# DESENVOLVIMENTO SUSTENTÁVEL

## Regulação

- Instrumentos de comando e controle e instrumentos económicos
- Vantagens /Desvantagens
- Taxas Pigouvianas e ITQs

*O caso das Pescas*

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# FISHERIES REGULATION

## DIRECT (COMMAND AND CONTROL) METHODS

- Technical conservation measures

*fleet and equipments restrictions: Mesh size, TAB, dimension/power

*open/closed seasons, open/closed areas

* Fish products restrictions: dimension of caught fish, by-catches, sea devolution

- TACs (total authorized capture)
- Quality Controls

## INDIRECT/ECONOMIC METHODS

- Entry limitation - Licences
- Taxes/subsidies
- ITQs (Individual Transferable Quotas)

- **DIRECT CONTROLS**

STANDARDS

NORMS-REGULATIONS

*COMMAND AND CONTROL INSTRUMENTS*

- Direct relation with the permission of use, type of effort, technology.
- Objectives:

- selectivity, elevation of medium age level of capture (technical conservation measures);
- control of catch rate: contingents (TAC), restrictions on fishing effort.

# ECONOMIC METHODS

- Introduce mechanisms that should conduct the fisheries to the efficiency:
- eliminate the less efficient
- change the agents behavior

- **Barriers to Entry – Licences**
- **Pigouvian Taxes – Taxes/Subsidies**
- **Rights Based Management – ITQs**

  - Contracts

  - Self-control

  - Less State Intervention - External effects internalization by negotiation and market change (COASE) – Property Rights Theory (See the similarities with $CO_2$ Emission Trade Market )

# DIRECT CONTROLS / ECONOMIC METHODS
# **ADVANTAGES/DISADVANTAGES**

## Direct controls

- + efficacy
- + less expensive in administrative terms (at least in the short term)
- + flexibility
- + simple dialogue with agents and decision makers

- - social and political restrictions
- - control and monitoring
- - do not eliminate competition and " the tragedy of the commons": Overcapacity and "race for fish" will result; maintain "common property", only a palliative measure, not an actuation on the causes
- - difficult process of TACs negotiation: high "transaction costs": information and negotiation costs of political discussion and contracts.

# Economic Methods

- + guaranties of economic optimum (MEY) approach
- + Environmental Efficiency

- - Administrative difficulties/monitoring
- - High costs (time and money) in the definition/execution of the policies
- - Social-political costs
- - Less flexibility
- - Difficulties of the adjustment process – “social crisis”? Highly fisheries dependent regions? Unique level of optimum taxes? Spatial differentiation of policies?

# TAXES (Pigouvian Taxes)

$e^{-\delta t}\,[p - c(x)\,] = \lambda\,(t)$

- **$p - c(x) = \Psi\,(t)$**

$\Psi$ **(t)** **-** Current shadow price of the resource

- **$p = c(x) + \Psi\,(t)$**

<u>Economic Interpretation</u>:

- In equilibrium, the market-selling price of the resource should be equal to the marginal cost of exploitation plus the inter-temporal opportunity cost of capturing this marginal resource unit.
- Given the Free Access, the user doesn't pay by the use of the resource according to its marginal productivity.

- The Economic Efficiency is reached >>> establishing a tax over the captured quantities to impose the intertemporal rationality to the agents.

- The Tax is equal to the shadow price of the resource (current). This Pigouvian tax obliges the internalisation of the external costs that result from the “extraction” of an additional unit.

