

# CLEAN COMMUNITIES

## FACILITATING COMMUNITY INVOLVEMENT IN SOLID WASTE MANAGEMENT



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The first step towards getting somewhere is  
to decide that you are not going to  
stay where you are



This document is a training program intended to guide staff from Government Ministries or Community Based Organizations (CBO's) to deliver the 'Clean Communities' training program to Islands communities in the Atolls.

Waste management is one of the biggest environmental challenges to the Maldives. The 'Clean Communities' approach recognizes and supports the Maldives Government's policy direction toward decentralization in the delivery of social services. Effective waste management requires communities to take ownership of waste issues, starting from the household level. Through participation in this program, communities will be supported in making changes to household waste management practices, and undergo a process of learning that will provide participants with skills, knowledge and empower them to participate in decision making effecting waste management on the Island and Atoll level.

'Clean Communities' is based on the 'train the trainer' approach, where key community members are trained to pass on skills and knowledge to other members of the community.

## A VISION FOR CLEAN COMMUNITIES IMAGINE...

The sun peeks across the horizon and casts its rays against the rippling sands of the Island, heralding the start of a new day full of promise. Aneesa and Kareem walk along the sands, leaving behind the first footprints of the morning. Apart from the washed up shells and a coconut husk there is nothing else on the beach, certainly no sign of the plastic bags and bottles strewn across the sand of many other islands. The tourists who visit the Island to buy souvenirs really marvel at its natural beauty. There are no plastic bags on the Island since the people decided to ban them a year ago; Aneesa was one of the leading advocates for this initiative.

Having completed the morning prayers, Aneesa and Kareem walk home by going around the island. They meet Mariyam who is returning from the waste management site with an empty wheel barrow. Although the waste site is only 100 meters from the houses, you would hardly have known it was there. Mariyam was only delivering a small load of inorganic waste, because on this island almost all of the organic wastes stay in the household for composting and reuse. At the waste site Mariyam had placed the waste into separate piles; one for glass, another for plastic containers. The glass is reused in building materials on the Island, and the plastic is crushed and shipped for recycling.

After exchanging good mornings with Mariyam, Aneesa and Kareem continue to their home, to be greeted by three healthy and very hungry children – breakfast is on the menu! After a good breakfast Kareem departs to work on his agricultural plot where he expects a good harvest of chilies and beans. He takes two buckets of composted material from the compost pile that he and Aneesa share with the neighbors; Kareem believes that he can thank the compost for the great crop this year. Aneesa sees the children off to school and then takes the left over food and places it in the new compost pile that she has created. She also takes the time to turn the compost pile created last week to ensure that it's working properly, she adds some leaves that have been raked up from the yard, Aneesa now has composting down to a fine art.

This morning Aneesa is expecting a visit from Seema, who is a 'Clean Communities Leader,' one of several volunteers who assists Aneesa and her neighbors to manage their household wastes and assist to establish the composting program. This will be a follow up visit to see how Aneesa is going with the composting. Aneesa is very proud of her work and intends to tell Seema that she would like to undertake the training and also become a Clean Communities Leader. The sun is shining and Aneesa thinks that it will be a good day...



## CLEAN COMMUNITIES TRAINING PROGRAM



### Learning Outcomes for participants

By the completion of this course participants can:

- Identify and explain the issues of waste management locally and nationally
- Explain the links between environmental problems and people's health and well being
- Conduct a waste management home survey
- Create a basic composting system and train others in how to do it
- Provide householders with simple recommendations about how to reduce, reuse and recycle
- Communicate confidently about waste management issues
- Feel motivated and empowered

### SESSION 1: (2 HOURS)

1. **Activity:** Welcome & participant introductions (15 minutes)
2. **How does the program work:** The Clean Communities Program, training course objectives (15 minutes)
3. **Activity:** Dramatic Connections (45 minutes)
4. **Activity:** Timelines: how has the waste problem changed? (45 minutes)

*Refreshments*

### SESSION 2: (1.5 HOURS)

5. **Activity:** 'Introduction to the waste survey' and tips for conducting the survey  
Conduct the waste survey (practical)

### SESSION 3: (1.5 HOURS)

6. **Activity:** 'Community Knot' (30 minutes)
7. **Activity:** Background: Household composting technique (1 hour)

*Refreshments*

### SESSION 4 (PRACTICAL): (2 HOURS)

8. **Activity:** Practical: Household composting technique, demonstrate household composting techniques and practically make a compost pile in one of the households.

### SESSION 5: (2 HOURS)

9. **Activity:** 'Action Brainstorm' (50 minutes)
10. **Activity:** Waste Reduction Plan (30 minutes)
11. **Activity:** 'Mobilization' (30 minutes)
12. **Conclusion & Evaluation:** Review of course outcomes & evaluation (10 minutes)

*Refreshments*

# 1 WELCOME & PARTICIPANT INTRODUCTIONS



15 minutes

## Objectives:

- Highlight the significance of the course by involving a high profile community leader.
- Get to know each other and set the tone for a participatory style of training

## Materials needed:

Cards for icebreaker game, safety pins or sticky tape

## What to do:

1. Introduce the training staff to participants
2. Ask the participants to introduce themselves to the group. You may wish to use an 'ice-breaker' activity for the introduction. Use the 'Who am I' ice-breaker (below) or another of your own choice. Your selection activity will depend on whether the participants already know each other.

### ICEBREAKER ACTIVITY: "WHO AM I?"

**Preparation:** Make a series of cards with the name of one item that commonly ends up as waste written clearly on one side. (E.g. nappy, plastic bottle, margarine container, fish bones, lettuce leaves, corrugated iron, plastic bag, glass bottle, shoes, etc).

Affix one card to each participant's back – make sure they don't read it. Everyone should be standing and ready to interact.

**Instructions:** Tell each person that they each have the name of an object that commonly ends up as waste written on their back. Their task is work out what it says by asking the other participants questions. The answers can only be 'yes' or 'no,' therefore it is o.k. to ask 'am I organic' but not 'where do I come from?'

Ask participants to introduce themselves to the person whom they are asking a question. They may only ask one question to another person, and then must introduce themselves to someone else before asking another question (hence ensuring that they mingle).

The activity ends when all participants have correctly guessed the name that is written on their backs.



