

Appendix I



CASE STUDY TEMPLATE FOR IMBER- ADApT



Integrated Marine Biogeochemistry and Ecosystem Research

www.imber.info

The purpose of this case study template is to collect case studies to develop a decision support tool to enable managers, researchers and local stakeholders to: (1) make decisions efficiently, (2) improve their response and (3) evaluate where to most effectively allocate resources to "reduce" vulnerability and enhance the capacity of coastal peoples to adapt to global change. This decision tool, IMBER-ADApT (Assessment based on Description, Responses and Appraisal for a Typology), will build on knowledge learned from existing marine case studies, where some action was taken to counteract the environmental, social or other impacts of global change. The case studies should take into account the highly interconnected natural and human systems of today. Here we explicitly ask what can be learned from existing responses that were taken to global change generally and how this information can be used to decide how best to respond to current and future global change. Thus, the information that you will provide is key to the development of this decision support tool.

IMBER-ADApT is being developed by the Human Dimensions Working Group of IMBER (Integrated Marine Biogeochemistry and Ecosystem Research project, www.imber.info). The overall goal of IMBER is to provide a comprehensive understanding of, and accurate predictive capacity for, ocean responses to accelerating global change and the consequent effects on the Earth System and human society. One program focus area is the interactions between human and ocean systems and investigation of what human institutions can do to mitigate or to adapt to global change. IMBER-ADApT has the capacity to be applied to a wide range of global change issues in the terrestrial and marine realms, but our current focus is on marine social and ecological systems related to fisheries and aquaculture with respect to global change. By taking a broad perspective on human-ocean interactions, from biogeochemistry to governance, and recognising the interconnections and feedbacks, we address the complex nature of both the marine ecosystems and of the human interactions. As marine ecosystems are subjected to a complex set of natural, social and/or governance drivers, with responses and interactions occurring at multiple levels and scales, focusing on understanding how humans interact with the marine environment can help us address issues threatening security of food, shelter, livelihoods, and human health.

The development of such a framework necessarily requires an interdisciplinary approach. The case study template is comprised of six sections (A-F in "Contents" below) with a total of 30 questions, which will probably require input from several people. We encourage you to consult with your colleagues in order to complete the case study template. The case study template is designed around an "Issue" affecting fisheries and



aquaculture that links the natural properties of the marine ecosystem with the social and governance systems. In completing this case study template, please focus on only the most prominent **issue** (e.g. over-fishing, invasive species, ocean acidification, globalised markets, tourism etc.). If there are other relevant issues, please note these in the background section and where appropriate in the case study template. Sections A-F should be completed in full and Section G is a glossary of terms.

Our longer term intention is to develop a database of global case studies as an open-access web site to help decision makers, researchers and stakeholders decide how to respond when faced with difficult choices and trade-offs. This means that some of the information and data that you provide will be made accessible to other users. By returning the completed case study template to us, it is understood that we have your permission to include this information on-line. If you do not agree to this, please let us know by returning a completed non-consent form (Section I).

We are also planning to publish a book that will describe IMBER-ADApT and synthesise lessons learned from its application to specific case studies. We would like to invite you to join us and contribute a chapter about your case study. Please let us know if this is of interest to you.

Thank you once more for agreeing to complete this case study template. This case study template is downloadable from our website (<http://www.imber.info/index.php/Science/Working-Groups/Human-Dimensions/IMBER-ADApT>). We have also provided an example of a completed case study template for a case study from Uruguay for your guidance. Please submit your completed case study template to IMBER HDWG at: imber@imr.no. We will keep you informed of progress and in the meantime please visit our website <http://www.imber.info/index.php/Science/Working-Groups/Human-Dimensions>

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If you have any questions, please contact us at imber@imr.no



Many thanks for agreeing to complete this case study template!

CASE STUDY TEMPLATE SECTIONS

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A. BACKGROUND INFORMATION

In this section, please provide background information about yourself and your case study, as well as a clear description of the Main Issue affecting fishing or aquaculture in your case study. Please provide as much information as necessary to understand the Main Issue. If required, use an extra page and feel free to provide references where relevant.

