

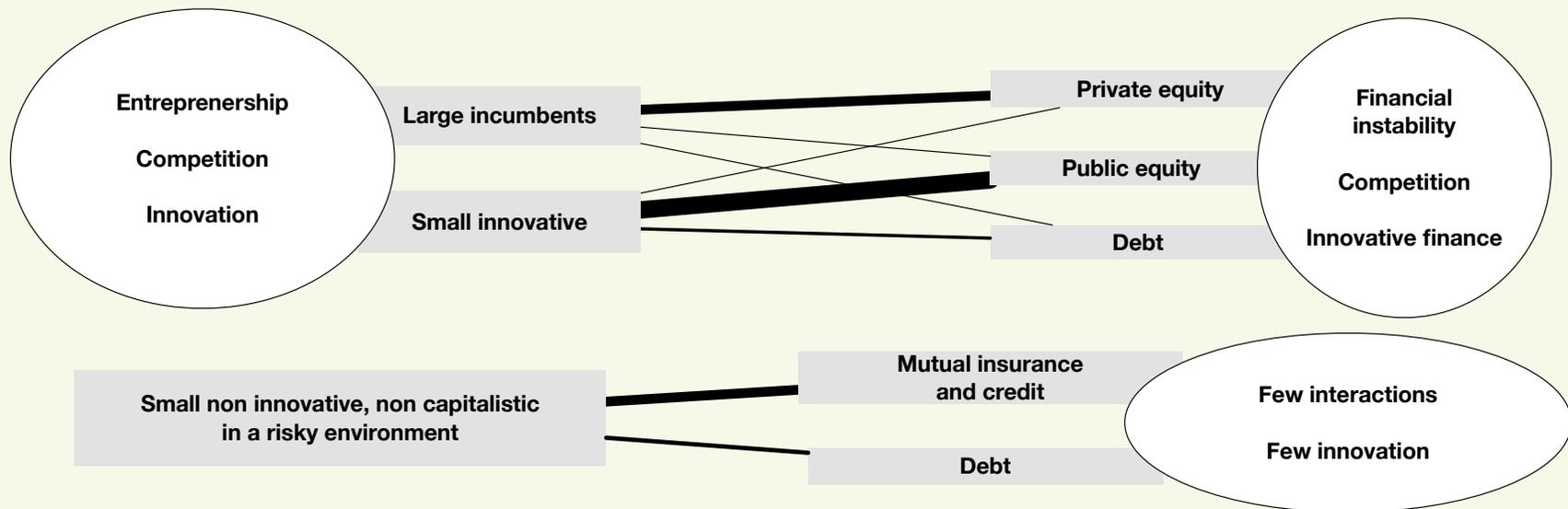
# *The race for boats*

Christian Mullan (IRD-France),  
Charles Mullan (UFL- Switzerland)

# The race for boats

- IRD
- French Research Institute for Development.
- Research programs about socio-economic systems involving fisheries in several African countries.
- The future of small scale fisheries in developing countries in the economic globalization

# The race for boats



- A tentative to represent the issue in a Schumpeterian framework.
  - an emphasis on innovation process and its financing,
  - a taking into account of changes in finance.
- Top of figure : the theory, and maybe the reality.
- Bottom of the figure : what we still observe in developing countries fisheries.
- Integration of both?
- Something will happen. We don't know what. We have concerns.
- A framework in which to address these concerns.
- A general framework, valid many kinds of fishing systems.

# Introduction. Ostentatious behaviors



## Introduction. Failures to manage fishing capacity

- Quotes from Sebastian Villasante. *Global assessment of the European Union fishing fleet: An update*. Marine Policy 34 (2010) 663-670.  
*The structural policy clearly has been unsuccessful in reducing fishing capacity. This is because in spite of the reduced number of vessels, tonnage, and fishing power in all sectors examined, the EU fleet has adopted more technically efficient vessels with greater fishing capacity.*  
...
- The intriguing point: why did it happen like that? are there specific behaviors of fishermen, of fleets, of fisheries manager, of policy makers that logically explain what has been called a failure? If so, what are they?

# Introduction. Rationality in fisheries

- Fishermen economic behavior
  - Do fishermen acquire big boats to earn money by selling the fish they catch,
  - Do they earn money by selling fish to pay the big boats they want?
- Goals of fishing policies
  - Do fishing policies encourage investment in boats to insure a larger income to a country,
  - Do they ensure minimum profit for fishing companies to allow the development of their national fishing fleet?

# Introduction. Fishing entities

Which fishing entity

- boat skipper,
- fishing company,
- fishery,
- fishery management,
- fleet,
- fisheries policy,

maximizes what ?

