



HAL
open science

How monitor the coral reef social system?

Gilbert David

► **To cite this version:**

Gilbert David. How monitor the coral reef social system?. École thématique. Regional thematic school on the Vulnerability of Reef heritage DIDEM program, University of Seychelles, Seychelles. 2024. hal-04740724

HAL Id: hal-04740724

<https://hal.science/hal-04740724v1>

Submitted on 17 Oct 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Regional thematic school on the Vulnerability of Reef heritage DIDEM program

How monitor the coral reef social system?

Gilbert DAVID, IRD,
UMR Espace Dev, GDR LADIVA

June 10, 2024 – Blue Economy Research University of Seychelles



UNIVERSITY OF
SEYCHELLES
Knowledge hub of the Indian Ocean

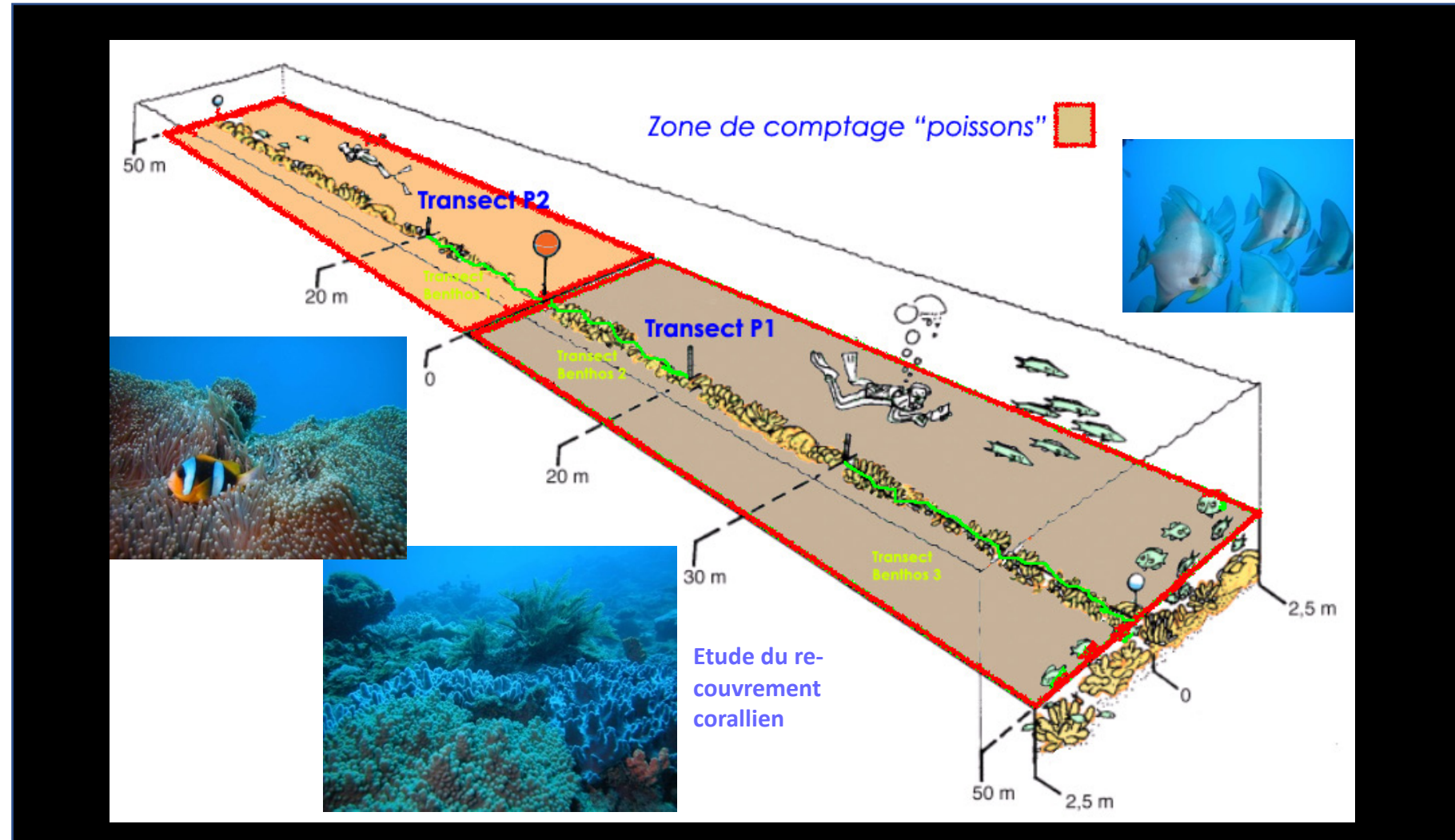


The framework

□ **Until the beginning of this new century very few social sciences oriented studies has been performed on the management of coral reefs. Why ?**