INFORMATION	DETAILS		
CASE STUDY CONTRIBUTORS (please include all contributors)	NAME: AFFILIATION: Email:	NAME: AFFILIATION: Email:	NAME: AFFILIATION: Email:
NAME OF STUDY AREA			
COUNTRY/COUNTRIES WITH JURISDICTION			
GEOGRAPHIC LOCATION (Temperate, Tropical or High Latitude)			
ECOSYSTEM TYPE (Coastal, Lagoon, Shelf or Open Ocean, other)			
MAIN ISSUE (a) Provide a concise, detailed description of the Main Issue affecting the case study. Include the following information to show the extent of the effect of the Main Issue:	Description of Main Issue location size of marine area in your case study (km²) main species main habitats size of area inhabited by people in your case study (km²)		



	<p>key stakeholders</p> <p>number of people affected by the Main Issue</p> <p>total number of people in your case study area</p>
<p>(b) When did the Main Issue occur?</p>	
<p>(c) Are there other geographical areas that are also affected by this issue, but not included in this case study? If so, please indicate what they are.</p>	

Please insert a map of the area of your case study here



B. DESCRIPTION OF THE STRESSORS AND THEIR IMPACTS

This section aims to gather information about the scale of the affected natural and social systems, and the governing systems, the main stressors affecting these systems, the consequent changes that these cause, and their impacts. Please provide as much information as necessary, but in no more than 200-300 words for each question. Please provide references where relevant.

Questions	Natural system	Social system	Governing system
1. What are the boundaries of the natural, social and governing systems?			
2. Which of the following levels is the Main Issue related to? Please describe for each system and level, where appropriate.	A. LOCAL B. REGIONAL (within country) C. NATIONAL D. INTERNATIONAL/GLOBAL	A. LOCAL B. REGIONAL C. NATIONAL D. INTERNATIONAL	A. LOCAL B. REGIONAL C. NATIONAL D. INTERNATIONAL
3. What are the main natural, social and/or governance stressors that affect this system?			
4. What changes in the natural, social and governing systems do these stressors cause and where?			
5. What are the impacts or			



consequences of this change on the natural, social and governing systems?			
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C. VULNERABILITY (6 questions)

Please provide as much information as necessary in no more than 200-300 words for each question, and provide references where relevant.

NB: These questions refer to the period PRIOR to the Main Issue

QUESTION	Details
6. What was the ecological status of the affected ecosystem (e.g., eutrophication, changes in size and/or trophic level, loss of key species, habitat quality, invasive species structure, dead zones)?	
7. What was the productivity of the system (low, medium or high)	
8. What were the main livelihood activities (e.g., fishing, tourism, etc.) directly affected by the Main Issue?	
9. What other livelihood opportunities (e.g., farming, manufacturing, forestry, etc.) were there in the affected area?	
10. What % of the total catch/production from fisheries and or aquaculture was used for own household consumption (not sold)?	
11. What proportion of household income came from fish caught or produced locally (including post-harvesting activities)?	



D. GOVERNANCE (10 questions)

Please provide as much information as necessary, but in no more than 200-300 words for each question, and provide references where relevant.

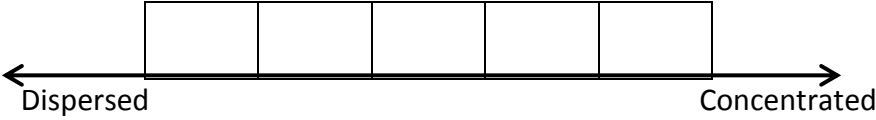
NB: These questions refer to the period PRIOR to the Main Issue

QUESTION	Details
12. What were the relevant organisation(s) or individual(s) (including state, market and civil society) responsible for governance of fisheries and aquaculture at local, regional and national levels in this area?	LOCAL: REGIONAL: NATIONAL:
13. What was the mode of governance (e.g., self-, co-, hierarchical (local), hierarchical (larger scale), mixture). Please describe.	
14. What were the long-term management objectives?	



<p>15. What were the key rules, regulations, instruments and measures employed to achieve the management objectives?</p>	
<p>16. Were there any informal rules, regulations, instruments and measures that play an important role in the governance of fisheries and aquaculture?</p> <p>Please describe.</p>	
<p>17. What was the nature of the relationship between the different sectors or livelihood occupations in this system (i.e., is there conflict or cooperation)?</p> <p>Are there any special circumstances in their relationships that should be noted?</p>	<p>Please tick the box corresponding to the most appropriate situation</p> <div style="text-align: center;"> <p>← Conflict □ □ □ □ □ Cooperation →</p> </div>
<p>18. Who dominated or wielded the most social power in the area (e.g., fishers' associations, unions, corporations, governments, business owners, etc.)?</p>	



<p>19. How concentrated was social power in the area (ie., was power held by a few people/1 organisation (concentrated) or was it dispersed over several organisations ?</p>	<p>Please tick the box corresponding to the most appropriate situation of the social system</p>  <p>← Dispersed <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Concentrated →</p>
<p>20. Were there any structural changes in the governing system or individuals prior to the main issue? Please describe the changes and why they occurred?</p>	
<p>21. Were there any changes to the key rules, regulations, instruments and measures, or have any new ones been introduced prior to the main issue? Please describe the changes and why they were introduced</p>	



E. RESPONSE (2 questions)

The objective of this section is to evaluate the response of the natural, social and governing systems to the Main Issue. We ask for information about Short Term (within 2-5 years) and Long Term responses for the natural, social and governing systems. Please provide as much information as necessary, but in no more than 200-300 words for each question. Please provide references where relevant.

