Identify roles/responsibilities • Ensure resources are in place
Social	What types of waste does your community generate and how is it managed	<ul style="list-style-type: none"> • Encourage community participation in all phases of management planning
Financial (Funding)	Where will you go to get funds for creating a solid waste management system	<ul style="list-style-type: none"> • Identify sources that can provide funding for SWM: <ul style="list-style-type: none"> -General revenues -User fee -Government etc

Important Questions and Steps to Consider

Factors	Questions to Consider	Steps to take
Economic (costs)	What will it cost to implement various waste management activities	<ul style="list-style-type: none"> •Capital Investment •Evaluate public's ability and willingness to pay
Technical (location and equipment)	Where will you build collection and disposal facilities and what equipment will you need?	<ul style="list-style-type: none"> •Include geological factors, transport distance etc •Determine what equipments and training will be necessary to perform waste management task
Environmental (Natural Resources and human health)	Will SWM activities (eg landfill, combustion/burning) affect the environment?	<ul style="list-style-type: none"> •Establish procedures to verify the protection of groundwater and drinking water •Monitor compliance with the national standards to ensure human health risks are minimized

Step 2: Formulate a Committee

- Identify people from different stakeholders
- Formulate a committee for the proposed program
- Outline terms of reference or responsibilities



Step 3: Conduct Baseline survey



- Identify the priority needs & issues to be addressed
- Conduct waste survey
- Conduct household survey

Step 4 : Develop Schedule / Plan of Action/Activities

- Identify key activities
- Develop schedule of activities
- Identify resources needed/required



Step 5: Implement Plan of Action/Activities

- Conduct activities according to schedule of activities or timeline

Step 6: Monitor and Evaluate Plan of Action

- Identify the priority needs & issues to be addressed
- Conduct waste survey
- Conduct household survey

Lessons Learnt from Case Studies

- Consultations is important in the early stages
- Community Initiative driven
- Stakeholder partnership & collaboration
- Train-the-Trainers in community
- Education and Awareness

Thank you for listening!

Any Questions??

Annex 9: Presentation 6_Case Studies in Integrated Solid Waste Management




Case Studies in ISWM

Integrated Solid Waste Management Training
31st March – 1st April 2015
Taro, Choiseul Province

Prepared by Environment Unit
Environment and Conservation
Ministry of environment, climate change, disaster management & meteorology

Presentation Outline

- ❖ **Honiara case studies**
 - ❖ Panatina Valley Community Solid Waste Management Initiative
 - ❖ Eco-school program
 - ❖ Eco-bag –Alternative to Plastic Bags
- ❖ **Gizo case studies**
 - ❖ Gizo community zoning program
 - ❖ Clean School Program
 - ❖ Gizo medical staff promoting 3 R Activities

Honiara Case Studies

- ❖ **Panatina Valley Solid Waste Management Initiative**
- ❖ **Objective:**
 - Development of Panatina Valley Community Action Plan to Improve waste collection schedule for non organic waste





Activities:

- Providing awareness materials regarding proposed collection schedule, waste separation and segregation & recycling
- Household and collection survey
- Erection of Billboard
- Installation of Waste Bin stands
- Installation of Notice board
- Establishment of task committee with regular meetings

Eco-school program

Objectives:

1. To raise awareness in Schools for both teachers and students to understand the impacts of waste on health and environment.
2. To advocate and educate schools to practice 3Rs and minimize waste
3. To encourage school teachers to learn how to teach 3Rs and waste reduction to students by equipping them with the 3Rs knowledge and skills.
4. To have schools engage in Eco-School activities




Activities:

- Teachers Training Workshop
- Preparation of School Action Plan
- School Visit- Follow Up on Action Plan
- Teachers Follow –Up Workshop
- Launching of Program
- St. Nicholas School Class Competition

- **Eco-bag –Alternative to Plastic Bags**

Objectives:

1. Raise awareness of the impacts of plastic bags on the environment



2. Promote use of Eco-friendly bags, alternative to plastic bags
3. Minimize use of plastic shopping bags



Activities:

Awareness at Central Market Vendors and Shops

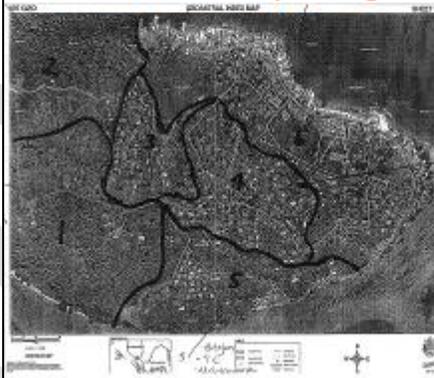
Launching of Eco-bag program

Sewing of Eco-bags



Gizo case studies

- **Gizo community zoning**



- **Clean School Program**



Activities:

- Teachers Workshop
- School Visits- Follow Up
- Paper Craft Teaching



- **Gizo medical staff promoting 3 R Activities**

Objectives:

- Medical staffs as role- model for SWM in Gizo
- All medical staff houses to have refuse bins
- Awareness and training for medical staff house occupants
- Conduct collection and disposal twice a week



Activities:
Awareness workshops
Medical trucks collect and dispose two days a week
Each households provided with bins

Thank You

DRAFT

Annex 10 : Presentation 7_ Importance of Waste Characterization Survey

 <h2>Characterizing the Nature of Solid Wastes</h2> <p>Integrated Solid Waste Management Training 31st March -1st April 2015 Taro, Choiseul Province</p> <p><small>Prepared by Environment Unit Environment and Conservation Ministry of environment , climate change ,disaster management & meteorology</small></p>	<h2>Presentation Outline</h2> <ul style="list-style-type: none"><input type="checkbox"/> Definition<input type="checkbox"/> Purpose<input type="checkbox"/> Characteristics<input type="checkbox"/> Significance<input type="checkbox"/> Step by Step Procedure
<h2>Waste Characterization (Definition)</h2> <ul style="list-style-type: none"><input type="checkbox"/> Method of separating waste/ rubbish into different types or categories<input type="checkbox"/> Other definitions: "A solid waste audit is carried out to determine the composition and estimate the quantity of wastes generated in a particular location or process (Dr.Mataki, 2009)."	<h2>Reason for Waste Characterization /Audit</h2> <ul style="list-style-type: none">• To manage an operation better, • It is useful to know what you are dealing with.
<h2>Characterizations of Waste</h2> <ul style="list-style-type: none">• Excessive amount of packaging of wastes• Difficulty in maintenance of equipment• Difficulty in site acquisition for landfill• Insufficient human resources or lack of trained human resources• Lack of Cleanliness, awareness amongst the public	<h2>Significance of Waste Audit</h2> <ul style="list-style-type: none">• Information and Data Collection• Strategic Planning , Decision making• Identification of source of wastes generation• Identification of different compositions, waste streams• Identification of feasible resource recovery and export for recycling overseas• Improvement of waste collection methods and disposal• Maintain final disposal site life span• Identify current environmental health issues• Opportunity for awareness raising and team work

Waste Auditing Methodologies

- **Direct Measurement**
 - **Census**
 - **Sampling (weight/area, weight/volume)**
 - **Sample (truck-load, weight/volume)**
- **Indirect Measurement**
 - **Material Flow Analysis ('cradle to reincarnation')**
 - **Trade data (import and export data, local sales)**

PROCEDURE

A. Selection of Sampling Sites

- Define different residential areas (ethnic/income groups)
- Select 10-20 HH randomly from each area
- Collect wastes from selected areas once a day for 8 successive days to allow difference in waste generation over a week
- **NB that the samples on the first day will be discarded as they may contain waste accumulated from 2 or more days before.**

B. Preparation for Waste Audit

- Transportation (prefer open pick-up)
- Workers/People to collect & load waste bags into vehicle, weigh, measure, separate and recording
- Equipment
- Assign numbers to Households, shops, offices for data recording & analysis
- Coding of plastic bags according to HH #
- Data entry sheets
- Survey of household family size
- Decision appropriate collection route for audit /MAP
- Determine volume & weight of wastes (record volume of bucket)
- Instruction to team /Briefing
- Distribution of leaflet and plastic bags

C. Step-by-Step Procedure

1. Prior to audit visit HH distributing leaflets and plastic bags to households and put a ID number



2. Collect plastic bags from HH. Replace a plastic bag to HH.



3. Repeat step 2 for each sample area & proceed to site for separation & segregation (Tab. I)

4. Weigh each plastic bag & record weight in data sheets according to # assigned to HH



5. Randomly select 5-10 plastic bags from 20-25 HH plastic bags from each sample area, record HH # for volume measurement (Tab.2-1)

6. Open 5 sample bags, empty contents into bucket until full. Count & record # of bucket loads of waste contents and empty contents into tarpaulin. Repeat process until 5 sample bags from each sample area done. (Tab.2-2)



7. Separate wastes into different types/categories

8. Measure weight of each type of waste, record on data sheet (Tab.3)



9. Clean up all equipment for next day

Thank you all for listening

DRAFT