

Multiple Criteria Decision Making

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Project Team

- ▶ **Liz Dooley (Independent researcher) and Iona McCarthy (Massey University)** Project management, survey to identify options of interest, research and information collation, decision tool development
- ▶ **Becks Smith (The Whole Story)** Initial option identification, workshop co-ordinator and facilitator, podcast delivery
- ▶ **Chris Kavazos (DoC)** UTW catchment group liaison, project planning

Funders

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- ▶ Department of Conservation, and especially Rosemary Miller for supporting this work
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Background

- Update a generic process and MCDM spreadsheet-based decision support tool that farmers / farm businesses and their advisors can use to work through strategic decisions in a structured, objective and transparent manner.
- Introduce the process and tool to farmers and industry people and seek feedback
- Amend if required.
- Make the process and MCDM spreadsheet tool freely available to farmers and industry

Prior Work with this Model

- ▶ Developed about 2002 for Multiple Criteria Decision Making research for agribusiness or farm systems
 1. Agribusiness: Meat company technology decision
 2. Farm business: Beef policy decisions
 3. Agricultural-environmental: Farm systems for a capped nitrogen environment
- ▶ Used by a group of Taihape farmers in 2021 to explore selection of an arable or horticultural crop for diversification

Feedback from farmers who used the model and process previously was largely positive

Multi-Criteria Decision Making (MCDM)

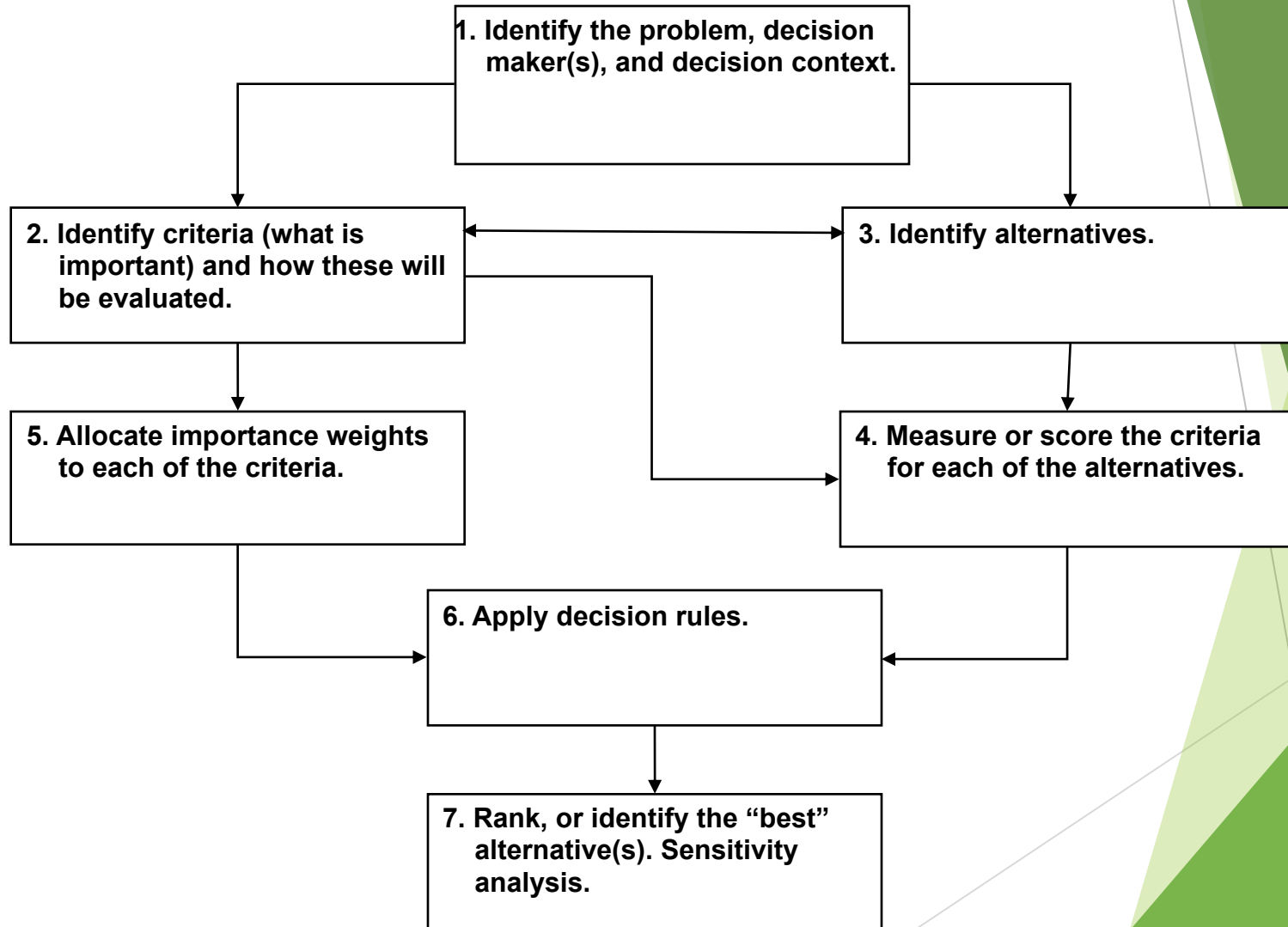
Also known as Multiple Criteria Decision Analysis (MCDA)

