

A participatory approach frame to integrated social aspect in LCA: The case of aquaculture systems

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INTRODUCTION

Identification of relevant social impact indicators for a Social Life Cycle Assessment (SLCA) is still difficult and poorly documented (Jorgensen, *et al*, 2009). In aquaculture systems, the studies based on social aspects are essentially focused on manpower or on conflicts with other activities. In the PISCEnLit project**, we aim to broaden the vision of social impacts of fish farming systems using a new approach of SLCA. We studied fish farming pond systems in France (Lorraine and Brenne) and Indonesia (Tangkit Baru and Kumpeh Ulu in Sumatra island). In this study, we focused on the choice of the impact categories using the participation of stakeholders (James *et al.*, 2002) by the identification and selection of the relevant social impacts to be assessed. From a practical viewpoint, the proposed approach consists in implementing surveys and focus groups about the social representations at different stages of the assessment process. Through this process, the opinions of the stakeholders about potential or real social impacts of aquaculture may be taken into consideration. However, the technical construction of the relevant impact indicators allowing evaluation of the impacts still have to be done by the researchers.

METHODOLOGY

We investigate the advantage of using a participatory approach based on the Principle, Criteria and Indicator (PCI) method (Rey-Valette *et al*, 2008), in order to identify relevant social indicators for a SLCA in fish farming pond systems cases. This method provides a basis for discussion, allowing the stakeholders to rank and validate a list of principles and associated impacts. The figure 1 presents the stages of the method:

■ Stage 1: The stakeholders (Cf. table 1) select a list of ecosystem services provided by aquaculture and identify related social impacts.

■ Stage 2: Using various sources (International conventions, well-being components of the Millennium Ecosystem Assessment, results of stage 1), a reference list of social principles and associated impacts is built. Impacts are identified at two levels: company level and territorial level.

■ Stage 3: The stakeholders select principles and ranked associated impacts in the reference list. Then, the selected impacts are associated with indicators.

■ Stage 4: The identified indicators will be introduced by the researchers in the specific LCA tool : PISC'n'Tool

Stage	Productive sector				Institutions			
	Upstream	Non farmers owners	Farmers	Downstream	Public services	Research institutes	Trade organisation and unions	Other associations
1	x	x	x	x	x	x	x	x
2								
3	x		x		x	x		
4								

Table 1. Involved stakeholders at the stages 1 and 3

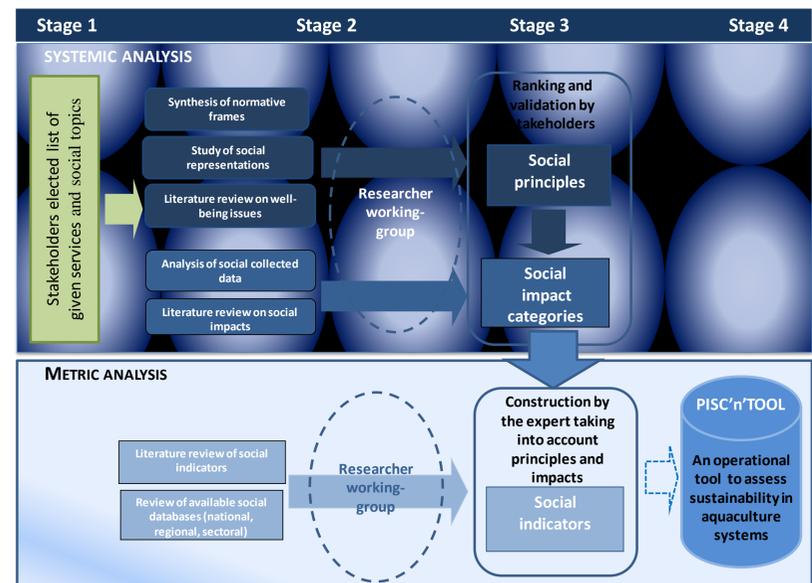


Fig. 1. Methodological process to integrate the participatory approach

RESULTS AND DISCUSSION

The first intermediate results highlight the importance of nutritional aspects and well-being in both countries (Fig. 1). The collective action is important in France regarding the size of the activities and the existing conflicts with other users of water and lands. The question of working conditions is less selected. The associated criteria will permit to identify quantitative and qualitative indicators.

