PROTECTING DUGONGS
CONSERVING SEAGRASS
CHANGE FOR COMMUNITIES

Seagrass research & ecosystem services

INCEPTION WORKSHOP
THE GEF DUGONG AND SEAGRASS CONSERVATION PROJECT
20-21 October 2015
Colombo, Sri Lanka

What is the question you are trying to answer?

- Resource inventory (supporting dugong populations)
  - extent
  - abundance (e.g. % cover, biomass, etc)
  - species
- Level of change (natural vs impacted)
- Health (resilience)
- Ecosystem services
- Threats

What is the environment?

- water depth, water clarity, remoteness, etc
- social / political

Resource inventory

Scale

Mapping requires different approaches depending on whether survey area is relative to a region *(tens of kilometres),* locality *(tens of metres to kilometres)* or to a specific site *(metres to tens of metres)*.

Accuracy

Errors that can occur in the field directly influence the quality of the data.

Choosing a Survey/Mapping strategy

A decision tree. The data capture methods used to map the distribution of seagrass meadows vary according to the information required and the spatial extent. *From McKenzie et al. 2001.*

What is the size of the region or locality to be mapped?

Less than 1 hectare	**1**
1 hectare to 1 km^2	**2**
1 km^2 to 100 km^2	**3**
greater than 100 km^2	**4**

1 Fine/Micro-scale (Scale 1:100 1cm = 1m)

Intertidal	aerial photos, *in situ* observer
Shallow subtidal (<10m)	*in situ* diver, benthic grab
Deepwater (>10m)	SCUBA, real time towed video camera

2. Meso-scale (Scale 1:10,000 1cm = 100m)

Intertidal	aerial photos, in situ observer, digital multispectral video
Shallow subtidal (<10m)	in situ diver, benthic grab
Deepwater (>10m)	SCUBA, real time towed video camera

3. Macro-scale (Scale 1:250,000 1cm = 250 m)

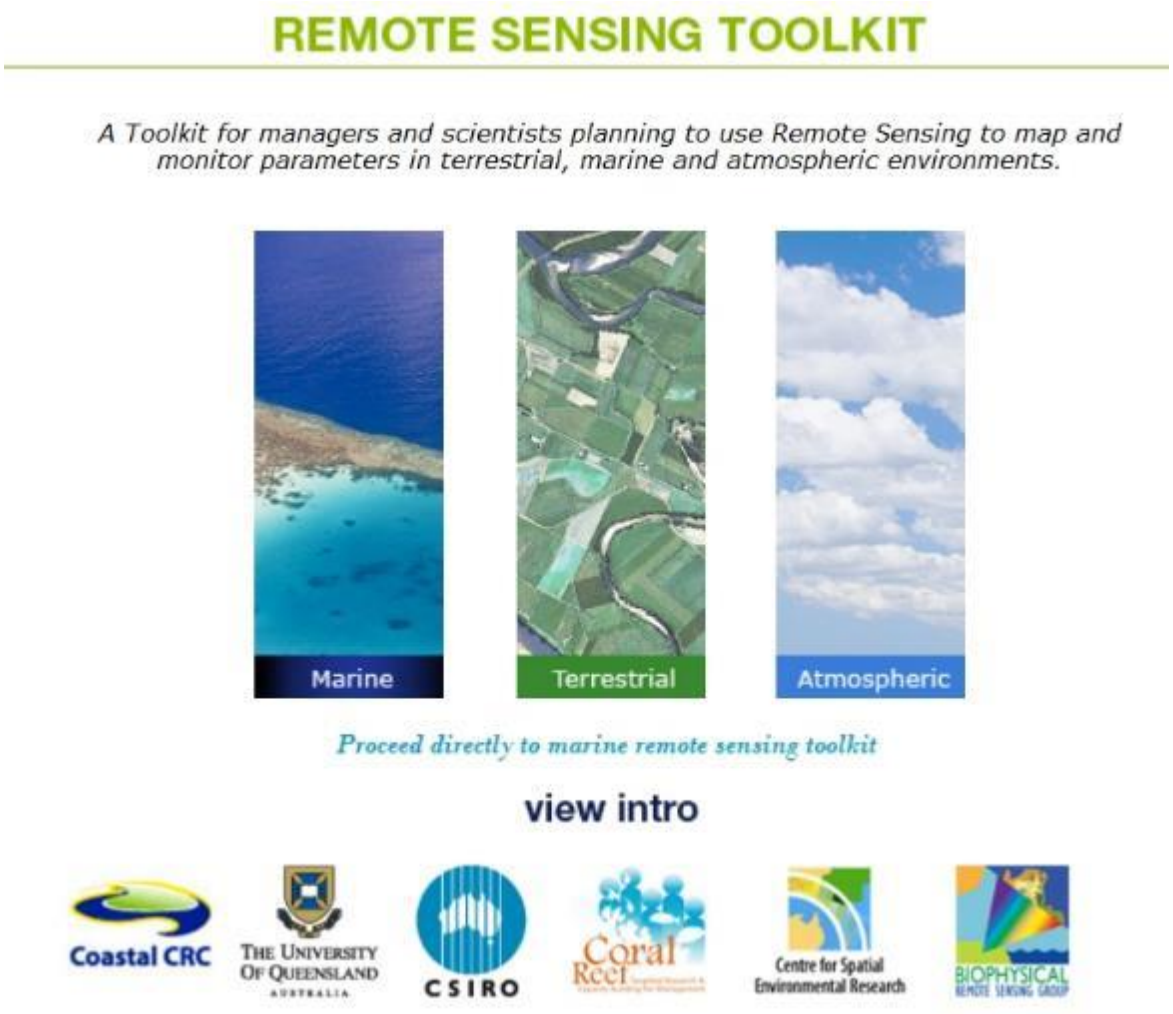
Intertidal	aerial photos, satellite
Shallow subtidal (<10m)	satellite & real time towed video camera
Deepwater (>10m)	real time towed video camera

