

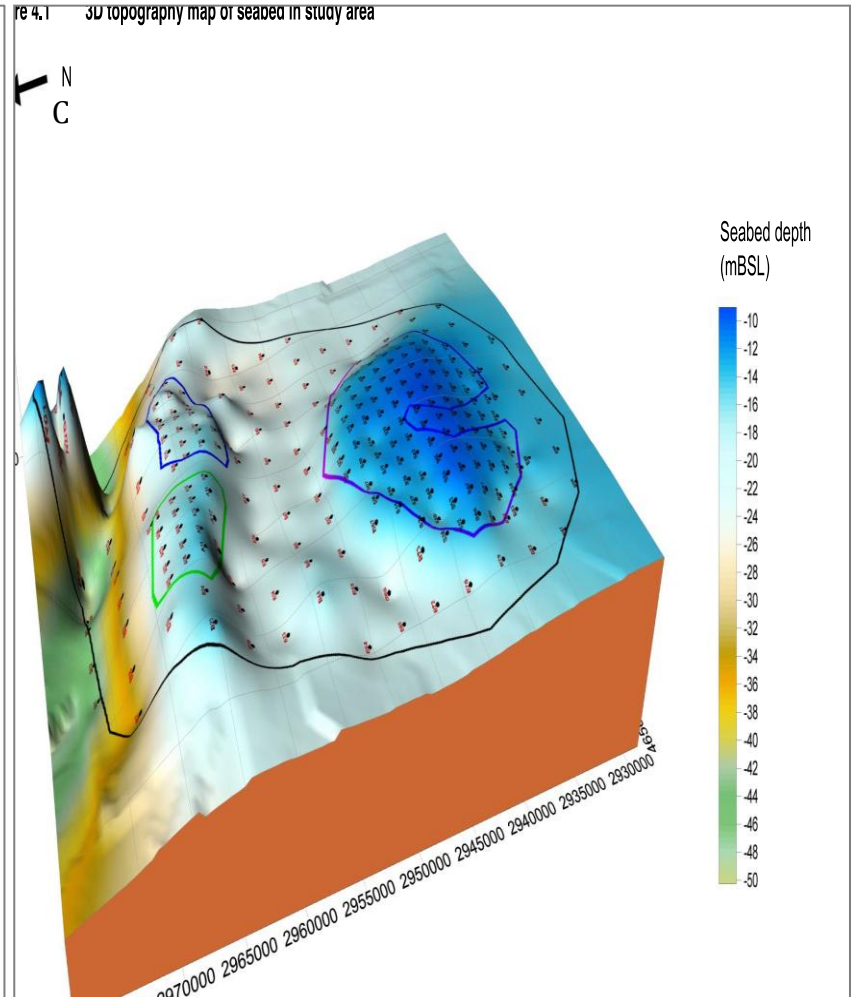
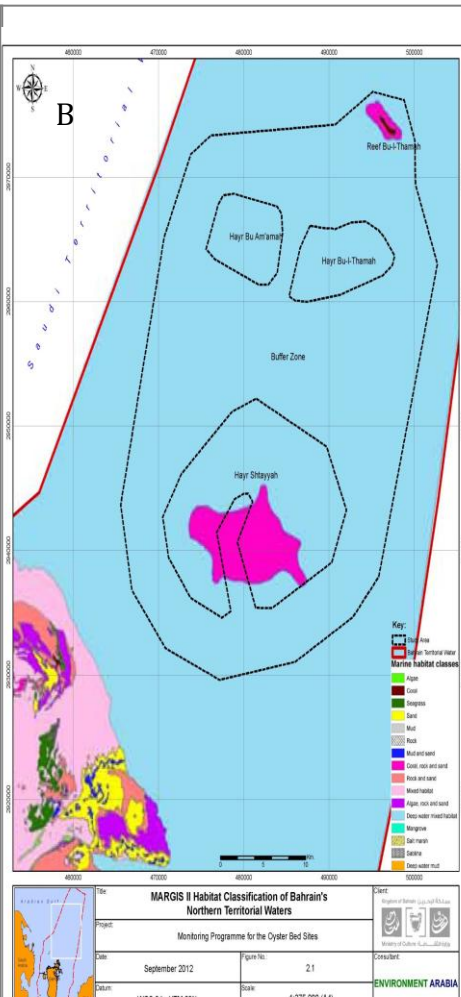
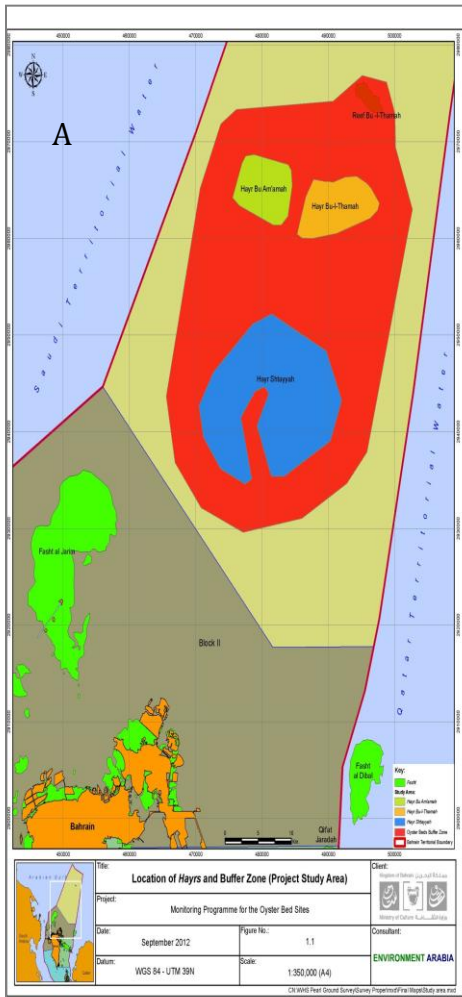
# Application of Ecosystem Approach to the Management of Pearling WHS in the Kingdom of Bahrain