a) The research demand (GCRMN) was mainly on biological and ecological studies

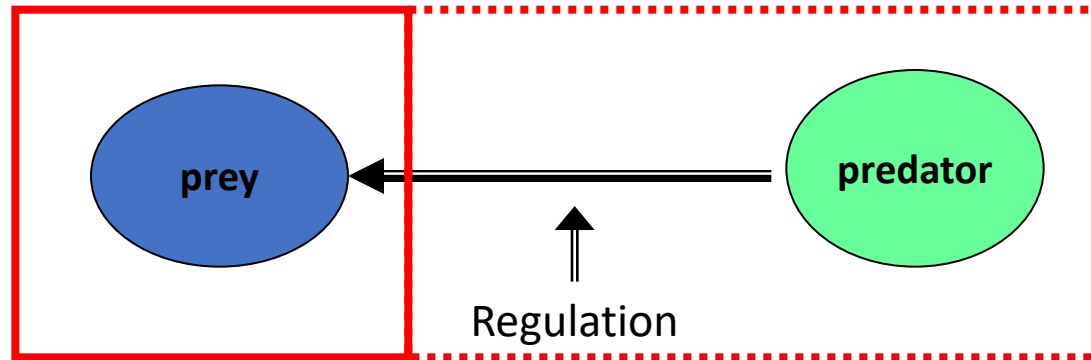
b) In the WIO region, social science teaching at university level was poor when it comes to coastal and marine issues, therefore very few social scientists were involved in reef studies



❑ But the demand on social science studies of coral reef management was increasing

Why this evolution?

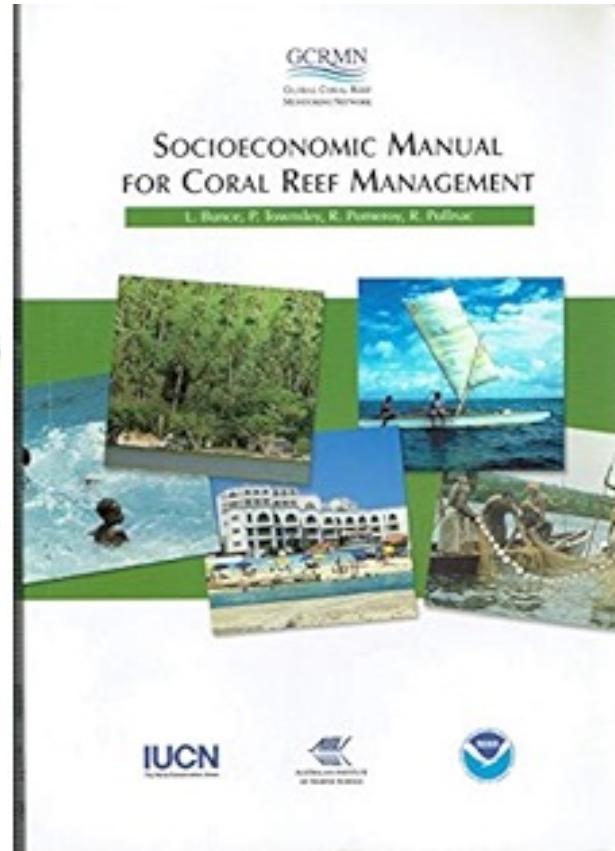
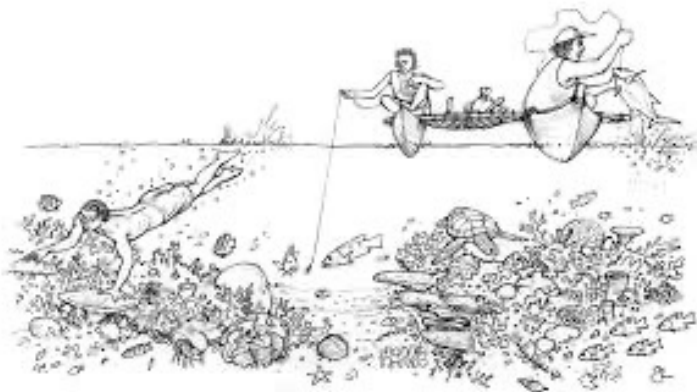
- The need to improve coral reef management.
- The need of advocacy at the international level for coral reef ecosystem conservation.
- Both are based on the following rationale: Coral reef management is an issue of the human-nature relationship. It aims to regulate the human use of the coral reef.



