WP 6   Establishment of stakeholders' platform and project information management

Task 6.3   MCDA survey among stakeholders

WP Coordinator: Rosa Caggiano (MEDAC)
Task Coordinator: Giuseppe Lembo (COISPA)

Authors: Giuseppe Lembo[1], Isabella Bitetto[1], Rosa Caggiano[2], Erika Monnati[2], Maria Teresa Spedicato[1]

[1]COISPA Tecnologia & Ricerca, Bari, Italy
[2]MEDAC, Roma - Italy

Incorporating stakeholder view and knowledge

The importance of involving stakeholders in the fishery management processes was first expressed by the Code of conduct for responsible fishery (FAO, 1995).

The new CFP (Reg. EU 1380/2013) explicitly encourage the industry to take more responsibility in implementing the CFP.

See art. 3 - Principles of good governance.

This means that the role of public authorities would be to set the limits within which the industry must operate and then the industry would have the responsibility and the authority to develop the best solutions taking into account economic, social and technical considerations.

Multiannual plans & fisheries management

Multiannual plans shall be adopted as a priority, based on scientific, technical and economic advice, and shall contain conservation measures to restore and maintain fish stocks above levels capable of producing maximum sustainable yield (art. 9 and 10)

The industry-science partnership could ensure more coherent information and a progressive implementation of the Multiannual Plans by incorporating their knowledge into research-based advice.

A **participatory management** or co-management requires that stakeholders are enabled to express their qualitative and quantitative perception of the processes.

How implement the participatory management?

Management plans are complex and, as the majority of decision problems in fisheries management, typically characterized by multiple and often conflicting objectives.

Multiple criteria decision analysis techniques (MCDA), which are based on pairwise comparisons, have been used:

- to provide insights into the stakeholders potential participatory role to the fishery monitoring framework;
- to understand how the stakeholders recognize the importance of indicators to monitor the stocks, the ecosystem and the fishery sector.

A survey with two Scenarios

Scenario n°1 ➡ **The Analytical Hierarchy Process (AHP)**

Scenario n°2 ➡ **The Non-Structural Fuzzy Decision Support System (NSFDSS)**

AHP
- **Has the advantage to decompose the decision problem into a hierarchy of more easily comprehended sub-problems, each of which can be analysed independently;**
- **Converts the human expert judgement to numerical values that can be processed and compared.**

NSFDSS
- **Applies fuzzy logic to model the ambiguity and imprecision of vague terms such as "marginally different", "strongly different", "indifferent", etc.**

Scenario n°1 (AHP)

The aim of the scenario n°1 is to understand how the stakeholders consider the EU framework used for the stock assessment and the process of evaluation of the biological and economic indicators.

First the high level priority objective has been defined: Contribute to a sustainable fishery management.

Then the main components of objective have been identified:
- Ecological state
- Pressure/impact
- Economic state

Finally, the hierarchic processes for the classification of the criteria/factors and the associated indicators have been defined.

Scenario n°1 (AHP) – Decision Tree
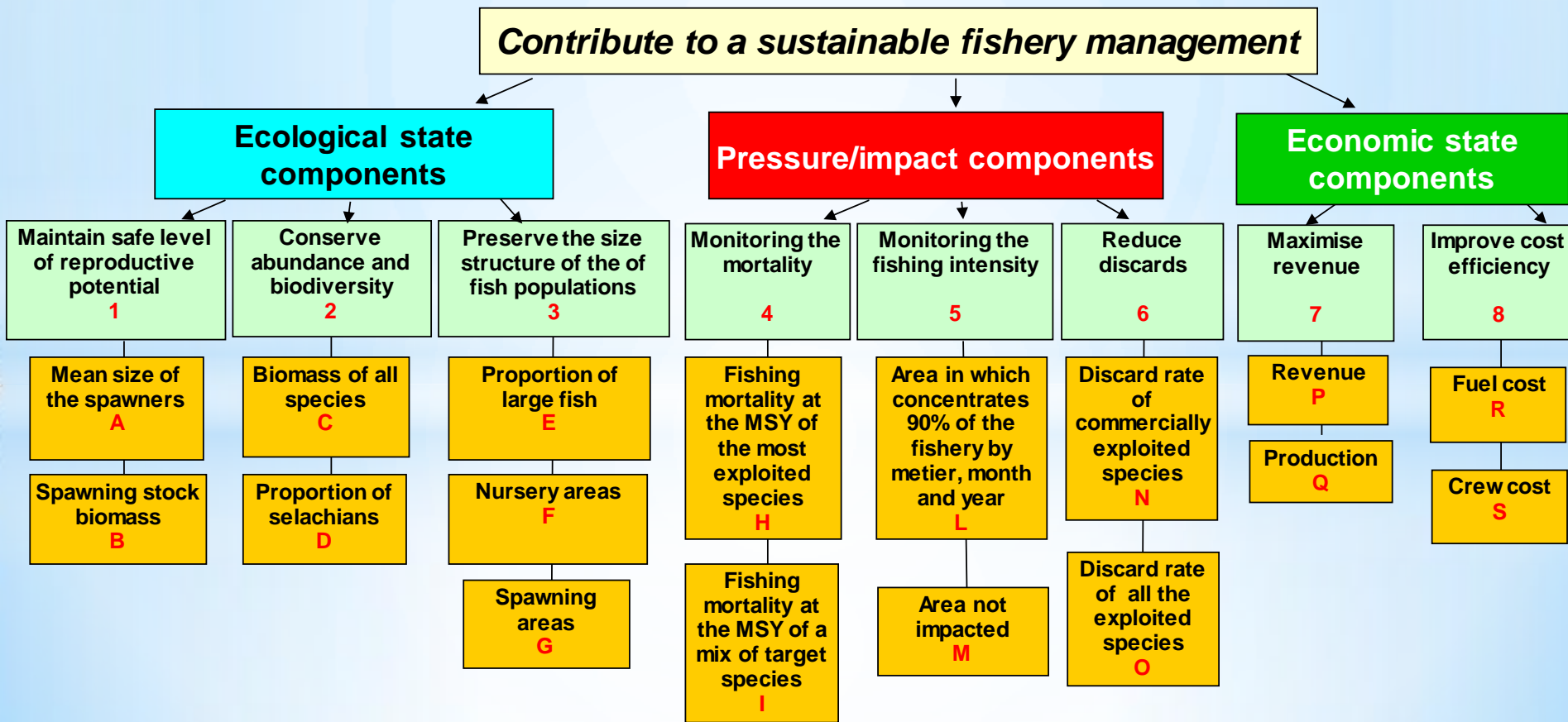
Scenario n°1 (AHP) - Scoring notation