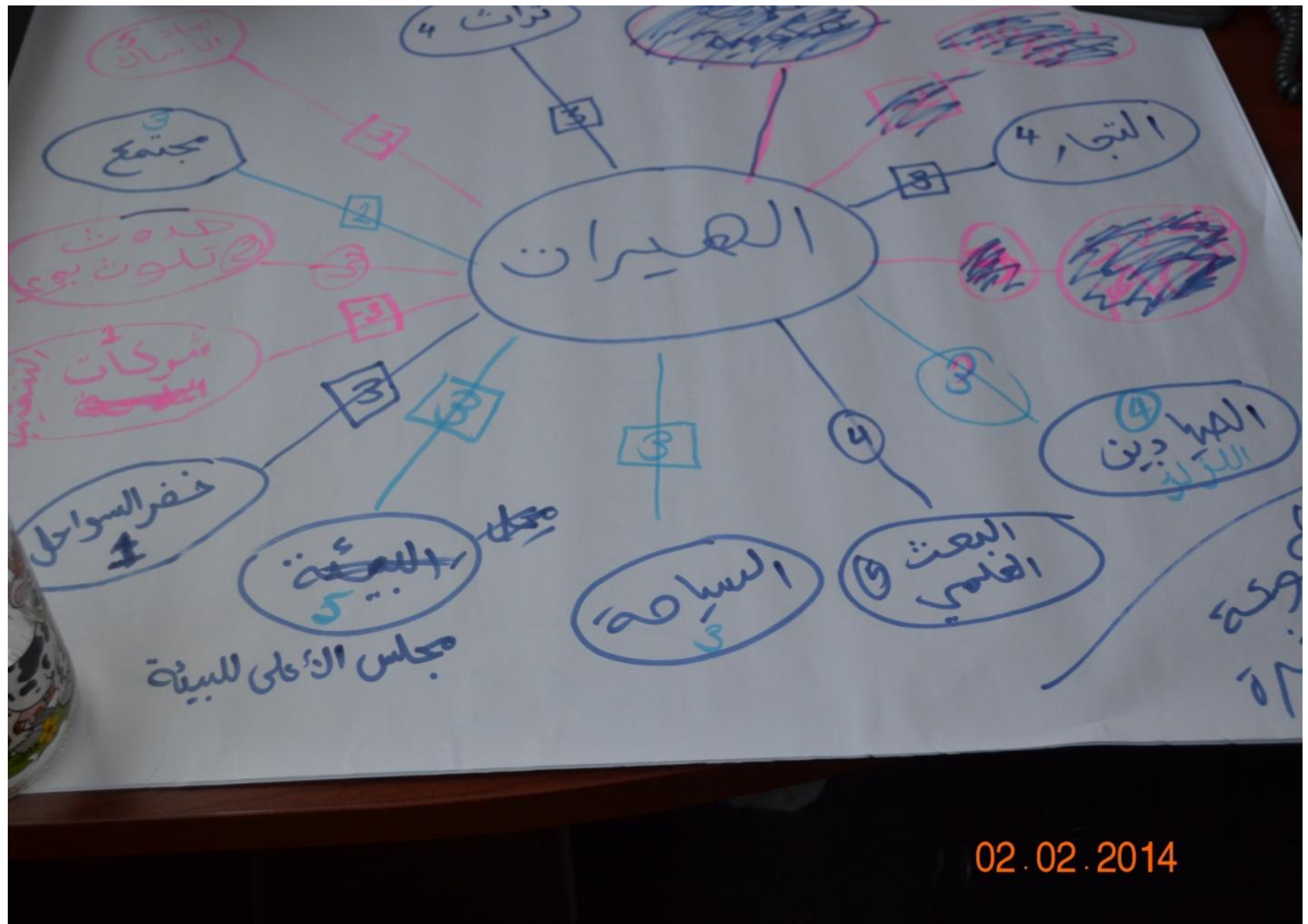
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