



PROJECT DESCRIPTION

LCA case study of Casamance shrimp fishery

Background

A handful of Life Cycle Assessment studies have been done of wild-caught seafood products to date, all of which concern relatively industrialized fisheries in Europe, North America and Japan. So far, no seafood LCAs have been done of small-scale fisheries in developing countries. With the current wave of attention around the role food production plays in global climate change in general and long-distance food transportation in particular, demand for life cycle data for seafood products increasing rapidly in Europe both from consumers and retail chains. It will therefore be a great benefit for producers exporting to Europe being able to provide the carbon footprint of their products. Another customer demand increasing in importance is the supply of seafood products from sustainably fished stocks. Various types of eco-labels for wild-caught seafood have been developed, the most common and well-known of which is the Marine Stewardship Council (MSC). A problem of many fisheries in developing countries is that the requirements of stock and fishery data in the assessment procedure cannot be met and that many of these fisheries therefore fail due to the mere lack of data.

Shrimps are currently exported from Senegal to Europe and have the potential to become an even more important export commodity for Senegal compared to today considering the projected growth in global production of farmed shrimps together with the, from an environmental point of view, in some cases highly criticized farming techniques. Shrimps are in Senegal produced in several fisheries both in artisanal coastal fisheries and in more large-scale offshore trawl fisheries. However, with regard to the above, added-value could be achieved if it could be shown that the shrimps imported into Europe are sustainably fished and potentially have a low carbon footprint compared to alternative products despite having been transported a long way.

Aim

The aim of this case study is to quantify the environmental impact of the artisanal shrimp fishery in the Casamance region in Senegal, to identify environmental hotspots in the life cycle of this seafood product and, if possible, to compare it with an active trawl fishery located off Dakar in northern Senegal.

Life Cycle Assessment methodology

The project will follow the ISO standardised LCA methodology. The performance of an LCA is divided into four main parts: Goal and scope definition, Inventory analysis, Impact assessment and Interpretation of results. In the goal and scope definition, the system to be studied and the purpose of the study is defined. System boundaries are chosen, preferably reflecting the boundary between the natural and the technical system under study, that is, normally starting with extraction of raw materials and ending with some sort of waste

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treatment. The inventory analysis consists of gathering of data about the resource use, energy consumption, emissions and products resulting from each activity in the production chain. All in- and outflows are then calculated on the basis of a unit of the product called the functional unit. The choice of this unit should represent the function of the product.

The first result of an LCA is a matrix of inventory results. In order to simplify this table and to get an idea of what kind of environmental impact the emissions cause, characterisation methods are used which weight together all emissions causing for example global warming, acidification, toxicity, eutrophication, photochemical ozone formation and stratospheric ozone depletion. Characterisation together with qualitative assessment of types of environmental impact that cannot be characterised is called impact assessment. Qualitative assessment means that when no reliable method to quantify a category of environmental impact exists or data is lacking, it can be assessed qualitatively. Interpretation of results and identification of key figures and initial assumptions and a sensitivity analysis follows to finalise the LCA. In the sensitivity analysis, key figures are varied and the dependence of the results on certain data is analysed in relation to the quality of those data.

LCA as applied to the Casamance fishery

In the case of the Casamance shrimp fishery, the fishery-specific categories Seafloor impact, Discard and Impact on stock of target species will be discussed qualitatively and, if possible, based on the data found, quantified. The functional unit could e.g. be one kilogram of shrimps or a typical size of a package, or even the entire production of a processing plant. This will be decided together with local partners. In addition to the fishing phase, processing, packaging and transportation to consumer markets will be included. Two fishing methods currently in use to fish the species; passive and active trawling will be included in the inventory and if data of sufficient quality is available, the LCA will be done as a comparison between the two. If data of sufficient quality is lacking for the active trawl fishery taking place in northern Senegal off Dakar, the study will only concern the passive fishery in the Casamance.

Expected results

Quantitative results for each of the impact categories chosen to be included will be the main result of the study. Important life cycle phases and processes in them contributing disproportionately to the overall impact will be identified. Target stock impact, discards and seafloor impact of active trawling will be described and quantified if possible. Results will be presented in a project report which will be written in English and French and presented orally at FAO at the end of the project.

Possible applications of results

The FAO will gain experience of working in the field of applying LCA to food, in this case seafood, products. Quantified knowledge about the environmental performance of the Casamance shrimp fishery will result from this first case study on which decisions of how to proceed, eventually with the establishment of guidelines, can be based. If possible with regard to data availability, the LCA will be an environmental comparison between active and passive shrimp fisheries in Senegal. Moreover, the study will show which life cycle phases contribute significantly to the total environmental impact of the product and improvement



options will be discussed in the final project report. The LCA study, if showing environmental benefits of this fishery compared to others, may also justify support of this fishery from various stakeholders.

Partners

The study is funded by SWEDMAR, the unit for international development cooperation at the Swedish Board of Fisheries and by the Fisheries and Aquaculture Department at FAO. It is performed by SIK in collaboration with Idee Casamance, a Dutch-Senegalese NGO based in Ziguinchor, Senegal and with help from LCA seafood experts from Aalborg University, Denmark and INRA, France.

Time Schedule

The project will be conducted between November 6 2007 and February 28 2008