4. Broad-scale (Scale 1:1,000,000 1cm = 10 km)

Intertidal	satellite, aerial photography
Shallow subtidal (<10m)	satellite, aerial photography & real time towed video camera
Deepwater (>10m)	real time towed video camera

Can I use remote sensing?

Benthic characterization



https://www.gpem.uq.edu.au/rsrc-rstoolkit

Monitoring

The level of change and accuracy of the detection will vary according to the methodology.

Environmental monitoring programs should ideally be designed to

- quantify the causes of change;
- examine and assess acceptable ranges of change for the particular site; and
- to measure levels of impacts.

Monitoring

Explicit objectives

Identified responsibilities (e.g., Gov agencies, consultants, community groups)

Rationale for using parameters (e.g., physico/chemico, biological indicators)

Baseline assessment / measure

Knowledge of spatial and temporal variation

- pilot study

Defined field protocols

Other considerations / challenges

Capacity needed

- standardised methodologies
- skills of personnel (both field + analysis)
- participatory mapping / monitoring (e.g. questionnaire or field assistance)
- training (education / capacity building)
- equipment (technology, software, etc)

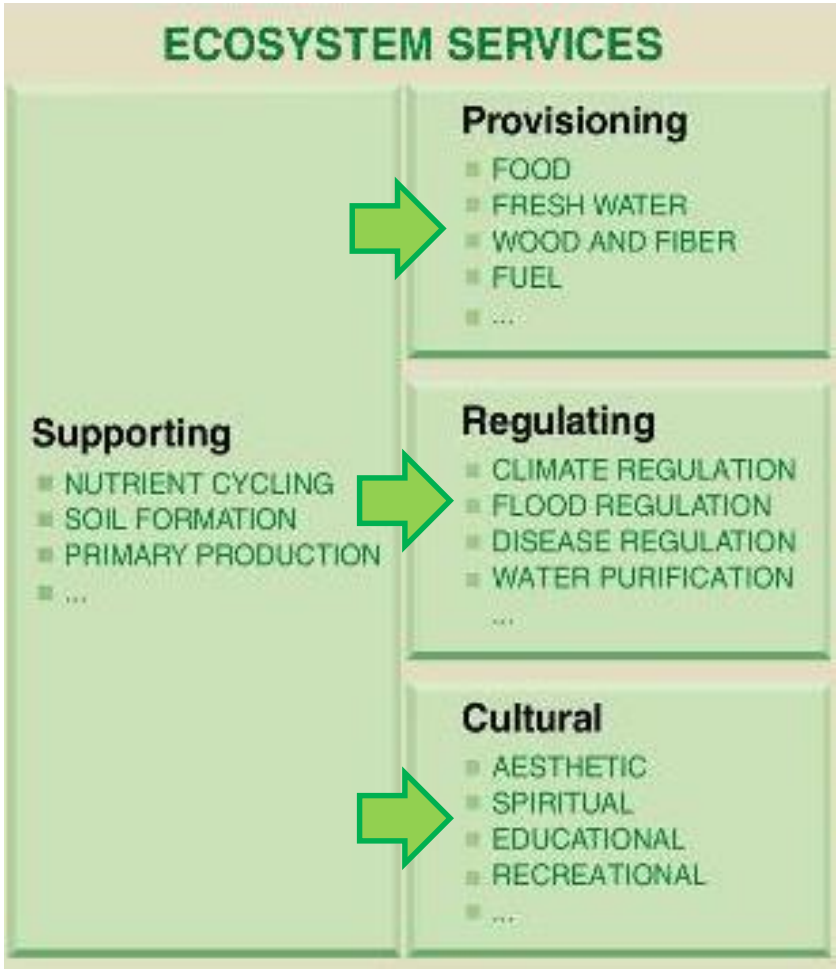
Appropriateness

- Legal / Institutional sensitivities
- Cultural sensitivities (e.g. taboo areas)

Timing / frequency

- time of year (e.g. growing season, weather, etc)

Seagrass Ecosystem Services



Supporting
- Primary production and nutrient cycling
- Support high biodiversity important for resilience and stability of the wider ecosystem

Provisioning
- Habitat for commercially important species

Regulating
- Carbon sequestration
- Sediment stabilisation
- Erosion prevention

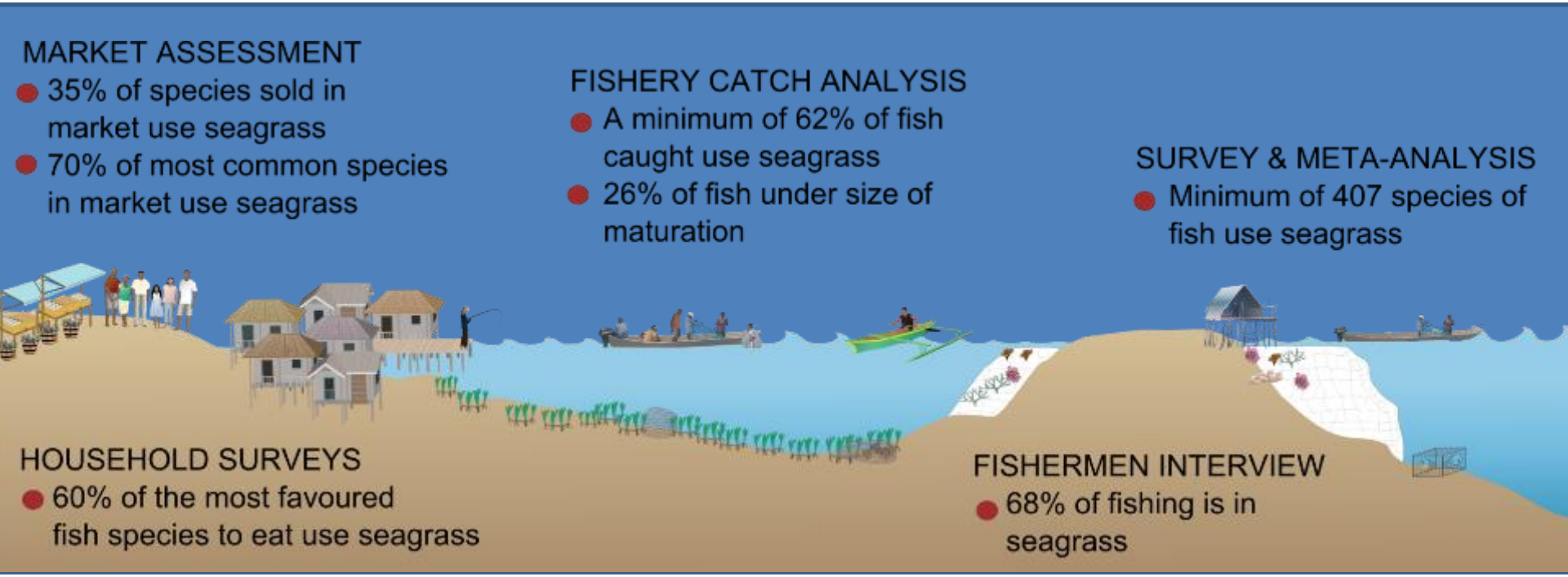
Cultural
- Habitat for culturally important species
- Educational value

