



Co-management of a recreational fishery with a social-ecological approach

MC. Leopoldo E. Palomo Cortés & Dr. Alvaro Hernández Flores

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Community Conservation
Research Network

Area of Study

- Ascension Bay is located inside the Sian Ka'an Biosphere Reserve
- Punta Allen is the nearest Fishing village of 600 inhabitants
- The bay has 285 mi²: shallow waters, sea floor with sand and sea grass beds, surrounded by mangroves, and protected by a coral reef barrier
- Designated by UNESCO as a world heritage site



Background

- Co-management has been studied focused on the lobster fishery in Punta Allen (Cochran, 1998; Seijo, 1993; Defeo and Castilla, 2005).
 - Cooperatives implemented collective agreements and had effective self-enforcement of rules
- Social-ecological system (SES) have been recognized between fishing and tourism sectors (Arce-Ibarra, et al. 2017).
 - Communities are dependent upon the Mesoamerican Barrier Reef system
 - Governance is fundamental to reduce conflicts and for the rights-based management



Economic Activities in Punta Allen

- Spiny Lobster Fishery

"Vigia Chico S.C.P"



- Spiny Lobster fishing cooperative: Example of a community **Sustainable Artisanal fishery**
- Right-based management system (TURF)
- MSC certified



- Ecotours



-Cooperatives offer: Boat trips to see turtles, dolphins, birds watching and snorkeling.

- Fly Fishing



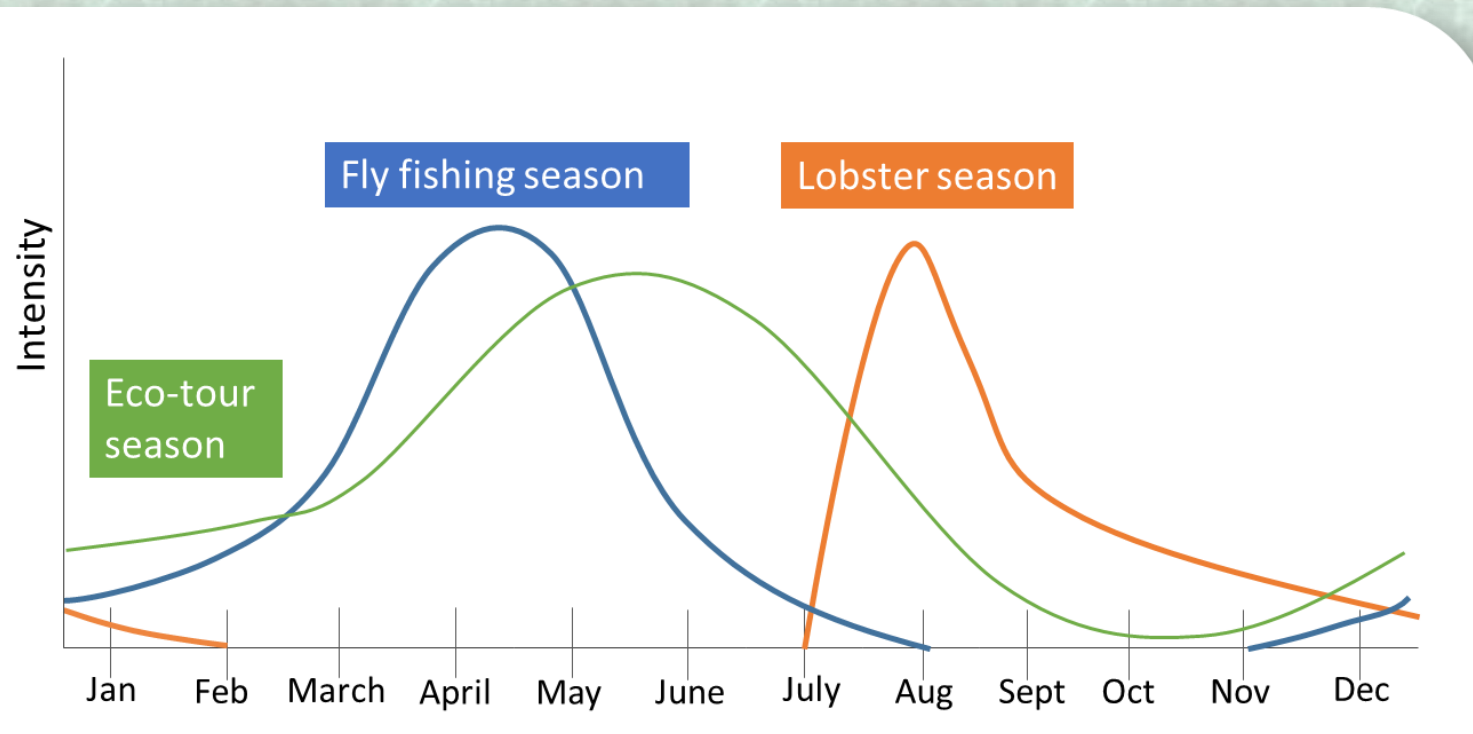
-Cooperative offer: Fly fishing Guide services & boat trips on the flats

