



SOCIAL REPRESENTATION TO IDENTIFY FRESHWATER AQUACULTURE ECOSYSTEM SERVICES

A comparison France-Brazil

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- 2. Method
- 3. Results



1. Context and problematic

Characteristics of environmenmental policies

Phases	Approaches aiming at regulating effects	Approaches aiming at regulating the direct causes	Approaches aiming at regulating interactions
Scales and objectives	Resources	Resources and socio- systems which have impact on the resources	Socio-ecological systems
Analysis grid	Pressure, State, Response	Driving forces, State, Pressure, Impact, Response	MEA based-services typology
Type of public policies	Sectoral approaches based on regulations or incitives to reduce effects	Territorial approaches based Regulations and incitives aiming at changing behaviours and maintaining sensitive area	Intergrated approaches based on service valorization schemes (Payment for ES)

Social representations: A key for environmental management?

- What is the process to create value? From problematization to institutionalization (Dewey, 2011)
- Social representations permit to assess public values
- Avoiding of reluctance for public policies (Myatt et al, 2003) and faciliting social acceptability.
- Importance of public perceptions level of knowledge to catch complexity of ecosystem approach (Lewan and Söderqvist, 2002)
- The manner in which services have been identified and selected and constitute a crucial phase (Kumar et Kumar, 2008).
- Social representations permit to identify ecosystem services

How to catch social representations

- Limited bibliography based specally on the step of identification
- Identification of some characteristics of this works: interdiscplinarity, complementarity between methods to collect data (focus groups, bibliographic review, inquiries)
- Two approaches based on questionnaire: opened questions or an adapted reference list.



Identification of complementarity between both approaches

Piscenlit Project

- To answer the increasing demand for aquatic products
- To develop aquaculture production by increasing its effectiveness with ecology levers (ecological intensification) vs To produce more without environment degradation
- To improve territorial insertion of aquaculture by taking into account its bonds with its abiotic, biotic and anthropic environment

Diversity of studied fishfarming systems

French ponds

RAS



Indonesian ponds

Brasilian ponds

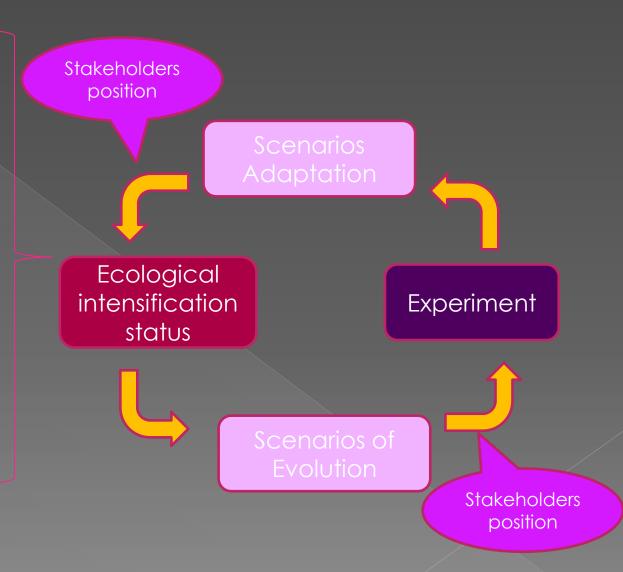
Structure of the project

Social representation of ecosystem services

Structural Typologies

Material and energy Flow analysis

Sociological and innovation status



French ponds



Lorraine

Brenne

Brazilian ponds chapeco





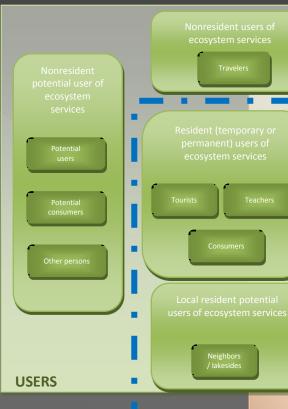


Alto Vale do Itajai



2. Method

Stakeholders identification

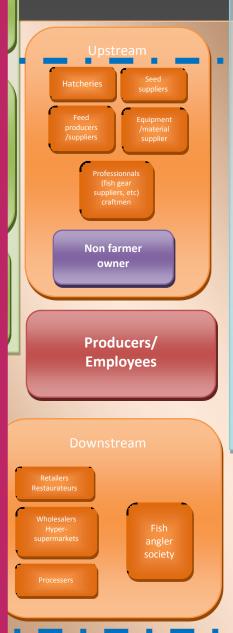


TERRITORY

PROD

JCTIVE SECTOR

Legend Each color (and color shades) corresponds to one type of questionnaire Farmers' Non farmer owners Institutions Productive sector' Society Territory border





Inquiries

	France		Brazil		Total
	Lorraine	Brenne	Chapeco	Alto Vale	Total
Number of exploitations	42	200	690	242	1174
Number of types of exploitation	Diversity of types	One type	Two types	One type	
Sample	25	33	50	25	133
Sampling rate	59%	17%	7%	10%	11%
Number of stakeholders	32	27	34		93



Two approaches of social perceptions in the inquiries

First approach: opened questions

• 16 Questions:

Questionnaire: Perception of ecosystems services

]	D. Perception of ecosystem services associated to fishponds	
D1.	How do you describe your region as a specific area of fish farming in ponds in three words? 1 =	D1a D1b D1c
D2.	How do you describe the fish farming in ponds for your region in three words? 1 =	D2a D2b D2c
D3.	In your opinion, what are the services provided to Human being by fish ponds and their associated ecosystems?	D3

Type of analysis of opened questions

 Textual analysis regarding sociological methods and MEA (2005) classification.

