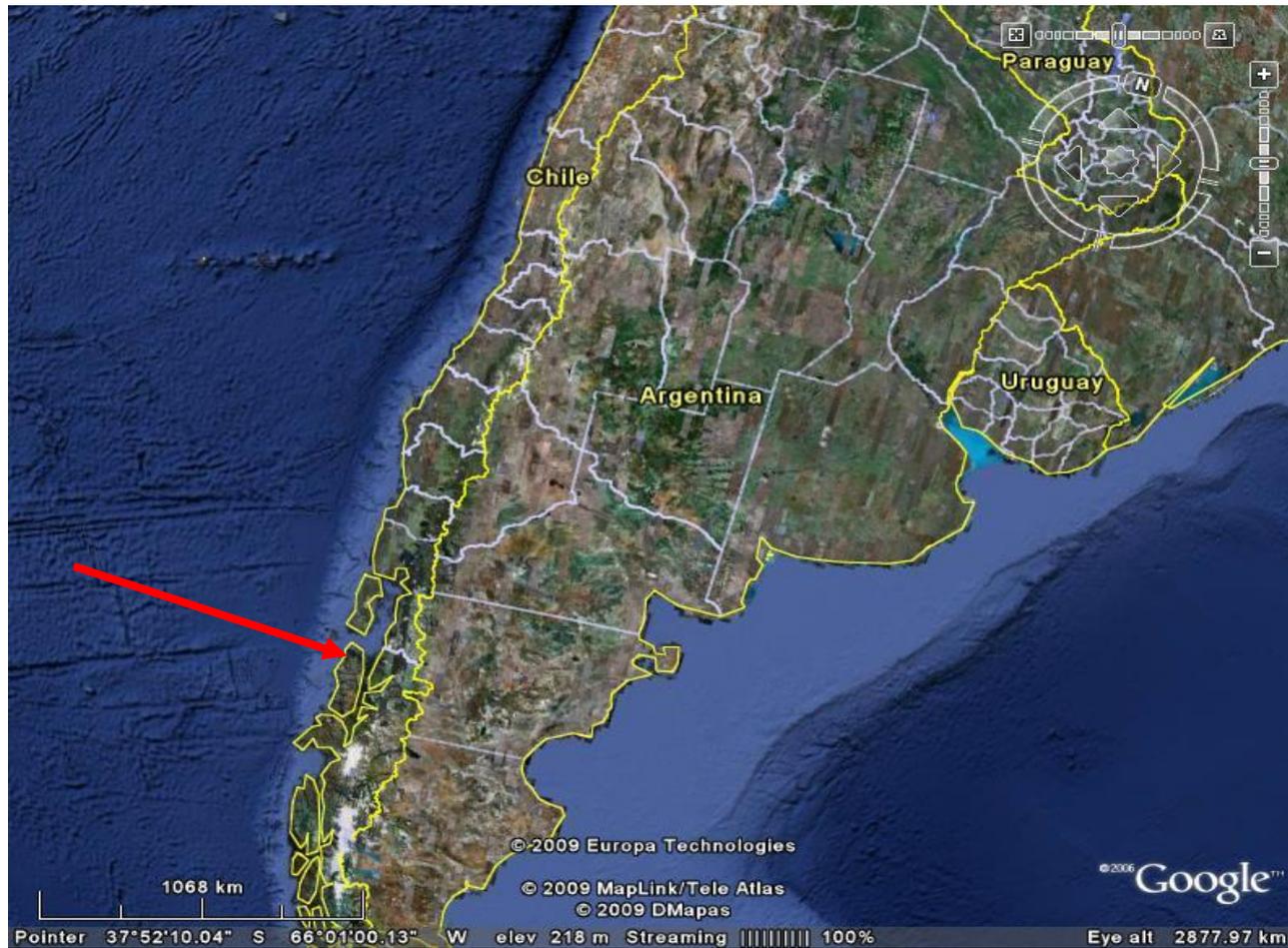