## 2 CLEAN COMMUNITIES HOW DOES THE PROGRAM WORK?

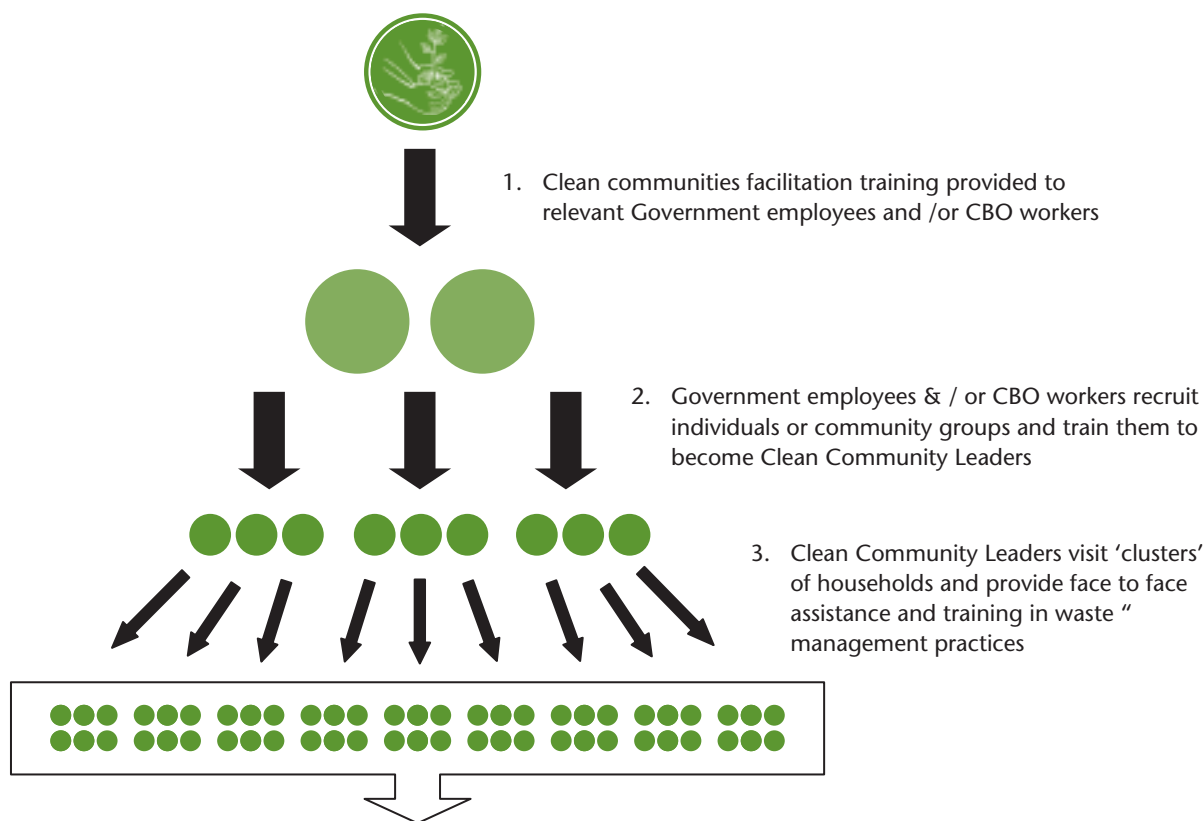


### What to do:

Start by reading out 'A vision for clean communities.' Then present the following information to participants:

1. Government and / or Community Based Organization staff will be trained to coordinate and facilitate the 'Clean Communities' program. Training will be focused on how to deliver the facilitation and training activities contained in this document.
2. Selected community members will be trained by Government or CBO staff to become certified 'clean community leaders.' This document is a guide to the delivery of the training.
3. The Clean Community Leaders will provide a face-to-face service to householders by conducting home visits. The visits will include:
  - Survey of waste management in the household
  - Assistance in establishing a simple composting system
  - Assistance in establishing a waste separation system
  - Provision of waste minimization measures.
4. Householders who receive a home visit and assistance will be encouraged to become member of a 'clean community' group, who can be identified and offered further support, incentives, or opportunities to be involved in waste management initiatives.

### Clean Communities implementation diagram



4. Trained groups of neighbors change behavior in their households and take actions for improved waste management in the community. These people will also be empowered and have increased capacity to participate in community waste management decisions

# 3 DRAMATIC CONNECTIONS



**Objectives:**

- Highlight the links between wastes and social / environmental impacts
- Refresh participants with an enjoyable and participatory game which encourages creative thinking and teamwork

**Materials needed:**

The following lists should be written on three separate sheets of paper:

List 1	List 2	List 3
A supermarket	A baby	An unhappy tourist
A dead Marine Turtle	A well	An empty rainwater tank
A happy Jelly fish	A person drinking	A beach littered with water bottles
A plastic bag	Several dirty nappies	A poor person
A person shopping	A poor person	A polluted well
A sad old man	A person with diarrhoea	A tour boat sailing away

**What to do:**

1. Divide participants into groups of six or into larger groups if you have more participants than is divisible by six.
2. Provide each group with one of the three lists (above). Ask each group to devise a short drama performance that must include each of the six objects or people on their list. Explain that the list can be arranged to tell a story that shows relationships between the environment and people's lives. There is no right or wrong order to use the objects or people in the drama.
3. Allow 15 minutes for the group to prepare a drama performance, and 5 minutes for each performance.
4. Discussion: After each performance ask the audience; *what was the message in the performance? Do you agree with the links that were made between people and the environment? Ask the performers, did you get your message across? What were the relationships that you were trying to show? Is this a realistic scenario in your community?*



## 4 TIMELINES



45 minutes

### Objectives:

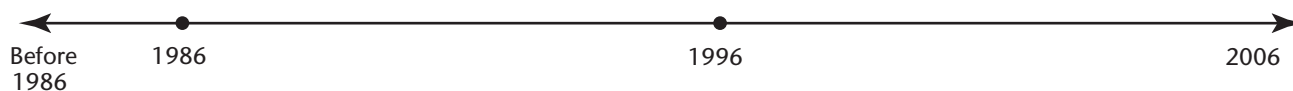
- Critically think about changes in consumable goods and waste generation through time
- Analyse the impact of waste generated by consumable goods and consider alternatives available to dispose of them
- Recognize and involve local knowledge in waste disposal and management

### Materials needed:

- Markers pens and several large sheets of kitchen paper
- Cards

### What to do:

- Write birth year in cards.
- Stick the cards on a large number line pasted on the wall, or kept on the floor.
- Discuss / and make a list of consumable goods available in the island while you were children (about 5 – 10 years old).
- Identify any changes to consumables (types) after 20 years.
- Make a list of consumable that you (commonly, occasionally, sometimes) use now.