MEA CIL Lation	
	F Juncea ids
(2005	
Provisioning	« nourriture » ; « nourrir la population » ; « nourriture » ; « production de poissons » ;
services	« alimentation » ; « apporte de l'argent » ; « aspect de production » ; « apport de poissons frais de qualité à la population logale » ; « production de poissons frais » ; « production » ;
Sel Vices	fait vivre grâg aux activités » nourriture, éng e » ; « généro y de protéines ;
	erve d'eau perve d'eau perve d'eau perve d'eau perve d'eau perve p
Culture vices	adition, los alté/délass a; « beaut aysage », voir et, fai
	urnées de de la construction de
	anarchique »; « foisirs »; « favoris ; les loisirs, pêche et chasse »; « s urce de destress »; « des touristes » ; « apport un cadre esthétique » ; « Sensibilisation et observation de la
	Nature, lieu de détente, de quiétude, lieu de pratiques de loisirs, pôle économique »; « lieu
	d'accueil et de lécouverte de la Nature » ; « sert à alimenter les grouits de pêche » ;
	loisirs/pêche » rôle touristiqu ; « attrait tour que, atout éco pmique (anima
COL	rge, événer » Hation (exc.) Leau et la particular de la
кедин	gulation hydrague»; « protes of contres les has ations »; « me est de tout
services	écosystème »; « one tampon de fention hydrique ; « filtration,
	dépollution»; « éburation de l'eau »; « préserver la Nature »; « régulation des cours d'eau (bassins tampons) »; « pouvoir tampon pour les catastrophes naturelles »; « retenir l'eau
	(réserve), éviter les inondations »; « entretien des nappes phréatiques »; « permet de gérer
	des sites, filtres no vrels»; « régulation du réseau hydraue » ; « amélioro on de la qualité
	es eaux », « éc que des crues y rôle tampon vlateur de l'ec « lagunage »
Super	R naturel' sintien d' versité» de biodir qu c'est n ; « milieux sants pour aux » ; « res cologique servateur
	versité végétal. ¿t animale » ; « ersité biologiqu » t diversité pays ere » ; « niches
	écologiques importantes (= biodive sité) » ; « de la biodiversité » ; « apport une énorme
	diversité biologique »; « maintenance de la biodiversité »; « diversité, équilibre
	écologique » ; « amélioration de la qualité des milieux par la biodiversité faunistique et floristique » ; « bio liversité »
	ionsilque », « bio-iveisile »



Classification has been used to built cluster using Multivariate Analysis

Second approach : ranking a reference list of ecosystem services

Select the 10 most important roles and Rank them (10 = the less important → 1 = the most important)

		1110 111001 11		 	
Roles of fish	onds			Select	most important
Production o	f fish/shellfish				C5a1
Production	food plants				C5a2
Freshwate	voir used fo	tion or oth			D5a3
Productio	er				C5a4
Production	fuel and energ,				C5a5
Ornamental	esources (fish, ot	ner animals and p	olants)		C5a6
Medical and	veterinary resour	ces			C5a7
Supply of fe	ers for agricul	2			C5a8
Régulati	al climat				C5a9
Hydrologica	egulation (gro	awater rechars	water storage,		E5a10
Protection ag	ainst fire/storms/	loods			C5a11
Pollutants sto	rage and pollutio	n abatement			C5a12
Maintenang	of biodiversity				C5a13
Regulation	man and	diseases			D5a14
Link to relig	local culture,	affions			C5a15
Inspiration (f	r artist), sentimer	al value			C5a14
Learning a sk	ill				C5a17
Environment	Awareness				C5a18
Hunting ap	hing				C5a19
Tourism,	.111				C5a20
Leisure					C5a21
Landscape d	nd attractiveness				C5a22
Production o	f plankton (phyto	plankton and zog	pplankton)		C5a23
	e and nesting r	gratory birds			C5a24
Area of sp	g and/or b	g grounds	vatic anim		C5a25
plants	the postural s	a of putrionts			C5a26
phosphorus,		es of nutrients \	rogen, carbon		
	and maintenan	ce			C5a27
Wetlands mg					C5a28