- catch,
- profit,
- capacity,
- pleasure

The question of rationality in fisheries is addressed in : D. W. Bromley.  
*Abdicating responsibility: the deceits of fisheries policy.* Fisheries,  
34(6):280-290, 2009.

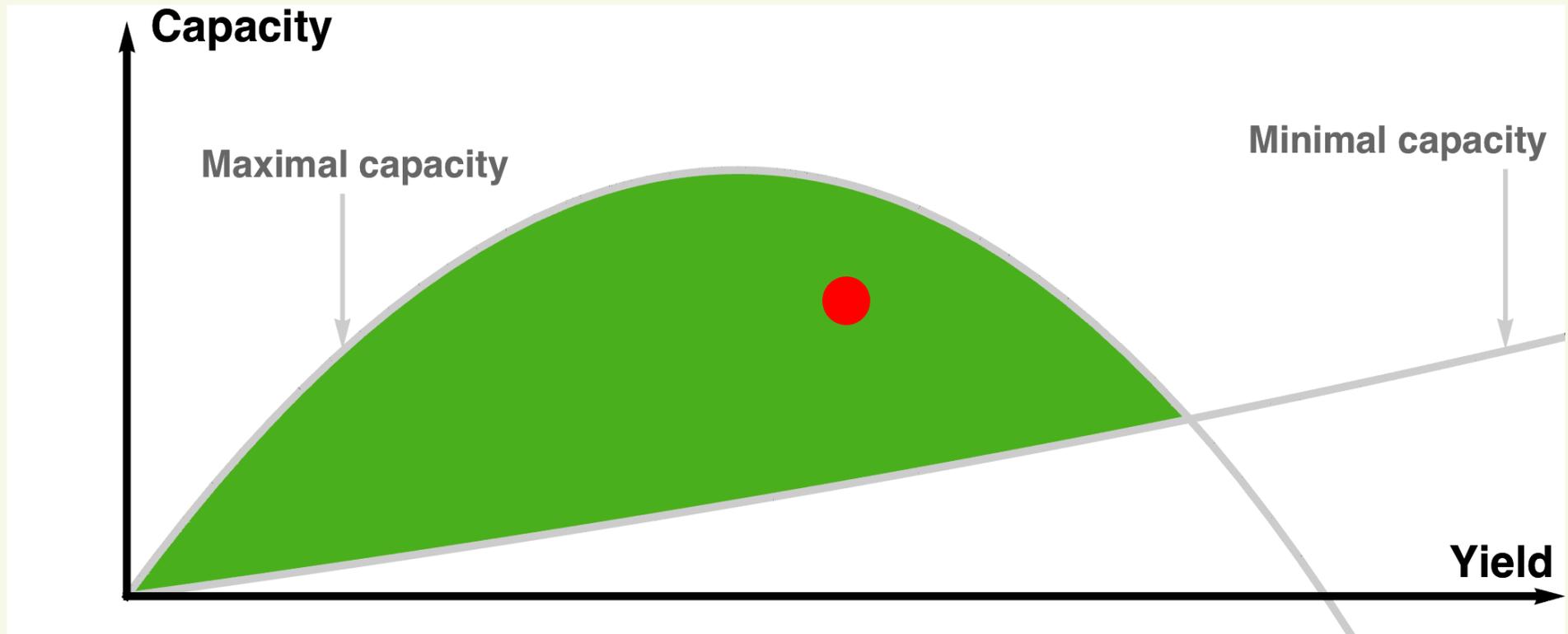
# A system with a single fishing entity. Model



