# CCRES

**Capturing Coral Reef and Related Ecosystem Services Project**
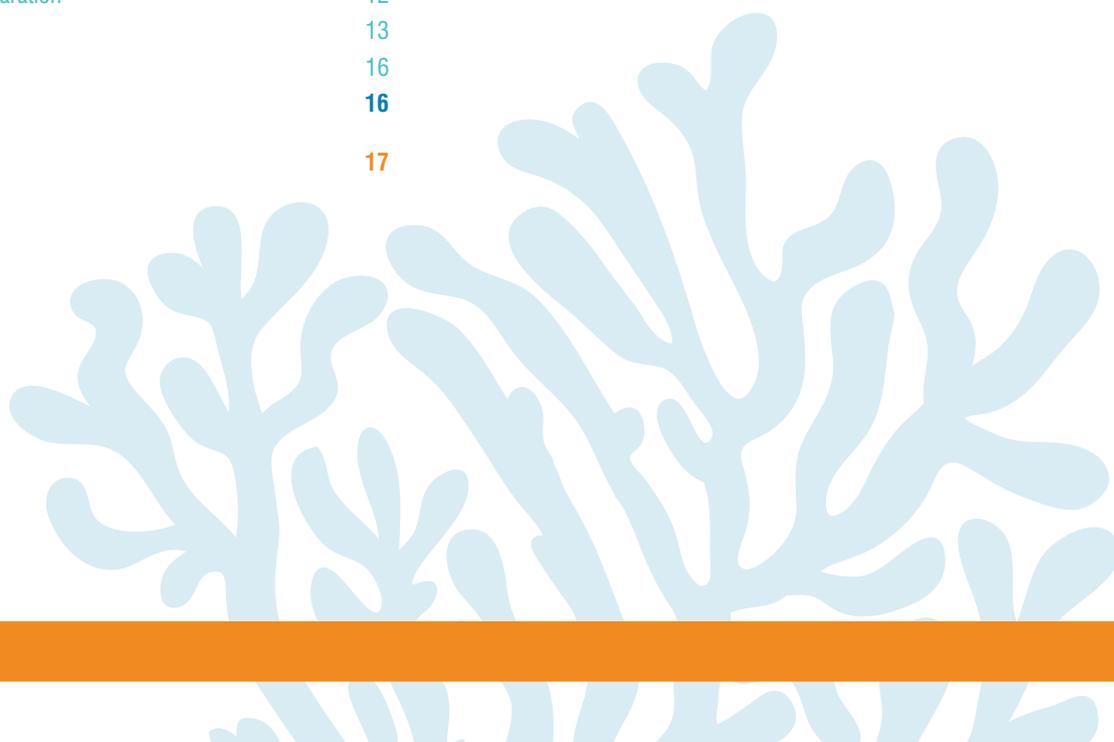
SESAMME

Socio-ecological Systems App
for Mental Model Elicitation

More information

CCRES

# Using the SESAMME app:

Scripts for guiding focus group discussions

# Contents

# Introduction

SESAMME (Socio-Ecological Systems App for Mental Model Elicitation) is a group model building tool. It is used within focus group discussions according to a script that outlines the discussion procedure. SESAMME, and its associated scripts, were designed to assist group discussions about coastal zone management problems (such as fish catch decline) and to capture information about components of these problems (such as resources, activities, pressures and decisions) from participants and help visualise how these components interact.

This document outlines scripts that can be used with SESAMME to conduct group model building sessions. Before we look at these scripts, it is important to understand what group model building is and what it involves.

## What is group model building?

Group model building (GMB) is a participatory method for involving people in a modelling process. It can be used within organisations (such a private companies or government departments) or with communities and the general public.

## What is the purpose of group model building?

Solving problems within systems involves:

1. Integrating knowledge from multiple sources and multiple people
2. Developing a shared understanding of how the problem arose and how it can be solved (a common dynamic hypothesis)
3. Changing long-held mental models (perceptions) that may be contributing to the problem

By developing models with groups of people:

1. The knowledge and perspectives of several people can be shared and integrated
2. A common understanding of how the problem arose and how it can be solved can be formed
3. Trust in the dynamic hypothesis can be built because people can see how they have contributed to its development
4. This trust in the dynamic hypothesis can lead to changes in mental models and increase the likelihood that solutions or insights identified through the modelling process will be implemented

## What is required for good group model building?

Before conducting group model building sessions with SESAMME, it is important that you understand the ingredients of good group model building. These are:

1. Teamwork: Group model building sessions are best conducted by teams rather than individuals. The high work load in facilitating group discussion, building a model and taking notes makes group model building difficult for individuals to do. A group model building team usually consists of:
   a. Facilitator: to lead the session and facilitate group discussion.
   b. Modeller/iPad Driver: to convert the group discussion into a model and display this back to the participants. The modeller/iPad Driver is the person that will use SESAMME during a group model building session.
   c. Recorder: to take notes and record the group discussion for later reference
   d. Runner: to assist all team members

2. A visual representation of the model: These are two- or three-dimensional word sparse representations (e.g., diagrams with few words) that are sufficient for participants to show key factors and the relationships between them. SESAMME was built as a visual representation tool that can be used for group model building.

3. A script: This is a document outlining a logical series of steps or exercises that the group model building session will follow in order to achieve outputs. The activities or steps within a script usually fall within four categories:
   a. Divergent: designed to produce an array of different ideas (e.g. brainstorming)
   b. Convergent: designed to categorise or cluster ideas
   c. Evaluative: designed to choose between options
   d. Presentation: designed to update or educate participants

   Scripts usually contain a sequence of divergent and convergent activities.

4. Participants: The participants that you involve in a group model building session depends on the problem you hope to address. Usually a stakeholder analysis is needed beforehand. This identifies those groups of people affected by the problem and those groups of people affecting the problem, both directly and indirectly. It is generally best to engage these groups of people in separate group model building sessions so that the discussion can be frank and open. For example, you wouldn't involve illegal fishers and police in the same session when investigating the problem of fish catch decline!

# SESAMME scripts

There are three scripts to use with SESAMME in the group model building process:

1. **Script one – SESAMME Map Development:** This is used to conduct the first group model building session with participants. The purpose of the first group model building session is to capture the mental model of participants and to develop a visual representation, or SESAMME map, that describes a problem of interest (such as fish catch decline).