Type of analysis of the ranking

		Selection 1	Score		
	Production of fish/shellfish	10			
D	Production of food plants				
] .⊑	Freshwater reservoir used for irrigation or other	3			
6	Production of fiber	14			
isi	Production of fuel and energy		14		
Provisioning	Ornamental resources (fish, other animals and plants)				
	Medical and veterinary resources				
	Supply of fertilizers for agriculture	1			
ත	Régulation of local climate				
Regulating	Hydrological regulation (groundwater recharge, water storage)	4			
💆	Protection against fire/storms/floods		6		
8	Pollutants storage and pollution abatement	2			
~	Regulation of human and animal diseases				
	Link to religion, local culture, traditions				
	Inspiration (for artist), sentimental value				
ᄝ	Learning a skill				
Cultural	Environment Awareness		11		
	Hunting and Fishing	6			
	Tourism/Ecotourism	5			
	Leisure				
	Landscape and attractiveness				
	Maintenance of biodiversity	9			
	Production of plankton (phytoplankton and zooplankton)				
<u>ව</u>	Areas of refuge and nesting migratory birds	7			
₩	Area of spawning and/or breeding grounds for aquatic animals or plants	24			
Suporting	Participation in the natural cycles of nutrients (nitrogen, carbon, phosphorus,)				
	Soil formation and maintenance				
	Wetlands maintenance	8			

Classification has been used to built cluster using Multivariate Analysis

Archetypes of social representions

cat	Categories of services which have been mentioned in the typologies	PERCEPTION ARCHETYPE
1	Provisioning	Production-based perception
2	Provisioning + supporting	Eco production perception
3	Provisioning + culture (patrimonial + leisure)	Patrimonial production perception
4	Provisioning + regulating	Planning production perception
5	Provisioning + plusieurs	Multidimensionnal production perception
6	Supporting	Pro-biodiversity perception
7	Regulating	Planning perception
8	Cultural	Patrimonial, leisure and social perception
9	Two services (cultural + regulating or regulating + supporting)	Territorial perception
10	No perception	

Graduation of the perceptions

Productionbased perception

Territorial perception

Productionbased perception Eco producer perception, Patrimonial producers perception, Planning producers perception

Multi dimensionnal producers perception

Pro-biodiversity
perception,
Planning
perception,
Patrimonial,
leisure and
social perception

Territorial perception



3. Results

Diversity of social representations

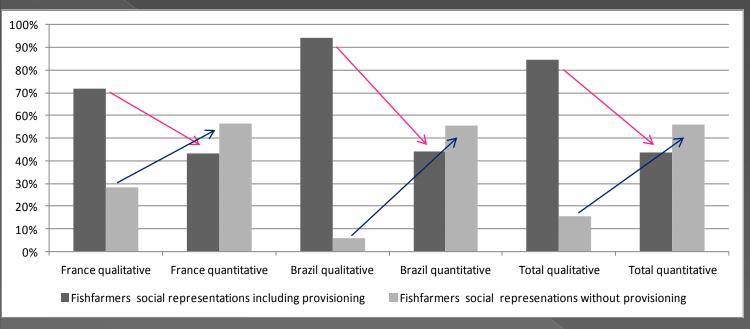
France

- The most important service are « production of fish », « maintenance of biodiversity », « wetland maintenance », « areas of refuge and nesting migratory birds » and « hunting and angling »
- The role of provisioning of ponds is less cited by stakeholders than producers. This role is attribuate to the past for stakeholders.
- In Lorraine, there is a strong interest for biodiversity and patrimonial aspect of the activity (Heritage of monks). These roles are linked with leisure activities.
- In Brenne, the role of leisure is imporatnt particularly for hunting and angling

Brazil

- The most important service are « production of fish », « freshwater reservoir », « pollution control », « production of plankton » and « rhydrological regulation (aquifer and grounwater).
- The role of provisioning of ponds is stronger than in France
- Provisioning is associted with supporting function of recycling manure
- In Chapeco, provisioning concerns fish but also production of comestible plants
- In Alta Vale, the provisioning functions are associate with regulation (pollution control) and supporting (plankton production)

Comparison per category



France quantitative

■ Stakeholders social representations including provisioning

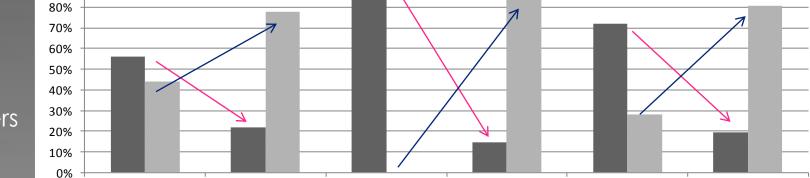
Fishfarmers

Total qualitative

■ Stakeholders social represenations without provisioning

Total quantitative

Brazil quantitative



Brazil qualitative

Stakeholders

100% 90%

France qualitative

Conclusion

- Qualitative approaches increase the place of provisioning services in social perceptions particularly production.
- Qualitative approaches permit to have a more descriptive vision concerning patrimonial aspects and identify dis-services (Zhang et al., 2007).
- Quantitative approaches based on check-list permit that the respondants broaden their visions to territoriale dimensions.
- Interest to adopt complementary approaches (qualitative and quantitative) to construct scenarios of ecological intensification and implement environmental public policies