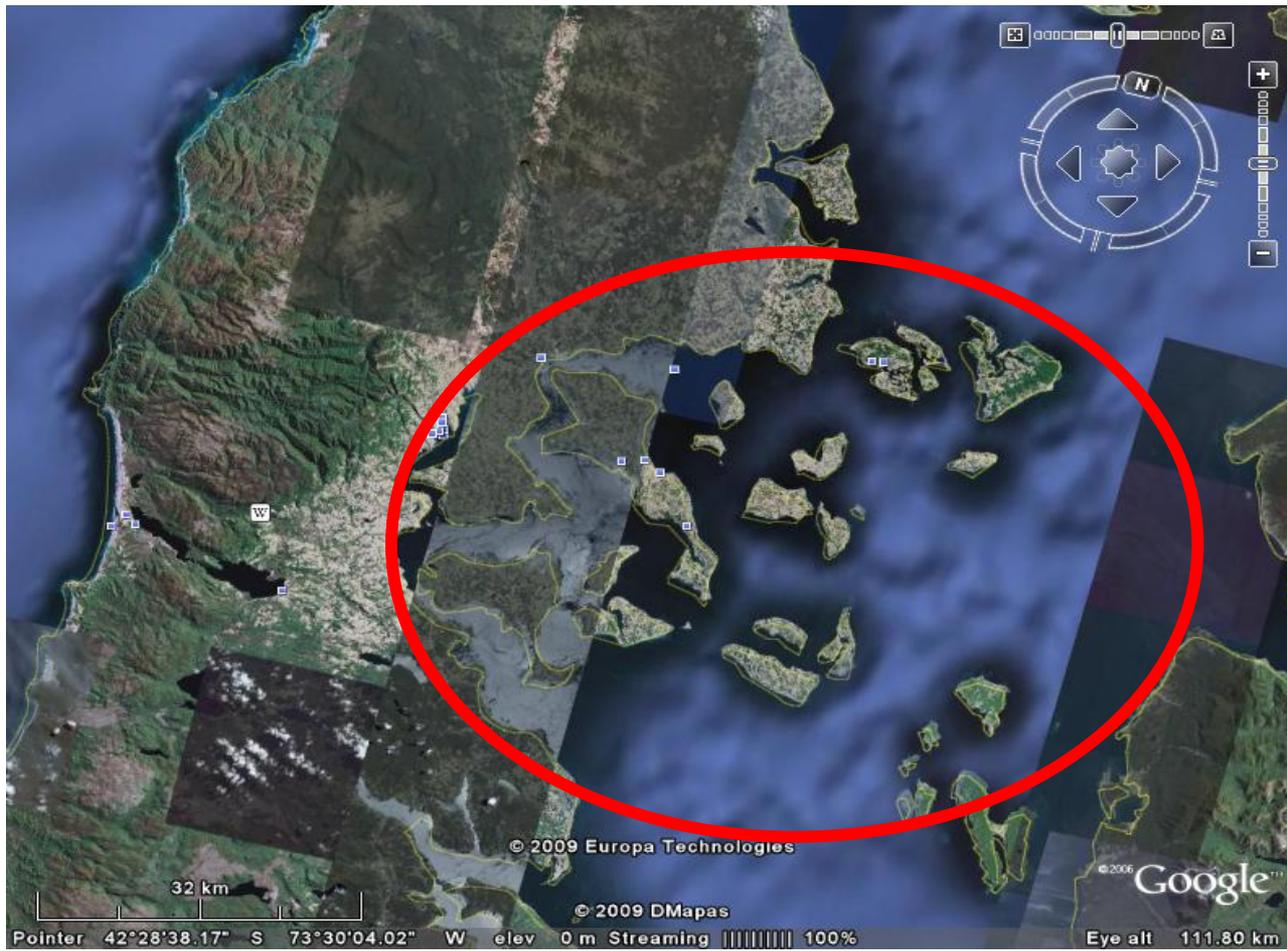

