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Fisheries Management: Basic Principles

Workshop on
Fisheries and Aquaculture in Southern Africa:
Development and Management

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Organization of talk

1. Social purpose of fisheries
2. The fisheries problem:
 - Why is fisheries management needed?
3. The fisheries management regime
 - The fisheries management system, FMS
 - Monitoring, control and surveillance, MCS
 - The fisheries judicial system, FJS
4. The future of fisheries management

The Social Purpose of Fisheries

Maximize the net value of production

Why?

Because the net production is what is left over for consumption!

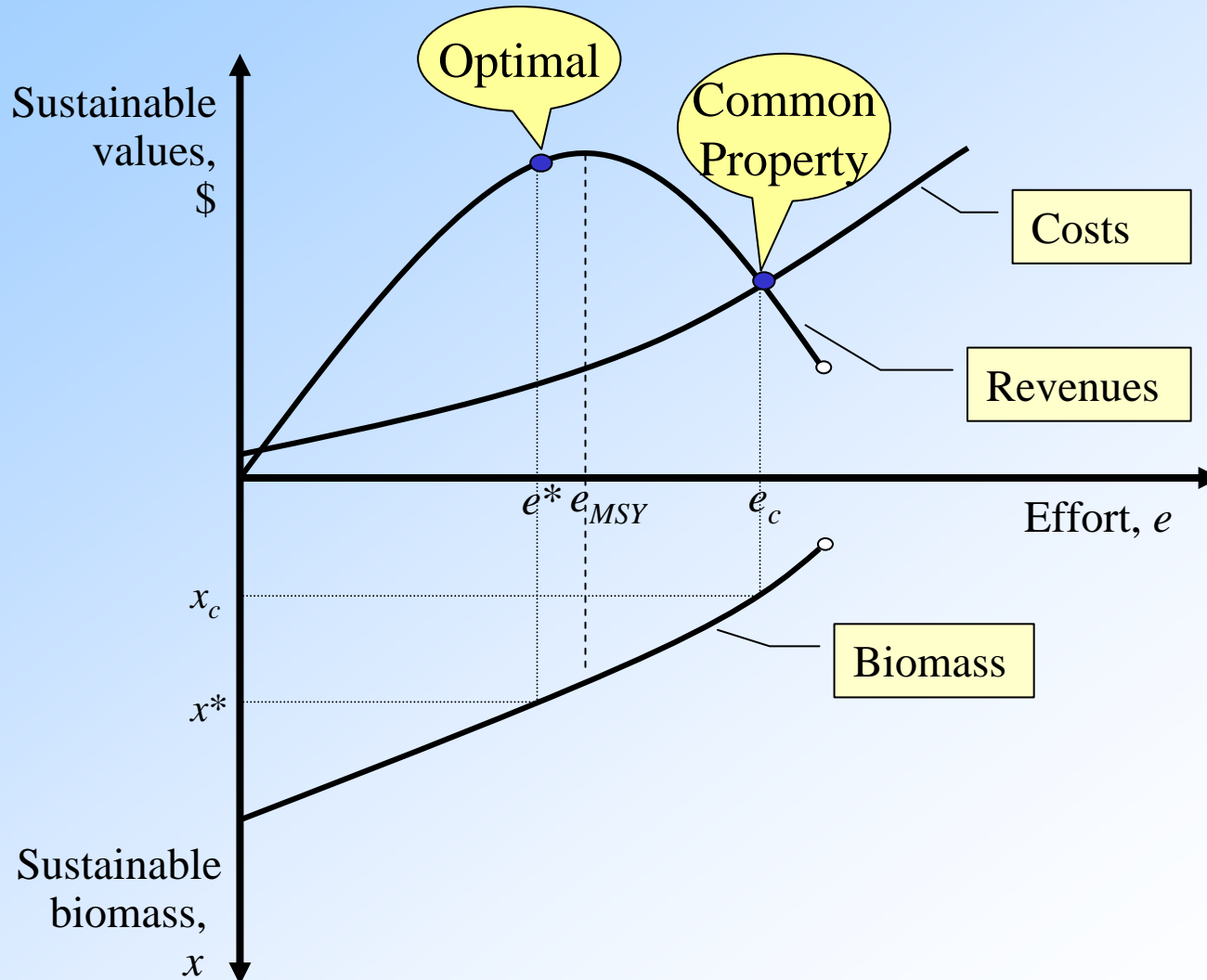
- Equivalent to maximization of profits
(..if prices are correct)