A simple model. Modelling assumptions

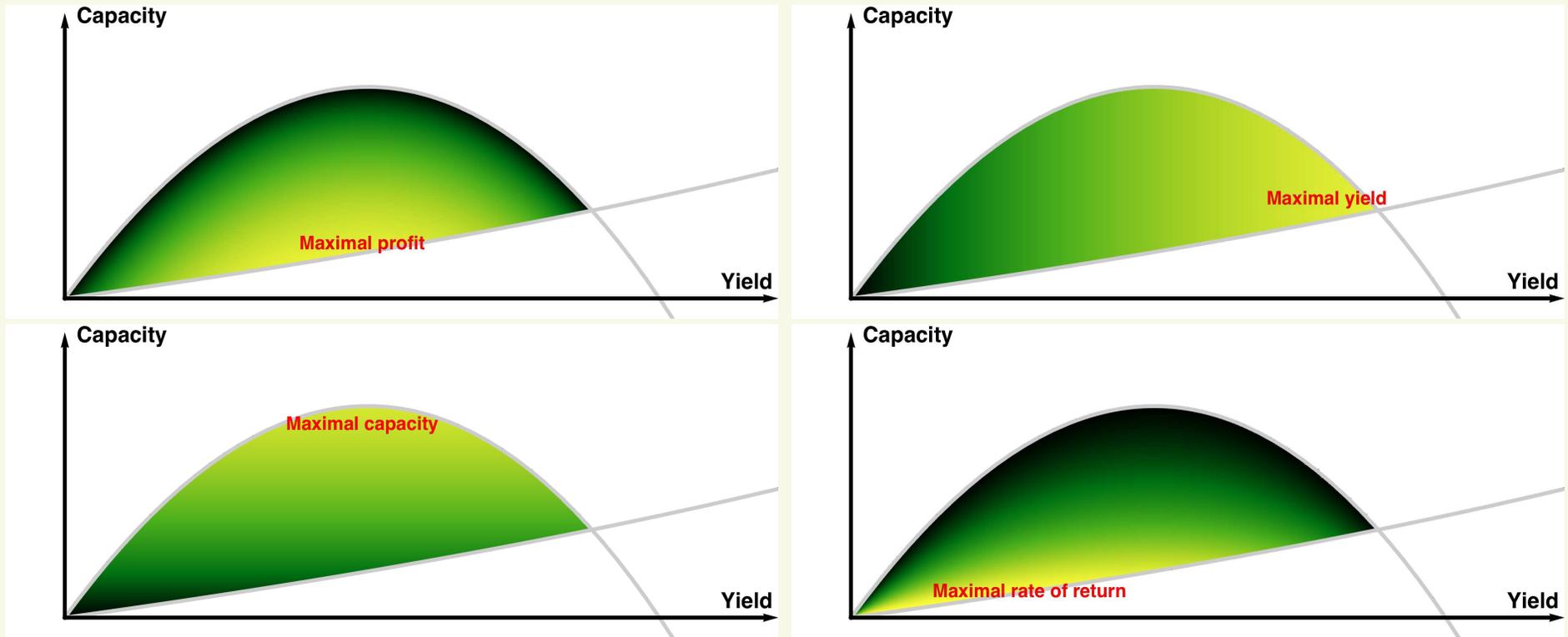
- Fish stock depends negatively on catch,
- Fish prices depends negatively on catch,
- Fishing costs depends negatively on fish stock,
- Effort is limited by fishing capacity,
- There is a conventional relationship between stock, effort and catch,
- Capital (fishing capacity) is costly.

# A system with a single fishing entity. Feasible space



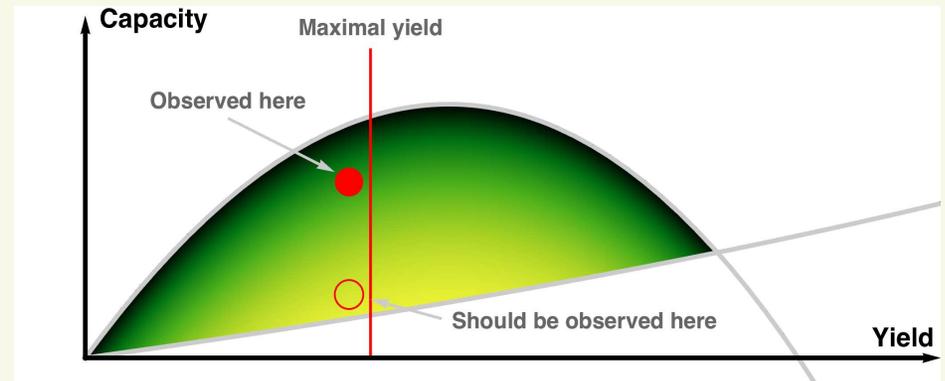
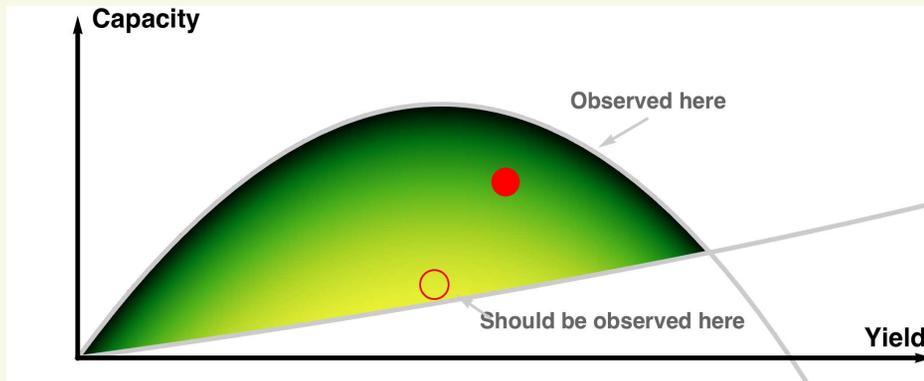
- All characteristics of the system: income, fish price, fishing costs, fish stock depends on fishing and yield
- The system is characterized by capacity and yield: to a fishing entity corresponds a point in a plane where x-axis corresponds to yield and y-axis to capacity.
- Yield is limited by capacity: yield is related to effort and effort is limited by fishing capacity.
- Capacity is limited by yield: fishing capacity is costly; this implies a minimal income, thus a minimal yield.
- There is a space of feasible states