   You may conduct group model building sessions with multiple participant groups that focus on the same problem of interest. For example, you may conduct a group model building session with 10 villages in a community to explore the problem of fish catch decline. This would result in 10 SESAMME maps (visual representations), one for each village. By comparing these maps you might find that some villages identified activities, resources or pressure relating to the fish catch decline problem that other villages did not. For example, 8 out of 10 villages identified bomb fishing as an activity while 2 villages didn't (you can use the results analysis functions within SESAMME to extract statistics from across multiple SESAMME maps). Using the editing and track changes functions within SESAMME, you can edit the SESAMME map produced by each village. You might decide to add bomb fishing to the maps of those 2 villages that did not identify it and take the edited maps back to your participant groups for discussion and review.

*Script two* outlines the procedure for editing SESAMME maps before conducing a second group model building session with your participants.

*Script three* outlines the procedure for conducting the second group model building session with your participants to review edits that you have made to SESAMME maps produced in the first group model building session.

2. **Script two – SESAMME Map Update:** This is used produce an updated SESAMME map for a specific problem ready for review in a second group model building session with the same participants that attended the first session.

3. **Script three – SESAMME Map Review:** This is used to conduct a second group model building session with the same participants that attended the first. The purpose of the second session is to review any edits made to the visual representation, or SESAMME map, that was developed in the first session.

*Note: In the SESAMME scripts that follow, a group model building session is referred to as a focus group discussion or FGD. A core modelling team refers to the team that will be conducting the FGD and is usually made up for four people (a Facilitator, a Modeller/iPad Driver, a Recorder and a Runner)*

# Script One – SESAMME Map Development

## Preparation and requirements

**Context:** First focus group discussion (FGD) with participants

**Purpose:** To develop a SESAMME map for a specific problem and location that reflects the knowledge of participants

**Status:** Working script

**Primary nature of group task:** Convergent

**Time:** 2 to 3 hours

**Materials:**

*Essential:*

- iPad (charged)
- SESAMME app
- Data projector
- Projection screen
- Refreshments
- Pen and paper or a laptop for the Recorder
- Focus group activity schedule (to be posted on the wall at the beginning of the FGD)
- Internet connection (the background geographic map used in SESAMME works in a similar way to Google maps and requires an internet connection to download)

*Desirable:*

- Voice recorder
- Video recorder
- Digital camera

**Inputs:** None – this is the first FGD

**Outputs:** SESAMME map for a problem

## Roles

1. Facilitator (this is the person who will lead the FGD and facilitate group discussion; it is recommended that at least 2 people on the core modelling team co-facilitate the FGD to avoid facilitation fatigue)
2. iPad Driver (this is the Modeller who will use SESAMME during the FGD)
3. Recorder (this is the person who will take notes and/or manage audio-visual recording during the FGD)
4. Runner (this is the person will assist the other core modelling team members)

## Steps

### A. Pre Focus Group Preparation

1. Core modelling team familiarises themselves with the problem that the focus group will address for the villages that they will visit (use existing environmental and socio-economic data to do this)
2. Make a focus group activity schedule poster that includes each activity that will be conducted within the focus group, the duration of each activity and the facilitator for each activity
3. Core modelling team rehearse this script before conducting actual FGDs
4. iPad Driver: check and update the iPad software (i.e. iOS and SESAMME updates) and the geographic maps within SESAMME (includes zooming into fine detail within the area that the focus group will discuss) before running a focus group, check the status of the iPad and projector (i.e. brightness and contrast of the projector, power of the devices). Bring portable WI-FI device (such as internet dongle) in case the geographic maps within SESAMME need updating.
5. Have backup materials and a backup focus group plan in case the iPad, projector or SESAMME fail (prepare visual materials)
6. Make sure invitations and participant information sheets have been sent to participants

### B. Actual Focus Group

1. **Focus group introduction:** to provide context for the focus group
   a. Facilitator welcomes participants and asks them to individually introduce themselves
   b. Facilitator introduces the core modelling team (who is the facilitator, recorder, iPad Driver, runner etc.)
   c. Facilitator explains the project information sheet (may have to read out the project information sheet if there are participants that have difficulty reading) and emphasises that participation in a focus group is voluntary and that the results of the focus group will remain strictly confidential (the project information sheet should be attached to the front of the attendance/registration folder passed around to participants)
   d. Facilitator explains the ethical rights of participants
   e. Facilitator explains the purpose of the focus group, the focus group schedule and the expected outputs of the focus group (use the focus group activity schedule poster to assist with this)

f. Facilitator asks participants for permission to use voice and/or video recording

g. Facilitator explains that an iPad app called SESAMME will be used in the focus group

h. Facilitator provides a brief overview of the focus group topic using existing information available for the study area/village (such as fish catch trends)

i. iPad Driver opens SESAMME and logs in. iPad Driver then completes the focus group information page in SESAMME while the Facilitator is introducing the focus group or before the focus group commences

2. **Problem:** provides the focus of the meeting

   a. Recorder turns on voice and/or video recording if permitted

   b. Facilitator describes the problem that the focus group will explore (such as fish catch decline) if this wasn't already done in the introduction

   c. Facilitator asks participants to comment on the problem description and clarify any questions that participants may have

3. **Activities:** mapping resource use activities (such as fishing, farming, harvesting timber, hotel development, dumping of waste, etc.)

   a. iPad Driver opens a blank map in SESAMME in the Activity menu, and turns on satellite view so that landmarks are visible

   b. Facilitator asks participants to validate the map shown in SESAMME and identifying landmarks and other points of references

   c. Facilitator asks participants to identify the activities that influence the problem and where they are located (these can include exploitative activities such as fishing or mangrove cutting, or conservation activities such policing of no take zones or replanting of mangroves)

   d. iPad Driver adds the activities to the map using the appropriate icons

   e. Facilitator recaps and validates the mapped activities that influence the problem with participants

   f. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

4. **Resources:** mapping resources (such as fish, mangroves, seagrass, coral reefs, water sources, farm land, tourist attractions, etc).