- Problem: Lack of social scientists dealing with coastal environment.
- What to do ? *The bare feet Chinese doctors solution* : the socio-economic monitoring tool kit allows you to change a biologist into a socio-economist in one or two weeks of courses and practices.



- ❑ The demand on social science studies of coral reef management has taken one main direction:
the Socio-economic monitoring to provide data at regular intervals, on the same pattern as the coral reef ecosystem monitoring organized by GCRMN at the world wide scale



In 2000, AIMS published a reference work (Bunce et al.)



In 2003 the SocMon initiative was launched with the publication of Guides for Caribbean and Asia

2006, publication of the Indian Ocean guide

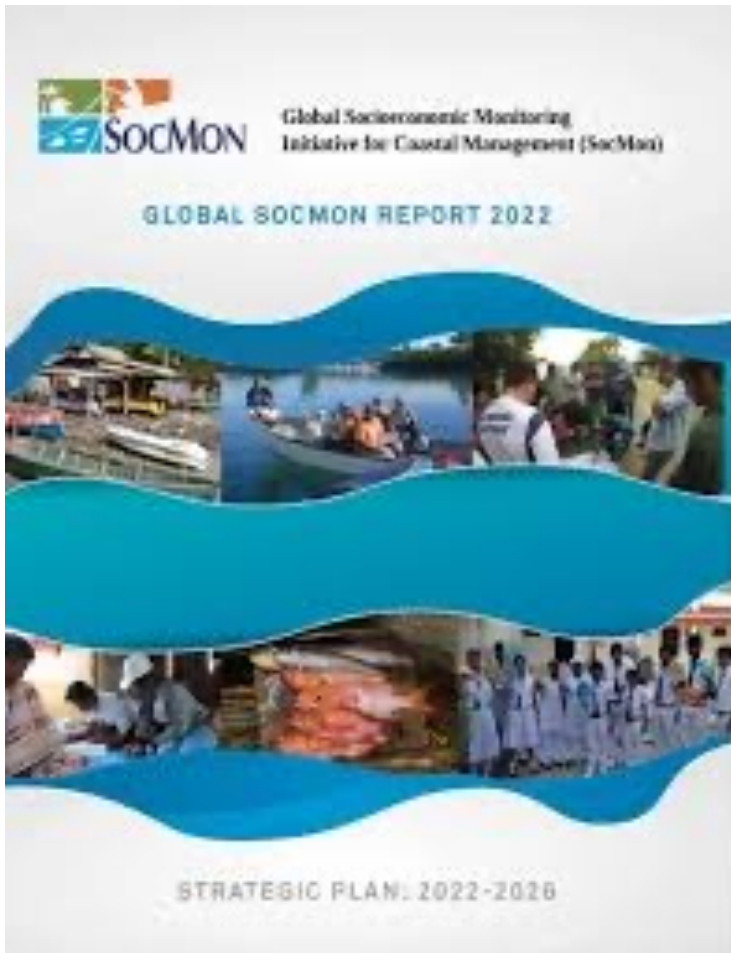
2008 publication of the Pacific Ocean guide



Global database for the social monitoring of coral reefs



In 2022, the Socmon initiative is still alive as it answers to a true demand



“Socioeconomic monitoring is important to track **how people use and depend on coral reefs**, and to **understand human impacts to coral ecosystems** so that we can mitigate negative effects while promoting positive benefits. To have effective coral reef conservation, we need an informed and engaged public, and **socioeconomic monitoring is a way to bring in the human dimension of coral reef conservation**” (Allen, 2022, NOAA)