# A system with a single fishing entity. Maximization behavior



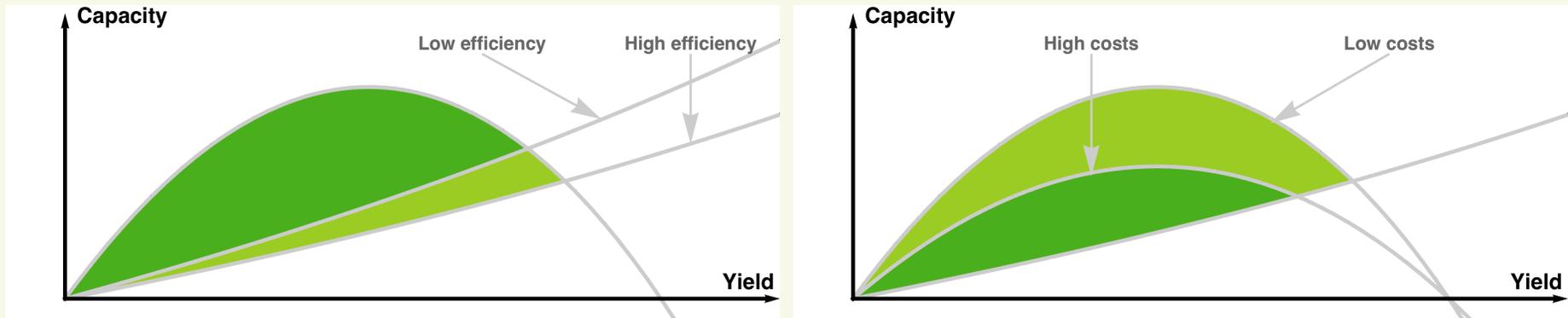
What a fishing entity maximizes corresponds to a location inside the feasible space. These plots represent its location if it maximizes its profit, its yield, its fishing capacity or its rate of return

# A system with a single fishing entity. Rationality



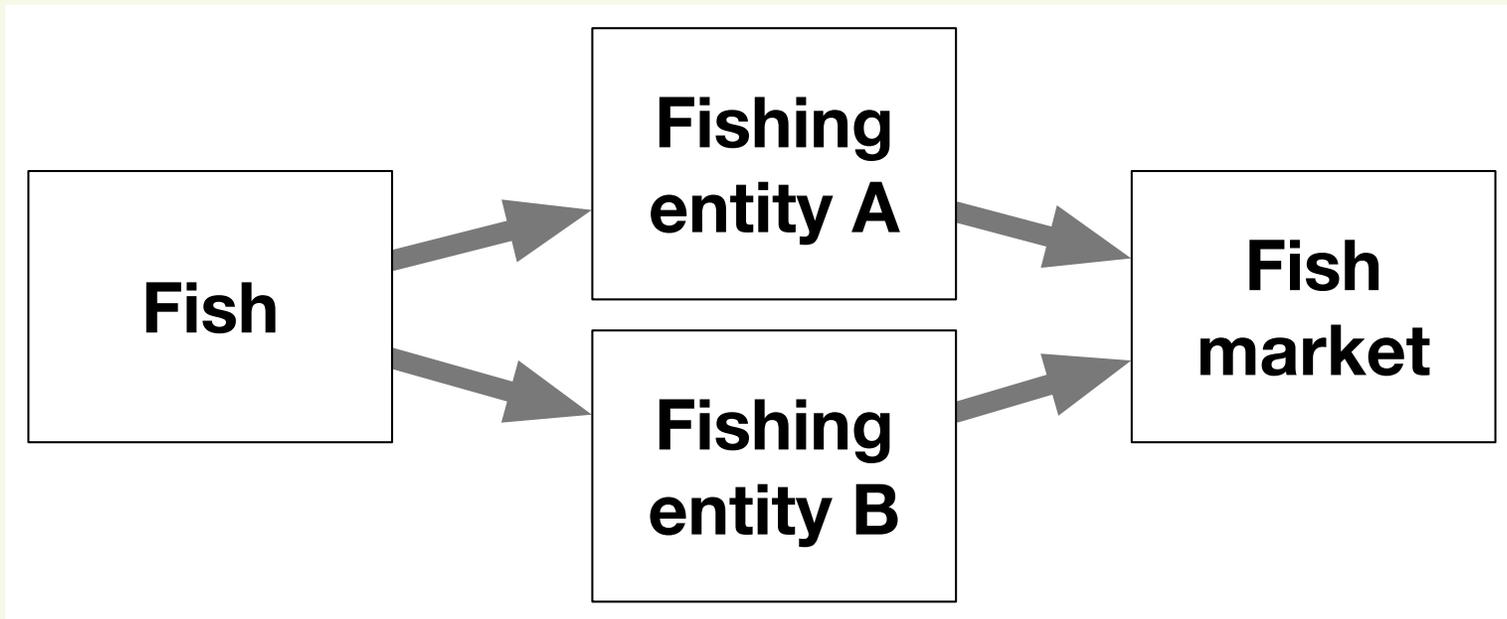
Addressing the question of rationality consists in comparing observed behavior and expected behavior according to a supposed rationality. For example, this plot represents the over-capacity issue.

