



Summary of Actions

Year 1 Annual Review

4.2. Evaluation of the impact on the ecosystem	
<i>Activity 1.1</i> - Incorporate the results of the study into the development of objectives and management plans, so that ecosystem impacts are restrained at an appropriate level	<i>Year 1 Milestone</i> Existing data analysed and reviewed, and overlapping / cooperating projects identified; at-sea observation scheme developed; ecosystem modelling project developed Funding sources identified
<i>Activity 1.2</i> - Work with IMROP to support work on ecosystem impacts of the fishery in Mauritania; e.g. supporting work to develop the existing ecosystem model, supporting joint funding proposals with other regional or international groups or by some other suitable	
<i>Update as of December 2017</i>	IMROP intend to carry out an analysis of data collection and create a plan for the ecosystem modelling project. This will be presented at the FIP meeting in March. It might look something like the Moroccan modelling for key LTL and we could invite Dr. Sylvie to comment on it.
<i>Update as of March 2019</i>	INRH & IMROP have laid out plans looking at Ecopath and better understanding the ecosystem. View full plan on the next page.



Mass balance model construction "Ecopath" on the food chain of the Mauritanian upwelling ecosystem

INRH & IMROP

Please note, this document was translated from French. Please see the French version if errors in meaning have occurred.

Introduction:

The concept of fisheries ecosystem management first emerged in the convention of United Nations in 1982, Law of the Sea (UNEP 2001).

Over the last two decades, the focus has been on the interaction between ecosystem resources and the fact that these interactions are sometimes more important than the impact of fishing (Christensen and Pauly, 1997). However, an adequate assessment of the status of an ecosystem would require assessments and monitoring of all major species. Fisheries data are not available for most non-target species, scientific surveys are expensive and time consuming, and ongoing monitoring may be logistically impossible. The best option seems to be the development of models that represent the main elements of the ecosystem and the description of the biomass flows between them, according to the best available information on trophic cascades (Gibbons-Fly, 2000).

It is in this sense that our study, which seeks to evaluate the ecosystem role of sardinella and other small pelagics as key species, is imperative to claim certification of the Mauritanian fishery. Such an evaluation requires appropriate modeling tools, other than the traditional evaluation models (Essington and Pláganyi 2013), currently applied for the state exploitation stocks assessment. To answer this need that my work of end of study focus on implementation of an ecosystem model to understand the trophic relationships between fish and other species in the ecosystem and to highlight the species that play a key trophodynamic role in order to take these relationships into account in the small pelagic management system.

More recently, Ecopath with Ecosim models have emerged as very powerful and effective tools for contributing to the ecosystem approach to fisheries, providing a large number of indicators to help make decisions (Christensen et al. 2008).

This work serves to build a new Ecopath model of the Mauritanian ecosystem with updated data and focuses on the role of small pelagics in this ecosystem.

Methodology:

To carry out this work, we will need a huge quantity of data, some information is available on the bibliography like the food diets of different species, but these can differ from one ecosystem to another, statistical data at the local level. Also, we need to select the data from a recent year to establish the model, a year from which we have the maximum of statistical data.

Study area:



We are going to work on the north zone only where the upwelling is permanent, this is recommended in fact that this zone is more homogeneous in terms of ecosystems which makes the model more realistic, or we will consider the whole of Exclusive Economic Zone (EEZ) as a single ecosystem.

The species:

An inventory of species along the trophic chain in the study area should be established.

Definition of functional groups and their food diets

A list of functional groups and their diet are to be prepared to establish a predator / prey matrix (dietary matrix).

Construction of the Ecopath model

Ecopath's data requirements are usually already available from stock assessment, ecological studies, or literature: biomass estimates, total mortality estimates, consumption estimates, dietary compositions, and fish catches.

Ecopath settings:

For model configuration, Ecopath configures a system with as many linear equations as there are groups in a system and resolves the set to one of the following parameters for each group:

- Biomass;
- Production report / biomass;
- Consumption report / biomass ratio; or
- Ecotrophic efficiency

Expected results:

-Improved evaluation of MSC requirements for 'key' forage species ('key LTL' species in the MSC phrase).

-Evaluate the ecosystem role of the main species targeted by the FIP

-Establish different MSC tests for the evaluation of key LTL species.

Chronogram of internship:

Activity	Host organization	Period
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Bibliographic Research and Data Processing	IAV Hassan II	March, June and July 2019
Statistic data	IMROP (LERVA and Statistical Service)	April and May 2019
Biological and ecological data	IMROP (LEBOA)	