Production constraints and the impact of globalization on inland fishing products in Mexico

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Background

- **Inland fisheries** in Mexico represent between 2 and 3 % of the total fish catch volume in the country.

- However, their socioeconomic importance goes further because this activity **generates food** (high quality proteins), is a source of **cash** and **revenue**, creates **jobs** and it can be an important part of the **economic portfolio** of activities for rural communities.

- Furthermore, in addition to the fishers there are an important number of people working in associated **post-harvest activities**.

Objective

- This paper aims to examine main **production constraints in fresh water fisheries in Mexico** to increase production to satisfy national demand, considering a value chain analysis approach and a fish catch dynamic analysis.

Methodological approach

1) Fieldwork was carried out during two periods 2011 and 2012 in Lake Yuriria and Lake Chapala, Mexico.

This included interviews with fishers, fish traders (middlemen) and restaurant owners in two communities from each lake, and finally in "El Mercado del Mar".

2) Catch dynamics

- Catch temporal variations were analyzed considering the catch index proposed by Arreguín-Sánchez (2006). This expresses catch rate change as:

$$IC_a = ln(C_a / C_{\bar{a}})$$

- IC_a is the catch index
- C_a is the catch level in year a
- $C_{\bar{a}}$ is the average catch during the studied period
- If the index value (*IC*) is zero, this means that there is no change in one year in relation to the average.

3) To analyze catch relations, through the catch index, considering water level variations a Pearson correlation analysis was used the significance level was of a = 0.05.

Study sites

Lake Chapala

- Chapala is a natural lake, the **largest** in Mexico and the 3rd largest in Latin America.
- At the beginning of the 20th century the lake suffered from **a desiccation** of one third of its total area, with the aim to increase the **agricultural** frontier.
- Area 114,659 h