During the pairwise comparisons among the criteria/factors and indicators, the stakeholders should express their evaluation by choosing a score from 1 to 5, depending on what is considered more relevant.

Relative importance	Score
Equally important	1
Little more important	2
More important	3
Much more important	4
Exceptionally more important	5

Scenario n°1 (AHP) – Pairwise comparison

- **Which of the following criteria/factors is more relevant to achieve the objective?**

- **Tick the numbers on the left or the right to indicate your choice between the pairwise criteria/factors.**

Maintain safe level of reproductive potential	5 4 3 2 **1** 2 3 4 5	Conserve abundance and biodiversity
Maintain safe level of reproductive potential	**5** 4 3 2 1 2 3 4 5	Preserve the size structure of the of fish populations
Maintain safe level of reproductive potential	5 4 3 2 1 2 **3** 4 5	Monitoring the mortality
Maintain safe level of reproductive potential	5 4 3 **2** 1 2 3 4 5	Monitoring the fishing intensity
Maintain safe level of reproductive potential	5 4 3 2 **1** 2 3 4 5	Reduce discards
Maintain safe level of reproductive potential	5 4 3 2 1 2 3 **4** 5	Maximize revenue
Maintain safe level of reproductive potential	5 4 **3** 2 1 2 3 4 5	Improve cost efficiency

🌐 **Which of the following indicators is most effective to monitor the performance of the criteria/factor to which it is associated?**