	Natural	Social	Governing
<p>22. a. What were the short term responses of the social and governing systems to the main issue?</p> <p>(Include structural changes in the governing system(s) or individuals, or the changes in key rules, regulations, instruments and measures etc.)</p>	<p>NA</p>	<p>TYPE OF RESPONSE (eg behavioural change, exit of actors)</p> <p>LEVEL OF RESPONSE (national, regional , local) of response))</p>	<p>TYPE OF RESPONSE (eg management measure, technological change, \$ aid)</p> <p>LEVEL OF RESPONSE (national, regional , local) of response)</p>
<p>b. What were the long term responses of the social and governing systems to the main issue?</p> <p>(Include structural changes in the governing system(s) or individuals, or the changes in key rules, regulations, instruments and measures</p>		<p>TYPE OF RESPONSE (eg behavioural change, exit of actors)</p> <p>LEVEL OF RESPONSE (national, regional , local) of response</p>	<p>TYPE OF RESPONSE (eg management measure, technological change, \$ aid)</p> <p>LEVEL OF RESPONSE (national, regional , local) of response</p>



etc.)			
23. a. What were the objectives of the short term social and governing responses for the natural, social and governing systems?			
b. What were the objectives of the long term social and governing responses for the natural, social and governing systems?			



F. APPRAISAL (7 questions)

The objective of this section is to evaluate the response of the natural, social and governing systems to the Main Issue. We ask for information about Short Term (within 2-5 years) and Long Term responses for the natural, social and governing systems. Please provide as much information as necessary, but in no more than 200-300 words for each question. Please provide references where relevant.

	Natural	Social	Governing
24. a. What were the results of the short term response for the natural, social and governing systems (ie were the objectives in Q.23.a achieved)?			
b. What were the results of the long term response for the natural, social and governing systems (ie were the objectives in Q. 23.b achieved)?			
25. Was the Main Issue addressed (Section A)? Please describe.			
26. a. What factors contributed to the successful short term results described in Q 24.a (e.g., enabling policy, government funding)			



b. What factors contributed to the successful long term results described in Q 24.b (e.g., enabling policy, government funding)			
27. a. What factors (if any) prevented the short term objectives from being fully achieved? (e.g., regulatory barrier, lack of social cohesion, costs too high, climate variability, judicial decisions).			
b. What factors (if any) prevented the long term objectives from being fully achieved? (e.g., regulatory barrier, lack of social cohesion, costs too high, climate variability, judicial decisions).			
28. Has there been a formal evaluation of the responses? If so, how was this done and			



when?			
29. a. What were the benefits related to costs of the short term response?			
b. What were the benefits related to costs of the long term response?			
30. Were other options considered for the short and/or long term responses? Why were these not selected?			



G. GLOSSARY

Driver

Any natural or human-induced factor that directly or indirectly causes a change. (<http://www.greenfacts.org/glossary/def/driver.htm>)

Ecosystem

A discrete unit that consists of living (e.g. assemblage of plant and animal species) and non-living parts (e.g. the physical environment), interacting to form a stable system.^[1,2]

Eutrophication (Q#6)

The process of nutrient enrichment (usually by nitrates and phosphates) in aquatic ecosystems, such that the productivity of the system ceases to be limited by the availability of nutrients. The increased growth of plants and algae depletes the dissolved oxygen content of the water and often causes a die-off of other organisms. It occurs naturally over geological time, but may be accelerated by human activities (e.g. sewage disposal or land drainage); such activities are sometimes termed 'cultural eutrophication'.^[1]

Governance

Governance refers to groups of people coming together to achieve a particular outcome. It involves all interactions among government, private firms, civil society, citizens as well as any other relevant stakeholder groups to solve societal or environmental problems and to create opportunities. In addition to the day-to-day management tasks, the boundary of governance includes the formulation and application of principles and visions guiding those interactions and care for institutions that enable and structure them.^[4,6]

Governance refers to mechanisms, processes and institutions through which public and private sectors articulate their interests, exercise their rights, meet their obligations and mediate their differences in order to make decisions affecting society (Rosenau, 1999).

Habitat (Main Issue)

The natural environment, characterized by its physical features (e.g., temperature range, availability of light, food availability or dominant plant types) in which an organism or population normally lives. Marine habitats include, for example, mangroves, intertidal zones, coral reefs, deep sea.

**Household (Q#10, 11)**

A household is a domestic unit consisting of the members of a family, as well as any non-relatives who live together in the same dwelling.