   a. iPad Driver switches to Resources menu and leaves satellite view on so that landmarks are visible

   b. Facilitator selects one activity and asks participants to identify resources affected by that activity and the location of these

   c. iPad Driver adds the resources to the map using the appropriate icons

   d. Facilitator asks participants to rate the current amount/ condition of the resources using traffic lights (green = good, orange = moderate, red = poor)

   e. iPad Driver sets the traffic light condition for each resource location using the 'state' function in SESAMME

   f. Repeat steps b to e for all activities until participants are satisfied that the resources affected by each activity have been mapped and their current amount/ condition rated

   g. Facilitator recaps and validates the mapped resources with participants

   h. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

5. **Trends in activities and resources:** past, expected future and desired future trends in activities and resources

   a. iPad Driver switches to the Trends menu, turns off satellite view and uses plain map view

   b. Trends in activities

      i. iPad Driver goes to Trends menu and hides all icons except for activities

      ii. Facilitator selects one activity and asks participants to identify a trend that best matches the **past** trend (for the last 5 to 10 years) in the amount of that activity

      iii. iPad Driver adds the appropriate **past** trend icon to that activity

      iv. Facilitator asks participants to identify a trend that best matches the **expected future** trend (for the next 5 to 10 years) in the amount of that activity

      v. iPad Driver adds the appropriate **future** trend icon to that activity

      vi. Facilitator asks participants to identify a trend that best matches the **desired future** trend (for the next 5 to 10 years) in the amount of that activity

      vii. iPad Driver adds the appropriate **desired future** trend icon to that activity

      viii. Repeat steps ii to vii for all activities

      ix. Facilitator recaps and validates the trends with participants

      x. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

   c. Trends in resources

      i. iPad Driver goes to Trends menu and hides all icons except for resources

      ii. Facilitator selects one resource and asks participants to identify a trend that best matches the **past** trend (for the last 5 to 10 years) in the condition or amount of that resource

      iii. iPad Driver adds the appropriate **past** trend icon to that resource

iv. Facilitator asks participants to identify a trend that best matches the **expected future** trend (for the next 5 to 10 years) in the condition or amount of that resource

v. iPad Driver adds the appropriate **future** trend icon to that resource

vi. Facilitator asks participants to identify a trend that best matches the **desired future** trend (for the next 5 to 10 years) in the condition or amount of that resource

vii. iPad Driver adds the appropriate **desired future** trend icon to that resource

viii. Repeat steps ii to vii for all resources

ix. Facilitator recaps and validates the trends with participants

x. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

6. **Pressures influencing past trends in activities and resources:** mapping pressures affecting past trends in activities and resources (such as population growth, tourism growth, economic or financial pressures, pollution, climate change, etc.)

   a. iPad Driver selects the Pressures menu and turns on satellite view so that landmarks are visible

   b. Pressures affecting past trends in activities

      i. iPad Driver hides all icons except for activities

      ii. Facilitator selects one activity and asks participants if any pressures have influenced the past trend in that activity

      iii. If the answer is yes, the Facilitator asks participants to identify those pressures and also asks participants if the pressures are local or external

      iv. If a pressure is a local pressure, Facilitator asks participants where the pressure is located

      v. iPad Driver adds the pressure to the map using the appropriate icon

      vi. If a pressure is external, iPad Driver adds the pressure to the map using the appropriate icon and sets it as an exogenous pressure

      vii. Repeat steps ii to vi for all activities until participants are satisfied that all pressures influencing past trends in activities have been mapped

      viii. Facilitator recaps and validates the mapped pressures with participants

      ix. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

   c. Pressures affecting past trends in resources

      i. iPad Driver hides all icons except for resources

      ii. Facilitator selects one resource and asks participants if any pressures have influenced the past trend in that resource

      iii. If the answer is yes, the Facilitator asks participants to identify those pressures and also asks participants if the pressures are local or external

      iv. If a pressure is a local pressure, Facilitator asks participants where the pressure is located

      v. iPad Driver adds the pressure to the map using the appropriate icon

      vi. If a pressure is external, iPad Driver adds the pressure to the map using the appropriate icon and sets it as an exogenous pressure

      vii. Repeat steps ii to vi for all resources until participants are satisfied that all pressures influencing past trends in resources have been mapped

      viii. Facilitator recaps and validates the mapped pressures with participants

      ix. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

7. **Trends in pressures:** past, expected future and desired future trends in pressures

   a. iPad Driver selects the Trends menu, turns off satellite view and uses plain map view

   b. iPad Driver hides all icons except for pressures using the green button in the right-side menu

   c. Facilitator selects one pressure and asks participants to identify a trend that best matches the **past** trend (for the last 5 to 10 years) in the amount of that pressure

   d. iPad Driver adds the appropriate past trend icon to that pressure

   e. Facilitator asks participants to identify a trend that best matches the **expected future** trend (for the next 5 to 10 years) in the amount of that pressure

   f. iPad Driver adds the appropriate **future** trend icon to that pressure

   g. Facilitator asks participants to identify a trend that best matches the **desired future** trend (for the next 5 to 10 years) in the amount of that pressure

   h. iPad Driver adds the appropriate desired future trend icon to that pressure

   i. Repeat steps c to h for all pressures

   j. Facilitator recaps and validates the trends with participants

   k. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

8. **Interactions:** mapping direct interactions between resources, activities and pressures (The interactions highlighted in orange are priority interactions, so if the focus group is going over time then the identification of interactions can be limited to these priority interactions):

   a. iPad Driver selects the Interactions menu, turns off satellite view and uses plain map view

**b.** Direct interactions between resources and resources (for example, the amount/condition of coral reefs may influence the amount/condition of fish):

i. iPad Driver goes to the Interactions menu and hides all icons except for resources (i.e. toggles off Activities, Pressures, Trends and Decisions)

ii. Facilitator selects one resource and asks participants if the amount/condition of this resource directly affects the amount/condition of any other resources (for example, does the amount/condition of coral reefs affect the amount of fish)

iii. If the answer is yes, the iPad Driver adds arrows (Arcs) from the resource to the affected resources

iv. Facilitator then explains interaction polarity to participants using visual aids to show what "+" and "-" mean (plus means cause and affect move in the same direction; minus means cause and effect move in opposite directions)

v. Facilitator asks participants to assign a polarity for each interaction that has been added and the reason for assigning each polarity

vi. iPad Driver adds these polarities along with a short description for why a particular polarity was assigned to each interaction

vii. Repeat steps ii to vi for all resources until participants are satisfied that all direct interactions between resources have been identified

viii. Facilitator recaps and validates the interactions with participants

ix. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

**c.** Direct interactions between activities and resources (for example, fishing activity may affect the amount of fish):