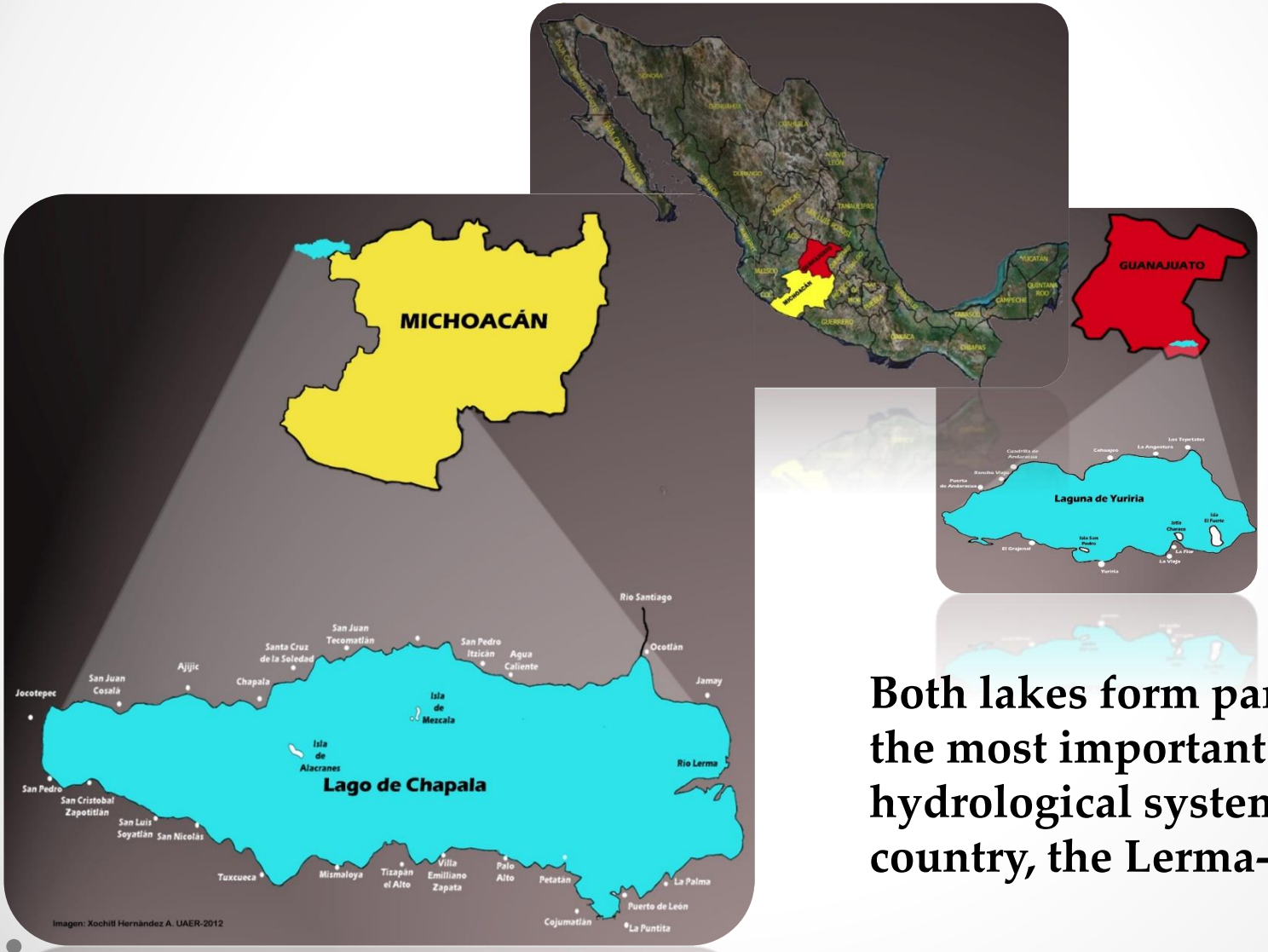
Lake Yuriria

- Artificial lake created in 1548 to **regulate** the water level of the Lerma River.
- One of the 10 most important water bodies in the country.
- Area 4800 h

- The most important fisheries in both lakes are: **Tilapia *Oreochromis aureus*, Charal *Chirostoma jordani*, Carpa *Carassius auratus*.**

- Both lakes are classified within the Ramsar Convention of Wetlands and represent an economic, environmental and cultural heritage for the country.

Location

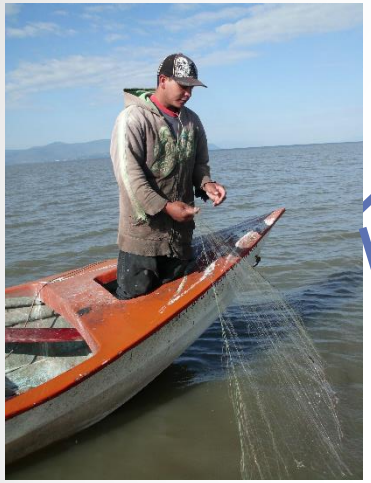


Both lakes form part of one of the most important hydrological systems in the country, the Lerma-Chapala.

