

SLCA scenarios: engaging producers and consumers in new domestic oyster value chains in Denmark

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1. Context and scope

Efforts to develop a Social LCA methodology target the need to account for social impacts in the life cycle of existing products. Most often, the objective is to provide scientific support for decisions on alternative suppliers and terms of governance in the value chain of a particular product. This paper suggests an application which shifts the focus to the design phase of life cycles of products and services yet to be constructed, not by a major lead company, but rather by start-ups and community groups.

Health concerns and negative environmental impacts of industrial food production motivate the development and testing of new systems of growing, distribution and consumption. Ecological farmers contest conventional production methods, home delivery of fresh vegetables bypasses physical markets, and new food paradigms change meal preparation and dining experiences.

One example is the entrepreneurs, NGOs and consumers setting up urban farming projects. One project attracting particular attention concerns maritime gardening: the growing, harvesting and eating of native oysters in the harbour of Copenhagen. The shift to container transport has deserted large dock areas in the harbour. Residential development along with new recreational spaces, including a public facility for swimming, is rising on the waterfront.

The experiments with oyster banks in the harbour are small in scale. Nonetheless, they may signal a broader trend of vertical value chains collapsing, as information and communication technologies allow consumers to produce, distribute and share on their own, thus transforming into *prosumers* (Rifkin 2014). Not much research has been conducted on these initiatives, and this paper refers to the outline of a planned research project only. The claim made in relation to Social LCA is that the nature of the oyster case points to further reformulation, as the discussion moves beyond what has been termed 'life cycle CSR' (Macombe 2013).



Figure 1: Vision of oysterbank above surface

During thousands of years, oysters were an essential food item for people settling in Southern Scandinavia. Today, Danes only consume a total of 50,000 oysters per year, the majority of which are imported. The native oysters fished in Limfjorden, Denmark, are mainly exported as high priced delicacies to Southern Europe.

Entrepreneurs and consumers groups in Denmark are experimenting with the development of new oyster value chains for a lower priced food product with high nutritional value in collaboration with the municipalities of Copenhagen, Ebeltoft and Fredericia. In a life cycle perspective, environmental and human health impacts of cultured oysters needs to be precisely assessed, value chain constraints must be addressed, and new business models developed. In addition and most importantly, prospective producers and consumers are engaging in participatory experiments on practices in farming, harvesting, distribution, and meal preparation and dining.

The move for “democratization” of oysters to increase domestic production and consumption targets aquaculture of oysters - the essence of ecological food - run as maritime kitchen gardens by an association of citizens, accompanied by pop-up oyster serving initiatives, encouraged through educational partnerships with schools and supported via trend-setting chefs and gourmet bloggers.

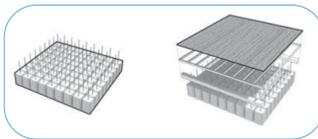
2. Main text

Aquaculture, the fastest growing sector in food production, is an attractive alternative to drastically declining fish stocks. It is now exceeding the wild fish supply for human consumption. Shellfish farming is considered as one of the most sustainable form of aquaculture, as it is organic extractive and not artificially fed like fish aquaculture.

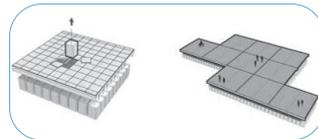
To increase the production volume of the native European flat oyster *Ostrea edulis*, Danish Shellfish Centre has developed methods to provide oyster seed all year round, thus reducing cost and removing one key constraint in the oyster value chain. To engage producers and consumers beyond the experimenting pioneers, positive health, environmental and social effects need to be validated and communicated.



Just below the surface, small oysters are placed in a basket. They grow in the water for 2-3 years; then are ready for harvesting. Several baskets are hanging on top of each other.



The baskets are joined together on a floating platform constructed in a way so that the baskets can be taken up and inspected.



On top of the platform, a swimming facility, a restaurant or a mini maritime experience centre can be built.