i. iPad Driver hides all icons except for resources and activities (i.e. toggles off Pressures, Trends and Decisions)

ii. Facilitator selects one activity and asks participants if this activity directly affects the amount/condition of any resources (for example, does the amount of fishing affect the amount of fish)

iii. If the answer is yes, the iPad Driver adds arrows (Arcs) from the activity to the affected resources

iv. Facilitator then asks participants if the amount/condition of any of the resources directly affects the activity (for example, does the amount of fish affect the amount of fishing)

v. If the answer is yes, the iPad Driver adds arrows (Arcs) from the resources to the affected activity

vi. Facilitator then explains interaction polarity to participants using visual aids to show what "+" and "-" mean (plus means cause and affect move in the same direction; minus means cause and effect move in opposite directions)

vii. Facilitator asks participants to assign a polarity for each interaction that has been added and the reason for assigning each polarity

viii. iPad Driver adds these polarities along with a short description for why a particular polarity was assigned to each interaction

ix. Repeat steps ii to viii for all activities until participants are satisfied that all direct interactions between activities and resources have been identified

x. Facilitator recaps and validates the interactions with participants

xi. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

**d.** Direct interactions between activities and pressures (for example, population growth may affect the amount for fishing activity, or household debt/poverty may affect the amount of fishing activity):

i. iPad Driver hides all icons except for activities and pressures (i.e. toggles off Resources, Trends and Decisions)

ii. Facilitator selects one pressure and asks participants if this pressure directly affects any activities (for example, does population affect the amount of fishing)

iii. If the answer is yes, the iPad Driver adds arrows (Arcs) from the pressure to the affected activities

iv. Facilitator then asks participants if any activities directly affects the pressure (for example, does the amount of fishing affect population)

v. If the answer is yes, the iPad Driver adds arrows (Arcs) from the activities to the affected pressure

vi. Facilitator then explains interaction polarity to participants using visual aids to show what "+" and "-" mean (plus means cause and affect move in the same direction; minus means cause and effect move in opposite directions)

vii. Facilitator asks participants to assign a polarity for each interaction that has been added and the reason for assigning each polarity

viii. iPad Driver adds these polarities along with a short description for why a particular polarity was assigned to each interaction

ix. Repeat steps ii to viii for all pressures until participants are satisfied that all direct interactions between pressures and activities have been identified

x. Facilitator recaps and validates the interactions with participants

xi. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

**e.** Direct interactions between pressures and resources (for example, climate change or pollution may affect the amount/condition of coral reefs):

  i.  iPad Driver hides all icons except for pressures and resources (i.e. toggles off Activities, Trends and Decisions)

  ii.  Facilitator selects one pressure and asks participants if this pressure directly affects any resources (for example, does pollution affect the amount/condition of coral reefs?)

  iii.  If the answer is yes, the iPad Driver adds arrows (Arcs) from the pressure to the affected resources

  iv.  Facilitator then asks participants if the amount/condition of any resources directly affects the pressure (for example, does the amount/condition of coral reefs affect the amount of pollution)

  v.  If the answer is yes, the iPad Driver adds arrows (Arcs) from the resources to the affected pressure

  vi.  Facilitator then explains interaction polarity to participants using visual aids to show what "+" and "-" mean (plus means cause and affect move in the same direction; minus means cause and effect move in opposite directions)

  vii.  Facilitator asks participants to assign a polarity for each interaction that has been added and the reason for assigning each polarity

  viii.  iPad Driver adds these polarities along with a short description for why a particular polarity was assigned to each interaction

  ix.  Repeat steps ii to viii for all pressures until participants are satisfied that all direct interactions between pressures and resources have been identified

  x.  Facilitator recaps and validates the interactions with participants

  xi.  iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

**f.** Direct interactions between activities and activities (for example, the amount of farming may affect the amount of fishing):

  i.  iPad Driver goes to the interactions menu and hides all icons except for activities (i.e. toggles off Resources, Pressures, Trends and Decisions)

  ii.  Facilitator selects one activity and asks participants if the amount of this activity directly affects the amount of any other activities (for example, does the amount of farming affect the amount of fishing?)

  iii.  If the answer is yes, the iPad Driver adds arrows from the activity to the affected activities

  iv.  Facilitator then explains interaction polarity to participants using visual aids to show what "+" and "-" mean (plus means cause and affect move in the same direction; minus means cause and effect move in opposite directions)

  v.  Facilitator asks participants to assign a polarity for each interaction that has been added and the reason for assigning each polarity

  vi.  iPad Driver adds these polarities along with a short description for why a particular polarity was assigned to each interaction

  vii.  Repeat steps ii to vi for all activities until participants are satisfied that all direct interactions between activities have been identified

  viii.  Facilitator recaps and validates the interactions with participants

  ix.  iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

**g.** Direct interactions between pressures and pressures (for example, population growth may affect the amount of pollution):

  i.  iPad Driver goes to the interactions menu and hides all icons except for pressures (i.e. toggles off Resources, Activities, Trends and Decisions)

  ii.  Facilitator selects one pressure and asks participants if the amount of this pressure directly affects the amount of any other pressures (for example, does the population affect the amount of pollution?)

  iii.  If the answer is yes, the iPad Driver adds arrows from the pressure to the affected pressures

  iv.  Facilitator then explains interaction polarity to participants using visual aids to show what "+" and "-" mean (plus means cause and affect move in the same direction; minus means cause and effect move in opposite directions)

  v.  Facilitator asks participants to assign a polarity for each interaction that has been added and the reason for assigning each polarity

  vi.  iPad Driver adds these polarities along with a short description for why a particular polarity was assigned to each interaction

  vii.  Repeat steps ii to vi for all pressures until participants are satisfied that all direct interactions between pressures have been identified

  viii.  Facilitator recaps and validates the interactions with participants

  ix.  iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

**9. Decisions:** what decisions or changes could address problematic trends in resources?

  **a.**  iPad Driver turns off satellite view and uses plain map view

  **b.**  iPad Driver goes to Interactions menu and hides all icons except for resources

  **c.**  Facilitator asks participants to identify those past resource trends that they are worried about and takes note of these

d. iPad Driver then selects the Decisions menu

e. Facilitator selects one problematic trend identified by participants and asks them what decisions could they make to address this trend and what activities or pressures would these decisions directly affect