- Lodges offer: All-inclusive packages (Fishing, meals, lodging, ground transportation Cancun - Punta Allen)

5 Touristic Cooperatives

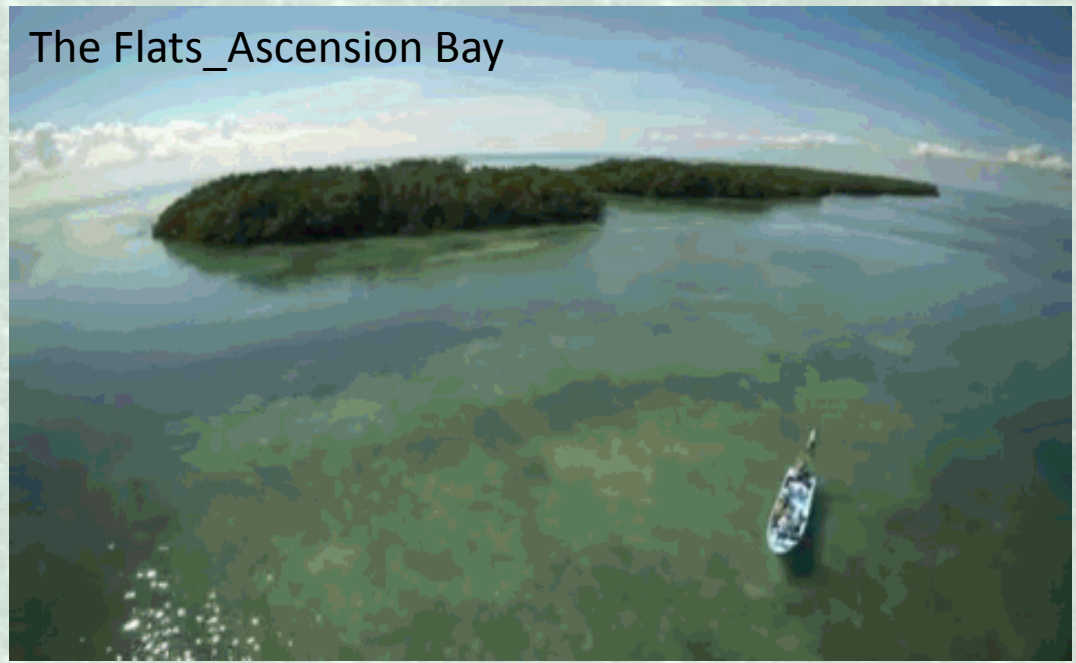
Seasonal activities

- Fishing Lobster activity: Season starts from July to February, peaks on July-August
- Ecotours activity: It is done all year. High seasons: Holly week, Summer Break and Christmas Holidays
- Fly fishing activity: runs from January to June, peaks from March to May. (Some lodges operate all year round)



Objective

- To establish the factors that intervene in the co-management of the recreational fishery in the Ascension Bay and its role in a social-ecological system



Research questions

- What are the factors that intervene in the co-management of the fly fishing fishery?
- How does fly fishing interact with other activities in the social-ecological system?
- How recreational fishing contributes to the economic livelihood of the local people?