The Fisheries Problem

(The common property problem)

- Excessive fishing fleets and effort
- Too small fish stocks
- Little or no profitability
- Low personal incomes
- Low contribution to the GDP
- Threat to sustainability

The Sustainable Fisheries Model



Therefore,
due to the fisheries problem:

Fisheries management is needed!

The Fisheries Management Regime

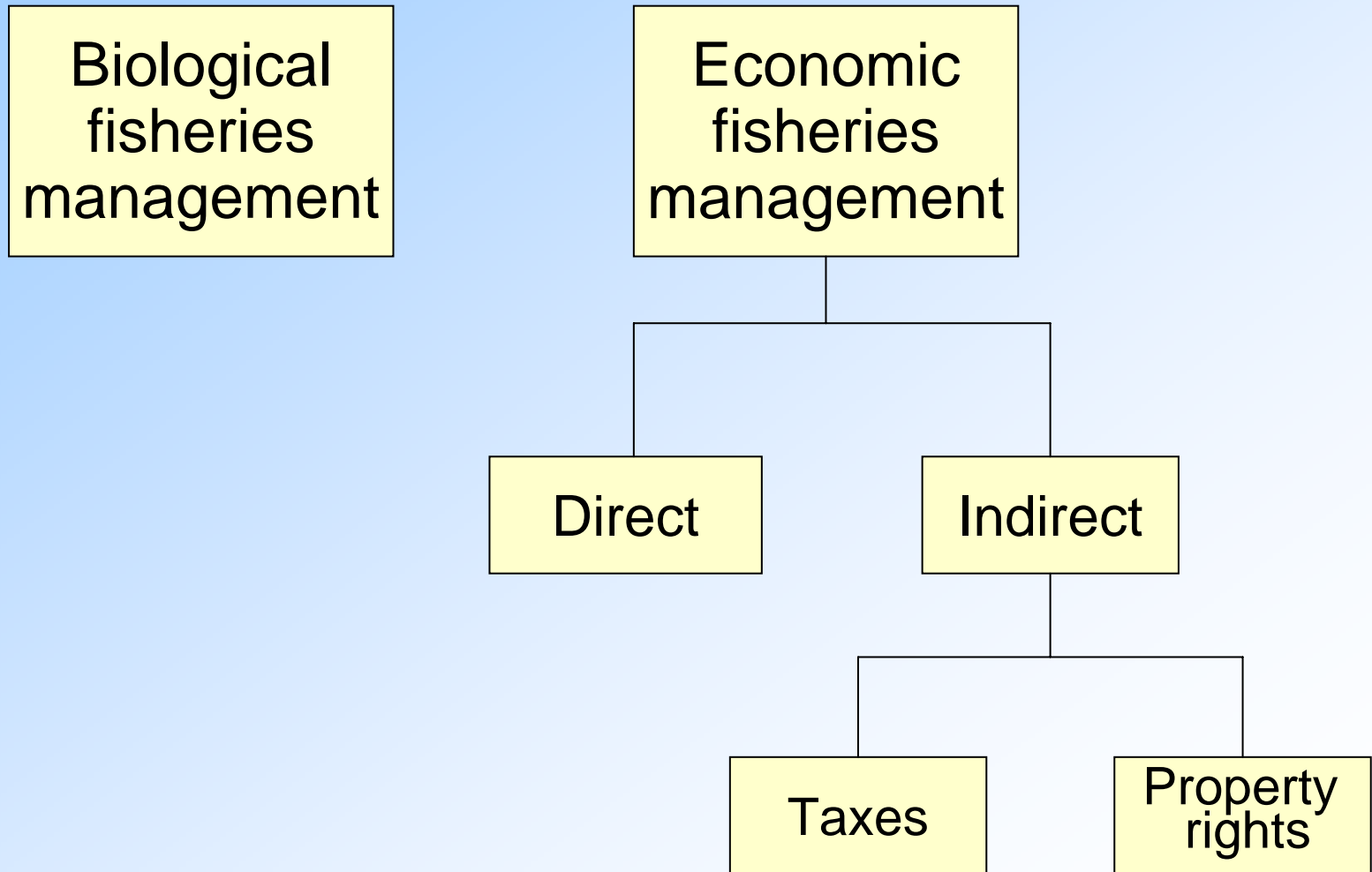
Fisheries
management
system,
FMS

Monitoring,
control &
surveillance,
MCS

Fisheries
judicial
system,
FJS

- All links in the same chain
- Interdependent
- Each must be designed w.r.t. the others

Fisheries Management Systems



Biological fisheries management