f. If any decisions are identified the iPad Driver adds and names decision icons to represent these decisions and adds arrows from them to the appropriate activities and pressures that they affect

g. Facilitator then explains interaction polarity to participants using visual aids to show what "+" and "-" mean (plus means cause and affect move in the same direction; minus means cause and effect move in opposite directions)

h. Facilitator asks participants to assign a polarity for each interaction that has been added and the reason for assigning each polarity

i. iPad Driver adds these polarities along with a short description for why a particular polarity was assigned to each interaction

j. Repeat steps e to i for all problematic trends

k. Facilitator recaps and validates the decisions with participants

l. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

## C. Post Focus Group

1. iPad Driver makes a backup of the SESAMME map file (.sme file) and any photos of the iPad screen taken during the focus group. If you go into your iPad settings, then iCloud, then Photos, you can turn on "iCloud photo library" and "Upload to My Photo Stream". This will automatically upload any photos that you take on your iPad to your iCloud account. If you have a PC, you can install iCloud for Windows and download photos from your iCloud account to your PC

2. Recorder makes a backup of any video recordings, voice recordings or typed notes taken during the focus group

# Evaluation criteria

A SESAMME map that accurately represents participant knowledge about the problem

**Authors:** Carl Smith and Russell Richards
**History:** Version 3.0, 23 January 2018
**References:** None
**Appendices:** None

# Script Two – SESAMME Map Update

## Preparation and requirements

**Context:** Preparation for a second focus group discussion (FGD) with participants

**Purpose:** To produce an updated SESAMME map for a specific problem and location ready for participant review

**Status:** Working script

**Primary nature of group task:** Convergent

**Materials:**

*Essential:*

- iPad
- SESAMME app

**Inputs:** An original SESAMME map developed by a participant group for a specific problem at a specific location during the first of focus group discussion

**Outputs:** An updated SESAMME map developed by the core modelling team for the same specific problem and location

## Steps

The intent of producing an updated SESAMME map is not to build a completely new map from scratch, rather it is to modify an existing map produced by a focus group in order to improve the explanation of the problem for that location. This may involve changes to resources, activities, pressures, decisions or interactions in the original map. The changes that are possible include:

1. Resources: additions, deletions, name changes, changes in trends, changes in state
2. Activities and Pressures: additions, deletions, name changes, changes in trends
3. Decisions: additions, deletions, name changes
4. Interactions: additions, deletions, polarity changes

These changes could mean that when producing an updated SESAMME map:

1. Omissions are added: these could be missing resources, activities, pressures, decisions or interactions
2. Corrections are made: these could be corrections to interactions and interaction polarities, or corrections to the names, location and trends of resources, activities and pressures
3. Feedback loops are identified: these could be the addition or identification of reinforcing and balancing loops that were previously overlooked but are important to system behaviour

### Identifying possible omissions:

1. Possible omissions can be identified by looking at the results from multiple focus groups and identified frequently occurring resources, activities, pressures, decisions or interactions. This can be done using the diagnostic functions in SESAMME, which can provide information on how frequently particular resources, activities, pressures, decisions and interactions occur across multiple SESAMME maps. For example, say 10 focus groups were conducted on the problem of water pollution, and in 9 of those 10 focus groups, population growth was recorded as a pressure. This indicates that population growth is a possible omission from the SESAMME map produced by the focus group that didn't identify it as a pressure. Population growth is then something that could be added to the updated SESAMME map and discussed with that group of participants in a second focus group to confirm whether it is a pressure or not.
2. Possible omissions can be identified by using the results of previous studies.

### Identifying corrections:

1. Corrections can also be identified by looking at the results from multiple focus groups and the diagnostic functions in SESAMME can help with this. For example, say a common interaction identified was the link between charcoal production and mangroves. In most focus groups this interaction was given a negative polarity, meaning that if charcoal production increases, mangrove amount decreases. However, in one focus group the interaction was given a positive polarity, meaning that if charcoal production increases, mangrove amount increases. This indicates a possible mistake in logic that can be corrected in the updated SESAMME map and then discussed with that group of participants in a second focus groups.
2. Corrections can be identified by checking the logic in the SESAMME map. Logic checks include:
   a. Direct and indirect interactions: For example, a focus group may have identified population growth or tourism growth as directly affecting mangrove loss, and they may have also identified charcoal production or hotel development as directly affecting mangrove loss. However, a more logical explanation might be that population growth affects charcoal production, which in turn affects mangrove loss. In other words, population growth or tourism growth don't directly affect mangrove loss, they indirectly affect mangrove loss via charcoal production and hotel development.

**b.** Interaction polarities: Polarities can be positive or negative. A positive polarity means that cause and effect move in the same direction. A negative polarity means that cause and effect move in opposite directions. Polarities are only relevant for a pair of variables (one cause and one affect). Checking the logic of polarities may identify corrections.

**c.** Feedback loops: A feedback loop occurs when a chain of cause and effect interactions creates a loop so that if you start anywhere within the loop, and follow the chain of interactions, you will come back to the same point where you started. Figure i does not contain any feedback loops. Figure ii contains two feedback loops.
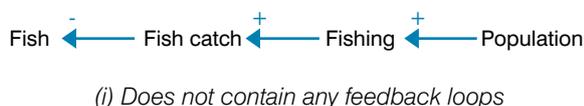


*(i) Does not contain any feedback loops*
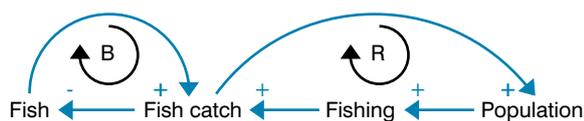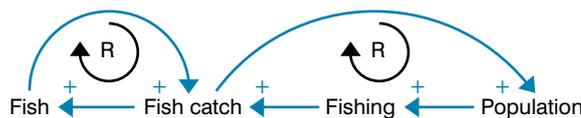


*(ii) Contains two feedback loops*

To complete feedback loops you may have to use intermediate variables. These are variables that are not resources, activities, pressures or decisions, but are important to explaining how a feedback loop works. For instance, the variable 'Fish catch' in Figure ii is an intermediate variable and explains why a change if fishing would feed back to affect population. In SESAMME a new category of variables called 'miscellaneous' has been added so that you can add intermediate variables to your updated SESAMME maps.