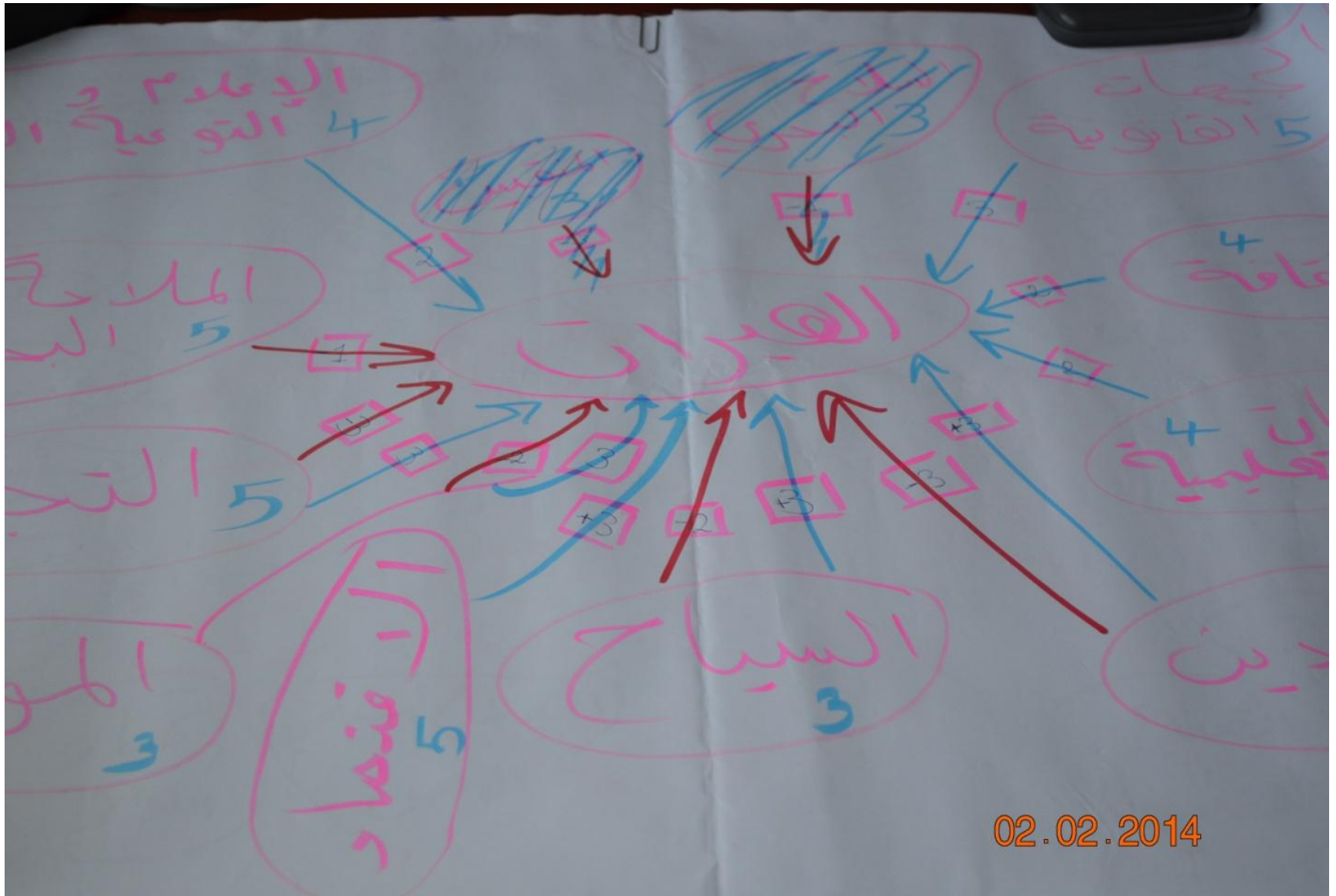
# Steps