- Attempts to increase biological productivity of the fish stocks
 - Mesh size restrictions, minimum landing sizes, nursery ground protection, spawning stock protection, time-area closures.... etc.
- Does not affect the common property problem
⇒ Economically useless!!
- Also costly to introduce and implement

But potentially useful in combination with a good fisheries management system

Direct economic restrictions

- Attempt to reduce excessive fishing effort and fleets
- Do not affect the common property problem
⇒ Economically useless!!
- Also costly to introduce and implement
⇒ Probably worse than doing nothing!

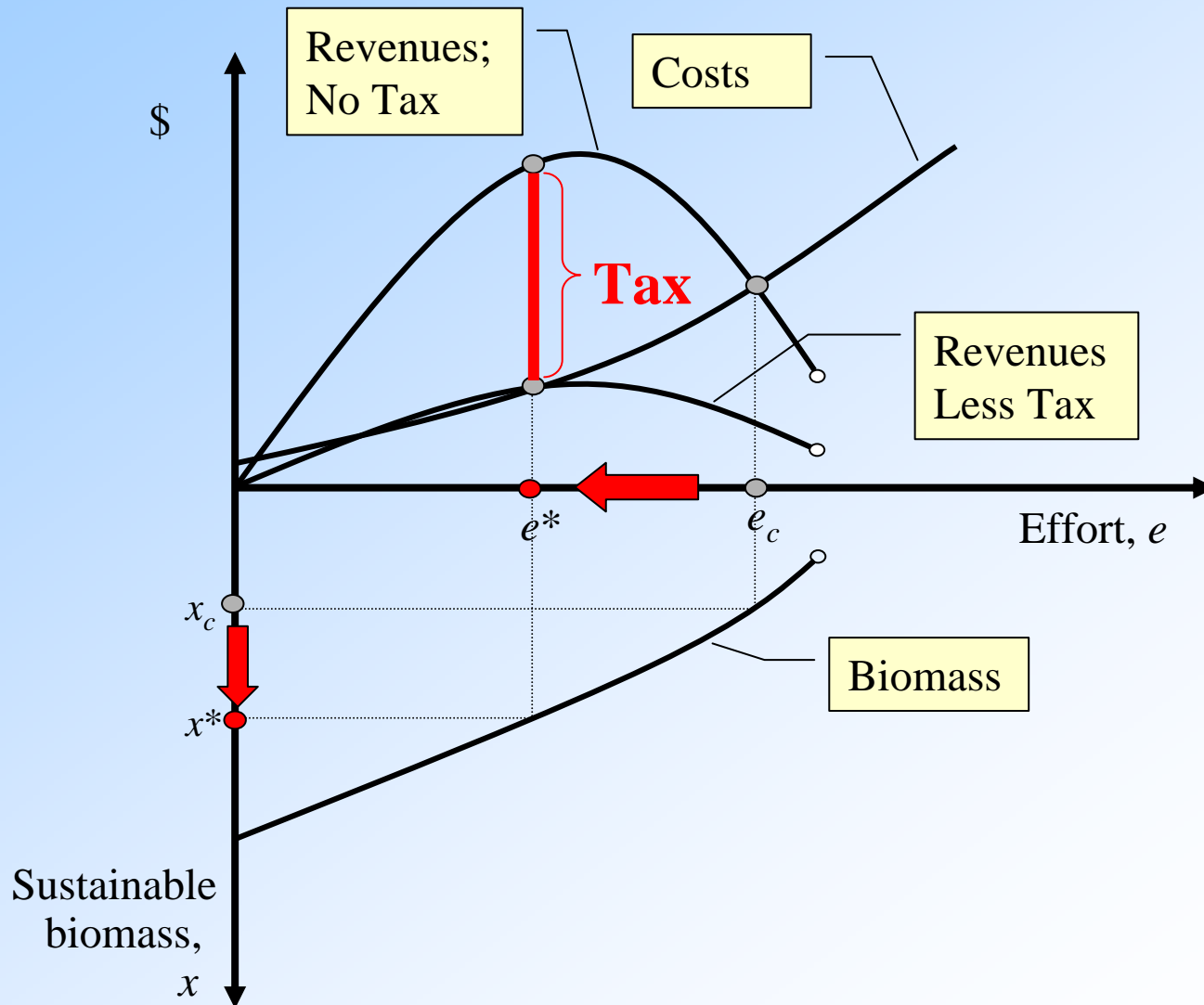
Only one class of fisheries management systems can succeed:

Indirect economic fisheries management

This consists of:

- Tax on landings
- Property rights regimes

Tax on Landings



Property rights

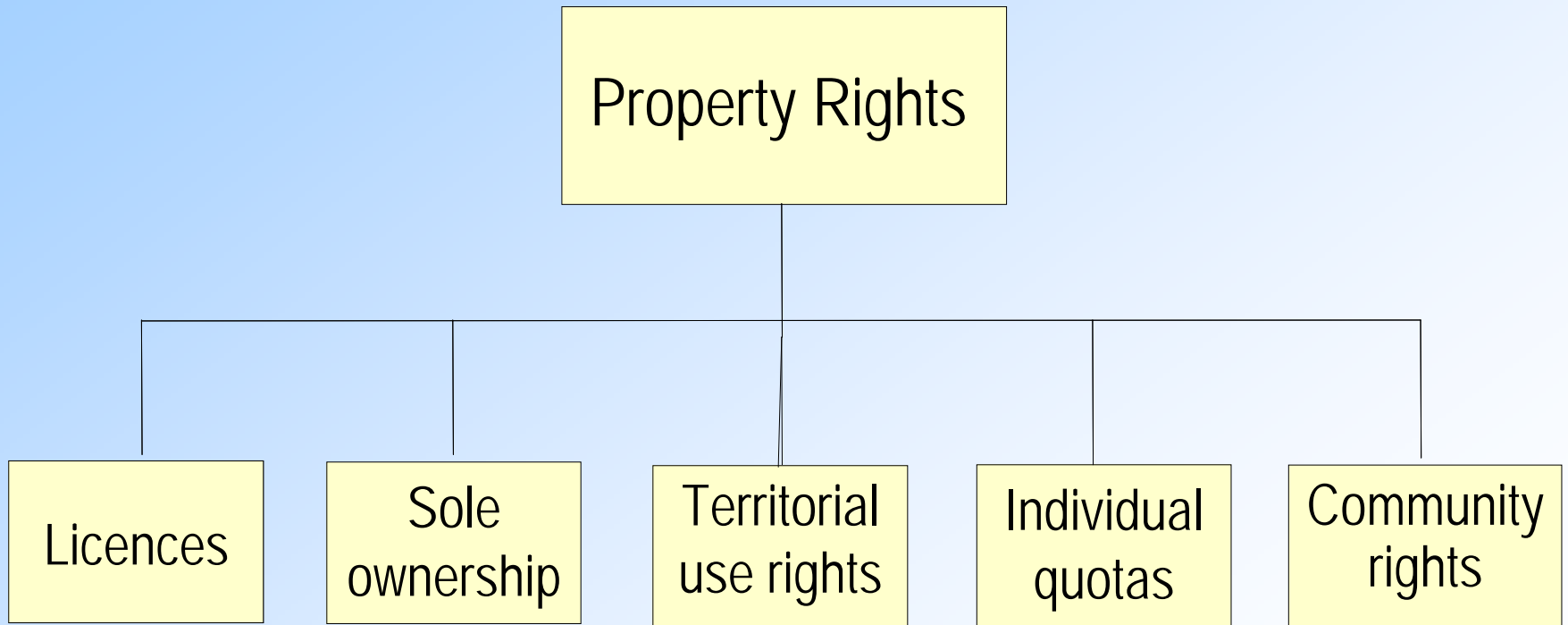
Remove the basic source
of the fisheries problem