A structured, objective process, supported with a software tool, to help

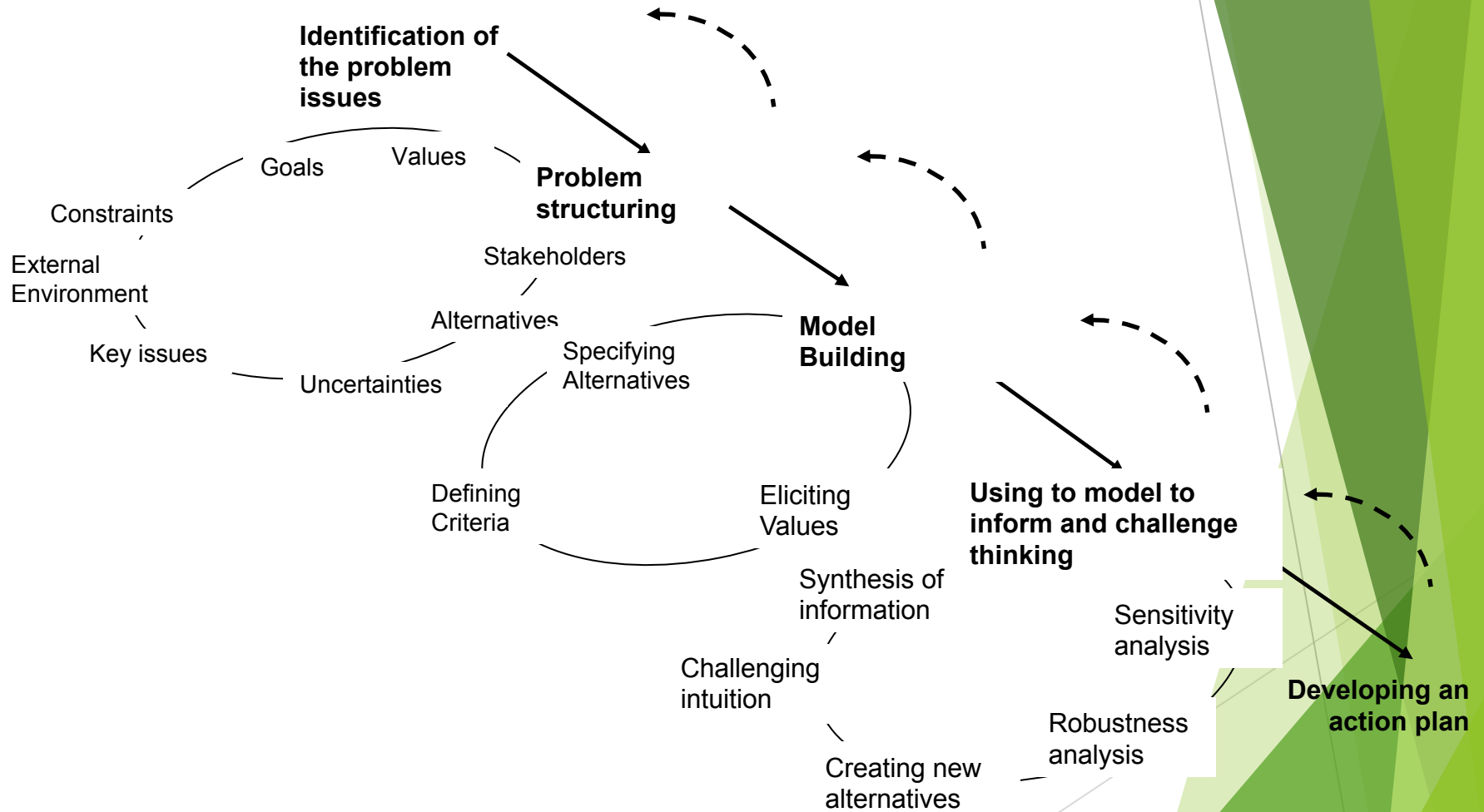
- ▶ identify the 'best' ranked alternative(s)
- ▶ explore and learn about a decision
- ▶ understand own and others' viewpoints
- ▶ make a decision transparent
- ▶ communicate a decision

... for decisions with multiple, conflicting criteria measured in different units.