Territorial Dynamics in Chiloé

Eduardo Ramírez and Felix Modrego

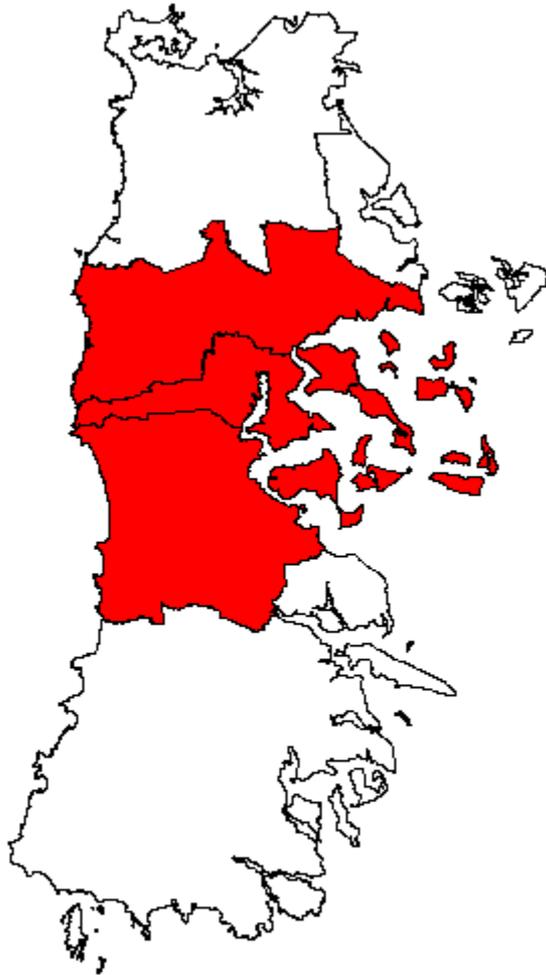
Rimisp – Latin American Center for rural
Development

Background





The area of study



- Castro, Dalcahue, Chonchi, Curaco de Vélez, Quinchao, Puqueldón.
- Territory articulated around the city of Castro
- From traditional agriculture and fishing and tourism to the salmon industry