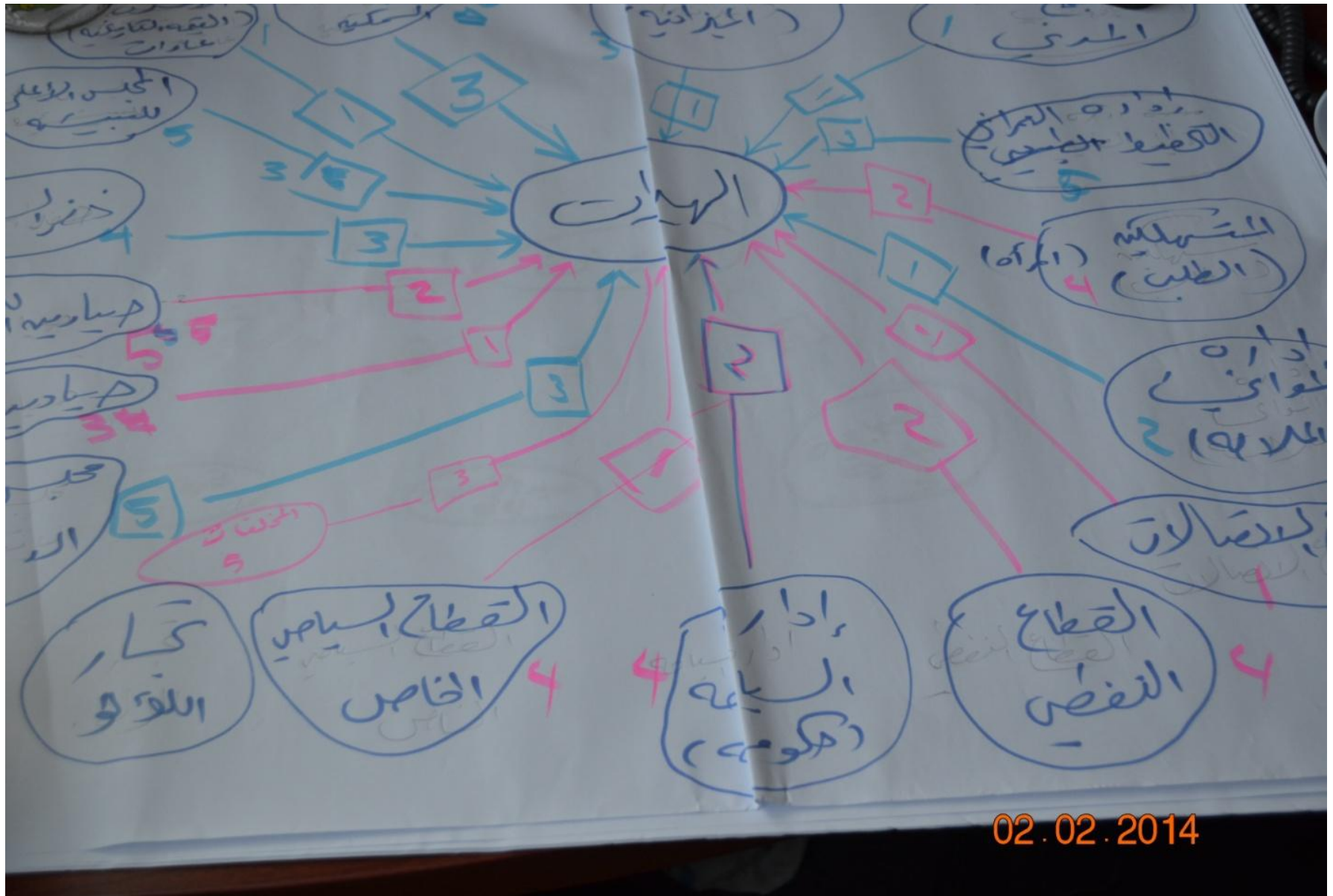
- Stakeholders mapping
- Characterization of ecosystems
- Development of
  - Vision
  - Strategic Objectives
  - Ecological Objectives
  - Operational Objectives
  - Targets and Indicators
  - Monitoring programme