The MCDA Process



The MCDM Process



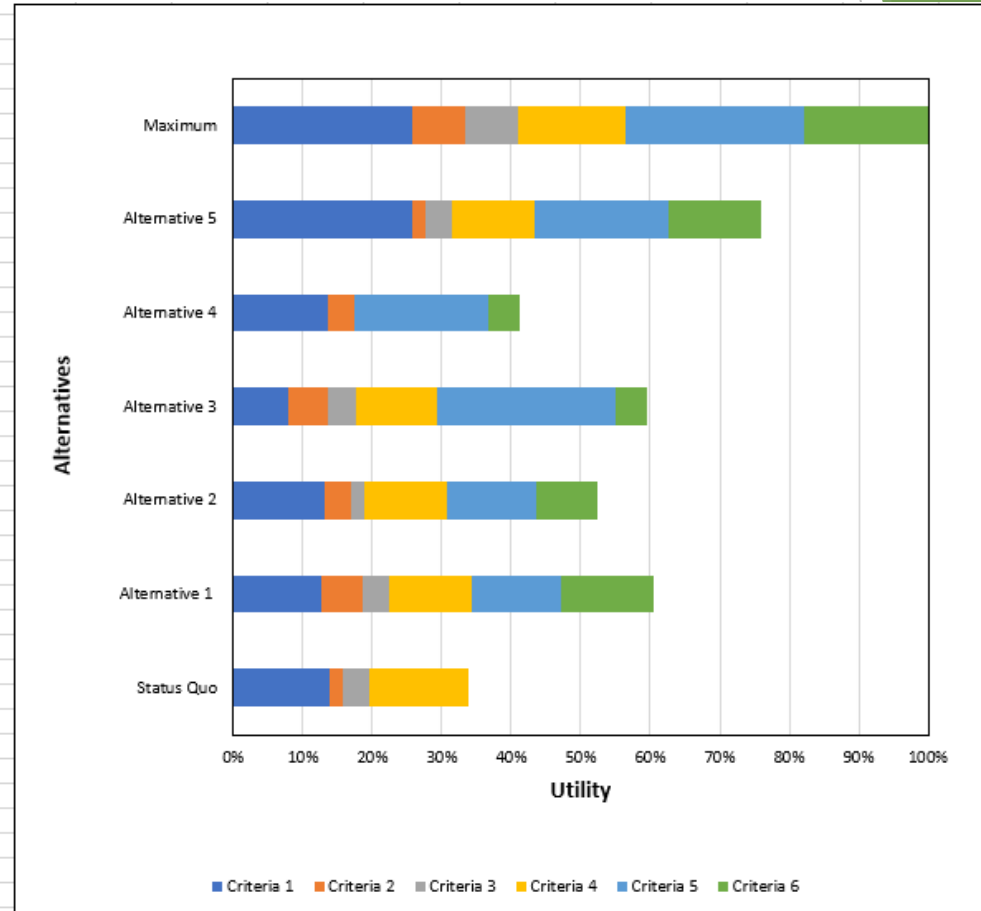
Criteria Weighting

WEIGHTS		No. of criteria			6				
Criteria name	Units	Worst	Best	Range	Swing	Rank	Weighting	Equivalence to Criteria 1	
Criteria 1	Unit1	280	620	340	100	1	25.6%	620.0	
Criteria 2	Unit2	1	5	4	30	5	7.7%	382.0	
Criteria 3	Unit3	1	5	4	30	5	7.7%	382.0	
Criteria 4	Unit4	1	5	4	60	4	15.4%	484.0	
Criteria 5	Unit5	1	5	4	100	1	25.6%	620.0	
Criteria 6	Unit6	1	5	4	70	3	17.9%	518.0	

Results

Alternative	Utility	Rank
Status Quo	33.8	7
Alternative 1	60.5	3
Alternative 2	52.5	5
Alternative 3	59.5	4
Alternative 4	41.1	6
Alternative 5	76.0	2
Maximum	100.0	1

Number of Alternatives 7 of a possible 20
 Number of Criteria 6 of a possible 15



Farming Strategy Selection Example