Methodology

Data collection

- **Analysis of official data and accounting records of cooperatives:** vessels concessions, number of coops transactions, MPA Management program
- **Participant observation process:** To explore events, behaviors and interactions of local people involved in recreational fishing
 - **Snowball technique:** To identify community leaders and gain contacts of fly fishing guides and assistants
- **Social-economic surveys:** To know the costs and revenues related to the recreational fishing on the community

Results: The Fly fishing Guide Service



Features

- 65 Fly fishing Guides: 30 are expert guides and 35 assistants guides
- Two local guides per boat: unique strategy
- Typical fishing-day from 8:00 a.m. to 4:00 p.m.
- MPA-authority stablished the carrying capacity: 140 boats
 - 43 eco-tours concessions
 - 45 Fly fishing concessions
 - 20 both type of concessions

The Fly fishing fishery

- There are no official records of visitors. Estimated: **700-1000** anglers per year (based in the number of lodges and average fishing)
- Only Catch & Release are allowed in the bay
- Ascension bay have the principal game species for a Grand Slam
- 90% of the anglers looking for permit (fish)
- Permit is one of the greatest challenges in Fly fishing
- Only Snook is an Exclusive specie for Sport-fishing (Mexican regulation)

Target species:



Permit

90%

Trachinotus falcatus



Bonefish

8%

Albula sp.



Tarpon

1%

Megalops atlanticus



Snook

1%

Centropomus undecimalis

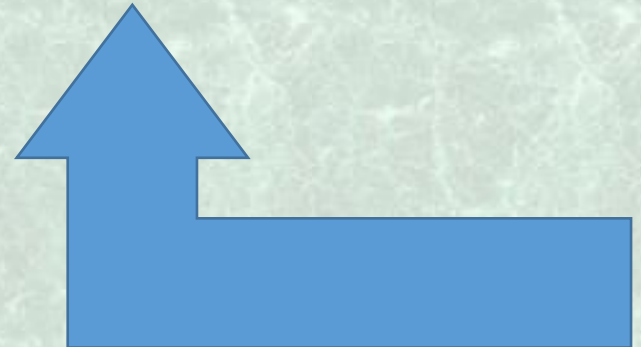
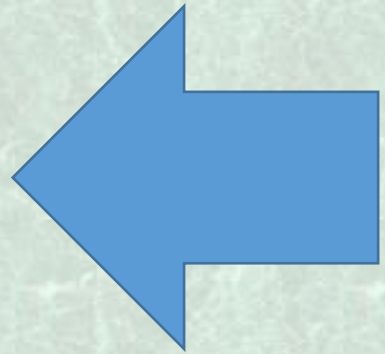
Local cooperatives & main fishing lodges: Fishing boats concession

Cooperatives	Concessions
Coop Punta Allen	14
Coop Vigia Grande	10
Coop Nativos de Punta Allen	5
Coop Las Boyas	3
Coop Los Gaytanes	1
Total	33

51%

Lodges	Concessions
Casa & Playa Blanca	17
Pesca Maya Fishing Lodge & Travel	8
Gran Slam Fishing Lodge	3
Victor's Fly Fishing Club	2
Cuzan	2
Total	32

49%



Lodges without concessions	
Palometa Club	Viejo Chac
La Pescadora	Punta Allen Fishing Club
Fishermanlodge	Sol Caribe