### Discuss:

1. The change in consumables and reflect on why there has been such a change.
2. What do you foresee would happen in the future? What consumables would you / your children use in 30 years in the future?
3. What is its impact on waste Management / disposal?
4. What actions could be taken to address the issues / problems? (refer to point 3)



# 5 INTRODUCTION TO THE WASTE SURVEY



1.5 hours

## Objectives:

- Introduce the concept of an survey as a way of directing efforts towards making positive change for the environment
- Practice using the waste survey
- Become familiar with the content of the survey

## Materials needed:

'Home waste survey' worksheets,  
'Tips for conducting the survey' sheets, clip boards, pens



## What to do:

### PART 1:

Introduce the concept of the waste survey; explain that the survey is a tool similar to a questionnaire that is used in order to:

- Engage with householders about the issues of waste
  - Identify who is responsible for waste management in the households
  - Understand how waste is generated and disposed of in the households
  - Identify opportunities to reduce, reuse and recycle (e.g. composting)
  - Discover opportunities for neighbors to work together
  - Identify barriers to changing waste management behaviors
  - Recording current practices in households as a benchmark for observing change
1. Distribute the surveying sheets. Read through the survey and describe the types of questions and the reasons for asking them.
  2. Distribute the 'Tips for conducting the survey' sheet (see next page). Ask one of the participants to read it aloud to the group.
  3. Divide participants into groups of four. Ask one participant to play the role of 'Clean community leader' i.e. the interviewer, while the other participants will play the role of householders. Instruct the leader to survey the other participants. During the activity change the roles played by participants (there are 4 parts to the survey form and each participant can do one part as the interviewer). Alternatively, practice the waste survey by organizing a visit to a real household. This will need to be conducted in small groups.
  4. Inform the group that participants will analyze the survey results and use them to make recommendations to the householders. A session about recommendations will be conducted later in the workshop. Conclude this session with a group discussion:

*How will this information assist us to make recommendations about behavior change?*

*What have you learned about wastes by doing this survey?*

*Have you thought of any actions that could be taken to reduce waste based on this survey?*

## TIPS FOR CONDUCTING THE SURVEY

### BEFORE YOU START

- Make sure that you introduce yourself properly if you don't know the people you are surveying, try to make them comfortable and build some rapport before starting
- Clearly state the purpose of the survey and give a brief overview. Ensure that the householders know what is meant by waste (i.e. solid waste not sewage waste)
- Explain that your conversation will be confidential
- Tell the people how long the survey will take, and make sure that it is a convenient time

### CONDUCTING THE SURVEY

- Begin with some friendly general conversation to help the people feel at ease
- Ask the questions in order and try to keep the conversation to the topic of the question
- Be cautious about asking "why" because it can make people feel like you are passing judgment on them
- Beware of asking the questions in a way that could influence the householder's answers. For example, never ask "Don't you think that ..."? This is called a leading question
- Be sure that you have clearly understood the answer. If not, ask the person to repeat the answer. Always ask the householder to explain words and ideas that you do not fully understand. Do not assume that you know what the answer is because of your own knowledge and experience
- Avoid passing judgment, giving advice or your own opinion
- Avoid discussions that are not useful. Keep to the topic of the survey

### CLOSING THE SURVEY

- Ask the householders if there are any questions they would like to ask you
- Discuss the next steps
- Thank the participants for their time and trouble



# 6 COMMUNITY KNOT



30 minutes

## Objectives:

- Demonstrate and discuss the advantages of communities taking ownership of problems and participating in finding their own solutions

## Materials needed:

Nil

## What to do:

1. Ask the group to stand in a circle, each person holding the hand of the person standing next to them. Explain that *"everyone in the circle is a member of the same community, represented by linking hands (this is a rule!). You are not allowed to let go of the people standing next to you."*
2. Ask the group to nominate a person who is a good 'problem solver' and have this person leave the circle and to go to a place (e.g. outside the room) where they cannot see the group.
3. Instruct the group to create a 'knot' of people. This must be achieved without releasing hands (this is very important). For example people can duck under someone else's arms or swivel around, but not release their hands and then rejoin.
4. When the 'community knot' is completed, invite the 'problem solver' back into the room. Tell them *"this community has a big problem – as you can see they are really tied up in a big knot. Your task is to solve this problem for the community (i.e. untangle the knot) by telling them what to do. You cannot ask them for advice, physically touch anyone and they are not allowed to let go of the next person's hand. You must solve the problem as quickly as you can."*
5. Allow the problem solver 5 minutes to solve the problem. If they have not completed the activity give them the option to give up.
6. Discussion: Ask the group / problem solver: *Why was it difficult to solve the problem? How well did the problem solver understand the problem? Have you ever been in a situation where an outsider has tried to solve a community problem? What were the difficulties?*
7. Now repeat the exercise by asking the community to make the same knot again. This time tell the group that they must solve the problem by themselves, with everyone's participation. When the group is ready tell them to untangle themselves as quickly as possible (without letting go hands).
8. Discussion: Ask the group: *Why was it easier to solve the problem when everyone participated? How well did the group understand the problem? What are the advantages of solving a problem from within the community? How do the advantages of community participation apply in the real world?*



## 7 BACKGROUND: HOUSEHOLD COMPOSTING TECHNIQUE



1 hour

### Objectives:

- Consider the value of composting to the household and community
- Introduce the simple household composting technique
- Learn the basic principles of composting

### Materials needed:

Copies of 'Composting in the Tropics' booklet produced by HDRA

### What to do:

Provide a copy of 'Composting in the tropics' to each participant. Using the booklet as a guide, discuss the following topics.

1. What is compost and how is it useful? Basic introduction (from page 1 & 2)
2. What to put in a compost heap. Ask participants for suggestions and make a list. Label each item as containing mainly carbon or nitrogen (refer to page 4). Refer participants to the table on page 5 and make a large version of the table in order to discuss each item.
3. Materials that should **not** be put in the compost heap. Ask participants for suggestions and make a list. Refer to page 5.
4. How to build the compost heap. Draw the compost heap from page 10. Ask each participant to read out a step from page 9, explaining that the booklet is an easy resource to follow.
5. Organisms involved in the composting process & conditions required in the heap. Summarize the information on pages 11 & 12.
6. Managing a compost heap. Go through the 3 main management tasks from pages 13, 14 & 15.
7. Using compost. Ask participants to generate a list of uses for the compost in the community. Refer to page 16 for additional ideas.



# 8 PRACTICAL: HOUSEHOLD COMPOSTING TECHNIQUE



2 hours

## Objectives:

- Learn the basic principles of composting
- Gain hands on experience by beginning a real compost heap
- Examine an already functioning compost heap

## Materials needed:

- Copies of 'Composting in the Tropics' booklet produced by HDRA (attached)
- Vegetable scraps
- Coarse leaves sticks & yard wastes
- Coarse leaves sticks & yard wastes (to be finely chopped)
- Big knife (machete), spade, gardening gloves
- Access to water
- Cardboard boxes
- An example compost heap that is in operation (if possible)

## What to do:

1. Organise for participants to bring a supply of household organic waste (e.g. vegetable scraps) to the workshop for this activity.
2. Involve participants in the following:
  - Select an appropriate site for the compost heap. The site must be convenient, have access to water and located where it will not attract unwanted pests to a home. (Refer to page 6 of the HDRA booklet for a guide).
  - Lay out the materials that have been collected for the heap and ensure that there are also sufficient leaves or dry yard wastes. Examine each material and determine whether it contains mainly carbon or nitrogen. Place these into two piles. Dispose of any item that should not be placed in a compost heap.
  - Use the knife or spade to chop up half of the coarse leaves and yard waste into small pieces.
  - Lay the cardboard boxes underneath the heap. Explain that this will help to protect the groundwater from any leachate through the compost.
  - Make the compost heap in layers as described on page 9 of the HDRA booklet.
3. Examine a compost heap that has already been made. It does not matter if it is not designed in the same manner as the method described in the booklet. Discuss the good things and bad things about the heap. How old is it? Is it functioning well? What is being done to aerate the compost? What does the heap's temperature tell us about it? Does the heap have any odor? What could be done to improve this compost heap? Does it matter if this heap has a different design?