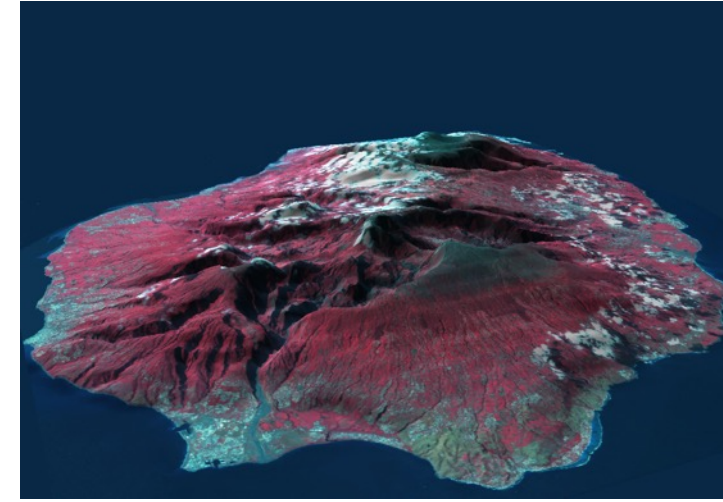
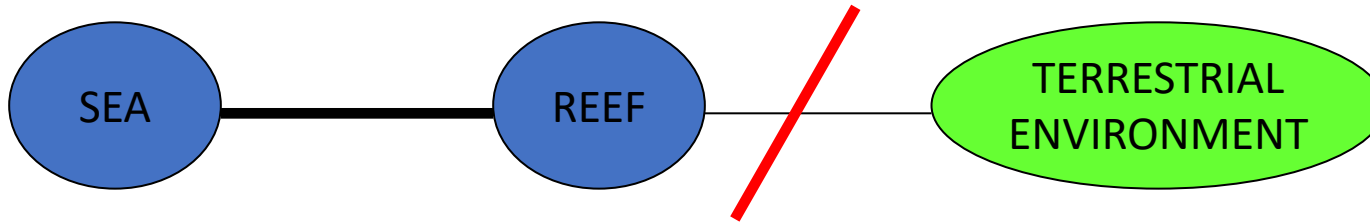
“...**Socioeconomic monitoring** is about measuring and detecting changes over time in order to make timely and informed management decisions. It involves the **long-term collection of social, cultural, economic and governance information of people, groups, communities and organizations at regular intervals**, which is analyzed and fed back into the planning and decision making process. Monitoring is not an end in itself but a means to improve or evaluate management. (Socmon Indian Ocean 2006)

PARADOX: If Socmon initiative is heavily supported by coral biologists, many true social scientists are reluctant to be involved. **WHY ?**

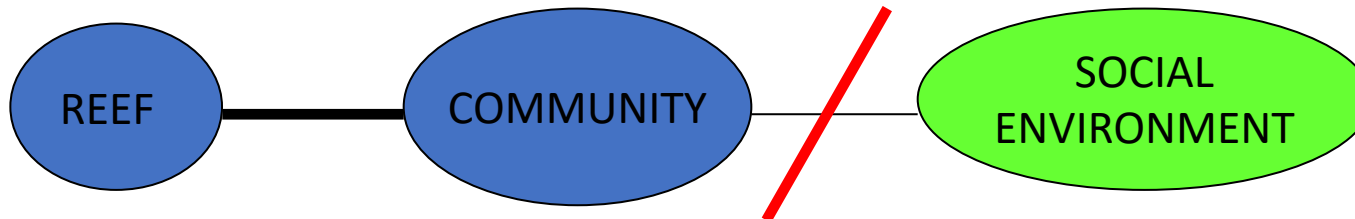
1. The socio-economic monitoring is based on the same pattern as the coral reef ecological monitoring

1.1 For data collection

The coral reef monitoring emphasises the relationship between the coral reef and the sea but excludes the relationship with the terrestrial environment, including the watersheds.



The socio economic monitoring emphasises the relationship between the community of coral reef users and the coral reef ecosystem but excludes the relationship with the social environment.



