Multi-Criteria Analysis (MCA)

Multi-criteria Analysis (MCA)

- A tool to help us choose between different adaptation options

- Each option is analysed in relation to agreed upon criteria

- Criteria = important considerations in making the decision, e.g.

  ➢ Cost

  ➢ Number of beneficiaries

  ➢ Sustainability

  ➢ Inclusion of marginalised groups

  ➢ Cultural acceptability

  ➢ Use of traditional knowledge

- Criteria can be weighted if some criteria are considered more important than others

Determine adaptation objective and list range of options available

Example

Adaptation objective:

Reduce vulnerability of existing infrastructure in the coastal zone to sea level rise

Options

1) Build concrete sea wall

2) Plant natural barriers (e.g. mangroves, coastal vegetation)

3) Create artificial coral reef

4) Relocate infrastructure further inland

Identify appropriate criteria, e.g.

COST
What is the action likely to cost?

EFFECTIVENESS
How effective will the action be in meeting the objective?

CO-BENEFITS
Will the action result in additional benefits?

BENEFITS TO WOMEN
Do what degree will women benefit from the action?

SOCIAL ACCEPTABILITY
To what degree will the action be socially acceptable?

Design a scoring template to use for each criterion

CRITERIA	SCORING RANGE	SCORE
COST	Low (<USD500k) Medium (<USD5mill>USD500k) High (>USD5mill)	3 2 1
EFFECTIVENESS (in addressing problem)	High Medium Low	3 2 1
CO-BENEFITS	Many Some Few	3 2 1
BENEFITS FOR WOMEN	Many Some Few	3 2 1
SOCIAL ACCEPTABILITY	High potential Medium potential Low potential	3 2 1

Add weights if some criteria are more important

CRITERION	WEIGHTING (Range 1-2)	SCORING RANGE	SCORE
COST	1.8	Low (<USD500k) Medium (<USD5mill>USD500k) High (>USD5mill)	3 2 1
EFFECTIVENESS	1.5	High Medium Low	3 2 1
CO-BENEFITS	1.2	Many Some Few	3 2 1
BENEFITS FOR WOMEN	1.5	Many Some Few	3 2 1
SOCIAL ACCEPTABILITY	2	High potential Medium potential Low potential	3 2 1