Results

Fish value chain in Lake Chapala

Subsistence value chain



Middlemen

Value addition process

Long commercial value chain

Fish from other water bodies

Fish value chain in Lake Yuriria

Local restaurant

Urban market

Middlemen

Fishers

Long and short commercial value chain

Rural market

Trading patterns

	Community	Middlemen	Restaurant	Local market
Chapala	**La Palma**	95 %		5 %
	Petatán	60 %		40 %
Yuriria	**La Angostura**	68 %	32 %	
	Yuriria	80 %	10 %	10 %

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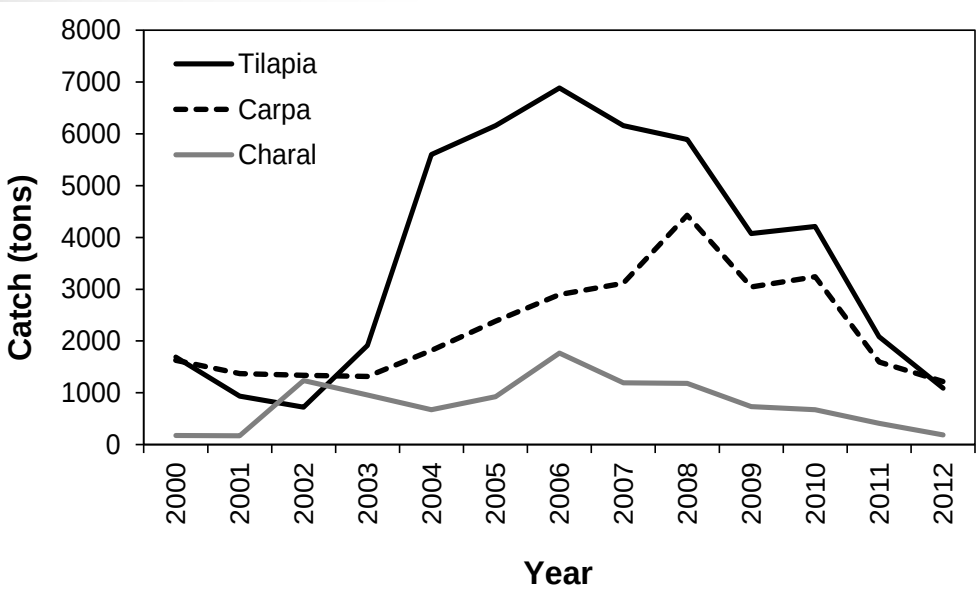
Lake Chapala

