11-12 October 2014,
Istanbul
First stakeholders event

WP4: Integration and internal communication of results.

- ***Setting up methodological basis for MCDA***

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How implement participatory management?

Organic Aquaculture can be typically characterised by complex decision and evaluation problems involving tradeoffs of multiple and sometimes conflicting objectives.

Multiple Criteria Decision Analysis techniques (MCDA) with the use of preference modelling can be useful for:

ranking a set of possible decisions on the basis of agreed-upon decision factors and criteria, once common wide objectives have been identified and agreed.

This will be achieved during the second stakeholders event by means of discussion and distributed questionnaires

Examples of methods

Two examples of methods of deterministic preference modelling:

- ✓ the Analytical Hierarchy Process (AHP, Saaty, 1990; 2003; 2008)
- ✓ the Non-Structural Fuzzy Decision Support System (NSFDSS, Tam et al. 2002; 2006)

AHP provides a complete decision-making framework for the analysis of appropriate management problems:

- has the advantage to decompose the decision problem into a hierarchy of more easily comprehended sub-problems, each of which can be analyzed independently;
- converts the human expert judgement to numerical values that can be processed and compared (allowing diverse and often incommensurable elements to be compared to one another in a rational and consistent way).

Examples of methods

NSFDSS is similar to the AHP in that both methods:

- ✓ decompose a problem in a hierarchical manner;
- ✓ apply pair wise comparisons at lowest level of the hierarchy;
- ✓ synthesise the results, working from most detailed level up through the hierarchy towards the general objective.

but NSFDSS

- ✓ applies fuzzy logic to model the ambiguity and imprecision of vague terms such as “marginally different”, “strongly preferred” etc.,
- ✓ modifies the process of consistency checks to the pairwise comparisons and allows for a larger set of semantic operators than the classical AHP;
- ✓ simplifies the decision process and may reduce errors because a stakeholder has only three possible answers to give: prefer A to B, prefer B to A; A and B are equally important.

Example of AHP implementation

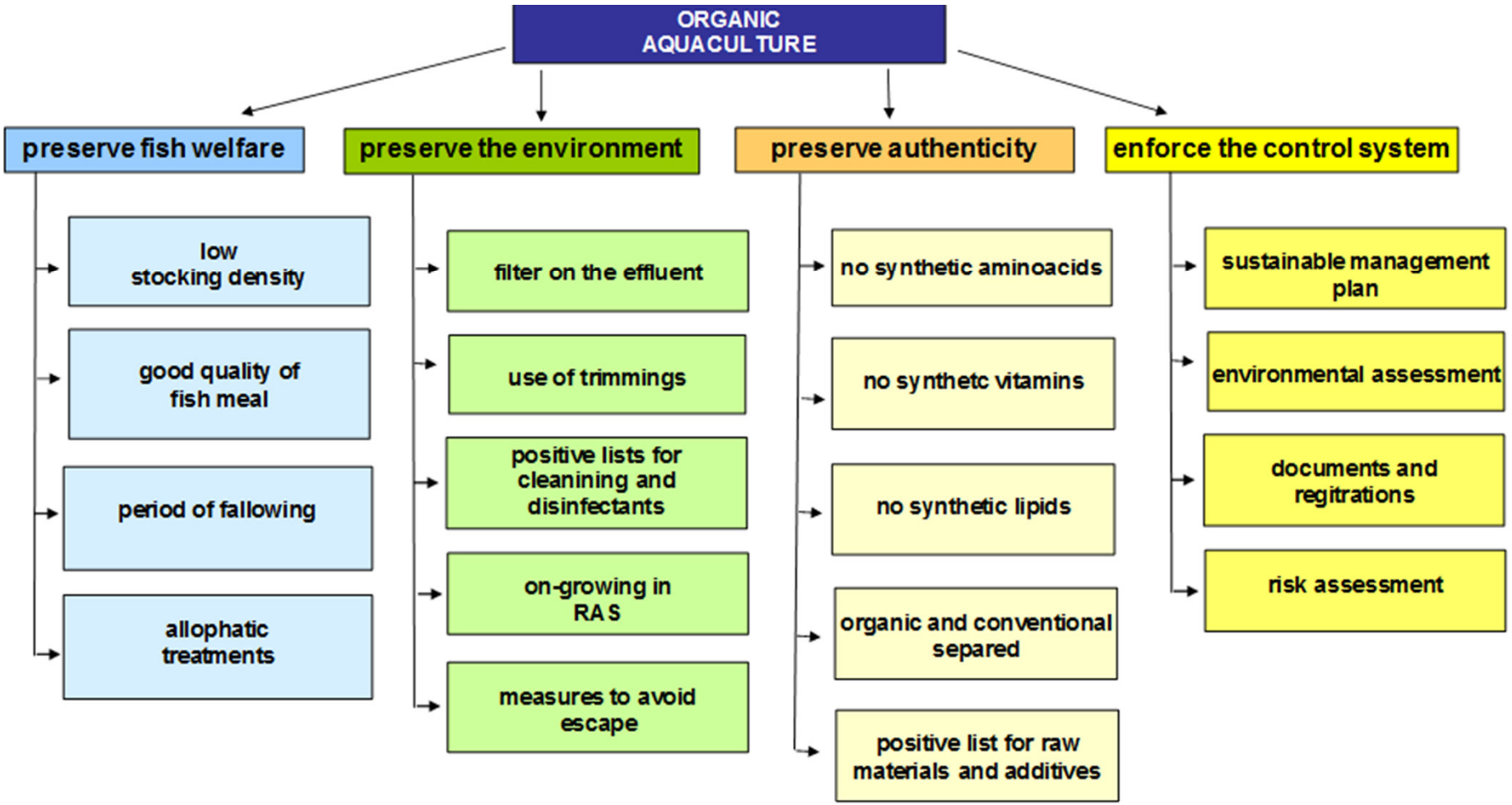
The AHP decision tree:

(1st level) the goal, *organic aquaculture;*

(2nd level) the main objectives, *fish welfare, environmental sustainability, preserve authenticity, enforce the control system;*

(3rd level) the associated indicators, …

Example of AHP implementation



Example of AHP implementation

PAIRWISE COMPARISONS										
preserve fish welfare	5	4	3	2	1	2	3	4	5	preserve the environment
			x							
preserve fish welfare	5	4	3	2	1	2	3	4	5	preserve authenticity
					x					
preserve fish welfare	5	4	3	2	1	2	3	4	5	enforce the control system
				x						
preserve the environment	5	4	3	2	1	2	3	4	5	preserve authenticity
							x			
preserve the environment	5	4	3	2	1	2	3	4	5	enforce the control system
									x	
preserve authenticity	5	4	3	2	1	2	3	4	5	enforce the control system
						x				
etc.	5	4	3	2	1	2	3	4	5	etc.

Examples of methods

Questionnaire with pairwise comparisons

LEGEND		
Intensity of importance	***Definition***	***Explanation***
1	Equal importance	The two indicators/criteria contribute equally to the objective
2	Moderate importance	Experience and judgement slightly favour one over the other
3	Strong importance	Experience and judgement strongly favour one over the other
4	Very strong importance	Experience and judgement very strongly favour one over the other. Its importance is demonstrated in practice.
5	Extreme importance	The evidence favouring one over the other is of the highest possible validity

The NSFDSS implementation