## 9 ACTION BRAINSTORM



50 minutes

### Objectives:

- Review the waste surveys conducted previously.
- Generate ideas for improved waste management practices that are relevant and achievable in the local context
- Develop the content of a document that can be provided to the 'Clean Community Leaders' to assist them in providing recommendations to the householders.

### Materials needed:

Waste surveys from day 1 (Activity 5), large sheets of paper, marker pens

### What to do:

1. Introduce the objectives of the activity. Explain why it is important that local people are involved in developing the recommendations for better waste management (reflect back to the 'community knot' activity).
2. Ask the participants to form the same groups that previously worked together in activity 5. Ask each group to spend 5 minutes reviewing the survey.
3. After the review of the surveys is completed, hand out a large piece of kitchen paper to each group. Explain that the purpose of this activity is to brainstorm (think of) as many opportunities and actions as possible that householders could reasonably do to improve waste management.
4. Ask the group to divide the paper into 3 sections (or provide three different pieces of paper), with the following headings: Reduce, Reuse, and Recycle. Explain what is meant by the 3 R's and provide a couple of examples. Allow 20 minutes for the groups to brainstorm ideas under these headings, and assist groups with ideas where appropriate.
5. At the conclusion of the brainstorm, select one or two people from each group to present their findings to the whole group. While the presentations are in progress, compile one complete list of potential actions.
6. Review the list at the end of the activity by a group discussion. Ask the participants; *which of these options would really stand out as a good recommendation? Which of these options may be difficult to implement?*
7. Make a commitment to writing up this list so that the participants can have a copy to assist them when developing recommendations during their home visit.



# 10 WASTE REDUCTION PLAN



30 minutes

## Objectives:

- Model the process of using the waste survey and ideas for action to create a waste reduction plan
- Create an example waste reduction plan

## Materials needed:

Waste Reduction Plan template (Attachment #2), notes from the 'Action Brainstorm' activity p.13, and survey results from the 'Introduction to the Waste Survey' activity p.8.

## What to do:

1. Ask the participants to reform the same groups that they worked in during the 'Introduction to survey activity' and the 'Action Brainstorm' activity.
2. Provide each group with a copy of the Waste Reduction Plan template. Explain the purpose and layout of the Waste Reduction Plan.
3. Ask the group to nominate a person to play the role of the 'Clean Communities Leader' and the other people will play the role of the householders.
4. Instruct the 'Clean Communities Leader' in each group to facilitate the group in creating a Waste Reduction Plan. Stress that the whole group should participate in the plan, and the role of the facilitator is to assist to capture the ideas and organize them into the plan rather than to express his or her own ideas.

Note that the plan has two parts: Individual actions that each household agrees to undertake, and collective actions that households will do together (e.g. build a communal compost heap).

5. Provide support and advice to the groups as they work, particularly to the facilitator. When each small group has completed their plans, ask them to present them to the whole group.
6. Reflect on this activity. This is a model of how they should develop a Waste Reduction Plan with the householders who they work with. Discuss the following: *Why is it important for the householders to participate in developing the plan? Who does the plan belong to? What could we do if the householders didn't come up with a very good plan? What could we do if we thought that their plan was too difficult or unrealistic?*



## 11 MOBILISATION



30 minutes

### Objectives:

- Participants will consider the task required for coordinating the program
- Participants will start the process of coordinating household visits and set the date, time and venue for a coordination meeting

### Materials needed:

Large sheet of paper (or whiteboard), note paper and pens

### What to do:

1. Explain to the group that after the workshop they will be completely responsible for coordinating their home visit program. This will take a fair bit of effort and coordination on their behalf. Write on a white board or large piece of paper '*we will need to decide...*' Make a list of decisions that will need to be made. The list should include
  - Which households will each person visit?
  - Will they do it individually, in pairs or in teams?
  - When will they start?
  - How will they inform the householders?
  - What is the best day of the week to do it?
  - What preparation needs to be done?
2. Give the participants the choice to either commence coordinating the activities today, or to decide on a date, time and venue to meet again to coordinate their activities. If the group decides to start during this meeting, allow them to coordinate their activities without any facilitator or trainer assistance. However, if they do not get finished, or decide that they will not start coordination in this session; ensure that they have arranged an agreed meeting.



## EVALUATION QUESTIONS FOR CLEAN COMMUNITIES PROGRAM

---

1. Will you segregate waste in your household?

.....  
.....

2. Do you think your neighbors will segregate waste?

.....  
.....

3. Do you like the idea of composting?

.....  
.....

4. Do you think it will work with your neighbors?

.....  
.....

5. Was the training useful?

.....  
.....

6. How do you think this training could be improved?

.....  
.....



## PART 1: HOME WASTE SURVEY

Name of Clean Community Leader .....

Name of householders .....

Location .....

Date .....

### Part 1: General Waste Management

a) Who usually makes decisions about the goods that are purchased for the households?

.....

b) Who usually makes decisions about removing wastes from the households?

.....

c) Who usually has the task of removing waste from the households?

.....

Describe how the households currently dispose of organic waste (e.g. is it burned, buried, thrown in the sea, composted, fed to the chickens, taken to the waste site etc)

Organic waste	Describe method/s of disposal
Vegetable scraps	
Meat and fish scraps	
Yard wastes (leaves, sticks etc)	
Paper & cardboard	



## PART 2: PURCHASING HABITS

a) Do the households bring shopping home in plastic bags?

Yes (tally)  No (tally)

If yes, how often do you use plastic bags for shopping?

Always (tally)	Most of the time (tally)	Occasionally (tally)
<input type="text"/>	<input type="text"/>	<input type="text"/>

(If applicable) What alternatives do the households currently use instead of plastic bags?

.....

.....

Consider the following list of consumables (and others that you can think of). Place them into the table below according to the quantity that is usually purchased by the households.

*Plastic water bottles, Aluminum cans (e.g. soft drinks), Canned foods, Drink Cartons, Plastic bags, Products in glass bottles or jars, Nappies, Newspapers or books.*

Small quantities (rarely purchased)	Moderate quantities (occasionally purchased)	Large quantities (often purchased)
<input type="text"/>	<input type="text"/>	<input type="text"/>

b) Do the households purchase any products in bulk? (Very large quantities). If yes, please list:

.....

.....

**Notes on purchasing:**

.....

.....

.....