This way of thinking is directly driven by the representation of the coral reef social-ecological system as a closed system



Reality, the Coral reef SES is closely linked with watersheds

The coral reef social-ecological system in Reunion island as a closed system



↔ Social-system

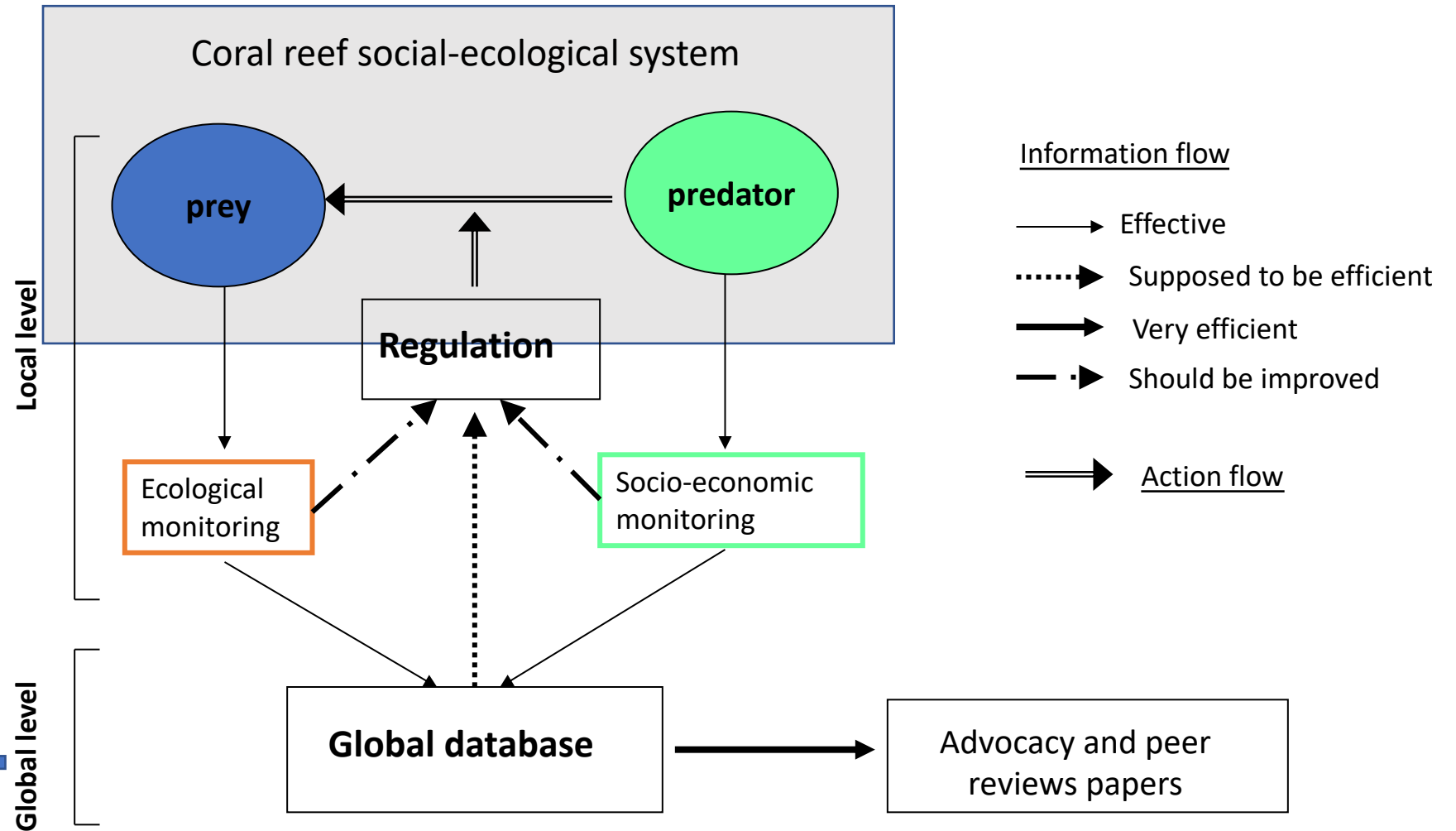
ecosystem →

1.2 For using the monitoring results

Both socio-economic and ecological monitoring are supposed to be efficient at local level coral reef management but in reality more used at global level for advocacy.

Local management requires the social, economic, and local environmental contexts to be taken into account by the survey protocol.

Reporting requires that implemented protocols are the most generic as possible in order to compare the monitoring stations.



2. Using questionnaires for collecting data

Common assumption among marine biologists demanding socio-ecological data :
Social science is easy, you just need to survey people with questionnaire.

It is true that questionnaires work well when they are designed to answer the right question with relevant sampling.

It was not the case of Socmon.