Co-management: The Actors



Lobster fishers



Fly fishing Guides



MPA Authorities



Ecotour Guides



Fly fishing Lodges

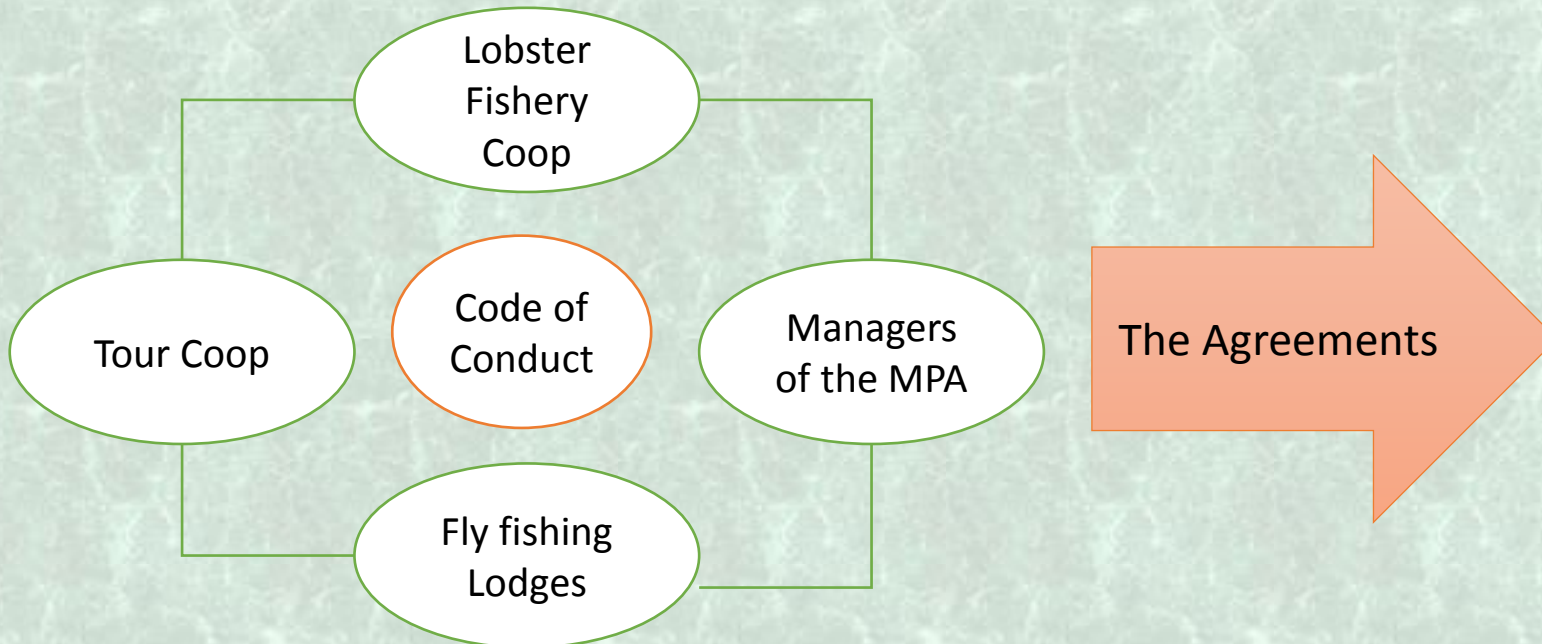


Co-management: Stakeholders agreements

Agreements for a better catch and release fishery

Partnership arrangement between government and resource users.

- In 2013, MPA promote meetings with all the actors
- Objective: Approve and adopted rules to avoid negative externalities