## PART 3: REUSE

a) Place ticks (✓) in the column that applies to each household

Re-useable article	Regularly	Occasionally	Rarely	Never
We purchase or obtain second hand clothing				
We give away unused clothing to other families or charities				
We purchase or obtain second hand furniture				
We give away or sell old or unused furniture				
We purchase or obtain second hand household items (pots / pans / cutlery etc)				
We give away or sell second hand household items (pots / pans / cutlery etc)				

b) How do the householders feel about using second hand goods such as those listed above?

.....

.....

.....

c) Consider the following list of consumables (and any others that you can think of). Place them into the table below according how often they are reused.

*Plastic drink bottles, Plastic bags, Glass bottles or jars, Paper or cardboard*

Never reused	Sometimes reused	Always reused

Notes on Reuse:

.....

.....

## PART 4: RECYCLING

a) Do your households compost organic waste?

Yes (tally)  No (tally)

If yes, please describe the compost methods used:

.....

.....

.....

.....

What do the households do with the compost that is produced?

.....

.....

.....

Would it be possible for the households to use the same compost area?

.....

.....

.....

What do the households do with organic yard wastes? (Leaves, branches, dead plants, etc)

.....

.....

.....

.....

.....



## WASTE REDUCTION PLAN INDIVIDUAL ACTIONS

Actions to **REDUCE** the amount of waste:

Actions we will take	Targets & indicators of success

# WASTE REDUCTION PLAN INDIVIDUAL ACTIONS

Actions to **REUSE** 'waste':

Actions we will take	Targets & indicators of success

## WASTE REDUCTION PLAN INDIVIDUAL ACTIONS

Actions to **RECYCLE** 'waste':

Actions we will take	Targets & indicators of success

WASTE REDUCTION PLAN  
COMMUNITY ACTIONS

Actions to **REUSE, REUSE & RECYCLE**:

Actions we will take <i>together</i>	Targets & indicators of success

## 1. BACKGROUND: THE ISSUE OF WASTE

Although waste is a World wide problem, the issue is even more critical in the Maldives and other small island states. The Maldives is rapidly running out of places to put waste. The wastes threaten the environmental values of the Islands that the community relies on to make a living; particularly fishing and tourism. Furthermore, wastes are having a negative impact on peoples' health and well being.

The problem of waste is getting worse in the Maldives due to increasing populations and changing patterns of consumption. Maldivians are following the world wide trend of consuming more disposable products, including plastic bags, plastic bottles, disposable nappies and packaging materials.

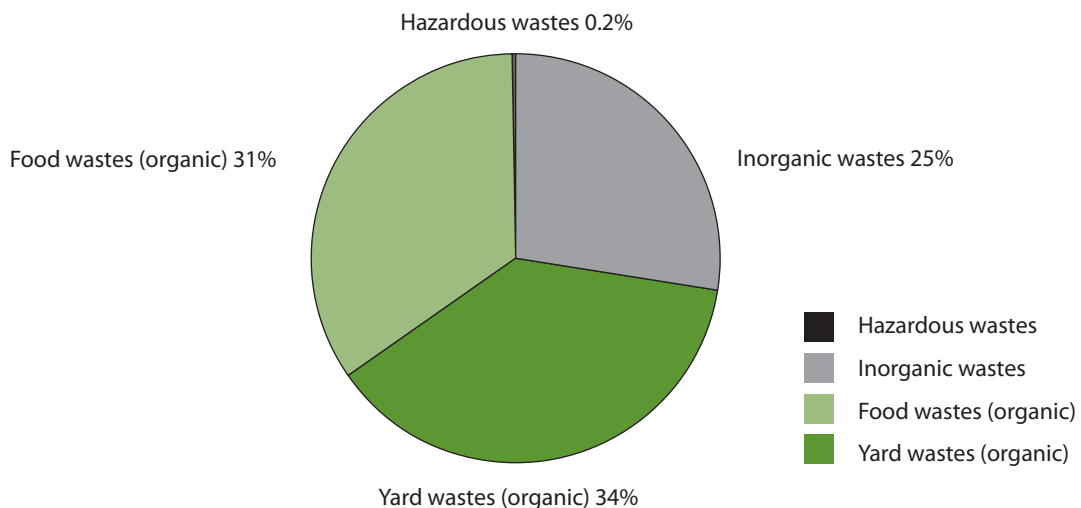


The Maldives face some special challenges with regard to the management of wastes. There is little space to put it, and due to the long distances separating small islands the handling and transport of wastes is very expensive.

The average resident in Male' produces 2.48 kg of solid wastes per day calculated on a per capita basis. This includes solid wastes from the construction industry. Comparably people living on the Atolls produce less waste, producing between 0.7 and 0.8 kg per day per person. All this waste adds up to a huge volume over time. On average approximately 103,200 tones of waste is transported from Male to the waste management site at Thilafushi every year.

## 2. WASTE IN THE ATOLLS

The types of waste produced in the Atolls differs from Male' in composition. Most of the waste in the Islands is organic, including kitchen wastes and green waste (e.g. leaves and branches). The following graph shows the composition of wastes from typical household in the Atolls:



There is currently very little waste segregation happening in Island households, although some households do undertake basic composting and hence separating organic wastes before the inorganic waste is removed. There is potential to increase the amount of composting that happens in households.

There are currently many initiatives to establish waste segregation on the Island level, and some Islands have been provided with new waste management and segregation facilities. Communities will need understand, support and get involved in these initiatives if they are to be successful.

### 3. IMPACTS OF WASTES

Poor waste management is a serious threat to public health and has the potential to be a major threat to economic development, particularly with regard to tourism and fishing industries.

Pollution that seeps from waste sites can enter ground water and hence drinking water supplies, or seep into the sea where it may be consumed by sea creatures and enter the food chain. Toxic pollutants such as Mercury can accumulate in fish and ultimately be passed onto humans who consume the fish. Some wastes such as plastic bags, can have a devastating impact on marine life. Marine turtles often mistake plastic bags for jelly fish and eat them by accident. This often results in the turtle slowly starving to death. Whales, dolphins and sea birds often meet a similar fate.

Wastes also impact on the tourism industry, beaches strewn with plastic bottles and bags are unattractive and a real turn off for Visitors. People come to the Maldives with the expectation of an 'un-spoilt paradise,' accumulating wastes could quickly and easily take away this perception, leading to a loss of tourist dollars and jobs.



Adapted from  
*Composting in the Tropics*  
by HDRA the organic organisation, UK, 1998



## WHAT IS COMPOST AND HOW IS IT USEFUL?

Compost is organic matter (plant and animal residues) which has been rotted down by the action of bacteria and other organisms, over a period of time. Many types of organic matter, such as leaves, fruit and vegetable peelings and manures can be used to make compost. The end product is very different from the original materials. It is dark brown, crumbly and has a pleasant smell.

Compost is cheap, easy to make and is a very effective material that can be added to the soil, to improve soil and crop quality.