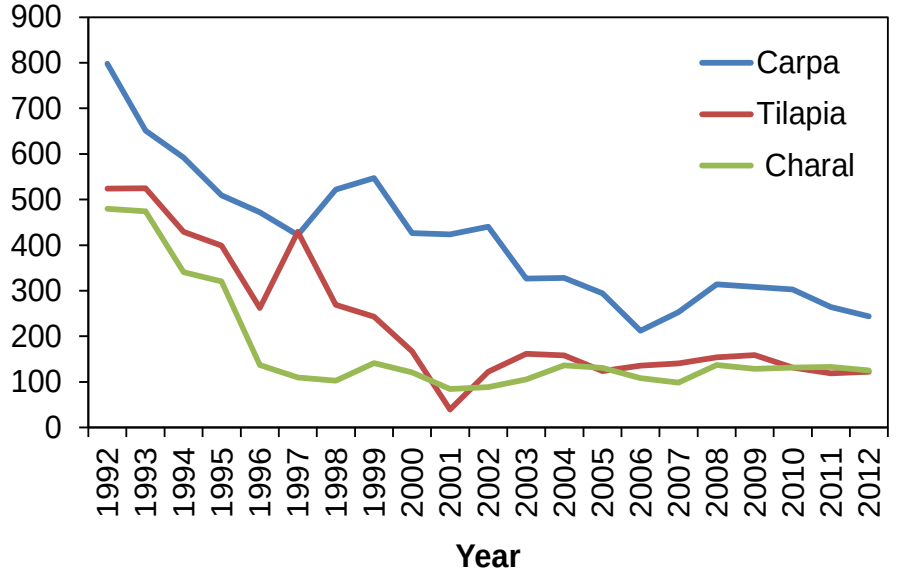
Lake Yuriria

Catch dynamics

Lake Chapala



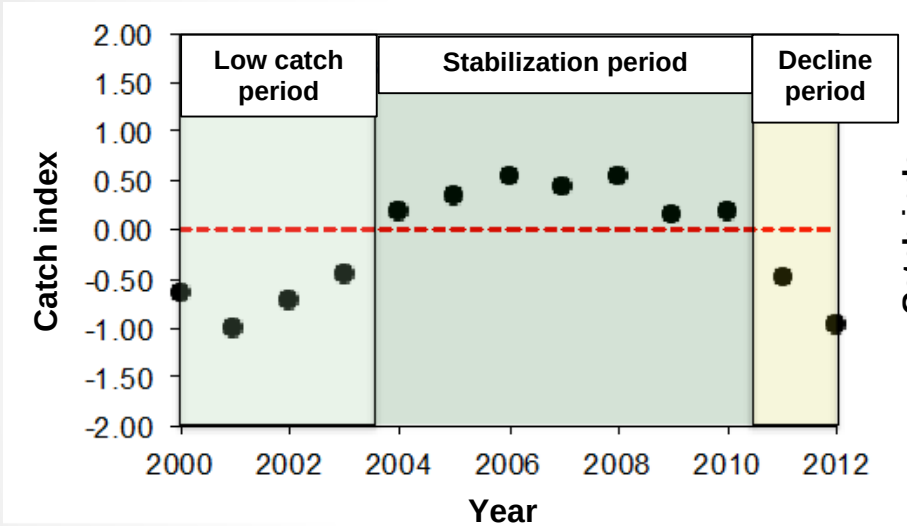
Lake Yuriria



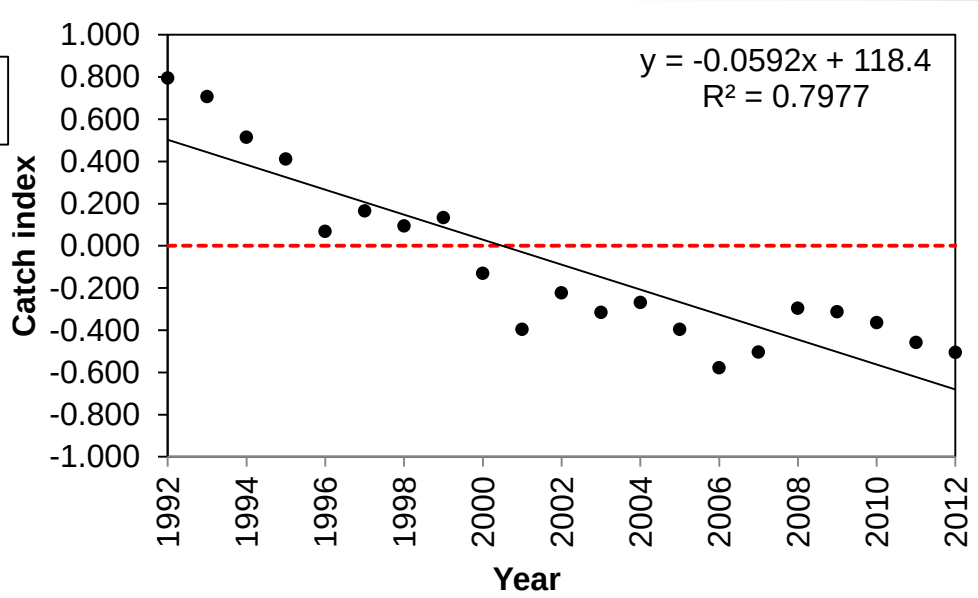
- Tilapia, carpe and charal were the most important fish resources representing 99.9% of total catch in both lakes. Native species represent les than 1% in catch levels.