# A system with a single fishing entity.



- Decreasing fishing efficiency shrinks the feasible space,
- Increasing finance constraint shrinks the feasible space,
- A new framework for fisheries policies
  - Acting on technical efficiency
  - Acting on finance constraint
  - While acknowledging that fishing entities behavior is diverse and little known
  - To control the space of feasible states

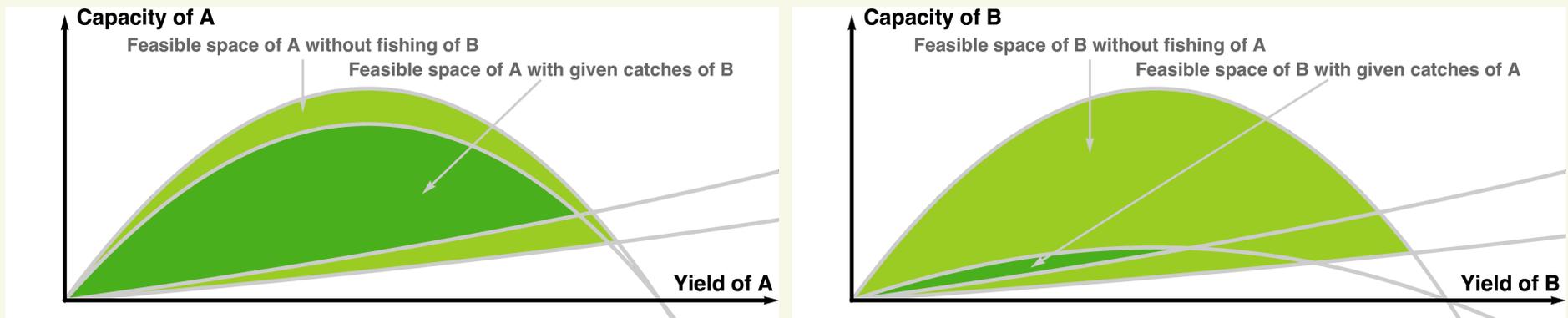
# A system with two competitive fishing entities. Model



## Modelling assumptions

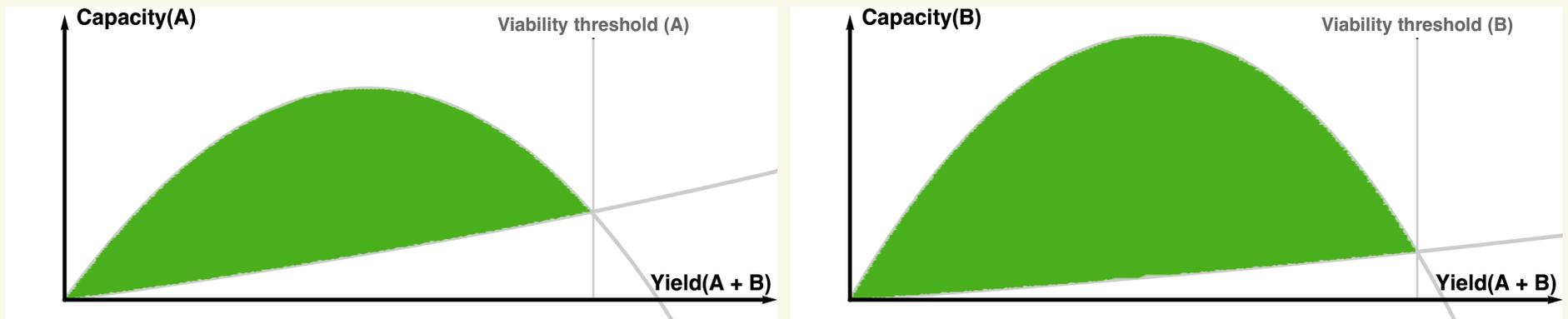
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# A system with two competitive fishing entities. A Generalized Nash Equilibrium Problem