(The common property arrangement)

Therefore,

**With private property rights
the fishery should achieve full
efficiency!**

Property Rights Regimes



Property rights regimes: Evaluation

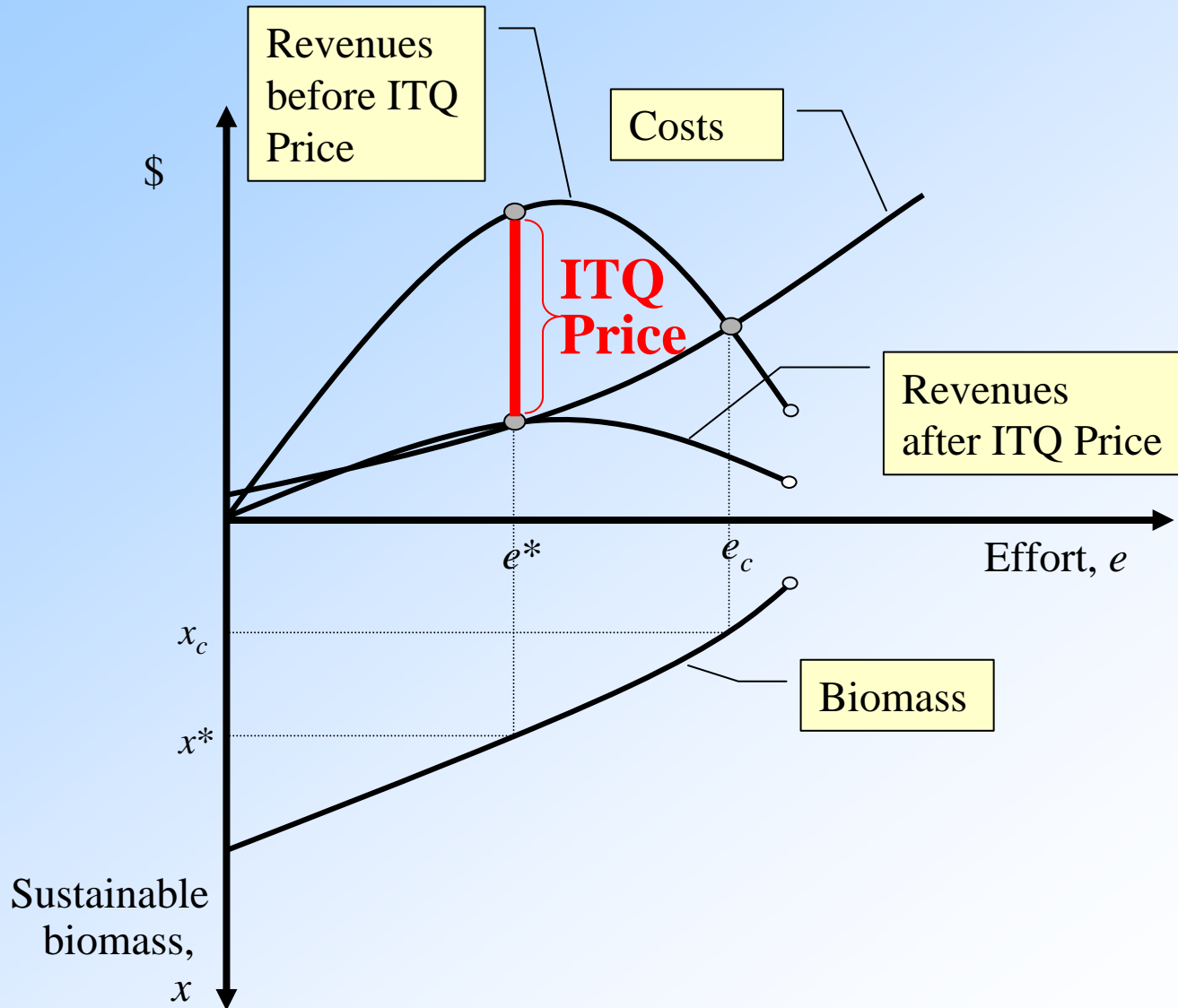
- Licences have little impact
(...too weak property rights)
- Sole ownership hardly applicable
(...usually politically infeasible)
- TURFs have limited applicability
(...at current technology)