1. Do not invade areas for recreational fishing

2. Use artificial lures

3. Participate in the monitoring of species

4. Protection and care of nature

5. Appropriate manipulation of species

6. Being professional at work

7. Do not use fishing nets

8. Minimum distance between boats of 500 m

9. Minimum distance of boats in transit of 150 m

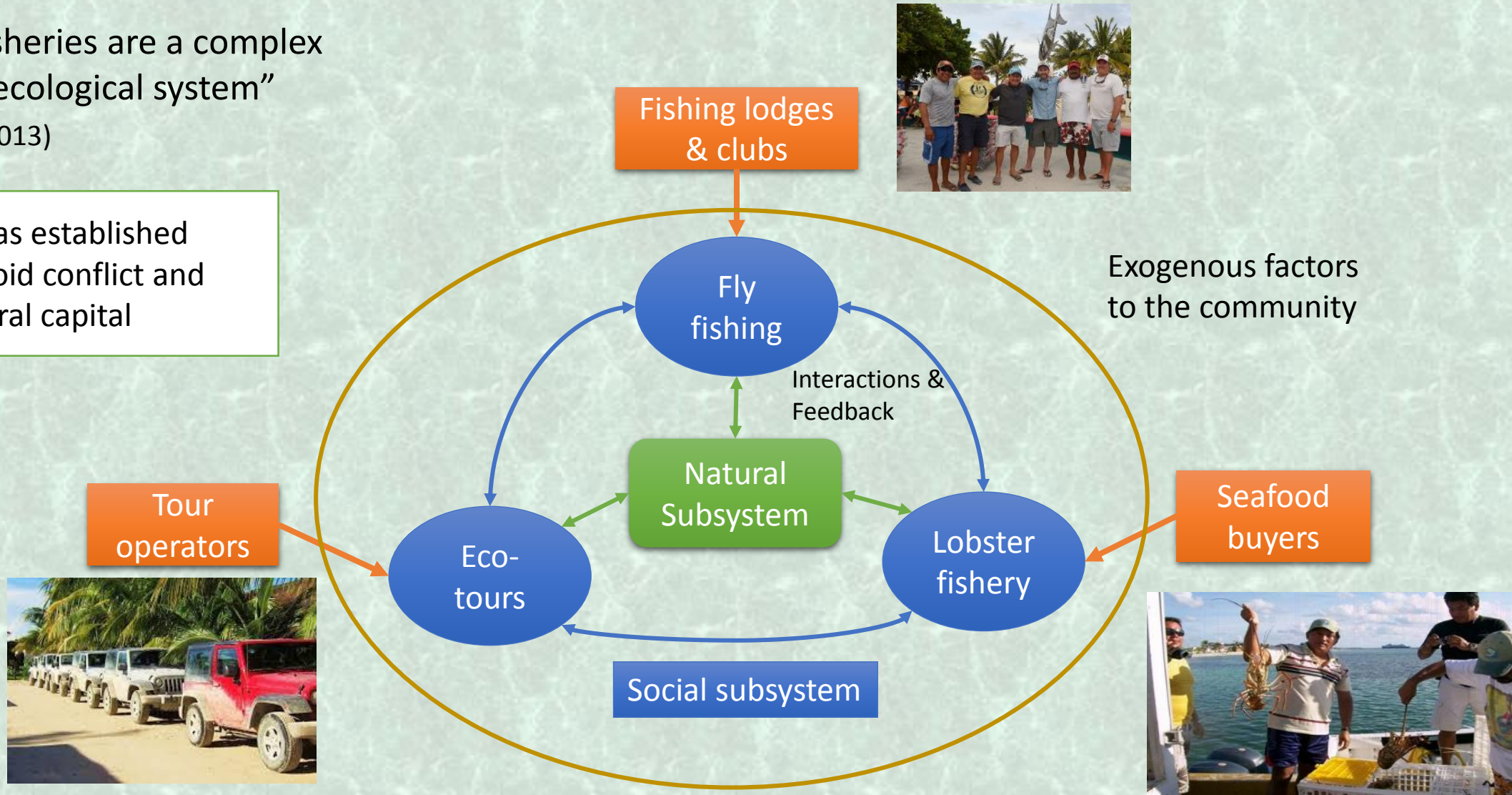
10. Maximum speed of 4 knots

The Social-Ecological System: Conceptual model

“Recreational fisheries are a complex adaptive social-ecological system”

(Arlinghaus *et al.*, 2013)

The community has established agreements to avoid conflict and preserve the natural capital



Social-Ecological System: Scales

Spatial scale into the bay

- Lobster fishing zones
- Fly fishing zones
- Coral reef barrier and estuarine areas

The geographical scale

- Resource use on Ascension Bay
- Local level: community rights-based in Punta Allen

Social-political scale

Community-based organizations

- Cooperatives: Sustainable livelihoods
- Private sector of local and international companies

State and Federal government

- MPA authorities
- Federal policies on conservation

NGOs

- Provide support negotiations
- Environmental Projects

Levels of Governance

Community level:

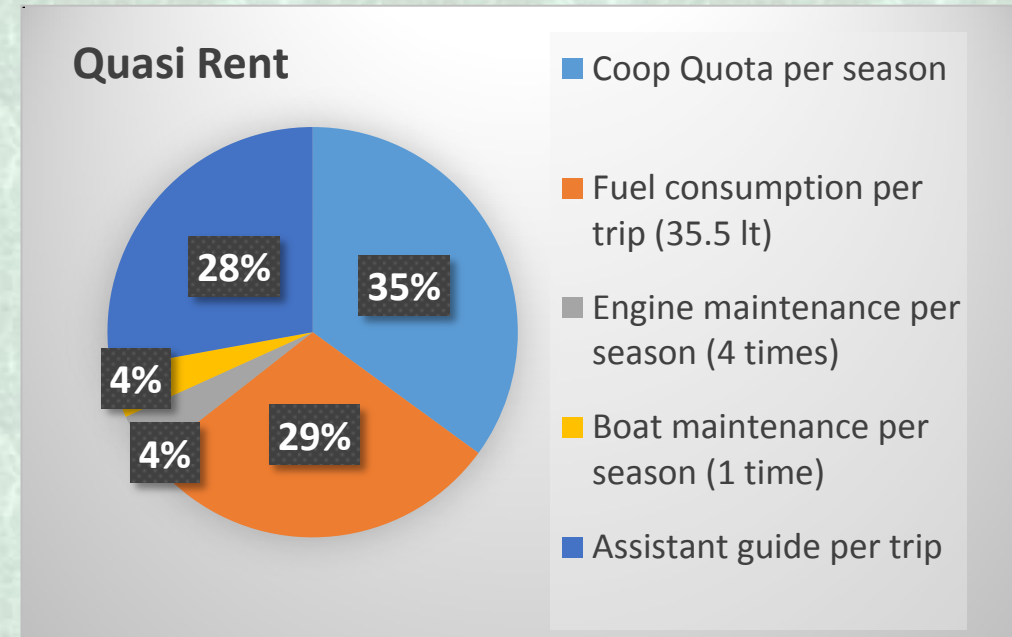
- Propose Initiatives, governance agreements and community rules
- Self-enforcement of environmental regulations