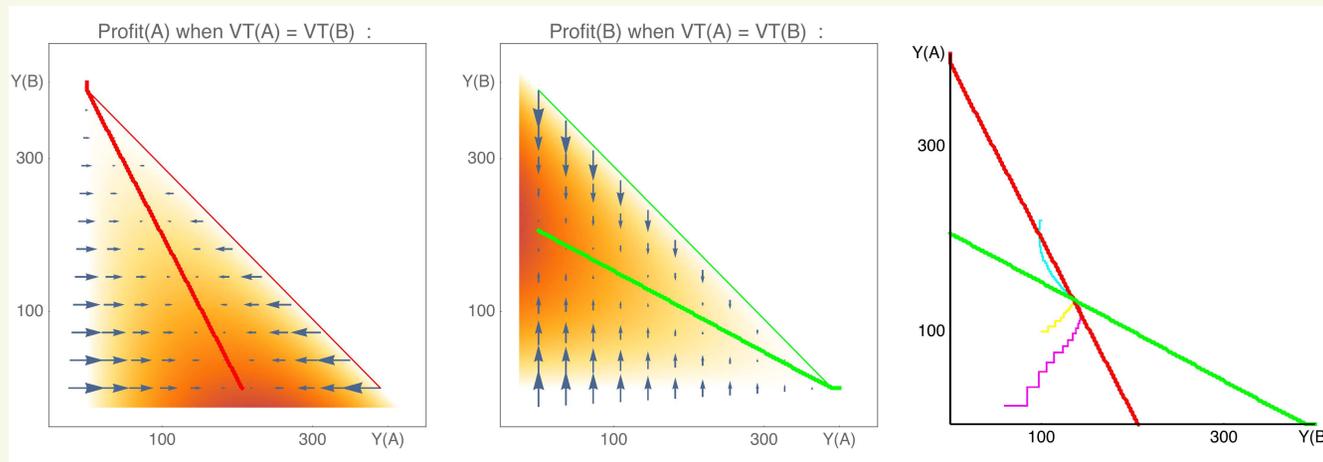
- Yield of B shrinks the feasible space of A
- Yield of A shrinks the feasible space of B
- The behavior of one entity constrains the set of possible behaviors of the other entity.
- As soon as we assume that fishing entities compete for something, we get a generalized Nash equilibrium problem.

# A system with two competitive fishing entities. Viability threshold

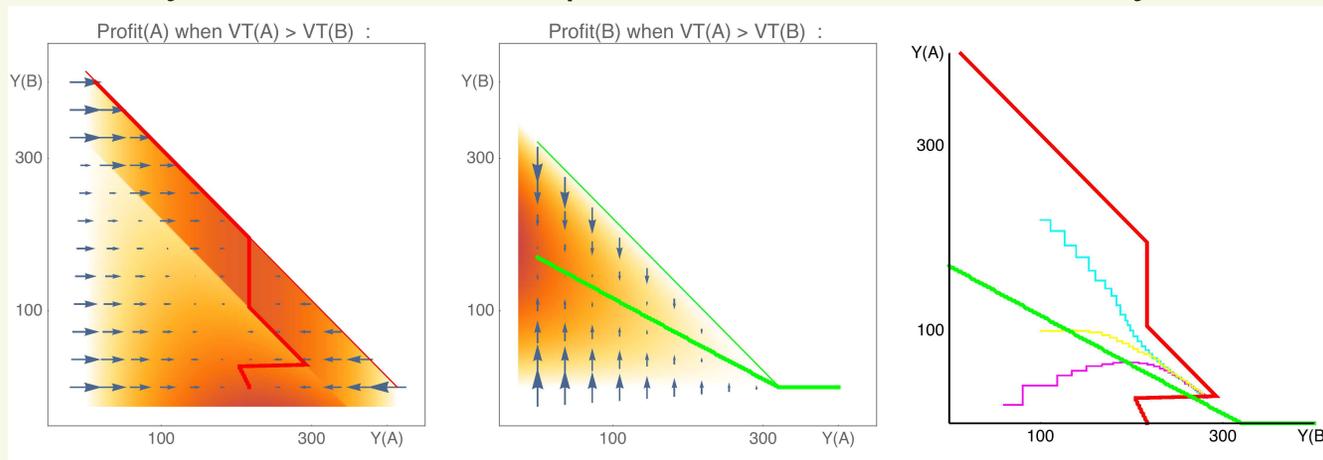


- To examine the equilibriums of this game,
- We define the viability threshold of a fishing entity as the maximal possible yield (by all fishing entities) it can live with.