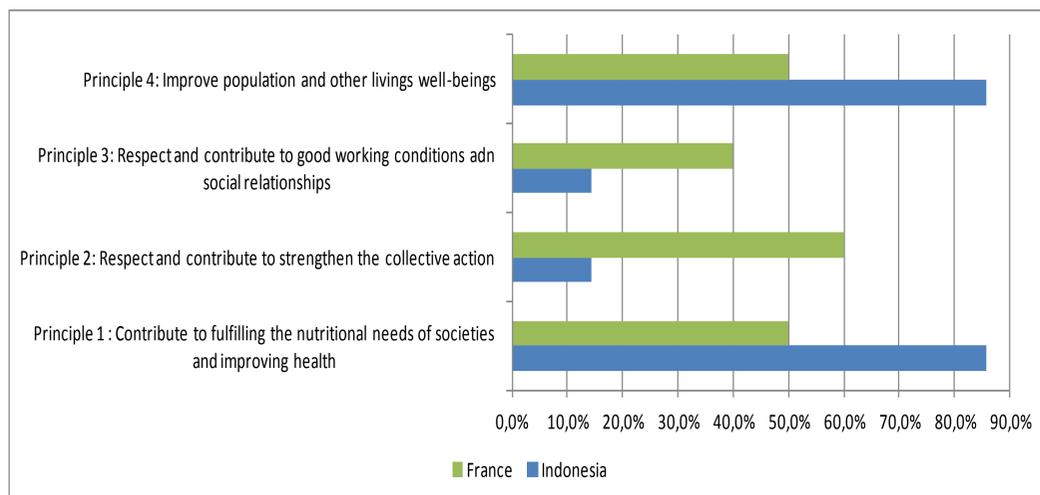


Figure 2. Selected social principles in France and Indonesia

The adaptation of the PCI method to the social LCA allows the comparison of different systems at the level of the principles without standardisation of social impacts. Some impacts are similar in the two countries but will not probably be measured using the same indicators. The selection of the associated indicators is the next step of the project.

In this approach we considered the whole aquaculture activities conducting to the question of the selection of the relevant functional unit.

	Indonesia	France
P1	-Accessibility of fish for the employees - Sanitary quality of products for consumer health - Impact on good diet	- Sanitary quality of products for consumer health
P2		-Capacity to take part in decision making in territorial management organisations
P4	- Valorization of heritage and traditional know-hows -Job creations or income support - Quality of living environment	-Job creations or income support - Quality of living environment - Leisures and recreational activities

Table 2. Selected social impacts in Indonesia and France

References

- James, K. L., Grant, T., Sonneveld, K., 2002. Stakeholder involvement in Australian paper and packing waste management LCA study. *Int J Life Cycle Assess.* 7, 151-157
- Jorgensen, A., Hauschild, M. Z., Jorgensen, M. S., Wangel, A., 2009. Relevance and feasibility of social life cycle assessment from a company perspective. *Int J Life Cycle Assess.* 14, 204-214
- Rey-Valette, H., Clément, O., Aubin, J., Mathé, S., Chia, E., Legendre, M., Caruso, D., Mikolasek, O., Blancheton, J-P, Slembrouck, J., Baruthio, A., René, F., Levang, P., Morrissens, P., Lazard, J., 2008. Guide to the co-construction of sustainable development indicators in aquaculture. © Cirad, Ifremer, INRA, IRD, Université Montpellier 1. Diffusion Cirad-Montpellier, Montpellier.

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