Catch index

Lake Chapala



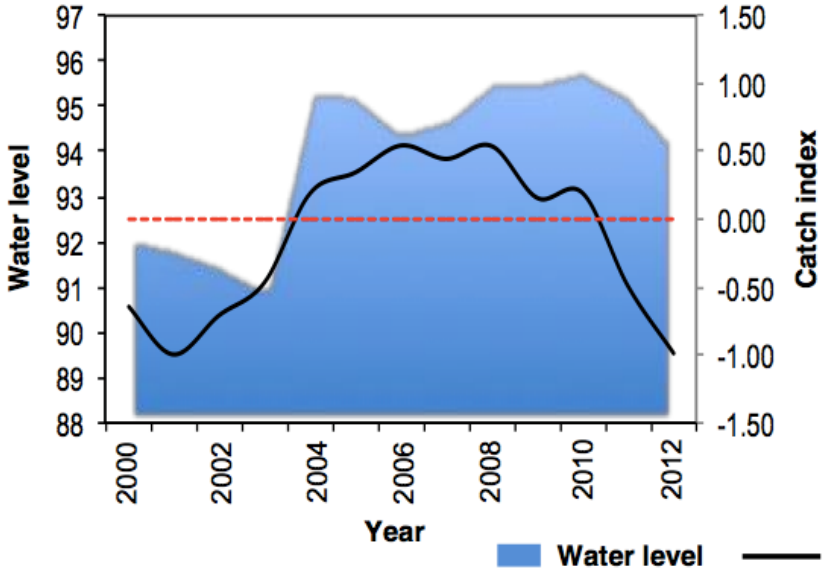
Lake Yuriria



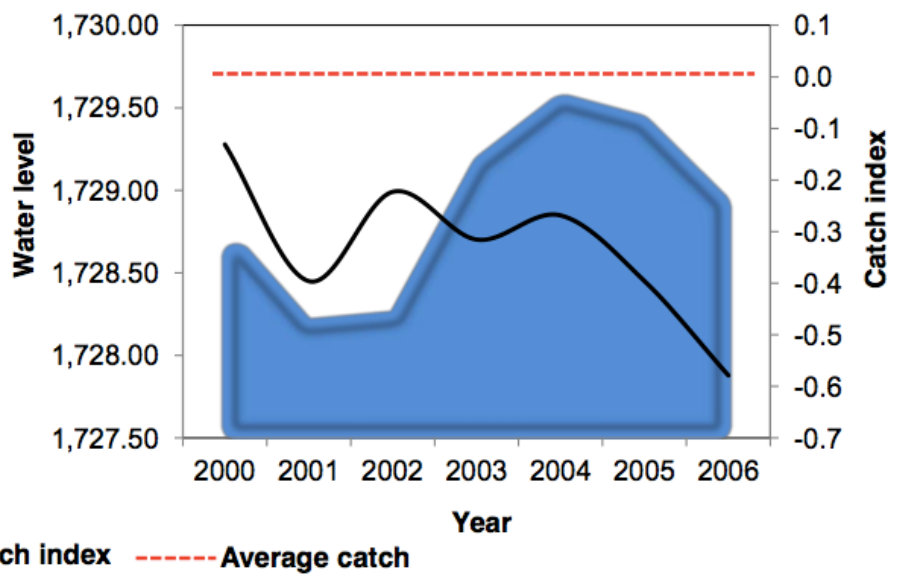
- The catch index was calculated in a global form, this includes catches from the three most important species from both lakes.
- For **Chapala** this shows that the studied period can be divided into three phases.
- For **Yuriria** it shows a declining trend.

Pearson's correlation between the water level and the catch rate from the main fish resources

Lake Chapala



Lake Yuriria



Water level — Catch index ------ Average catch

	General	Tilapia	Carpe	Charal
Lake Chapala	0.6850	0.7361	0.7047	0.2509

	Global	Carpa	Tilapia	Charal
Laguna de Yuriria	– 0.0950	– 0.5615	0.6200	0.9053

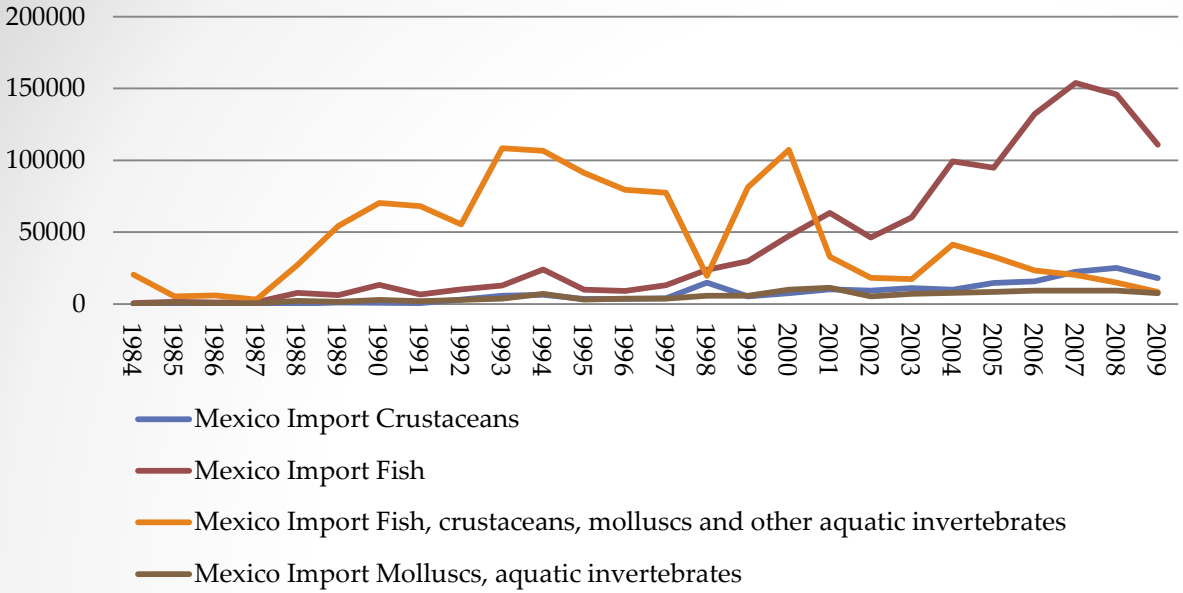
Processing

Income impact

	Lake Chapala		Lake Yuriria	
	Good	Bad	Good	Bad
Fishers	$ 350	$ 75	$ 490	$ 105
Middlemen	$ 11,200	$ 1,200	$ 16,800	$ 1,350