Source: *Millennium Ecosystem Assessment*

Assumed but poorly quantified in many locations

SEAGRASS ECOSYSTEM RESEARCH GROUP

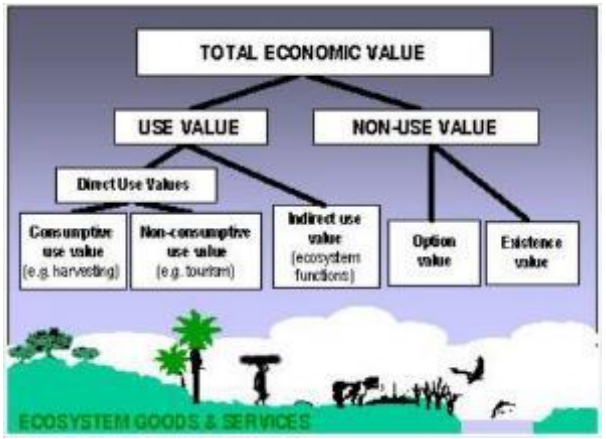
Fisheries, livelihoods and food security

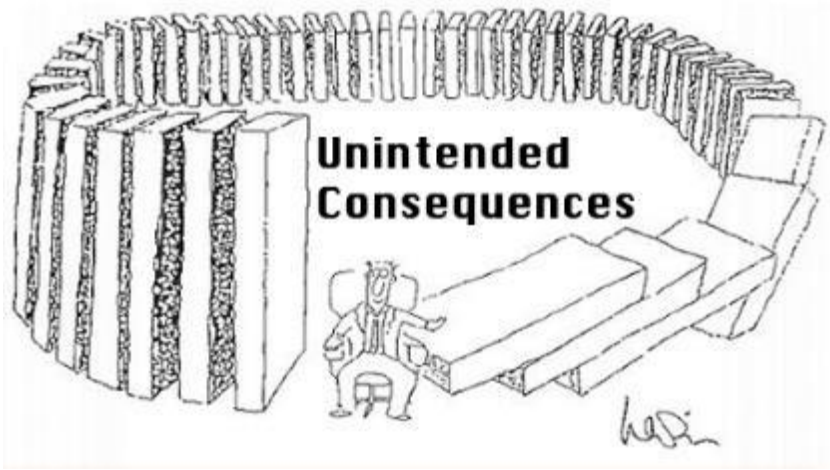


Provisioning services

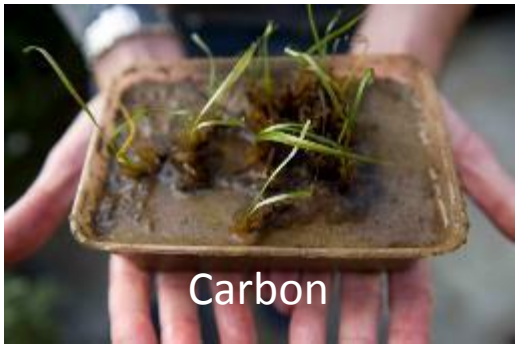
SUSTAINABILITY OF FOOD SUPPLY

Why assess ecosystem services?