- Compost improves the structure of the soil. It allows more air into the soil, improves drainage and reduces erosion.
- Compost helps to stop the soil from drying out in times of drought by holding more water.
- By improving soil structure, compost makes it easier for plants to take up the nutrients already in the soil. Compost may also improve soil quality by adding nutrients. This can help to produce better yields.
- Compost can reduce pest and disease problems in the soil and on the crop. The crop will be stronger and healthier and therefore resist pest and disease attack.

Compost is a better way of feeding plants than using chemical fertilisers.

These fertilisers provide nutrients for plants but do not improve soil structure or quality. They usually only improve yields in the season in which they are applied. Compost is not washed away through the soil like chemical fertilisers, so the beneficial effects are longer lasting.

Plants that are grown with chemical fertilisers are more attractive to pests because they have greener, sappy growth.

## MAKING COMPOST

Households and farms produce many materials which can be used to make compost. Making compost makes use of materials that may otherwise be wasted. Some of these wastes could also be used for other purposes. For example palm fronds may be needed for construction or kitchen wastes may be needed to feed livestock. A choice will need to be made as to whether to use such materials for the compost heap or not.

You may already be making compost. This booklet could help you to improve your methods. Organic matter is often piled up in the compound but left unmanaged. This will produce compost but the materials will take a long time to decompose and nutrients will be lost. If it is possible to invest some time and effort to manage the heap, the results will be very rewarding.

In a managed heap nutrient loss will be reduced, so more of the nutrients will be available to feed plants when the compost is used. This type of compost heap will often heat up enough to kill weed seeds and plant diseases.

## WHAT TO PUT IN A COMPOST HEAP

Nearly all organic matter can be used to make compost but different items will take varying amounts of time to decompose and form different end products. For example, fruit on its own will go slimy and coconut leaves will go dry and dusty.

**It is essential to include a mixture of old and tough with young and sappy materials for a good result.** This is because different types of organic matter contain different proportions of carbon and nitrogen. In general, young, living material that decomposes fast contains low levels of carbon but high levels of nitrogen. Tough, dead material, for example palm fronds and stalks, decomposes slowly and contains large amounts of carbon but low amounts of nitrogen. Too little nitrogen-rich material and the decomposition will be slow; too much and the heap will become acid and smelly.

If different compost ingredients are not available, households in the local community might have useful by-products such as coconut husks and groundnut shells. It may also be possible to obtain suitable material from the roadside. The table on the opposite page gives an indication of the type of items which can be put on a compost heap.



*High nitrogen (fruit and vegetable wastes) and high carbon ingredients (straw and seed husks)*

## EXAMPLES OF MATERIALS THAT CAN BE USED TO MAKE COMPOST

MATERIAL	PREPARATION	NOTES	PRECAUTIONS
<b>HOME</b>			
Fruit and vegetable peelings		Decomposes quickly	
Wood fire ash		High in potassium and lime	Use in very small quantities
Paper and cardboard	Tear up or shred	Decomposes slowly. Mix with wet/moist ingredients.	
House and compound sweepings		Variable quantity and quality	
<b>GARDEN</b>			
Crop residues (the remainder of a crop after it has been harvested).	Chop up tough material. If dry moisten well before use.	If the material is tough, it will decompose slowly.	Do not use if recently sprayed with herbicide
Dead leaves	If dry, use as above		
Crops grow on specifically for the compost heap	Chop up if large	Legumes commonly recommended	
Crops grow on specifically for the compost heap	Chop up if large		Avoid roots of perennial weeds and mature seeds of annuals.
<b>OTHER SOURCES</b>			
Manure		Not essential but an excellent source of nutrients.	
Urine (animal and human)	Difficult to collect. Maybe collected in the bedding of animals.	Sprinkle on heap. Will greatly accelerate decomposition.	Use in small quantities.
Soil	Use soil from the top 10cm of cropped land.	Not essential but a sprinkle may reduce nitrogen loss from hot heaps. May be used to cover a heap.	
Seaweed	If used in large quantities should be wilted first. Always apply with dry material.	Has an abundance of trace elements.	

## AVAILABILITY OF MATERIALS

Some of the materials mentioned in the table, such as soil or crop residues, may be collected on the day of building the heap. Some ingredients, such as kitchen wastes, are collected on a regular basis. If the heap is to be built in one single process these materials should be gathered and stored. They should be kept dry and cool and covered so that too much air does not reach it. Banana leaves or grass thatch provide a good cover. This treatment should prevent water loss before the heap is constructed.

It is also possible to build the heap in stages and add the material as it becomes available. However, the process of decomposition will be slower and it will therefore take longer to make compost.

### Materials that should not be put in the compost heap

- Material such as plants which have been recently sprayed with pesticides or herbicides
- Meat scraps, as these may attract rats and other pests
- Large amounts of material that is diseased
- Material with hard prickles or thorns
- Persistent perennial weeds. These should be killed by laying out in the sun to dry, or even burning, to avoid them spreading. The dried material or ashed could then be added to the heap.
- Non-organic materials such as metal or plastic



## WHERE SHOULD A HEAP BE PLACED?

There are three factors to consider when deciding where to put a compost heap:

### TRANSPORT

A compost heap should be placed in an area to where it is easy to carry the materials collected. Distance and access to the fields or garden where the compost will be applied are also important considerations.

### WATER

A compost heap should be placed in a shady, sheltered area to avoid too much evaporation, for example under a tree. If you want to provide more shelter you could construct a fence around the heap, although this is not essential if labour is limited.

Water usually needs to be added to the heap so ideally, a source of water should be nearby. If you do not have a well close by you should keep a container, such as a jerrycan filled with water, near to the heap.

## VERMIN

It is important to consider pests and vermin such as rats, termites, flies and mosquitoes. It is possible that they may be attracted to the compost heap so it should not be placed too close to the home.



*A compost heap should be placed away from the home, in a shaded position, with water available nearby*

## OTHER CONSIDERATIONS BEFORE BUILDING A COMPOST HEAP

### SIZE

A good size for a heap is about 2 metres wide by 1.5 metres high. If it is much larger air circulation will be poor. The heap should not be smaller than 1 metre by 1 metre. The length can vary, as required. If there is not enough material available to make a compost heap of this size, a number of people could collect ingredients together to make a common one.

### WATER

If water is scarce, it may seem preferable to use available water directly for irrigation rather than for producing compost. However compost added to the soil can improve its water holding capacity and, in the long term, will reduce the amount of the water required to irrigate the crops.

If water is scarce, you may want to consider building the heap in a pit. This method is preferred in dry areas because the heap needs less water. Trenches are dug and are filled in the same way as a compost heap. However, heavy rainfall or a high water table could make the pit too wet.

### LABOUR

Building a heap should be timed to fit in with the slack periods of labour. Some composting procedures, such as regular turning, are more labour intensive than others.