# A system with two competitive fishing entities. Profit Maximization. Equilibrium



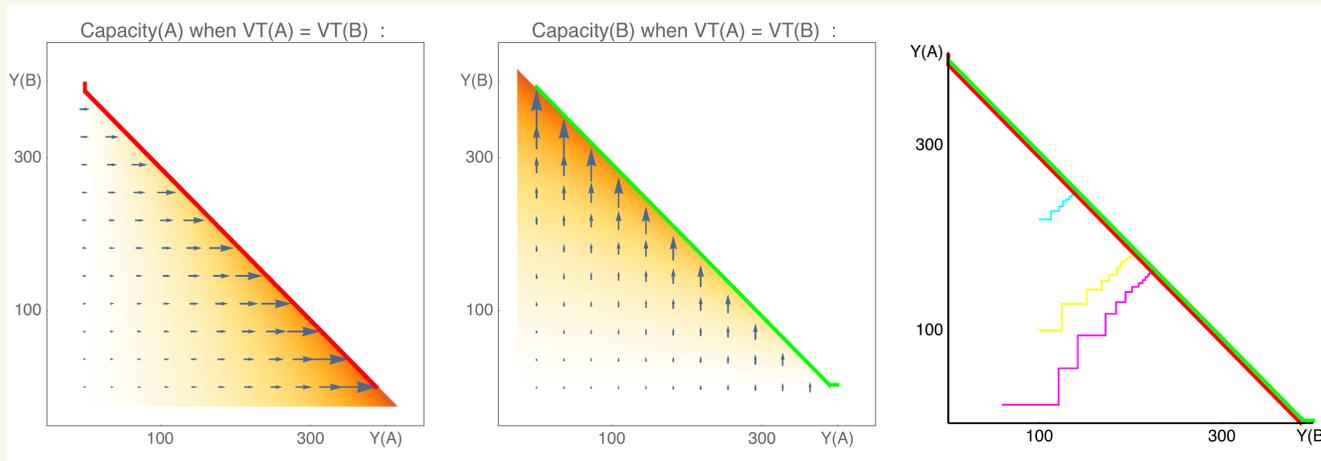
Similar viability thresholds. An equilibrium can be reached by "tatonnement"



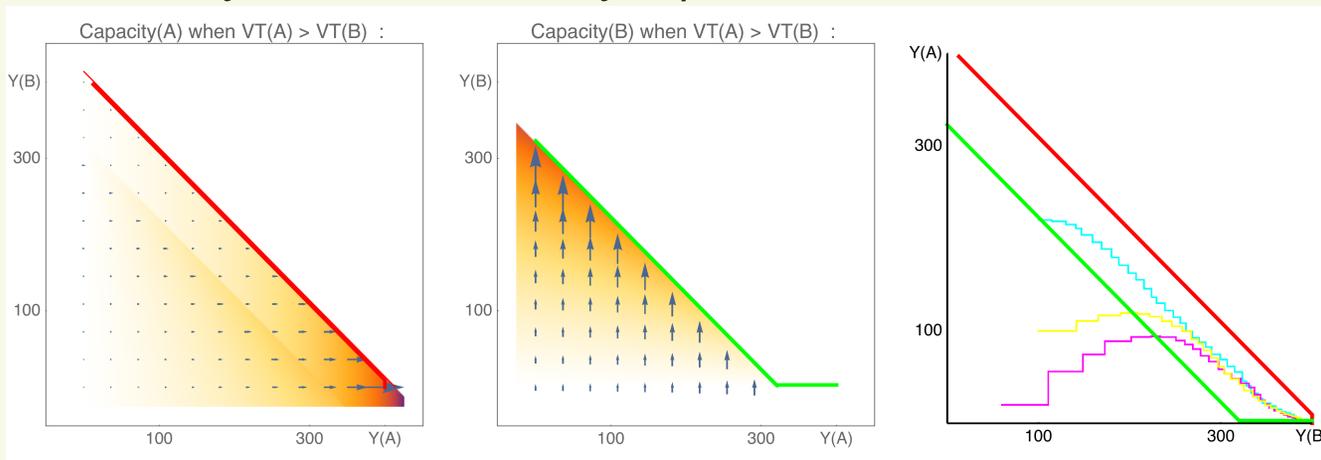
Slightly different viability thresholds. An equilibrium can be reached by "tatonnement"

Competition can be used as a policy tool.