Which ecosystem services?



Think local

At what scale can you collect meaningful data relevant to your study?

SW Sulawesi Household Survey 2015/16

VILLAGE_____ DATE_____ RESPONDENT_____ INTERVIEWER_____

Respondent background information

1	**Gender**	Male Female
2	**Age**	15-18 19-24 25-30 31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-70 71+
3	**Marital Status**	Never married Married Separated Divorced Widowed
4	**How many years have you lived in this village?**	< 1 2-3 4-6 7-10 11-15 16-20 21-25 25+

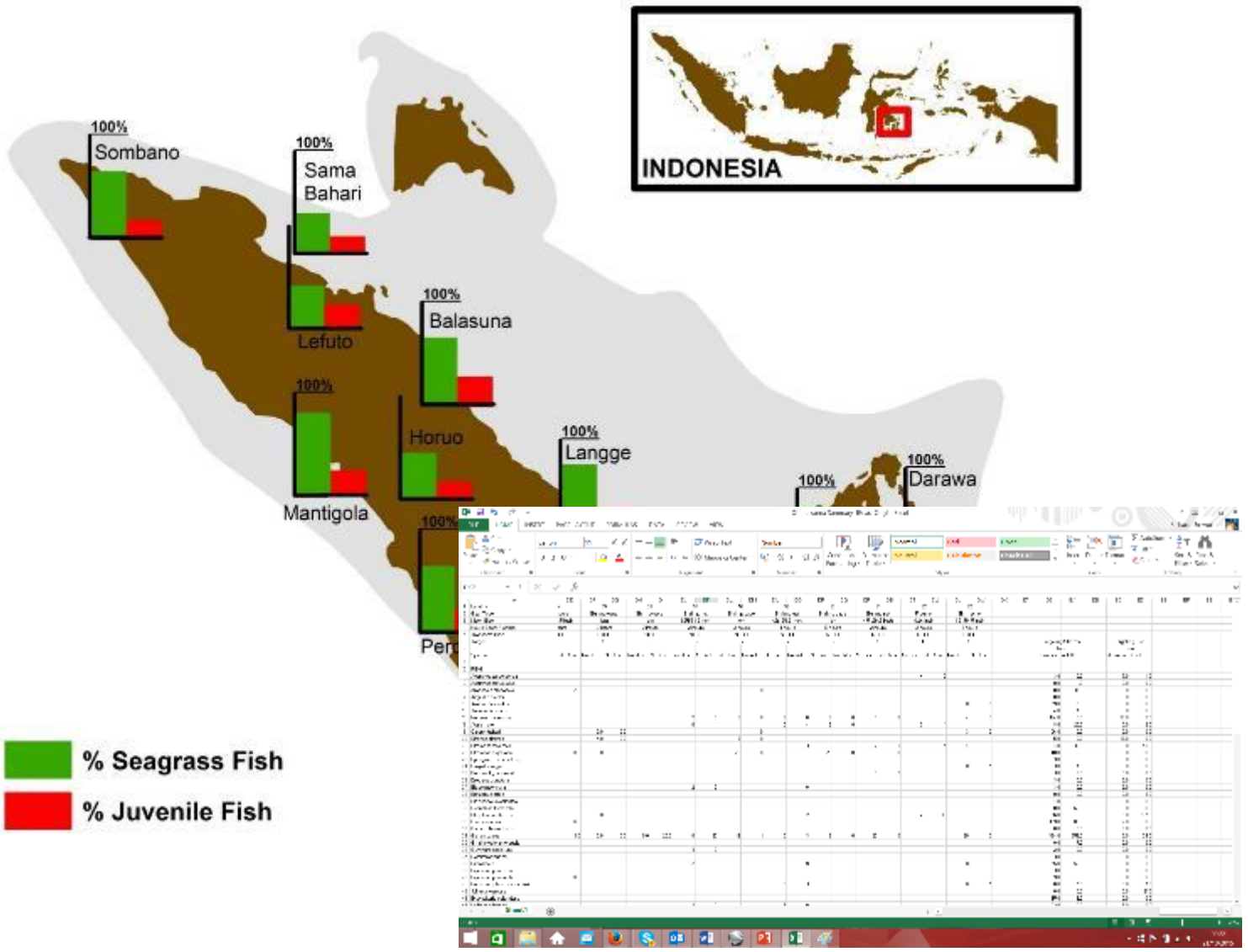
Household Characteristics

5	How many families live in your household?	
6	How many people live in your household?	Men _____ Women _____ Children ____
7	Does **any** member of your household own.	Canoe Motorboat Fishing net Bubu Fish fence Other fishing gear