2.1 Too many questions, some could have been avoided only by observation

2.2 Random sampling and two main problems:

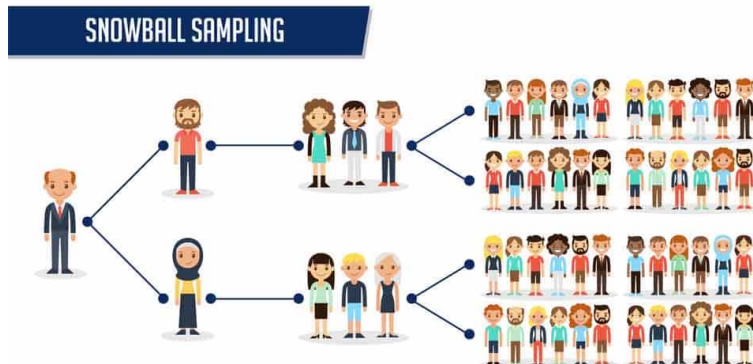
- very low probability to catch coral reef users among the total population investigated
- No information on the size of the mother population of each type of coral reef user



impossible to assess the representativity of the sample surveyed



- Snow ball sampling would have been more relevant



3. Too many expectations or objectives from Socmon

According to the Socmon guide for Indian Ocean, 7 purposes are expected from monitorings

- Identifying threats, problems, solutions and opportunities for coastal resources management
- Determining the importance, value and cultural significance of resources and their uses
- Assessing positive and negative impacts of management measures
- Assessing how the management body is doing (management effectiveness)
- Building stakeholder participations and appropriate education and awareness programs
- Verifying and documenting assumptions of socio-economic conditions in the area, community dynamics and stakeholder perceptions
- Establishing baseline household and community profile


4. A top down list of indicators drives the questionnaire design

Indicators are a very polysemous notion with lots of definition.

But Socmon guides does not provide a relevant definition of what are indicators and how bridging this list with the questionnaire design.

 Socmon users are ought to swim with their own skills

Heink and Kovarick (2010) recognize three dimensions to indicators: descriptive, normative, hybrid

Descriptive dimension  An indicator is a variable that describes the **state of a system** (Walz, 2000)

An indicator is an observed value representative of a phenomenon of study. In general, indicators **quantify information** by aggregating different and multiple data" (EEA, 2003).

Normative dimension  Index or measurement endpoint to evaluate **health of a system** (economic, physical, biological, human)" (Burger, 2006, p. 27).

 Concept of health of a system!!! How do we define it? According to what standards?

A function of variables. It provides an indication, i.e., an entity that can be used as an argument of a function used **to take a decision** (Riley, 2001).

 need to synthesize information, which requires reducing the volume of information to sort

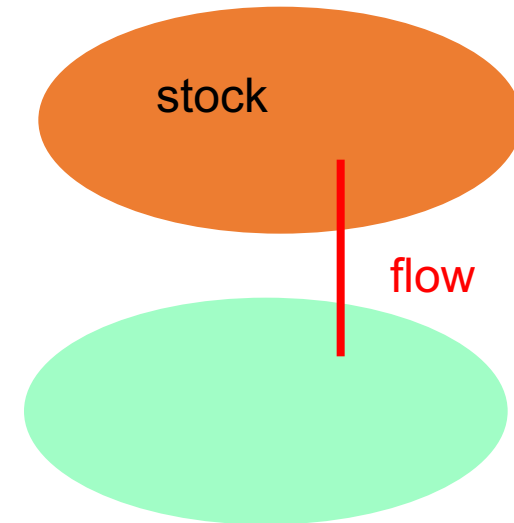
Hybrid dimension (normative and descriptive descriptive)

- An indicator is a parameter or value that reflects the condition of an environmental (or human health) component,
- usually with **significance** that **extends beyond** the measurement or value itself.



Need to have previously defined what the good state of health of the stock or the flow is?

an indicator is an observable variable used to create information and report an unobservable reality (Boulanger 2005)



Used alone or in combination, indicators provide the means **to assess progress** toward one or more **objectives** . . ." (Shear et al., 2003)



Concept of monitoring and evaluation of an action, a policy

5. Monitoring aims to study how works social systems

It is not the proper way, like starting a story from the end.

We need first to understand how the coral reef social ecological works and after it could be possible to design indicators/

The best way to design indicators is

- a) to built a model of the coral reef social-ecological system with an extensive list of variables
- b) select among theses variables which of them could be indicators

Proof of the concept: the model shows the same trajectory with theses indicators than with the initial variables which are 5 to 10 more numerous.