Instruments (or measures) (Q#15, 16, 21, 22)

Instruments are tools used in governance to overcome problems or obtain a desired effect. They are usually of a regulatory or economic nature. There is a large variety of instruments including 'soft' ones, like information and advice, and 'hard' ones such as taxes and regulations. Laws, treaties and appointments are formal instruments, while oral agreements, visits, or making a speech are more informal.^[4]

Invasive species (Q# 6)

A species that is not native to an area that it colonizes and that is capable of causing harm to native species or the natural environment, and incur economic damage, or injury to human health.^[1]

Mode of governance (Q#13)

There are three forms of governance: hierarchical, co-governance or self-governance. Hierarchical governance is a top-down 'steering and control' style of intervention, that uses policies and in law. Co-governance requires involvement from various parties with a common purpose (e.g. fisheries co-management). In self-governance (e.g., community- or market-based) the actors take care of themselves, outside the purview of government. While self-governance may be initiated by governments through deregulation or devolution, it can also come about of its own accord.^[5,6]

Power (relations) (Q#18)

Power is the ability to influence the behaviour of others and in social relationships is determined by the actors' access to power resources. Besides obvious power resources such as wealth and control over jobs, many others exist, for example, organizational capacity, expert knowledge, control of information, being in certain social positions, and even having a reputation of being powerful. Power has a reciprocal nature: A acts, B reacts, A reacts to B's reaction, and so on.^[7] This can manifest as power to exclude, power to influence markets or power to influence decision-making

Primary Productivity (Q#7)



The photosynthetic fixation of carbon by chlorophyll containing organisms, such as phytoplankton, macroalgae, mangroves, sea grasses and other sea plants. It is measured as the weight of carbon fixed per unit area per time, usually as $\text{g.C. m}^{-2} \cdot \text{yr}^{-1}$

Rules (formal and informal) (Q# 15, 16, 21, 22)

Formal rules (e.g., constitutions, laws and regulations) are consciously designed and often codified in written form. They are often enforced by an external authority such as the police and the courts. Informal rules evolve spontaneously and unintentionally over time through human interaction, and take the form of unwritten conventions, routines, customs, and behavioural norms. Informal rules are often self-enforced, because all (or most) actors find it beneficial to adhere to them (as long as others do too). Those who do not abide by the informal rules of society can expect the other actors to show their disapproval even to the extent of expelling them from the group.^[3]

Social system

Organisation of individuals into groups or structures that have different functions, characteristics, origin or status.

<http://www.businessdictionary.com/definition/social-system.html>. Characteristic pattern of interrelationships between individuals, groups, and institutions to form a coherent whole [http://www.merriam-webster.com/dictionary/social system](http://www.merriam-webster.com/dictionary/social%20system)

Stressor (Section B, Q# 3, 4)

An event, condition, individual, or other stimulus that causes stress to a system.^[9]

Structural changes (Q#20, 22)

Changes to the structure of an organization to achieve its goals. These can be either a partial adjustment or a total overhaul of the duties, tasks, and responsibilities of individuals and departments, as well as reporting relationships and the number of levels in the organization's hierarchy.^[8]

Trophic level (Q#6)

The position that an organism occupies in a food chain. For example, green plants (which obtain their energy directly from sunlight) are the primary producers, and herbivores are primary consumers (and secondary producers). A carnivore that eats only herbivores is a secondary consumer and a tertiary producer. Many animals feed at several different trophic levels.^[2]

References



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- ⁸ Law, J., ed. 2009. A dictionary of business and management, 5th ed. Oxford: Oxford University Press.
- ⁹ "Stressor" Merriam-Webster online: dictionary and thesaurus, accessed August 14, 2013, <http://www.merriam-webster.com/dictionary/stressor>



I. NON-CONSENT FORM

Purpose

The Human Dimensions Working Group of the Integrated Marine Biogeochemistry and Ecosystem Research project (IMBER) is developing a decision support tool known as IMBER-ADApT (Assessment based on Description, Responses and Appraisal for a Typology). It will be built from lessons learned from case studies collected from around the world, dealing with issues relating to global change impacts on marine fisheries and aquaculture, and the people who depend on them. Its aim is to provide managers, decision makers and other stakeholders faced with difficult decisions with considered options on how to respond effectively.

Information and data

Once developed, the IMBER-ADApT will be made available as an open-access web application available to all stakeholders. This means that some or all of the information that you provide in the ADApT Case study template will be available on-line. By signing this form, you have indicated that you do not agree to having the information that you have provided made available on-line.

If you have questions regarding this study, contact:

Dr. Alida Bundy, Chair Human Dimensions Working Group
Alida.Bundy@dfo-mpo.gc.ca

Statement:

The nature and purpose of this project have been adequately explained to me but I do not agree to the use of my data and research as indicated above.

Signature: _____ **Date:** _____

NAME:

ADDRESS:

Email:

Please send this form with your completed case study to imber@imr.no. You will receive a copy of this form for your records.