Conceptual framework

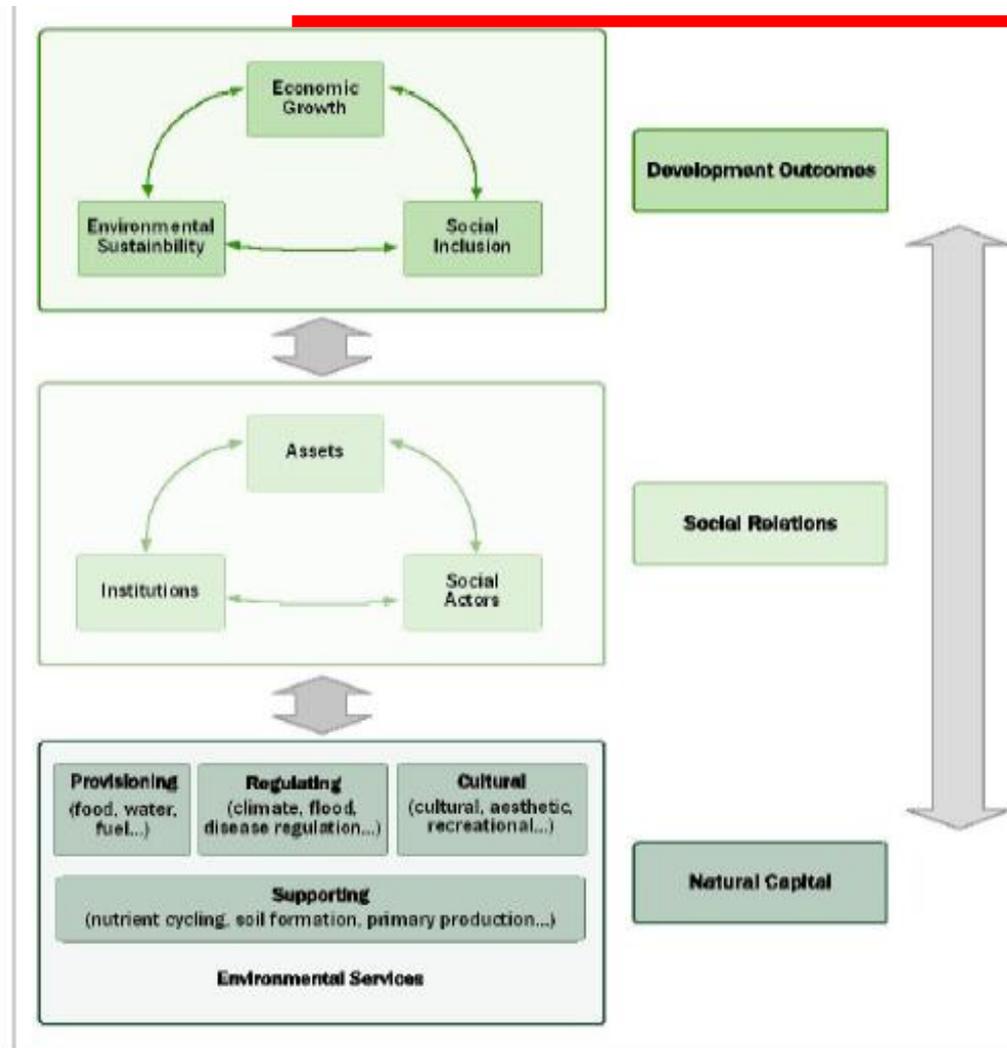