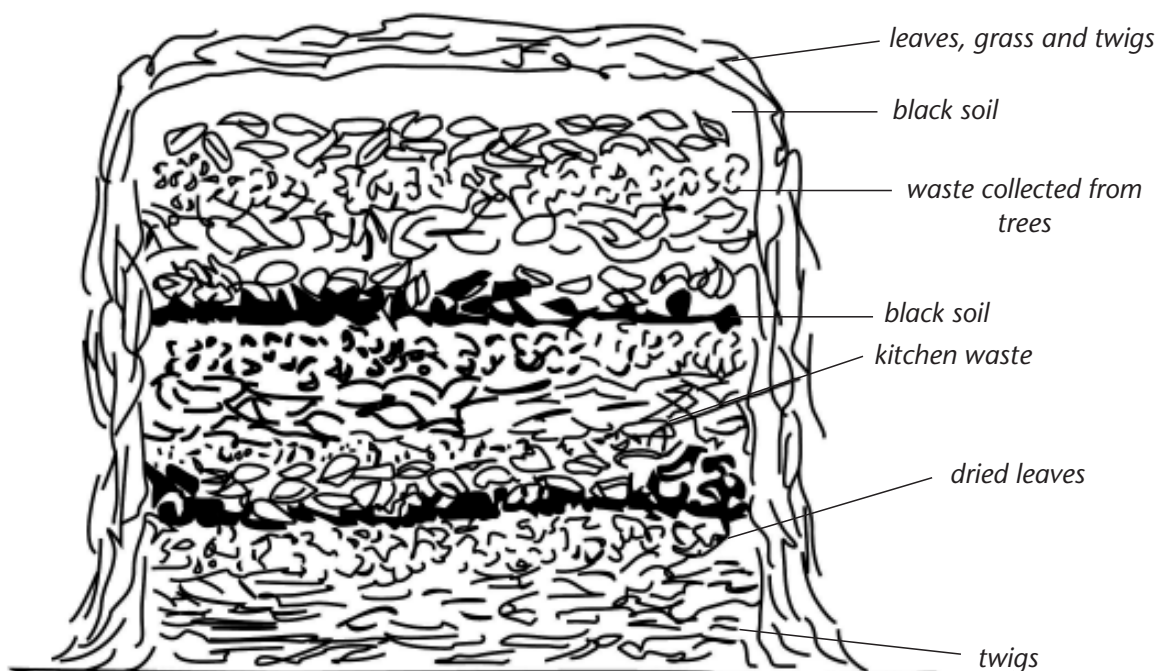
## HOW TO BUILD THE COMPOST HEAP

A compost heap should be built on bare soil and not on a hard surface such as concrete. This is the recommended way to build a compost heap:

1. Firstly make a base 30 centimetres (cm) high and 2 metres (m) wide with coarse plant material such as twigs. This will ensure good air circulation and drainage.
2. Add a 10cm layer of material that is difficult to decompose such as palm fronds or coconut husks.
3. Add a 10cm layer of material that is easily decomposed such as fruit and vegetable scraps.
4. Add 2cm of animal manure, old compost or slurry, if available.
5. Add a sprinkling of earth from the top 10cm of cropped land.
6. Ash and urine can then be lightly sprinkled onto these layers, to accelerate the process of decomposition.
7. Then water the whole pile well.
8. Repeat all these layers except the first layer of coarse material, until the heap reaches 1 to 1.5m high.

The heap should be covered to protect it against evaporation and heavy rain as this will wash away all the nutrients. Sacking, grass thatch or banana leaves are suitable for this.

Each layer should be laid down by starting at the edge of the pile so that the heap does not collapse. Another way to ensure this is to use a wire mesh (not useful in dry areas because it will allow drying out) or wooden planks around the heap. Air vents, made out of bamboo canes with holes cut in them and placed both vertically and horizontally throughout the heap, will improve the air circulation.



*Layers of the a compost heap*

## ORGANISMS INVOLVED IN THE COMPOSTING PROCESS

Most of the organisms involved in the composting process are so small that you cannot see them. In order to survive they need water, air and organic material which is their food. The organisms feed on the organic matter and produce carbon dioxide, water and heat.

There are three important phases during the decomposition of a compost heap; the hot phase, the cooling down phase and the maturation phase.

During the 'hot phase' the highest temperatures are reached at the centre of the heap. This has a hygienic effect, killing diseases, if present, in the organic materials and sometimes weed seeds also.

Next, the heap goes through a 'cooling down phase' and the fungi become important. They break down the tough fibrous material such as crop stems.

During the final, 'maturation phase' larger organisms such as termites and worms also have an important role in breaking down and mixing material.

In a hot climate the organisms are more active and the organic materials are broken down more quickly than in a cold climate. The types of organic matter used and the acidity of the soil will also affect the rate of decomposition.

## CONDITIONS REQUIRED IN THE HEAP

The compost heap requires three conditions: air, water and heat.

### **AIR**

The micro-organisms in the heap require oxygen to survive. The carbon dioxide produced by the activity of the organisms also needs to be blown out by a flow of air. If there is not enough air, other unwanted organisms will thrive which produce a bad smell and slow the decomposition of the heap.

### **WATER**

The activity of the organisms in the compost heap will slow down if the heap is too dry. But if the heap becomes too wet then there will not be enough air and the composting organisms will die. This will cause the heap to ferment rather than compost. Judging the right amount of water requires a little experience.

### **HEAT**

The heap will create its own heat as the decomposition process occurs. If the heap becomes too hot the micro-organisms may leave the heap, causing decomposition to slow down. When the heap cools down the organisms will return.

## MANAGING A COMPOST HEAP

To ensure successful compost production it is important that the heap is well managed after it is built. It requires water, turning, heat and a maturation phase.

### WATER

In dry conditions the heap will need to be watered twice a week. A way of testing the moisture is by placing a small bundle of hay in the middle of the compost heap. When removed, after five minutes, it should feel damp. If it does not, water needs to be added to the heap.

There are a number of ways to reduce evaporation from the heap and therefore the amount of water that needs to be added to it:

- Cover the heap with banana leaves or grass cuttings
- Cover the heap with a layer of mud
- Do not turn the heap (see page 14 for 'turning')

If the heap becomes too wet it should be opened up and mixed with dry organic matter or allowed to dry in the sun before rebuilding.



*Water should be sprinkled onto the heap if it is too dry*

## TURNING

Within three weeks of building the heap, its size will have decreased considerably. Turning the heap will replace the oxygen supply and will ensure that the material on the outside decomposes as well. To turn a heap take it apart, mix the ingredients and rebuild it. The material on the outside of the heap is put in the middle of the heap. If the heap is dry, add water, and if it is wet, add dry matter. The first turning should be done after 2 or 3 weeks and the next after another 3 weeks.

The temperature and moisture of the heap should be tested a few days after each turning. A third turning may be necessary before all the material, other than twigs and thick stems, has decomposed.