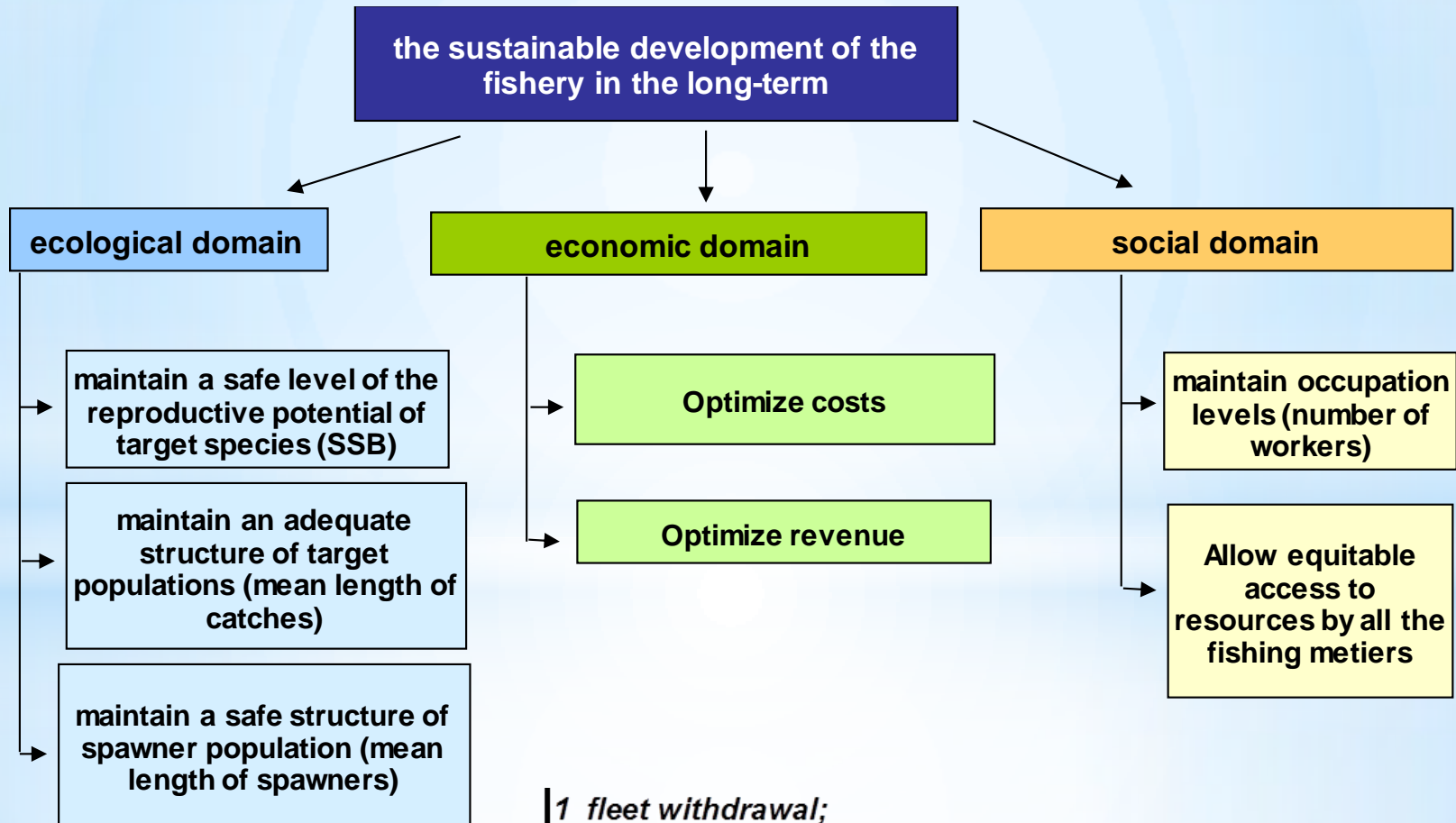|		
Spawning stock biomass	5 4 3 2 1 2 3 4 5	Mean size of the spawners
Biomass of all species	5 4 3 2 1 2 3 4 5	Proportion of selachians
Proportion of large fish	5 4 3 2 1 2 3 4 5	Nursery areas
Proportion of large fish	5 4 3 2 1 2 3 4 5	Spawning areas
Spawning areas	5 4 3 2 1 2 3 4 5	Nursery areas
Fishing mortality at the MSY of the most exploited species	5 4 3 2 1 2 3 4 5	Fishing mortality at the MSY of a mix of target species
Area not impacted by fishing gears	5 4 3 2 1 2 3 4 5	Area in which concentrates 90% of the fishery by metier, month and year
Discard rate of commercially exploited species	5 4 3 2 1 2 3 4 5	Discard rate of all the exploited species

Scenario n°2 (NSFDSS)

The aim of Scenario n°2 is to understand the stakeholders perception as regard the potential effects derived by the implementation of a pool of management measures, in the framework of a **Multiannual Plan.**

The first step is the definition a common objective such as: "**the sustainable development of the fishery in the long-term**".

The second step is the identification, within the three domains **ecological**, **economic** and **social**, of the main **criteria/factors** which can characterize the common objective.

The last step is to pinpoint a set of management strategies, potentially suitable to meet the identified criteria.

Scenario n°2 (NSFDSS) – Pairwise comparison

- In order to "**Maintain a safe level of the reproductive potential of target species (SSB)**" **which of the following management strategies is more efficient/fair?**
- **Make the pairwise comparison.**

seasonal fishing ban	INDIFFERENT	fleet withdrawal
seasonal fishing ban	INDIFFERENT	spatial fishing ban; (nursery and/or spawning areas)
seasonal fishing ban	INDIFFERENT	improve gears selectivity
seasonal fishing ban	INDIFFERENT	measures combination
seasonal fishing ban	INDIFFERENT	keep the status quo
fleet withdrawal	INDIFFERENT	spatial fishing ban; (nursery and/or spawning areas)
fleet withdrawal	INDIFFERENT	improve gears selectivity
fleet withdrawal	INDIFFERENT	measures combination
fleet withdrawal	INDIFFERENT	keep the status quo

Scenario n°2 (NSFDSS) – Pairwise comparison

- **In order to support the sustainable development of the fishery in the long-term which of the following criteria/factors is more efficient/fair?**
- **Make the pairwise comparison**

Maintain a safe level of the reproductive potential of target species (SSB)	INDIFFERENT	Maintain an adequate structure of target populations (mean length of catches)
Maintain a safe level of the reproductive potential of target species (SSB)	INDIFFERENT	Optimize costs
Maintain a safe level of the reproductive potential of target species (SSB)	INDIFFERENT	Optimize revenue
Maintain a safe level of the reproductive potential of target species (SSB)	INDIFFERENT	Maintain occupation levels (number of workers)
Maintain a safe level of the reproductive potential of target species (SSB)	INDIFFERENT	Allow equitable access to resources by all the fishing metiers

Thanks for your attention

Questions and comments are welcome