Sub-sector	Average price per kg of tilapia				% of final consumer price			
	La Palma	Petatán	La Angostura	Yuriria	P	P	A	Y
Fishers	5	6	9	7	8 %	10%	15%	12%
Middlemen	32	30	12		53%	50%	20%	-
Rural market	25	--	--	50	42%	-	-	83%
Restaurants	--	45 x 3= 135	40 x 3= 120	50 x 3= 150	-	75% 225	67% 200	83% 250
Supermarkets	60	60	60	60	100	100	100	100

Mexico-Imports



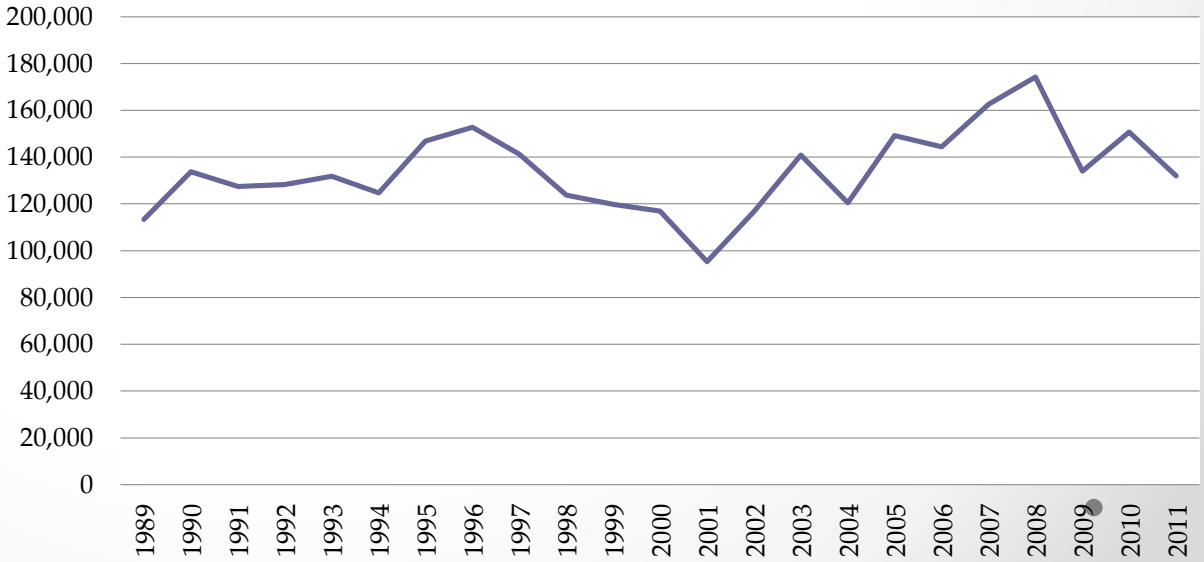
Mexico 150,684 (2010) (54% tilapia and 12% carp, only between 6 y 7%is wild catch and the rest comes from aquaculture) 2º capture place in Latin America 18%.

Imports

36% tilapia filets from China

30% pangasius filets from Vietnam

Fresh water fish production in Mexico



Critical factors

Environmental and fishery management factors

a) Pre-harvest

b) Harvest

c) Post-harvest

I. Processing

II. Marketing

Discussion

Pre-harvest	**Harvest**	**Post-harvest**	
		Processing	**Marketing**
Illegal Unreported Unregulated fishing activities			Informal trading (organization, price control)
Water pollution (Water hyacinth)	Overfishing	Transformation processes	Geographic location
Water mismanagement	State limits		Transport
Climate change	Exotic species	Poor hygiene Presentation	Consumer´s knowledge (Consumption, flavor, reputation)
Competition with other activities		No conservation facilities	Fish imports
P o l i c y F r am e w o r k			

Final remarks

- Policy framework
  - W**ater and pollution** levels
  - **IUU Fishing:** Fish catch is generally **underreported**, and catch coming from lakes and other water bodies is reported as **aquaculture** production. This alter the statistics and discourage **government investment** and support in the inland fishing sector.
  - Local communities **highly dependent** on fishing in terms of food and cash cannot improve their income because of poor production levels , lack of organization to sell the fish and price controls.
- Even though **tilapia** in particular and **fresh water fish** in general are the most consumed fish in Mexico, governmental support, or private investment are very limited for this sector and national demand is satisfied by fish imports coming from China and Vietnam.

Acknowledgements

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Thank you for your attention