- IQs and ITQs are widely applicable
(... helped by technological advance in MCS)
- ITQs are economically superior to IQs
- Community rights may or may not lead to good fisheries management

⇒ ITQs constitute the best general method to manage fisheries

(...but not necessarily all fisheries)

The Effect of ITQs



ITQs around the world

- ITQs are already quite common
 - Employed in several hundred ocean fisheries
 - At least 12 important fishing nations use ITQs in some of their fisheries
 - Some 10-15% of the global catch taken under ITQs
- ⇒ A great deal of experience with ITQs
- The experience of ITQs is generally good

Community Property Rights

- Not really a fisheries management system
- Fisheries management outcome uncertain
 - But, with the appropriate structure, odds for good fisheries management are good
- Potentially useful where ITQs are not feasible
 - Socio-political infeasibility
 - Technical infeasibility
 - Enforcement of ITQs is not possible (E.g. some artisanal fisheries)

Indirect Fisheries Management Summary Assessment

Systems	Efficiency	Application	Problems
Taxation	High	Very complicated	Socio-political opposition
Licences	Low	Fairly easy	
Sole ownership	High	Easy	Socio-political opposition
TURFs	High	Some complexity	Limited applicability
IQs	Medium	Complicated	Need good enforcement-
ITQs	High	Complicated	Need good enforcement-
Community rights	?	Complicated	