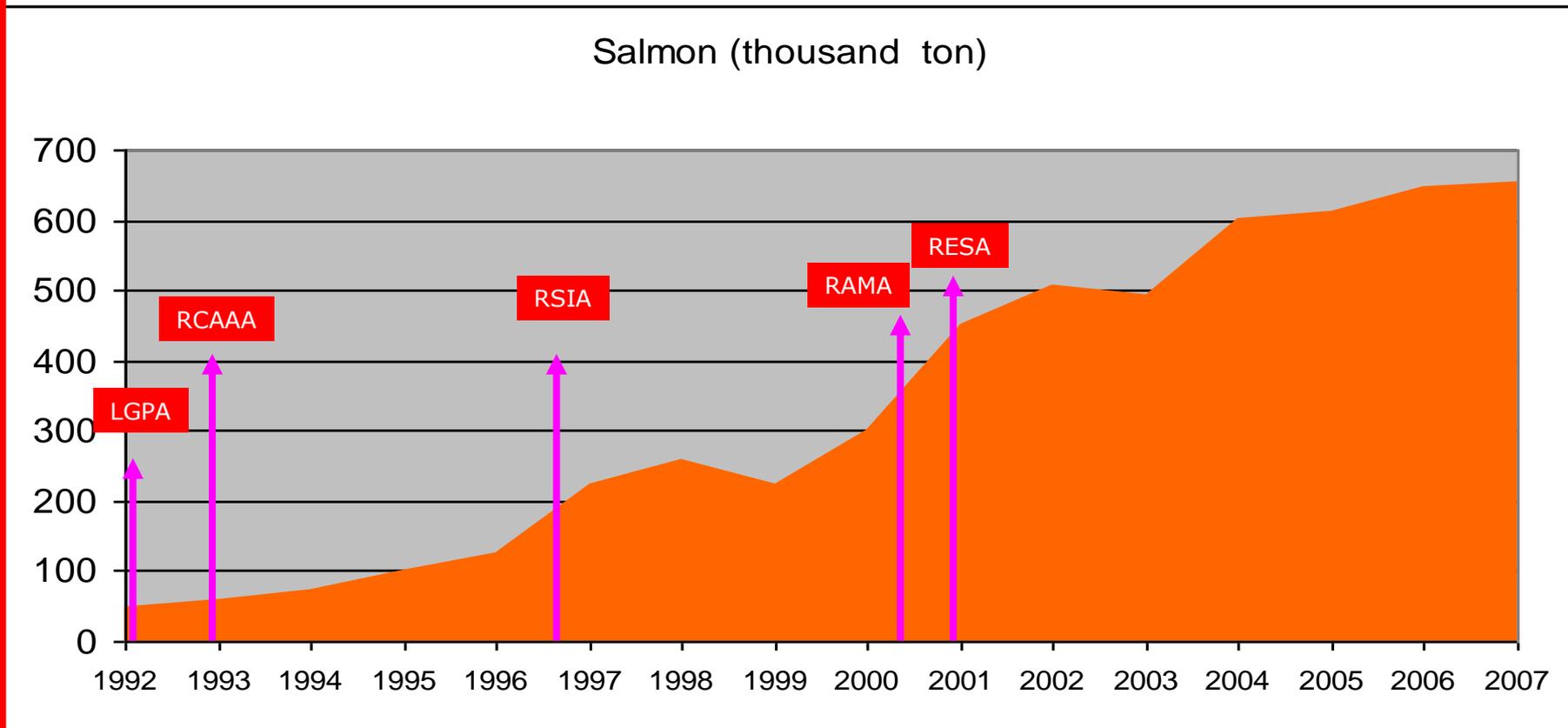