# A system with two competitive fishing entities. Capacity maximization. Equilibrium.



Similar viability thresholds. Many equilibriums. Yield has to be shared.



Different viability thresholds. No equilibrium. A fishing entity disappears.

Competition can lead to unwanted states. There is a need for equalizing viability thresholds. A need for organizing bargaining for the share of the yield.

## Discussion. Framework

A framework in which

- fishing entities are constrained by technical efficiency and finance constraint
- the behavior of a fishing entity can be identified by its position in a feasible space
- the behavior of a fishing entity does not correspond always to profit maximization
- the competition between fishing entities that maximize something else that profit may be more severe than expected

# Discussion. Management

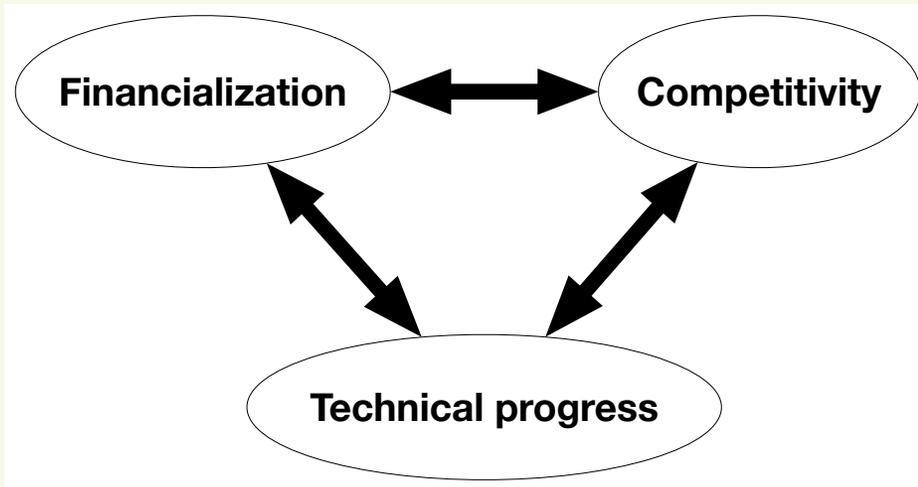
Fisheries policies have to

- protect resource
- ensure long term yield
- conserve fisher folks

In this framework it consists in acting on

- acting on technical efficiency
- acting access to finance
- be careful about the rationality of actors (including that of policy makers themselves)
- the consequent nature of their competition

# Discussion



- Small scale fisheries and world fisheries policies
- The infernal loop towards massive destruction weapons against the oceans. A mutual reinforcement of
  - of financialization (that is modernization and globalization of finance),
  - injunction to competition
  - injunction to technical progress
- A worry about the future of fish stocks, of fish yields, of especially of fisherfolks.

## Conclusion. Fisheries policies

Fisheries policies should contribute to

- equalizing fishing efficiencies at a quite low level instead of promoting universal economic competition through a never ending increase of fishing efficiency,
- maintaining differentiated independent local finance systems for fisheries instead of making them dependent of the present world's financialization process.

Practically, they should

- take account of the possibility of fishing capacity maximisation behavior,
- support and harmonize local fisheries management,
- organize fearlessly the public discussion about the orientation to give to technological change,
- instead of competition encourage cooperation at all levels, being careful about the fragility of local finance systems; adapt them to the orientation to give to technical change;

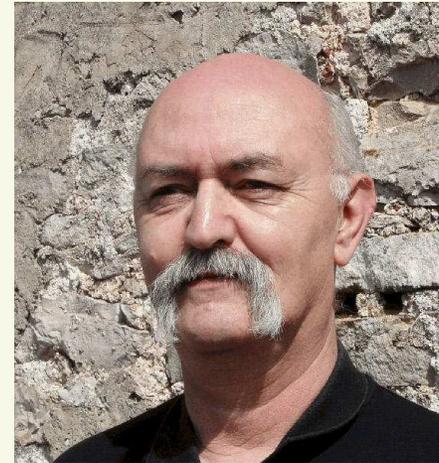
# Scottish enlightenment

Relate



Thomas Reid  
Scottish enlightenment  
Common sense

and



Jacques Weber  
Economic anthropology  
The benefits of the commons

# PS: Rationality