Coastal socio-economic dynamics are quite more complex than monitoring can assess

The reef ecosociosystem componants, a social science point of view

Subsystem 1 Advocacy and lobbying at the international level

Structuration : Top down and bottomUp

Goal : collect data from the groundfield to produce standardized data on the world wilde perspective and provide recommandations for the management system

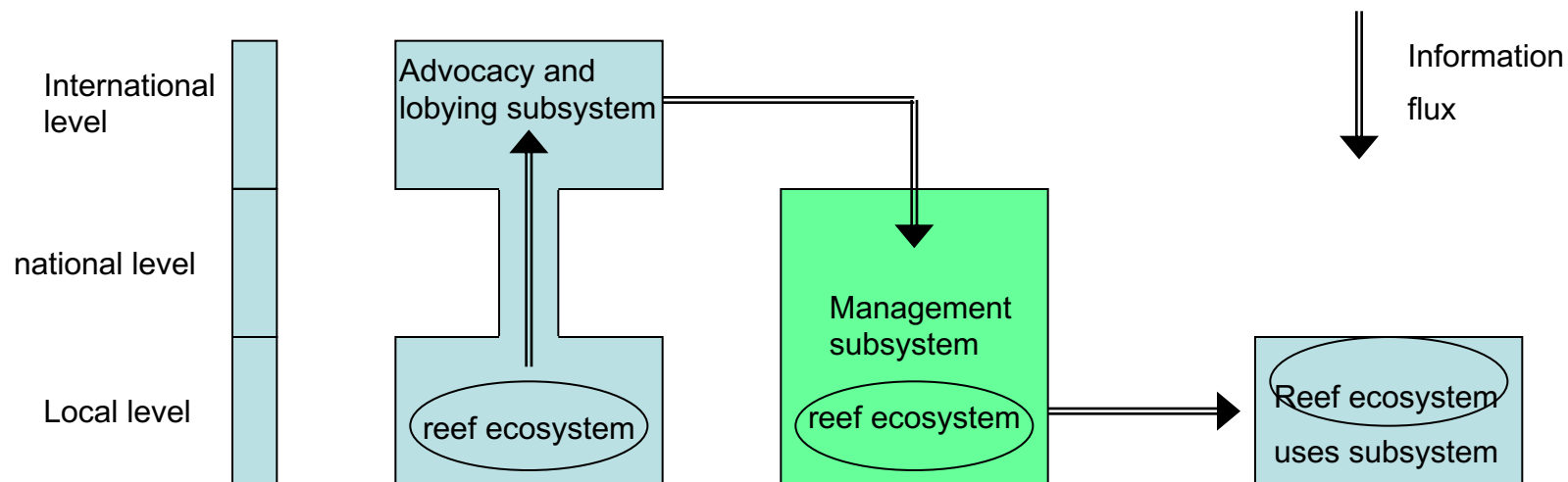
Subsystem 2 Reef ecosystems uses (local level)

Structuration :no, structure : heterogeneous, many stakeholders without cooperation Goal : use the reef to benefits of the stakeholders

Subsystem 3 Management (national and local level)

Structuration : Top down

Goal : properly manage the reef ecosystem at the local level through rules designed at the national and international levels



6) **Socio-economic monitoring aims to enhance understanding of communities and their relationship to coastal and marine resources”** (SocMon manual p.4).

First problem : what is a community ?

Is it a place ?

A social group where all the members live in the same place?

A social group whose members pray in the same place ?



the community is seen as a homogeneous whole and can be represented by its leader. Except the leader, community is seen as a group of individual social and economical agents. The notion of collective group is not mobilized but

Power relations are the driving forces in social dynamics within and outside the communities



Conclusions

Monitoring is a good way to assess changes over time but it's not a good way « to enhance understanding of communities and their relationship to coastal and marine resources. » (SocMon manual p.4)

A large range of international organisations support and promote socio-economic monitoring programs all over the world. **There is a risk to promote this method as the only way to study social dynamics in coastal communities.**

As a consequence, social scientists may leave this field of research and thus **lower the diversity of thinking** which is not the best way to preserve coral reef biodiversity.

Human-human relationships are both **internal** within communities and **external** between the community and the global environment (including the coral reef).

Finally, Instead of being an issue of the **human-nature** relationship, coral reef management is an issue of the **human-human** relationship about nature.



Thats 'all Folks !