Figure 1. A framework for the analysis of rural territorial dynamics (the section on natural capital is taken from Millennium Ecosystem Assessment, 2005).

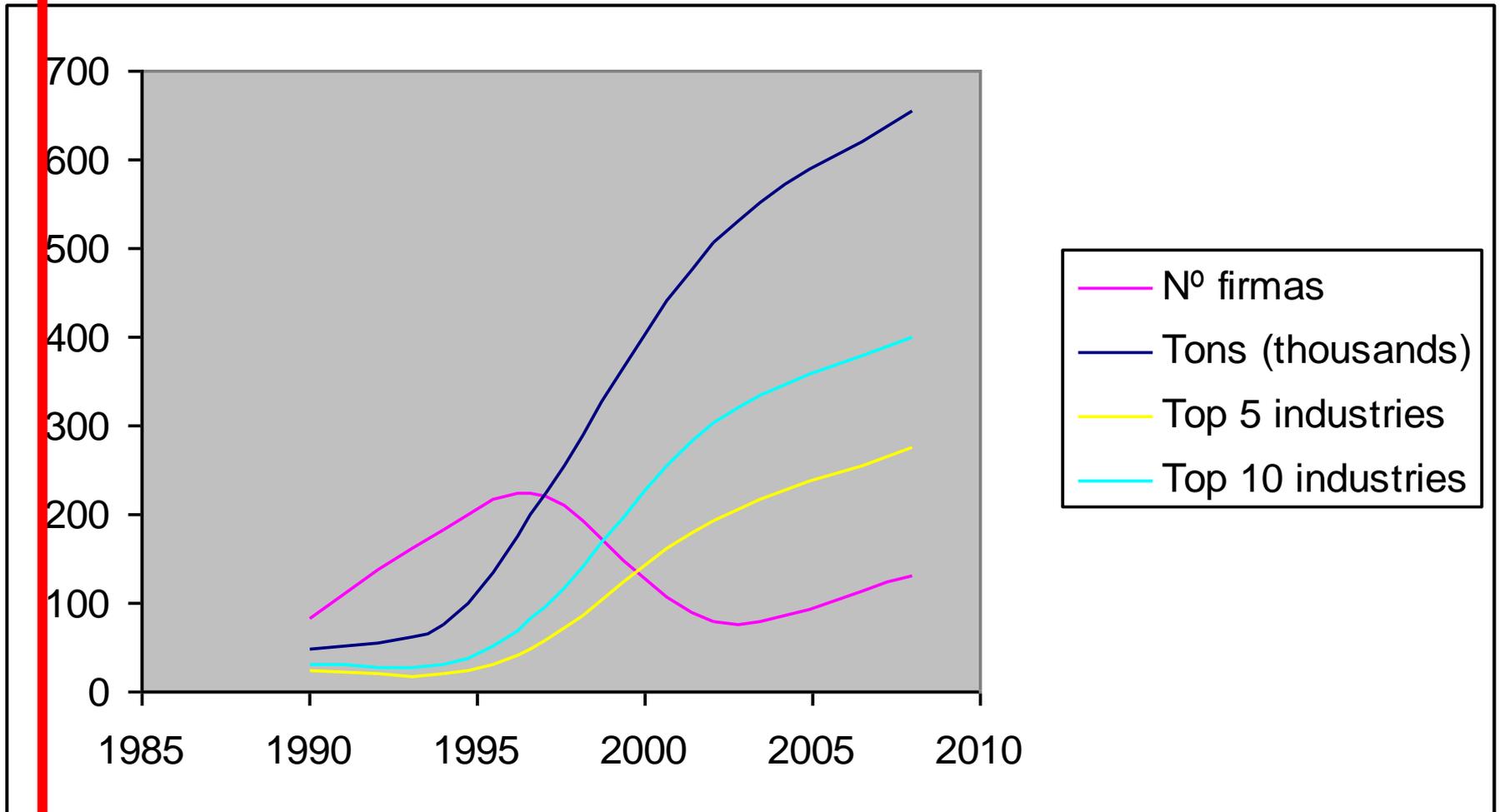
Evolution of the industry



The institucional change

- ❑ Property rights without limit of time over concession
- ❑ Concessions can be sold/bought in the market
- ❑ Processing (cambiar no sé la palabra exacta) in order to obtain property right is costly and difficult
- ❑ Environmental management based on self-regulation systems

Industry concentration



Effects on the territory

- ❑ Social changes (Income, population, poverty, employment)
- ❑ Environmental changes
- ❑ Cultural changes

Some economics changes

	Year 2003			Year 2006		
	Total Chile	Communes with salmons	Communes without salmons	Total Chile	Communes with salmons	Communes without salmons
Poverty (%)	19	17	25.1	13.7	9.9	19.6
Indigence (%)	5	3	6	3.2	2.6	4.3
Income (\$ de nov 2006)	579,919	478,135	419,591	613,206	560,244	452,012
Education	10.2	8.9	9	10.1	9	9.1
Analphabetism	4	5.7	5.3	3	4.1	4.6

Environmental effects

- ❑ **Pollution in marine ecosystems due to salmon feeding practices (Buschmann, A. y Fortt, A. 2005)**
- ❑ **Pollution in marine ecosystems due to applications of chemical (Chile apply 75 times more antibiotics by than Norway) (Cabello, F. 2003)**
- ❑ **Impacts on native ocean fauna due to the escape of salmons (Pizarro, R. y Furci, G. 2006)**
- ❑ **Beach pollution with industrial residues**
- ❑ **Proliferation of salmon diseases (ISA) due to poor sanitary management and weak control systems**

Community perceptions on the salmon industry contribution

		¿Are you agree?			
		Yes	No	WO	Total
Your perception that community think about salmon industries	High Beneficial	67	5	0	72
	Beneficial	13	2	0	15
	Neutral	4	1	0	5
	Negative	2	0	0	2
	High negative	2	0	2	4
	Without opinion	0	0	2	2
		0	0	0	0
		87	8	5	100

The survey

□ Data:

- Stratified Multi-stage sample design
- Territorial representative sample
- 856 surveyed households
- Retrospective questions to address demographic, labor and assets changes
- Current income module (multiple income sources)

Group incomes

Livelihood strategies	Mean autonomous income (year 2009)	Freq. 1990 (%)	Freq. 2009 (%)
Pure ag (1)	72,052	27.2	16.3
Mixed ag (2)	183,056 a	4.4	5.7
Pure acq/fish (3)	90,468 a b	13.3	19.9
Mixed acq/fish (4)	167,175 a b c	3.2	7.8
Sec-tertiary (5)	149,137 a b c d	22.9	33.7
Other (6)	113,593 a b c d e	28.9	16.7

(a) Statistically dif. from (1). (b) Statistically dif. from (2). (c) Statistically dif. from (3). (d) Statistically dif. from (4). (e) Statistically dif. from (5). Individual confidence level: 5% (t method) Welch standard errors, Satterthwaite approximate degrees of freedom.