There can be two types of feedback loop: Reinforcing or Balancing:

i. A reinforcing loop means: if a variable in the loop **increases** and you follow the loop around, that variable will **increase** again; OR if a variable in the loop **decreases** and you follow the loop around, that variable will **decrease** again. A reinforcing loop has NO negative polarities OR an EVEN number of negative polarities.

ii. A balancing loop means: if a variable in the loop **increases** and you follow the loop around, that variable will **decrease** again; OR if a variable in the loop **decreases** and you follow the loop around, that variable will **increase** again. A balancing loop has an ODD number of negative polarities.

Checking the feedback loops in a SESAMME map can help to identify:

i. Corrections in interactions: these are direct interactions that should be indirect or indirect interactions that should be direct.

ii. Corrections in polarities: these are positive polarities that should be negative and negative polarities that should be positive.

iii. Incorrect feedback loops: These are reinforcing loops that should be balancing and balancing loops that should be reinforcing. Figure iii is an example containing an incorrect feedback loop. The loop between 'fish catch' and 'fish' contains polarities that make it reinforcing, that is, if fish catch increases the number of fish will increase, which in turn increases fish catch. The logic of this loop does not make sense and you would expect the polarity between fish catch and fish to be negative, making the loop a balancing loop.



*(iii) Incorrect feedback loop between fish catch and fish*

**3.** Corrections can be identified by using the results of previous studies.

## Identifying feedback loops:

SESAMME maps may not contain feedback loops or not contain many feedback loops. If this is the case then you should check if feedback loops have been omitted. A few principles can help in the identification of feedback loops:

**1.** Use the known behaviour of the system to identify loops: System behaviour can come from the past and expected future trend graphs that participants have identified for activities, resources and pressures, or trend information that you have from other data sets or studies. If trend information shows growth over time then this indicates that one or more reinforcing loops must be present within the system. If trend information shows growth slowing over time, goal seeking behaviour, oscillations or collapse then this indicates that one or more balancing loops must be present within the system.

**2.** Use limits to growth: The principle of limits to growth means that nothing can grow forever. For example, population cannot increase indefinitely and at some point in time balancing loops will limit growth. Identifying limits to growth in a system can help to identify balancing loops.

3. Use system archetypes: If you believe that your system should display behaviour similar to a system archetype then use these archetypes to identify possible feedback loops. The main archetypes are:

   a. Fixes that fail

   b. Shifting the burden

   c. Limits to success (growth)

   d. Drifting goals

   e. Escalation

   f. Success to the successful

   g. Tragedy of the commons

## Evaluation criteria

An updated SESAMME map ready for review by participants in a second focus group.

**Authors:** Carl Smith and Russell Richards

**History:** Version 2.0, 24 January 2018

**Revisions:** None

**References:** None

**Appendices:** None

# Script Three – SESAMME Map Review

## Preparation and requirements

**Context:** Second focus group discussion (FGD) with participants

**Purpose:** To review an updated SESAMME map for the same problem and location discussed in the first focus group

**Status:** Working script

**Primary nature of group task:** Convergent

**Time:** 2 to 3 hours

**Materials:**

*Essential:*
- iPad (charged)
- SESAMME app
- Data projector
- Projection screen
- Refreshments
- Pen and paper or a laptop for the Recorder
- Focus group activity schedule (to be posted on the wall at the beginning of the FGD)
- Internet connection (the background geographic map used in SESAMME works in a similar way to Google maps and requires an internet connection to download)

*Desirable:*
- Voice Recorder
- Video Recorder
- Digital Camera

**Inputs:**

1. The original SESAMME map developed by participants for problem and location discussed at the first focus group
2. An updated SESAMME map developed by the core modelling team for the same problem location discussed at the first focus group

**Outputs:**

Revised SESAMME map for a problem at a specific location

## Roles

1. Facilitator (this is the person that will lead the FGD and facilitate group discussion; it is recommended that at least 2 people on the core modelling team co-facilitate the FGD to avoid facilitation fatigue)
2. iPad Driver (this is the Modeller that will use SESAMME during the FGD)
3. Recorder (this is the person that will take notes and/or manage audio-visual recording during the FGD)
4. Runner (this is the that will assist the other core modelling team members)

## Steps

### A. Pre Focus Group Preparation

1. Core modelling team have the original SESAMME map developed in the first focus group for the problem and location
2. Core modelling team have prepared an updated SESAMME map (using **edit mode** in SESAMME) to compare with the original SESAMME map. Ensure that you save the updated SESAMME map as a separate file so that the original SESAMME map remains unchanged
3. iPad Driver: check and update the iPad software (i.e. iOS and SESAMME updates) and the geographic maps within SESAMME (includes zooming into fine detail within the area that the focus group will discuss) before running a focus group, check the status of the iPad and projector (i.e., brightness and contrast of the projector, power of the devices). Bring portable WI-FI device (such as internet dongle) in case the geographic maps within SESAMME need updating
4. Have backup materials and a backup focus group plan in case the iPad, projector or SESAMME fail (prepare visual materials)
5. Make sure invitations and participant information sheets have been sent to participants

Other important points for focus group preparation:

1. Participants who didn't participate in the first focus group can attend as observers
2. Remember that the purpose of this focus group is to review updates that have been made to original SESAMME map produced in the first focus group discussion. These updates have been made based on additional information obtained by the modelling team (such as the results of other focus group discussions and the findings of other studies that have been conducted). Make sure that you focus the attention of participants on edits and changes that you have made to the updated SESAMME map. Don't try to review the entire SEAMME map again; use the **highlight** function within SESAMME to draw the attention of participants to the changes that you have made in the updated SESAMME map and discuss these changes: when discussing the updated SESAMME map, show the original map first (you can toggle to **original** to do this) to remind participants of what they did, then go into **highlight** to show the changes that have been

made; you can record an explanation for each change in SESAMME to remind you of why changes were made (you can use the **notes** function in SESAMME for this) and you can discuss the reasons for changes with participants

3. Add feedback loops to your updated SESAMME map before you conduct the focus group discussion (reinforcing and balancing loop icons are available on the **interactions** page). You can also prepare a poster that summarises the important feedback loops in the system so that it easy to explain to participants. Alternatively you can prepare your feedback loop diagram in Vensim that you can project via a data projector. Vensim is software that can be used to draw feedback loop diagrams and is available from http://vensim.com/

