

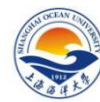
SEAT and Life Cycle Analysis (LCA)

Work Package 3

Leiden University, Institute of Environmental Sciences



UNIVERSITY OF STIRLING



Cefas



Life Cycle Assessment (LCA)

LCA and EU environmental policy

- Increasingly, LCA has become a core element in the development of environment policy in the European Union.
- The 'Ethical Aquatic Food Index' (EAFI), will amongst other things be based on detailed Life Cycle Assessment (LCA) studies.

LCA: what is it?

- (LCA) identifies the environmental impact of a product or service throughout its entire life cycle, from cradle to grave.
- LCAs in principle consider all types of environmental burdens, ranging from use of raw materials and space to emissions of potentially hazardous substances (such as carbon dioxide, sulphur dioxide, phosphates, heavy metals and pesticides), noise, radioactive substances etc.
- Aspects which are not directly related to the environment, such as product safety, cost and social aspects are generally not (yet) considered in LCAs.
- For an aquaculture system, a life cycle could comprise of growing and processing of feed, farming and processing of fish species, marketing, retailing and consumption of fish species and waste management of all related waste flows.

What to expect from LCA and what not?

- Because LCA addresses the entire life cycle it makes it easier to tackle the problem rather than shifting the problem.
- LCA is no "supertool" and other tools such as EIA, RA etc. have their own specific and complementary area of application. Therefore, LCAs in the SEAT project be applied in combinations with some of these other tools.
- LCA is a decision support tool: they do provide information which can be used as the basis for decisions and policy measures, but do not in themselves solve problems.
- Perhaps even more important than an LCA study is the concept of "life cycle thinking".

Introduction

Life Cycle Assessment, or LCA, is a term you come across more and more frequently. But what is LCA, and what can it do for the SEAT project? Governments all over the world are encouraging its use. Increasingly, LCA has become a core element in the development of environmental policy in the European Union for example. It is also a core topic in the EU FP7 SEAT project.

One of the main outputs of the EU FP7 SEAT project, the 'Ethical Aquatic Food Index' (EAFI), will amongst other things be based on detailed Life Cycle Assessment (LCA) studies. LCA systems thinking will be applied to analyse livelihood impacts along the global value chains of four farmed aquatic products, tilapia, shrimp, freshwater prawns and *Pangasius* catfish in four major producing countries China, Thailand, Vietnam and Bangladesh.

What is LCA?

Life Cycle Assessment (LCA) is designed to identify the impact a product or service has on the environment throughout its entire life cycle. It is based on a systematic examination and evaluation of the product or service's impact on the environment. Both in terms of the use of raw materials and space and in terms of emissions of potentially hazardous substances (such as carbon dioxide, sulphur dioxide, phosphates, heavy metals and pesticides), noise, radioactive substances etc. Aspects which are not directly related to the environment, such as product safety, cost and social aspects are generally not (yet) considered in LCAs.

Broadly speaking, a life cycle consists of all the processes connected with the production and use of a product: from the extraction of the raw materials, right up to reuse, recycling and waste management. For an aquaculture system, the life cycle could comprise of growing and processing of feed, farming and processing of fish species, marketing, retailing and consumption of fish species and waste management of all related waste flows. In this way it is possible to mutually compare and optimize different aquaculture systems producing the same or comparable fish species on their environmental burdens.

What to expect from LCA and what not?

LCA has proved a useful instrument for identifying the environmental impact of products throughout their life cycle - from the cradle to the grave. Because it addresses the entire life cycle it makes it easier to tackle the problem rather than shifting the problem, for example by transferring the impact to a later point in time, or from one issue to another (less waste, but more energy consumption) or from one phase in the life cycle to another (for example from production to consumption). However, an LCA study will not answer all the environmental questions. We already have other tools, such as risk assessment, material flow analysis, environmental impact assessment (EIA) and environmental audits, each with its own specific area of application. EIAs, for example, are used to assess alternative locations for a new building or activity. Therefore, LCA will in the SEAT project be applied in combinations with some of these other tools.

LCA is thus not a "supertool", and LCA studies do not in themselves solve problems. They do, however, provide information which can be used as the basis for decisions and policy measures which are designed to solve environmental problems. In this sense LCA is a decision support tool, to be taken into account in addition to the other

considerations, such as technological, economic and social factors, which generally play an important part in decisions.

Perhaps even more important than an LCA study is the concept of “life cycle thinking”. After you have carried out several LCA studies you generally automatically start thinking about tackling environmental problems in life cycle terms, which means you are less likely to try and avoid issues at an early stage. This may even produce ideas for totally new products, processes and systems.