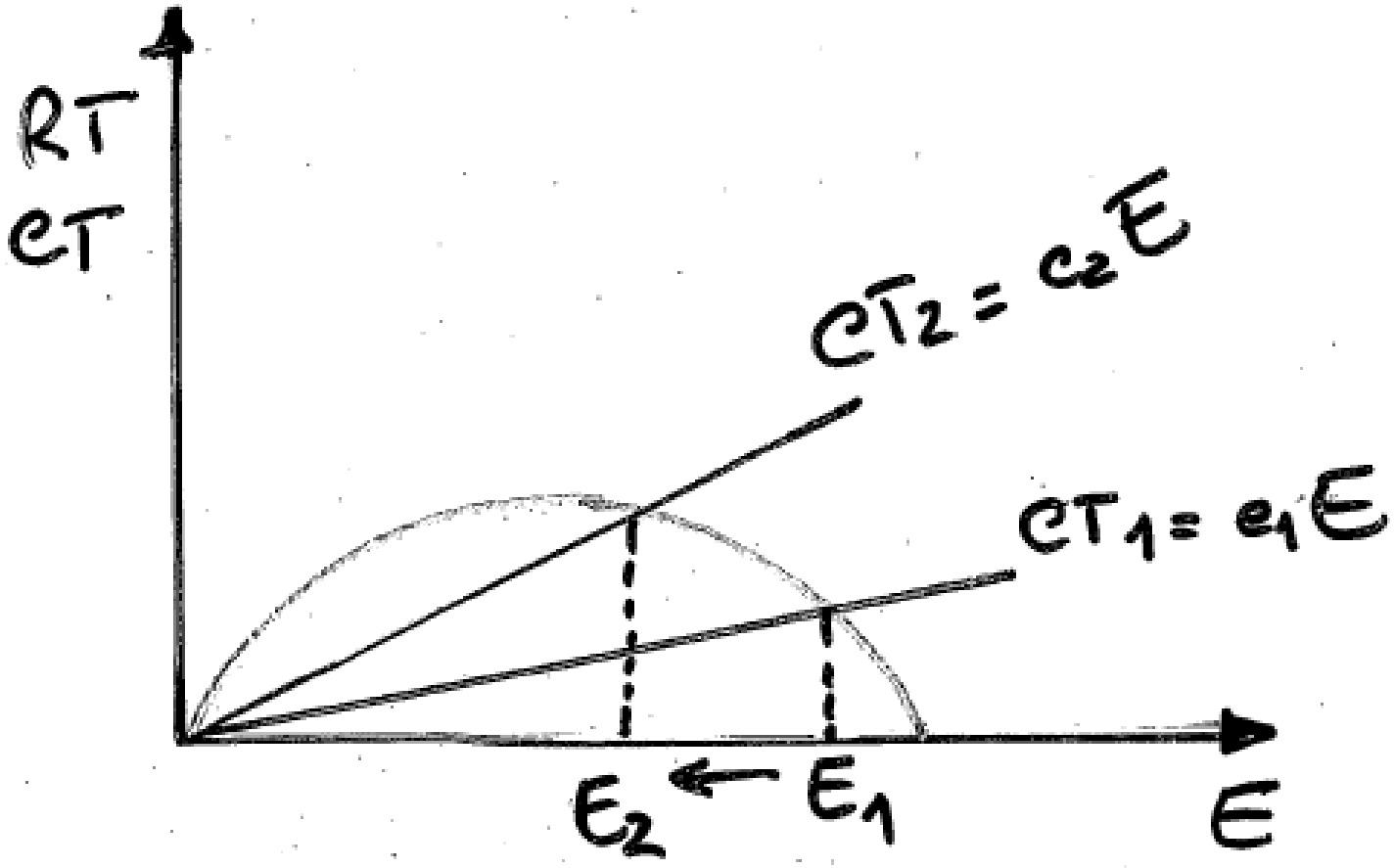
$$p = c(x) + T$$

**Pigouvian Tax** :

- Reduces the net revenue  by unit of captured fish (Higher costs)
- As a result, fishermen should reduce the quantities of fish caught >>>>> approach MEY.

Alternative:

- **Tax by unit of Effort**
- c2 = c1 + tax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# ITQs (Individual Transferable Quotas)

- Rights Based Management
- Property Rights/Use Rights
- Property as a “social relation”. Not a relation between men and things, but between men in respect to the use of things.

- The Mechanism:

- create a “quotas market”
- establish a global TAC and divide by “individual quotas”
- quotas are changed in the market

- Proves the **equivalence, in terms of efficiency, between the pigouvian tax and a scheme of ITQs** , **if**

**T = m** **,** where m is the price of the individual quota

**But:**

- in the first case (pigouvian tax) the rents are optimized by the Regulation Agency
- in the second (ITQs) rents and welfare gains are distributed between the private agents.

**PROBLEMS:**

- Unemployment
- “Windfall gains”
- “Transaction trap”
- Property concentration
- Monitoring
- Political reaction
- Revenues distribution (Efficiency vs. Equity)
- “Self-Regulation”?
- Initial distribution of property rights?

( **COPES (1986);** Land Economics; Vol. 62(3) ; pp 278-291)