Assess options against agreed criteria

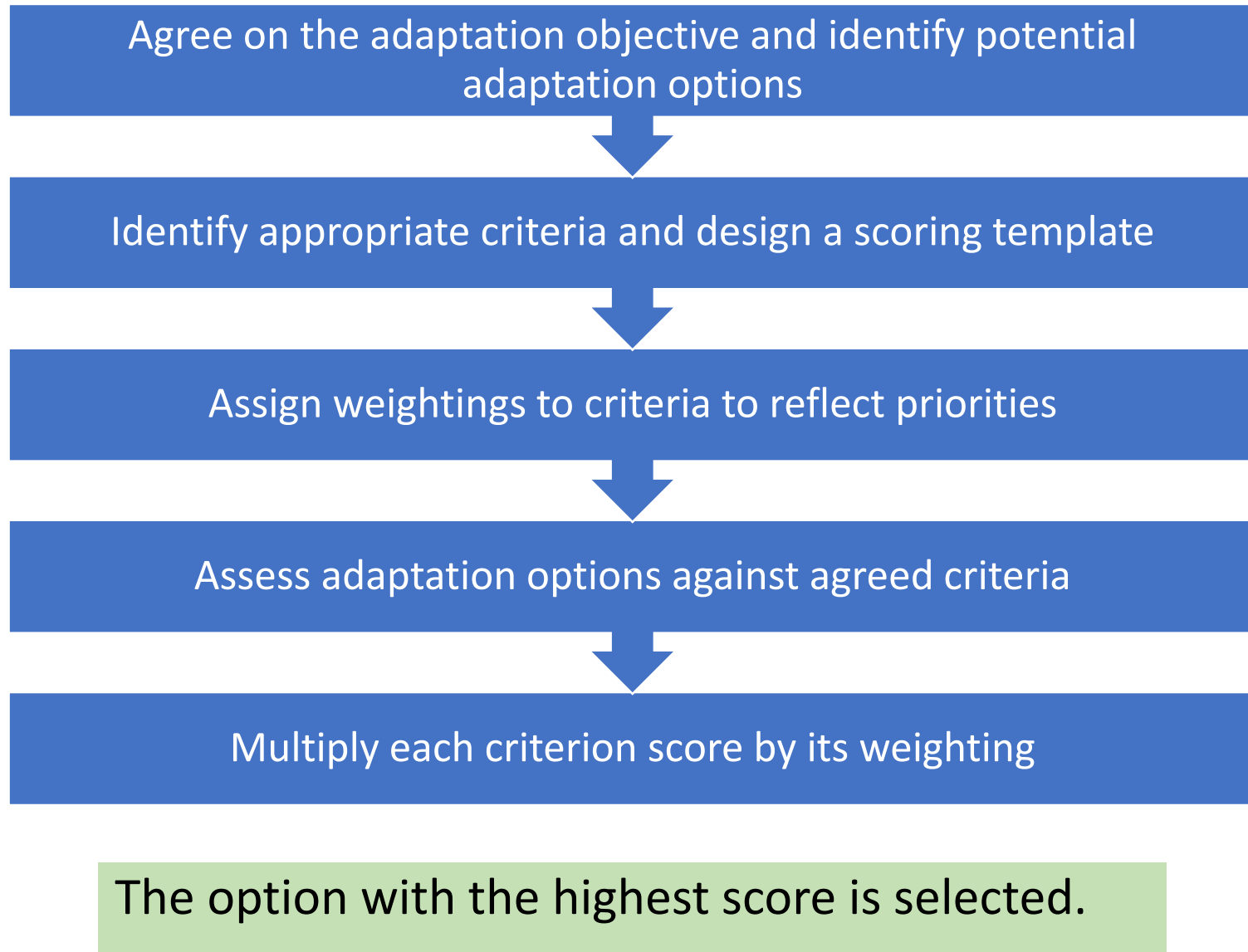| ADAPTATION OPTION	COST (Low = 3; Medium =2; High = 1)	EFFECTIVENESS (High = 3; Medium = 2; Low = 1)	CO-BENEFITS (Many = 3; Some = 2; Few = 1)	BENEFITS FOR WOMEN (Many = 3; Some = 2; Few = 1)	SOCIAL ACCEPTABILITY (High = 3; Medium = 2; Low = 1)	SCORE
Build concrete sea wall	1	2	2	1	3	9
Plant natural barriers	3	1	3	2	2	11
Create artificial coral reef	2	1	3	2	2	10
Relocate infrastructure further inland	1	3	1	1	2	8

Multiply each criterion score by its weighting

ADAPTATION OPTION	COST (w=1.8)	EFFECTIVENESS (w=1.5)	CO-BENEFITS (w=1.2)	BENEFITS FOR WOMEN (w=1.5)	CULTURAL ACCEPTABILITY (w=2)	FINAL SCORE
Build concrete sea wall	1.8 (1 x 1.8)	3 (2 x 1.5)	2.4 (2 x 1.2)	1.5 (1 x 1.5)	6 (3 x 2)	14.7 (9)
Plant natural barriers	5.4 (3 x 1.8)	1.5 (1 x 1.5)	3.6 (3 x 1.2)	3 (2 x 1.5)	4 (2 x 2)	17.5 (11)
Create artificial coral reef	3.6 (2 x 1.8)	1.5 (1 x 1.5)	3.6 (3 x 1.2)	3 (2 x 1.5)	4 (2 x 2)	15.7 (10)
Relocate infrastructure further inland	1.8 (1 x 1.8)	4.5 (3 x 1.5)	1.2 (1 x 1.2)	1.5 (1 x 1.5)	4 (2 x 2)	13 (8)

Important things to remember

- To avoid bias, try and involve a cross-section of stakeholders and interest groups in the process

- State your reasoning

- State your assumptions

- Spend time on getting the criteria and weightings right

- If possible, commission small studies into each option to inform your scoring

Summary of MCA steps

Agree on the adaptation objective and identify potential adaptation options

↓

Identify appropriate criteria and design a scoring template

↓

Assign weightings to criteria to reflect priorities

↓

Assess adaptation options against agreed criteria

↓

Multiply each criterion score by its weighting

The option with the highest score is selected.

Group exercise

1) Identify adaptation options to address the impacts of your selected climate change driver

2) Apply the MCA methodology

3) Two groups to report back