02.02.2014





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Stakeholder	Importance	negative /positive	negative impacts	positive impacts
Pearl Divers	5	N	3	0
Fisherman	5	N	3	1
Pearl Traders	5	N	3	2
People fishing as hobby	3	N	2	0
Maritime transport	5	N	2	0
Oil Exploration	5	N	3	0
Supreme of Council of Environment	5	P	1	3
Ministry Of Culture	5	P	0	3
Dept. of Fisheries	5	P	3	3
Tourism	4	N	2	0
dredging and sea filling activities	5	N	3	0
Coast Guard	5	P	0	3
Ports authority	5	N	1	3
Civil Society	3	P	0	2
Academic and research institutions	3	P	0	2

Stakeholder	Importance	Attitude
Pearl Divers	PS	Op
Fisherman	PS	Op
Pearl Traders	PS	Op
People fishing as hobby	SS	N
maritime transport	PS	N
Oil Exploration	PS	Op
Supreme of Council of Environment	PS	N
Ministry Of Culture	PS	N
Dept. of Fisheries	PS	Op
Tourism	SS	N
dredging and sea filling activities	PS	Op
Coast Guard	PS	N
Ports authority	PS	N
Civil Society	SS	N
Academic and Research institutions	SS	N



Stakeholder	Contribution
Pearl Divers	Decision making process
Fisherman	Decision making process
Pearl Traders	Decision making process
People fishing as hobby	Consultation
maritime transport	Support
Oil Exploration	Support
Supreme of Council of Environment	Decision making process
Ministry Of Culture	Decision making process
Directorate of Fisheries	Decision making process
Tourism	Consultation
dredging and sea filling activities	Support
Coast Guard	Support
Ports authority	Support
Civil Society	Support
Academic and Research institutions	Support