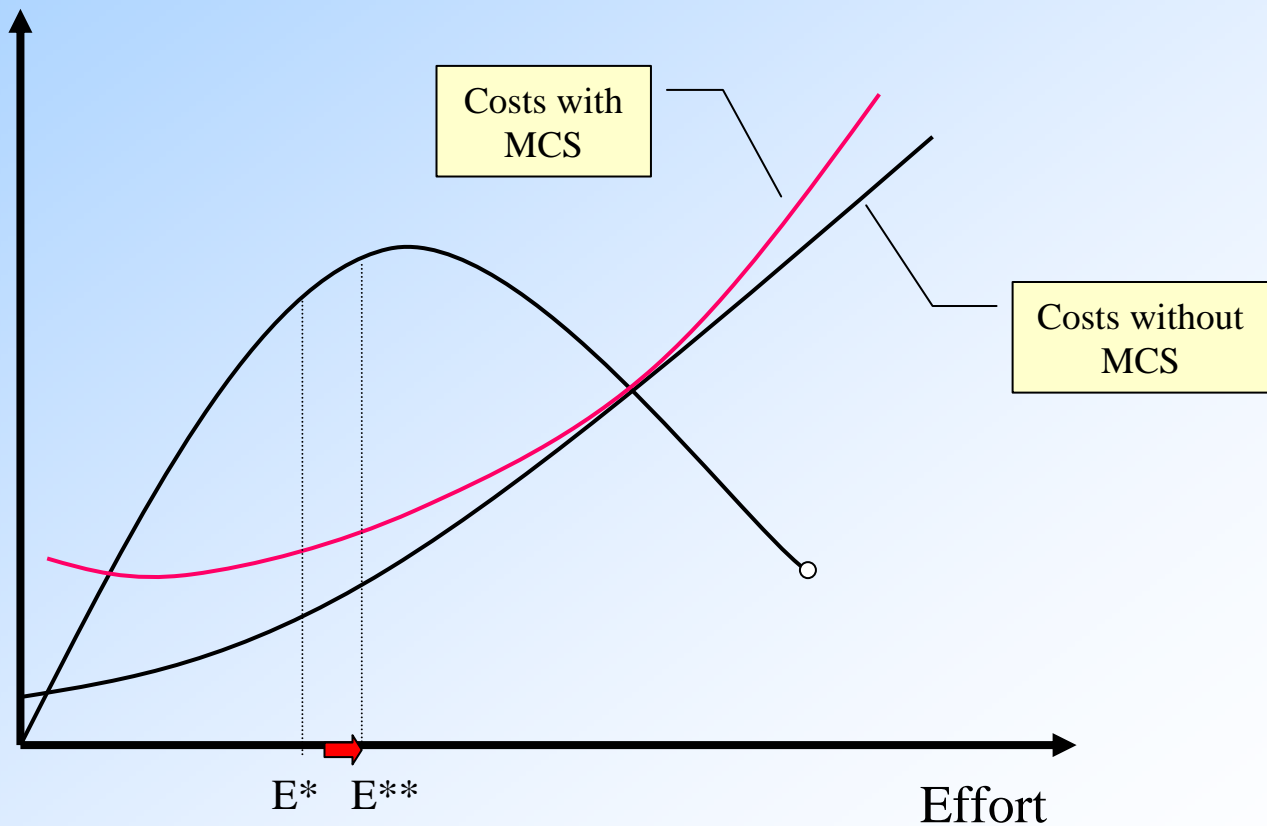
Monitoring Control and Surveillance

- Consists (primarily) of
 - Enforcement (of fisheries rules)
 - Data collection (biological and economic)
- Crucial
 - Without MCS there can be no fisheries management
 - If no enforcement \Rightarrow rules will not be followed
 - If no data \Rightarrow difficult to set fisheries management parameters

MCS (cont.)

- Costly
 - Studies for developed nations (OECD) indicate MCS costs of **3-25%** of fisheries revenues
 - Average: **≈ 7%** of fisheries revenue
- Affects optimal management
 - High MCS-costs suggest less restrictive management
 - Very high MCS-costs suggest no management

Impact of MCS costs on the optimal fisheries policy



Fisheries Judicial System

- Function:
 - Assess evidence against alleged violators
 - Impose penalties on those deemed guilty
- Crucial
 - Without FJS there can be no fisheries management
 - If no penalties \Rightarrow rules will not be followed

FJS (cont.)

- Good FJS is complicated
- Deterrence depends on:
 - A. Probability of getting caught (MCS, burden of proof)
 - This is costly to increase much (esp. the MCS)
 - B. The severity of the penalty
 - This is not costly to impose
 - But socio-politically problematic

The Future

- No new fisheries management method in sight
- ⇒ Future development will consist of:
- Wider adoption of efficient fisheries management systems around the world, esp. **ITQs**
 - Development and adoption of **community fisheries management** systems
- This trend will be assisted by greatly improved MCS technology

END