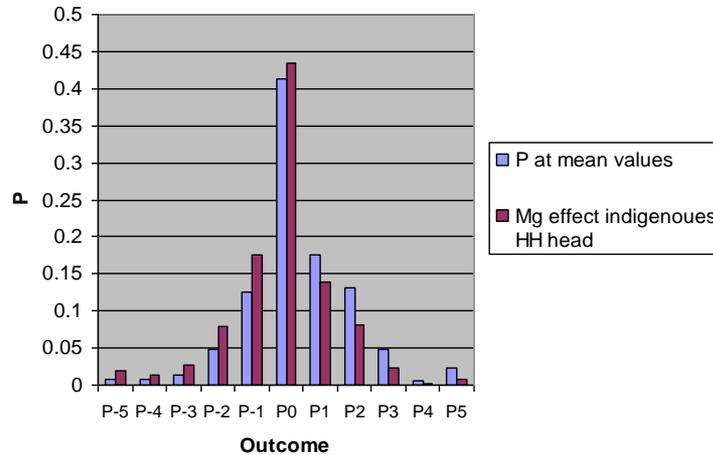
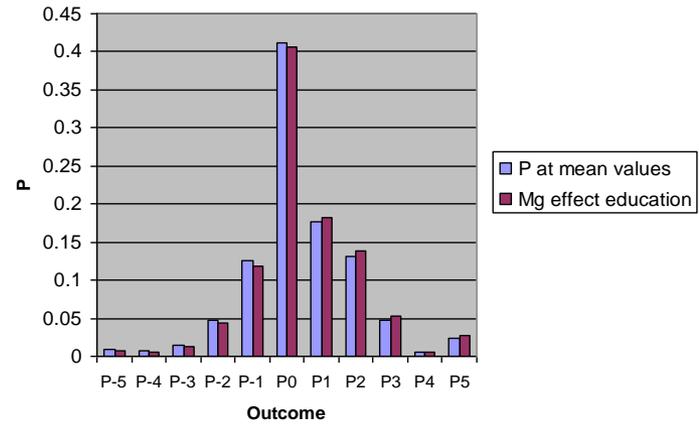
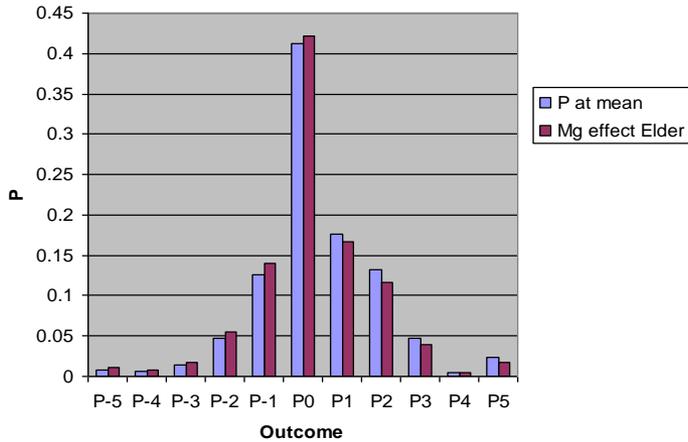
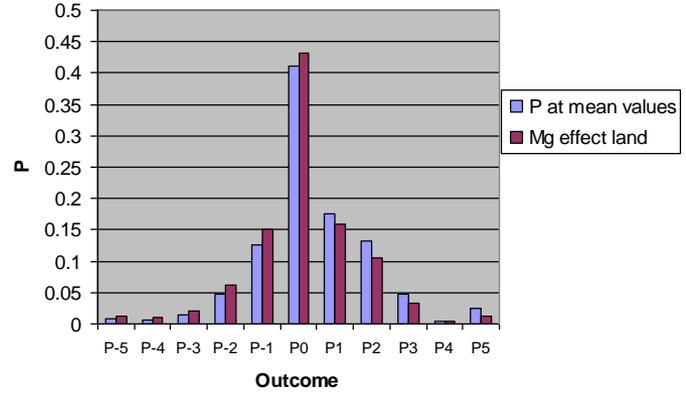
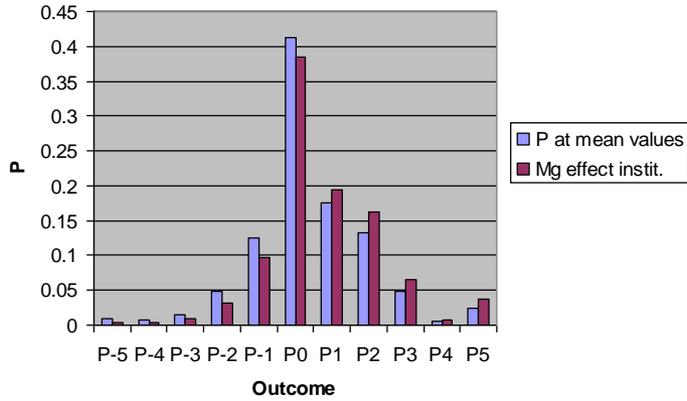
Transition matrix