Compost can be made without turning, but material left at the edge of the heap may not compost properly. Weed seeds and any diseased plant material present in this may not be killed. These materials should be separated from the finished compost and used in the next compost heap. Although turning is not essential it is recommended to produce better compost.



*Taking the thatch off the outside of the heap before turning the heap*

## HEAT

To test the heat of the heap put a large pointed stick into the heap, as shown, about 10 days after it has been built. The stick should feel slightly too hot to touch when removed after a few days. If it does not this may be because decomposition has not started. In this case, more air or water may be needed, or the heap may just need to be left for a while longer. If the heap is very hot, decomposition is happening but the excessive heat may kill the micro organisms.

In this case, the supply of air will need to be reduced and more water added to cool it down. You should test the temperature of the heap from time to time using the stick method.



*Placing a stick in the heap to test the temperature*

## MATURATION

Once the compost heap has cooled down it should be left to mature. The compost can be used as soon as most of the original material is no longer recognisable and has turned into a blackish brown colour, with a pleasant smell.

Even at this stage the heap should be kept covered to protect it from the rain and sun. The compost needs to remain moist, but not wet, while it is waiting to be used. If the compost is stored for too long before use it will lose some nutrients and may also become a breeding place for unwanted insects.

## USING COMPOST

The main use of compost is to increase and maintain crop yields by improving the ability of the soil to hold water and nutrients and keeping the soil healthy.

It can also be used to prevent soil erosion by incorporating it into the soil.

Compost is commonly used close to home in the kitchen garden. When preparing a soil bed for sowing seed, compost can be mixed with the top 10cm of soil. It should not be dug in any deeper as crop roots will not be able to take up the nutrients released by the compost. An effective way of using limited supplies of compost is to place small amounts of compost directly into the planting holes. In dry areas these holes can be extended into pits or furrows which can be used for trapping water.

Compost can be used for mulching between crops or around trees. Compost that has not fully decomposed can be used for this; it will continue to mature on the ground and animals in the soil will draw it into the soil where it will decompose further.

When using compost as mulch it should be covered with a thin layer of leaves. This will avoid loss of nutrients due to direct exposure to sunlight and heat. Compost can also be mixed with soil and used for raising tree seedlings and can be used as fish feed.



*Spreading compost around the base of plants to suppress weed growth and improve soil structure*

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## REFERENCE LIST

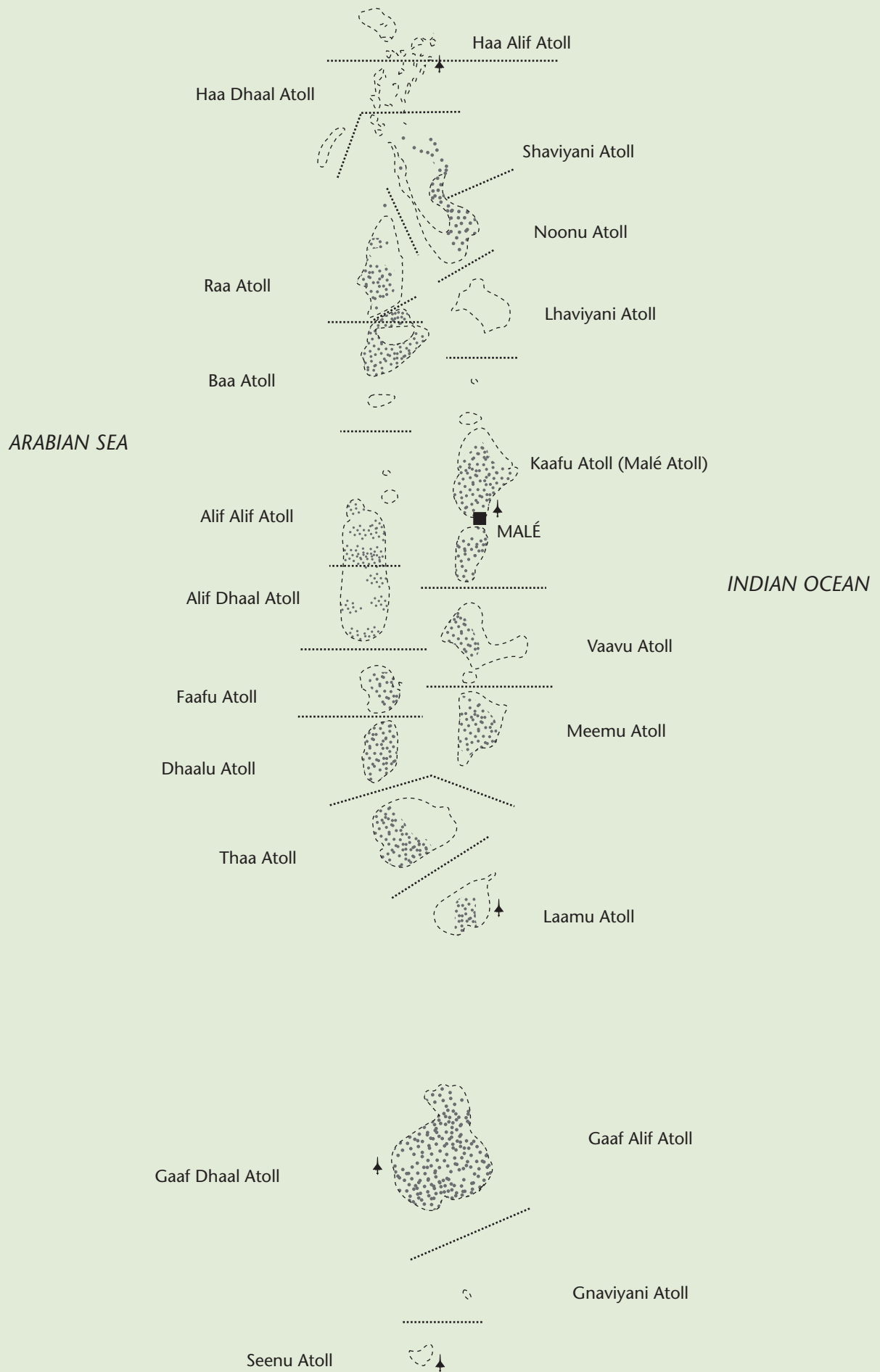
Other useful booklets about composting include the following:

**'The Preparation and Use of Compost; Agrodok 8'** (1990) by Inckel, M. et al AGROMISA, PMB 41, 6700 AA, Wageningen, The Netherlands

**'Soil Management: Compost Production and Use in Tropical and Subtropical Environments'** (1987) Food and Agriculture Organization of the United Nations (FAO) Soils bulletin 56. FAO, Via delle Terme di Caracalla, 00100 Rome, Italy

**'Field Notes on Organic Farming'** (1992) Njoroge, J. Kenya Institute of Organic Farming, PO Box 34972 Nairobi, Kenya

**Adapted from Composting in the Tropics by HDRA the organic organisation, UK, 1998.**



*The fisherman  
needs to know the sea  
to catch the fish*



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