Expenses for local Fly fishing Guides

- Data obtained from surveys (sample 23%)
- Effective fishing Days per season: 110 days
Avg for the cooperative members

Costs of Cooperative Guides per trip	USD
Coop Quota per season-day	\$31.65
Fuel consumption per trip (35.5 lt.)	\$26.58
Engine maintenance per season-day	\$3.43
Boat maintenance per season-day	\$3.54
Assistant guide per trip	\$25.17
Quasi-rent	\$90.37



Income per trip	USD
Coop Guide Service rate	\$ 180.00
Tip per trip (Avg)	\$ 35.00
Total income	\$ 215.00

Economic Benefits

- 65 local fly fishing guides
- Without considering the impact on other sectors (restaurants, cleaning staff and others)
- Incomes + tips in 110 fishing days (avg.)

Spillover of fly fishing guide services	USD – per season
30 Experienced guides	\$ 411,279.00
35 Assistant guides	\$ 231,654.50
Total	\$642,933.50



Anglers economic impact

- Rate \$3,686.00 avg. (All-inclusive package for 6 fishing days)

Combined Fishing lodges	USD – per season
700 Fishermen visitors	\$2,580,200.00
1000 Fishermen visitors	\$3,686,000.00

24% stay in the community



Final Remarks

- The local governance is based on **collective decisions**. Isolation contributes to maintain their traditions
- The lobster management experience gave them the skills to **organize** this another newest **activities based on Social-Ecological System**
- Community perceive that issuing more **concessions to Private sector will threat** their livelihood
- Since many concessions belong to foreign fishing lodges, there is a reduction of **70% of income** by the locals
- In to 2017 Cooperatives agreed to **set the price for the lodges in US dollars**, (\$260 USD per trip-day), no matter the currency exchange-rate

ACKNOWLEDGMENT

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Introduction

- Recreational fishing is a very important economic activity in México
- Offshore fishery represent the principal revenues for this activity
- Inshore fishery is very important for coastal communities, but its less study beside the enormous economic importance
- Fly fishing is practice in many places in México, mostly by foreign anglers of all the world in MPA
- Mexico don't have a systematic mechanism to register the visitors for recreational fisheries
- There is no enough regulations and researches about the principal game species of recreational fisheries

Results:

Local community Agreements

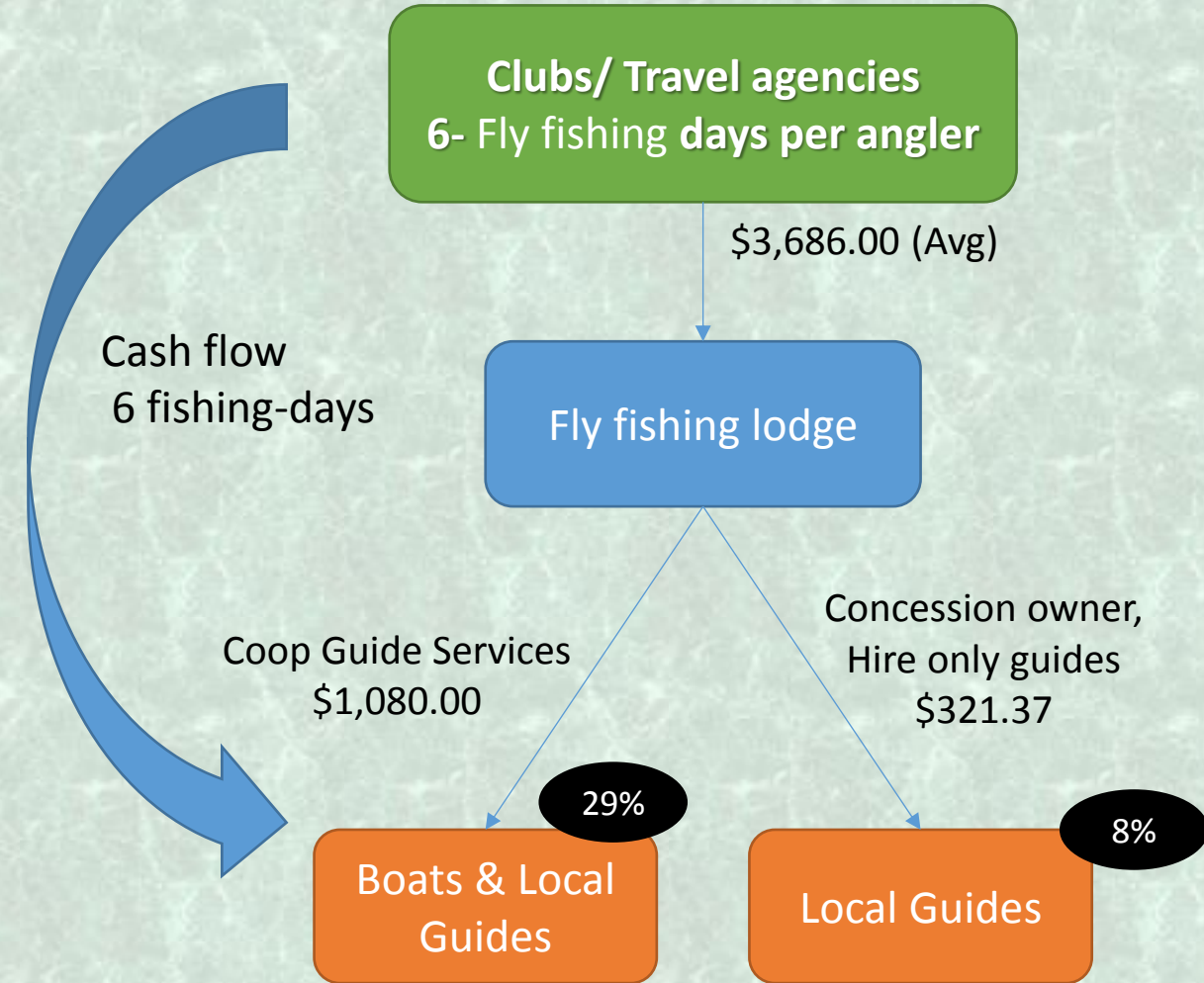
- 1990 Prohibit self-consumption of sport fishing species
- 1994 Create the first touristic cooperative
- 1996 Fishing net was banned (finfish fishery inside the bay)
- ---create other 3 coop, and offer fly fishing guide services to lodges
- 2010 Create Alliances between cooperatives and Set fix prices for all touristic services (“Alianza Turística Punta Allen”) to operators
- 2013 Establish with MPA authorities, code of conduct for fly fishing

In a Natural Reserves, managers encourage the development of the local communities, for which demand priority in the allocation of concession (CONANP). Despite this, some fishing lodges have obtained their own licenses.

The economic revenues to community

The most common All Inclusive pack for Anglers is for 8 days (6-fishing days) 7 nights per angler:

- > Avg. rate **US\$3,686.00**
- Cooperative rate service: **US \$180.00 (\$3,350 MX)**
- Concession owners Hire guides: **US \$53.56 (1,000 Mx)**



DOLLAR EXCHANGE avg 2016 \$18.67 MXN

Final remarks

- The factors that intervene in the co-management are historical traditions. This is a cohesive community
- Each one of the three activities of the ecosystem use, demand different skill from the locals
- Thus, locals can combine no more than two activities: fly fishing and lobster fishing, or ecotourism and lobster fishing
- Since 2015 the cooperatives charged the equivalent of \$180.00 usd per fishing day in Mexican pesos
- If the Government favored the community in the natural protected areas, locals could increase their income