2008 1990	Pure ag (1)	Mixed ag (2)	Pure acq/fish (3)	Mixed acq/fish (4)	Sec-tertiary (5)	Other (6)
Pure ag (1)	0.381	0.104	0.158	0.005	0.094	0.257
Mixed ag (2)	0.242	0.303	0.182	0.030	0.152	0.091
Pure acq/fish (3)	0.081	0.030	0.434	0.162	0.192	0.101
Mixed acq/fish (4)	0.000	0.000	0.167	0.333	0.458	0.042
Sec-tertiary (5)	0.029	0.035	0.059	0.065	0.700	0.118
Other (6)	0.107	0.009	0.251	0.098	0.358	0.177

Factors affecting changes in Livelihood strategies (Order probit estimates, outcome = shift to a higher/lower income strategy, up to 5 (-5) classes

	Spec. 1	Spec. 2
HH size	0.053**	0.057**
Access to institutions	0.204*	0.215**
Access to land	-0.158*	-0.185**
Members below 15 years old	0.016	0.011
Members above 64 years old	-0.085*	-0.102**
participation in social organizations	0.104	0.113
HH head with knowledge of traditional legends	-0.130	-0.101
Averga years of schooling (members above 14 years old)	0.001	0.053**
Female HH head	0.008	0.004
Indigenous HH head	-0.066	-0.364**
HH with radio	-0.001	0.034
Same HH head	0.252***	0.620***
Same HH head X schooling		-0.094***
Same HH head X indigenous HH head		0.487**
N	739	739
pseudo R2	0.013	0.021
Wald x2 (p-val)	0.000	0.000

Marginal effects



Conclusions

- ❑ Institutional change was a key factor permitting development of salmon industry in Chiloé (maybe as important as natural conditions)
- ❑ Institutional change the way that marine space is administered, excluding local population of decision making
- ❑ Institutional change without adequate environmental control (self regulation) also imply very negative impact over natural recourses, but...
- ❑ Allowed the growth of a major industry that change territorial economy providing incentives to households to modify their livelihood strategies, but
- ❑ Not all household seem equally propensity to shift their LS (for example Ag based HH seem less propensity to adapt, at least compared with aquic. Based HH)
- ❑ Shift to higher income strategies seems associated to some assets (labor supply (+), land (-), access to institutions (+), education (+), ethnic (-).