# Vision

Hayr Bu I-Thamah, Hayr Bu 'Amamah and Hayr Shtayyah ecosystems to be healthy , resilient, and maintain the productivity and biodiversity and used rationally to maintain the ecological services and benefits provided to the community in the Kingdom of Bahrain

# Strategic Objectives

- 1) Prevent , reduce and manage the sensitivity to risks arising from human activities and natural phenomena
- 2) Protect , and allow recovery, wherever possible, practical, the structure and function of ecosystems of pearling zones and thus the protection of biodiversity, in order to achieve good environmental status and maintained by allowing their use in a sustainable manner

# Development of a set of ecological objectives

1. Maintain and enhance biodiversity
2. Non-indigenous species do not cause adverse ecosystem impacts
3. Catching of commercially exploited fish and shellfish are within sustainable limits
4. Maintain sea-floor integrity
5. Alteration of hydrographical conditions does not adversely affect marine ecosystems
6. Pollution by contaminants, through discharge, marine inputs, land-based sources, is minimized

# Targets-Indicators

- For each of the ecological objectives
- Operational Objectives
- Indicators
- Targets
- Action
- Responsibility

# Proposed operational objectives and indicators per ecological objective

# Biodiversity is maintained, or enhanced through restoration

<b><i>Ecological Objective</i></b>	<b><i>Operational Objectives</i></b>	<b><i>Possible Indicators</i></b>
<b><i>1. Biological diversity is maintained or enhanced . The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climate conditions.</i></b> <b><i>2. Oyster species abundance increased or maintained</i></b>	<b>1.1 Species distribution is maintained and species are not lost or put at risk due to extinction</b>	<i>1.1.1 Distributional range change</i>
		<i>1.1.2 Area covered by the species (for benthic species)</i>
	<b>1.2 Population size and density of key species is maintained</b>	<i>1.2.1 Population size</i>
		<i>1.2.2 Population density</i>
	<b>1.3 Habitat distribution is monitored and key coastal and marine habitats are not being lost</b> <b>2.1 Number of individuals in specific area is increased or maintained as in the baseline (2011)</b>	<i>1.3.1 Potential /observed distribution of important habitats</i>
		<i>1.3.2 Observed changes to distributional pattern, with threshold rates of loss</i> <b>2.1.1 Oysters profile</b> <b>2.1.2 Estimation of density inside the pearling zones and outsides</b>

# Targets



1 This target indicates that, in the absence of historical data, the aim of the current management plan is to conserve the current ecological situation

Indicator	Target	Action	Responsibility
<p><i>1.1.1 Distributional range change</i></p>	<p>The ratio of Natural number of oysters / observed distributional range tends to 1</p>	<p>Decrease in the main human causes of the habitat decline</p>	<p>Fishermen, oil exploration</p>
<p><i>1.1.2 Area covered by the species (for benthic species)</i></p>	<p>Number of oyster individuals by area unit allows to achieve and maintain a favourable conservation status</p>	<p>Continual recovery of oyster population density</p>	<p>Fishermen, Fisheries, Supreme Council for the Environment</p>

# Derivation of a monitoring programme

Indicator		Who	When	In cooperation
1.1.1 <i>Distributional range change</i>		Fisheries/council	Annual	
1.1.2 <i>Area covered by the species (for benthic species)</i>		Fisheries/council	Annual	
1.2.1 <i>Population size</i>		Fisheries/council	Annual	
1.2.2 <i>Population density</i>		Fisheries/council	Annual	
1.3.1 <i>Potential /observed distribution of certain habitats</i>		Fisheries/council	Annual	
1.3.2 <i>Observed changes to distributional pattern, with threshold rates of loss</i>		Fisheries/council	Annual	

Thank you for your Attention