Figure 2: Growing of oysters below surface

The experiment in Copenhagen Harbour collapses a highly stratified production, distribution and consumption process into a much shorter and simplified life cycle situated in one locality only, and under the command of an association of citizens. As the oysters filter the polluted sea water, the regeneration of the water quality in the harbour accelerates and paves the way for new urban life spaces. Although a full ELCA has not been conducted, the pioneers are encouraged by this positive impact on the environment and claim that their design provides a range of potentially positive social impacts: oysters at reasonable cost are a nutritious addition to the daily diet; the activities throughout the life cycle of oysters provide learning and recreation for the families involved; and also a sense of community and belonging develops in the process.

In terms of human capital development, aquaculture - in particular under experimental conditions - requires a high level of managerial skills. However, according to Sen, this will be included in his broader concept of capabilities. The concept of human capital focuses on 'the agency of human beings - through skill and knowledge as well as effort - in augmenting production possibilities' (Sen 1997, 1959). Sen's concept of human

capabilities has a wider scope; he points to *'their direct relevance to the well-being and freedom of people; their indirect role through influencing economic production; and their indirect role through influencing social change'* (Sen 1997, 1960).

Tentatively, the list of ten central capabilities defined by Martha Nussbaum may be specified for the experimental oyster value chain (tableau 1).

However, the actual specification of relevant capabilities and how measure these must – in accordance with Sen's concept – be performed by those involved on the basis of what they consider as valuable functionings. Thus, suggested by several authors, e.g. by Syndhia Mathe (Mathe 2014), some form of participatory approach needs to be integrated into Social LCA to contextualize the assessment in terms of plurality of interests, local knowledge, diversity of social value judgements etc.

One important contribution towards the measurement of capabilities points the option for micro-foundations in normative assessments, *'the valuational foundation of the capability approach allows people to express their 'powers of discrimination' with regard to their well-being or to the good life'* (Comim et al. 2008, 180).

Table 1: Nussbaum's (2003) Ten Central Capabilities

	Capabilities	Definition (abbreviated)	Oyster value chain
1	Life	Live a life of normal length	
2	Bodily health	Incl. reproductive health, nourished, shelter	Contributes to a nutritional diet
3	Bodily integrity	Move freely, secure against violent assault	New, open recreational spaces
4	Senses, imagination, thought	Use as informed by education, not limited to basic training	Culinary, aesthetic and heritage experience
5	Emotions	Attachment to things and people	Associating with neighbours and others
6	Practical reason	Engage in critical reflection of one's life	Debate food and health issues
7	Affiliation	Show concern for other humans Social bases for self-respect	Be part of joint efforts to improve human well-being recognizing oneself and others as citizens
8	Other species	Concern for animals, plants, world of nature	Observe animal welfare and food ethics
9	Play	Being able to laugh, play, enjoy recreation	New community spaces for recreation
10	Control over one's environment	Participate effectively in political choices Property rights and right to employment on an equal basis	Ownership and command of value chain

The planned project on the oyster case proposes to apply Interactive Scenario Analysis, which is *'a method for creating scenarios that should be able to help stakeholders to navigate towards desirable futures'* (Baungard Rasmussen 2011, 99). The method consists of five phases:

Constitutive phase	Definition of the focal issue. Planning of the physical facilities, time schedules and resources necessary to carry out the subsequent phases
Problem-focusing phase	The focal issue is divided and specified into several sub-issues.
Scenario-building phase	Scenarios are developed through an interactive and iterative process
Back-casting phase	Development paths are elaborated between the scenarios and the current situation
Action-planning phase	Strategies and action plans are developed

The suggestion is to integrate the assessment of social impacts as design criteria in the process of constructing the new oyster chain and its enabling context.

This outline indicates that new forms of value chains beyond those organised by the conventional, privately owned manufacturing company add to the challenge of relevance for Social LCA, as the Commissioner of study may very well be the citizens themselves

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