4. Relate decisions to intervention points within the loops of your feedback loop diagram

## B. Actual Focus Group

1. **Focus group introduction:** to provide context for the focus group

   a. Facilitator welcomes participants and asks them to individually introduce themselves

   b. Facilitator introduces the core modelling team (who is the Facilitator, Recorder, iPad Driver, Runner etc.)

   c. Facilitator provides a brief reminder of what was done in the first FGD

   d. Facilitator explains the purpose of the focus group and the expected outputs of the focus group. Remember that the purpose is to review updates that have been made to the original SESAMME map produced in the first focus group discussion. These updates have been made based on additional information obtained by the core modelling team (such as the results of other focus group discussions and the findings of other studies that have been conducted)

   e. Facilitator asks participants for permission to use voice and/or video recording

   f. Facilitator explains that an iPad app called SESAMME will be used in the focus group

   g. iPad Driver opens SESAMME and logs in. iPad Driver then completes the focus group information page in SESAMME while the Facilitator is introducing the focus group or before the focus group commences

   h. iPad Driver loads the updated SESAMME map and switches on **edit mode**

2. **Review Problem:** provides the focus of the meeting

   a. Recorder turns on voice and/or video recording if permitted

   b. Facilitator describes the problem that was explored in the first focus group if this wasn't already done in the introduction

   c. iPad Driver switches to **original** to show what was developed in the first focus group

d. Facilitator provides a brief overview of the original SESAMME map to remind participants of what they did (highlighting the key activities, resources and pressures)

   e. Facilitator explains that the aim of this focus group is to compare the original SESAMME map with an updated SESAMME map that has been updated using information and ideas collected from several focus groups that looked at the same problem but in different locations

   f. Facilitator explains that changes made in the updated SESAMME map may be modifications to activities, resources, pressures, decisions, trends, links or link polarities. Changes may also include the addition of feedback loops that weren't in the original SESAMME map

   g. Facilitator explains that the original SESAMME map will be compared with the updated SESAMME map by comparing differences in activities, resources, pressures, decisions, trends, links and link polarities. During the comparison the Facilitator will explain why changes were made and participants will have the opportunity to comment on these changes and suggest further changes. These further changes will be added to the updated SESAMME map

3. **Review Activities:**

   a. iPad Driver switches to **highlight** and hides all icons except for activities

   b. iPad Driver **hides arcs and trends**

   c. The activities that have been modified from the original SESAMME map will be highlighted to indicate additions, deletions, name changes or changes in trends

   d. Facilitator explains any modifications to activities that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

   e. Facilitator asks participants if they wish to comment on any of the changes that have been made

   f. iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

   g. iPad Driver **displays trends**

   h. Facilitator explains any modifications to activity trends that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

   i. Facilitator asks participants if they wish to comment on any of the changes that have been made

   j. iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

   k. iPad Driver switches to **edit** to show participants what the updated SESAMME map now looks like

   l. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

**4. Review Resources:**

   **a.** iPad Driver switches to **highlight** and hides all icons except for resources

   **b.** iPad Driver **hides arcs and trends**

   **c.** The resources that have been modified from the original SESAMME map will be highlighted to indicate additions, deletions, name changes, changes in trends or changes in state

   **d.** Facilitator explains any modifications to resources that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

   **e.** Facilitator asks participants if they wish to comment on any of the changes that have been made

   **f.** iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

   **g.** iPad Driver **displays trends and states**

   **h.** Facilitator explains any modifications to resource trends and states that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

   **i.** Facilitator asks participants if they wish to comment on any of the changes that have been made

   **j.** iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

   **k.** iPad Driver switches to **edit** to show participants what the updated SESAMME map now looks like

   **l.** iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

**5. Review Pressures:**

   **a.** iPad Driver switches to **highlight** and hides all icons except for pressures

   **b.** iPad Driver **hides arcs and trends**

   **c.** The pressures that have been modified from the original SESAMME map will be highlighted to indicate additions, deletions, name changes or changes in trends

   **d.** Facilitator explains any modifications to pressures that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

   **e.** Facilitator asks participants if they wish to comment on any of the changes that have been made

   **f.** iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

   **g.** iPad Driver **displays trends**

   **h.** Facilitator explains any modifications to pressure trends that have been made and why these changes

were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

   **i.** Facilitator asks participants if they wish to comment on any of the changes that have been made

   **j.** iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

   **k.** iPad Driver switches to **edit** to show participants what the updated SESAMME map now looks like

   **l.** iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

**6. Review Interactions:**

   **a.** iPad Driver selects the Interactions menu, turns off satellite view and uses plain map view

   **b.** Direct interactions between resources and resources:

      i. iPad Driver switches to **highlight** and hides all icons except for resources (i.e. toggles off Activities, Pressures, Trends and Decisions)

      ii. The interactions that have been modified from the original SESAMME map will be highlighted to indicate additions, deletions or polarity changes

      iii. Facilitator explains any modifications to interactions that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

      iv. Facilitator asks participants if they wish to comment on any of the changes that have been made

      v. iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

      vi. iPad Driver switches to **edit** to show participants what the updated SESAMME map now looks like

      vii. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

   **c.** Direct interactions between activities and resources:

      i. iPad Driver switches to **highlight** and hides all icons except for resources and activities (i.e. toggles off Pressures, Trends and Decisions)

      ii. The interactions that have been modified from the original SESAMME map will be highlighted to indicate additions, deletions or polarity changes

      iii. Facilitator explains any modifications to interactions that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

      iv. Facilitator asks participants if they wish to comment on any of the changes that have been made

      v. iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

      vi. iPad Driver switches to **edit** to show participants what the updated SESAMME map now looks like

vii. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

d. Direct interactions between activities and pressures:

i. iPad Driver switches to **highlight** and hides all icons except for activities and pressures (i.e. toggles off Resources, Trends and Decisions)

ii. The interactions that have been modified from the original SESAMME map will be highlighted to indicate additions, deletions or polarity changes

iii. Facilitator explains any modifications to interactions that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

iv. Facilitator asks participants if they wish to comment on any of the changes that have been made

v. iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

vi. iPad Driver switches to **edit** to show participants what the updated SESAMME map now looks like

vii. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

e. Direct interactions between pressures and resources:

i. iPad Driver switches to **highlight** and hides all icons except for pressures and resources (i.e. toggles off Activities, Trends and Decisions)