8	What benefits does your household **currently** get from marine and coastal resources?	Income Food Both Other (If so please specify)

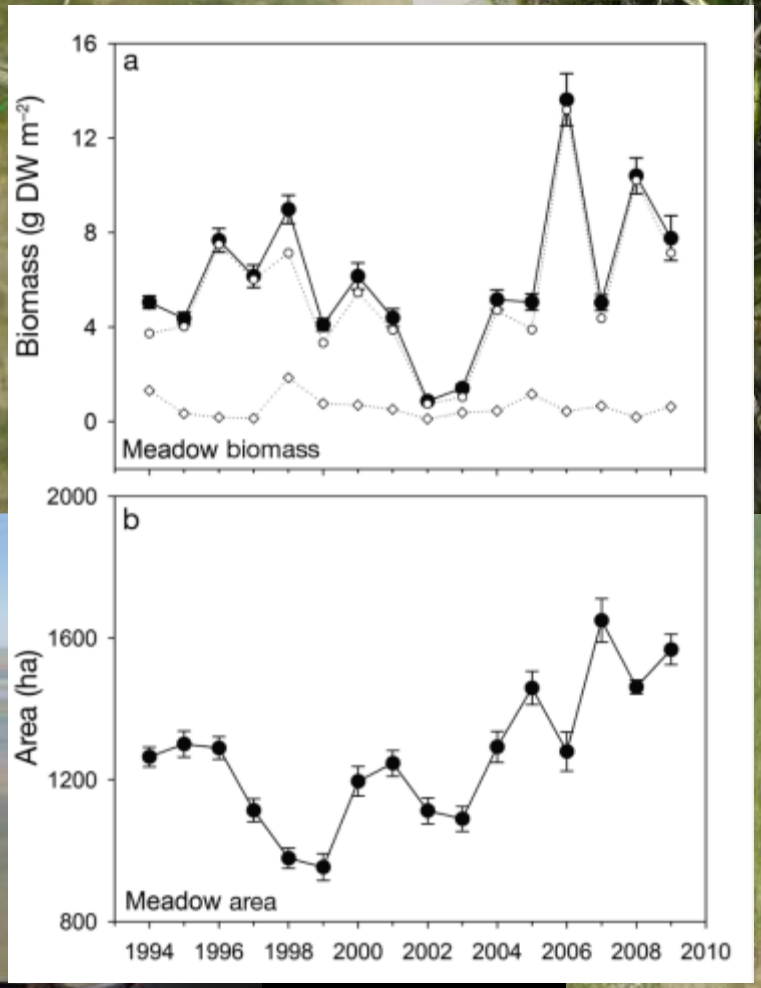
Occupation of household members

Consider your methods to reflect the data you need

Your data analysis and presentation



Ecosystem services vary with space, time and species



Ensure you communicate the findings to the appropriate people

Other considerations / challenges

Data

- Managing errors - a QAQC program
- Data management procedures, selection of statistical tools
- Data repository (legacy of data)
- Usefulness and use of data (e.g. improved decision-making, improved site conservation)

Final thoughts

- Beyond linear thinking
- How will this lead to a change

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Thank you for your attention!

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