ii. The interactions that have been modified from the original SESAMME map will be highlighted to indicate additions, deletions or polarity changes

iii. Facilitator explains any modifications to interactions that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

iv. Facilitator asks participants if they wish to comment on any of the changes that have been made

v. iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in highlight)

vi. iPad Driver switches to **edit** to show participants what the updated SESAMME map now looks like

vii. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

f. Direct interactions between activities and activities:

i. iPad Driver switches to **highlight** and hides all icons except for activities (i.e. toggles off Resources, Pressures, Trends and Decisions)

ii. The interactions that have been modified from the original SESAMME map will be highlighted to indicate additions, deletions or polarity changes

iii. Facilitator explains any modifications to interactions that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

iv. Facilitator asks participants if they wish to comment on any of the changes that have been made

v. iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

vi. iPad Driver switches to **edit** to show participants what the updated SESAMME map now looks like

vii. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

g. Direct interactions between pressures and pressures:

i. iPad Driver switches to **highlight** and hides all icons except for pressures (i.e. toggles off Resources, Activities, Trends and Decisions)

ii. The interactions that have been modified from the original SESAMME map will be highlighted to indicate additions, deletions or polarity changes

iii. Facilitator explains any modifications to interactions that have been made and why these changes were made (use the notes boxes in SESAMME to show descriptions for why changes were made)

iv. Facilitator asks participants if they wish to comment on any of the changes that have been made

v. iPad Driver and Recorder record any changes that participants wish to make and why these changes are necessary (this can be done in **highlight**)

vi. iPad Driver switches to **edit** to show participants what the updated SESAMME map now looks like

vii. iPad Driver takes a photo of the iPad screen (using the iPad screen capture)

7. **Review Feedback Loops:**

a. To review the feedback loops in the system, the Facilitator can refer to either a feedback loop poster or project a feedback loop diagram on the screen using Vensim. The feedback loops can also be labelled in SESAMME, however explaining the feedback loops in SESAMME may be more difficult if the SESAMME map contains many icons.

b. Before explaining the feedback loop diagram, the Facilitator explains that the behaviour of systems are controlled by two types of feedback loop: **reinforcing and balancing**. Facilitator then explains that reinforcing loops act to accelerate change over time while balancing loops act to counteract or slow change over time.

c. Review reinforcing loops:

i. Facilitator explains what a reinforcing loop is (if a variable in the loop **increases** and you follow the loop around, that variable will **increase** again; OR if a variable in the loop **decreases** and you follow the loop around, that variable will decrease again. A reinforcing loop has NO negative polarities OR an EVEN number of negative polarities.)

  ii. Facilitator follows one reinforcing loop around with participants, explaining the increase and decrease in variables as the loop is followed

  iii. Facilitator asks participants if they understand the loop and wish to comment on the loop

  iv. iPad Driver and Recorder record any further changes to the loop that participants wish to make and why these changes are necessary

  v. Facilitator moves to the next reinforcing loop

  vi. iPad Driver takes a photo of or saves the updated feedback loop diagram if changes have been made

 **d.** Review balancing loops:

  i. Facilitator explains what a balancing loop is (if a variable in the loop **increases** and you follow the loop around, that variable will **decrease** again; OR if a variable in the loop **decreases** and you follow the loop around, that variable will **increase** again. A balancing loop has an ODD number of negative polarities.)

  ii. Facilitator follows one balancing loop around with participants, explaining the increase and decrease in variables as the loop is followed

  iii. Facilitator asks participants if they understand the loop and wish to comment on the loop

  iv. iPad Driver and Recorder record any further changes to the loop that participants wish to make and why these changes are necessary

  v. Facilitator moves to the next balancing loop

  vi. iPad Driver takes a photo of or saves the updated feedback loop diagram if changes have been made

**8.** **Review Decisions:**

 **a.** Interactions between Decisions and Activities

  i. Facilitator shows on the feedback loop diagram the decisions directly affecting activities

  ii. Facilitator identifies those decisions that were captured from the first FGD and those new decisions that have been added

  iii. Facilitator explains the influence of these decisions through the system using the feedback loop diagram

  iv. Facilitator asks participants if they wish to comment on any decisions or make changes

  v. Recorder records any changes that participants wish to make and why these changes are necessary

 **b.** Interactions between Decisions and Resources

  i. Facilitator shows on the feedback loop diagram the decisions directly affecting resources

  ii. Facilitator identifies those decisions that were captured from the first FGD and those new decisions that have been added

  iii. Facilitator explains the influence of these decisions through the system using the feedback loop diagram

  iv. Facilitator asks participants if they wish to comment on any decisions or make changes

  v. Recorder records any changes that participants wish to make and why these changes are necessary

 **c.** Interactions between Decisions and Pressures

  i. Facilitator shows on the feedback loop diagram the decisions directly affecting pressures

  ii. Facilitator identifies those decisions that were captured from the first FGD and those new decisions that have been added

  iii. Facilitator explains the influence of these decisions through the system using the feedback loop diagram

  iv. Facilitator asks participants if they wish to comment on any decisions or make changes

  v. Recorder records any changes that participants wish to make and why these changes are necessary

## C. Post Focus Group

**1.** iPad Driver makes a backup of the updated SESAMME map file (.sme file) and any photos of the iPad screen taken during the focus group. If you go into your iPad settings, then iCloud, then Photos, you can turn on "iCloud photo library" and "Upload to My Photo Stream". This will automatically upload any photos that you take on your iPad to your iCloud account. If you have a PC, you can install iCloud for Windows and download photos from your iCloud account to your PC.

**2.** Recorder makes a backup of any video recordings, voice recordings or typed notes taken during the focus group

# Evaluation criteria

A revised SESAMME map that accurately represents participant feedback

**Authors**: Carl Smith and Russell Richards
**History:** Version 5.0, 24 January 2018
**References:** None
**Appendices:** None

# Notes

**CCRES**
Capturing Coral Reef and Related
Ecosystem Services Project

Capturing Coral Reef and Related Ecosystem Services
(CCRES) is a regional technical support project that seeks to
unlock the value of ecosystems for coastal communities in
the East Asia-Pacific region. CCRES will develop knowledge
products — which inform the design of global, regional
and national projects, plans and policies — and technical
models and planning tools which assist with preparation of
community-based coastal resource management plans.

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