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ITQ-systems: Where do the Benefits go?

Presentation at the conference

Fisheries: Sustainable and Profitable

RNH and Institute of Public Administration and Politics

Reykjavik
October 6. 2012

Global Ocean Capture Fishery

Has suffered from very poor fisheries management

⇒ Huge waste

- Biological:
  - 75% of commercial stocks fully or over-exploited
  - Most valuable ones are most overexploited
- Economic:
  - Loss of potential profits: ≈ 45 B. US$
  - High subsidies, perhaps USD 10 b. (EU, Japan)
  - Serious displacement of fishers and fishing communities

The Economics of the Global Capture Fishery

(FAO/World Bank 2006-2009 study)

	Units	Current	Optimal	Difference
Biomass	m. mt	115.1	264.0	148.9
Harvest	m. mt	82.0	89.8	7.8
Effort	m. grt	15.0	8.1	-6.9
Profits	b. US$	-5.0	40.4	45.4

Note: Logistic biomass growth
Refers to 2004

These problems have not gone unnoticed !

Since early 1900s
various management measures tried

Mostly restrictions on

- Fishing gear
- Fishing areas/times
- Fishing vessels (type and power)
- Allowable fishing days
- Access
- Total catch

…etc.

Outcomes: Disappointing!

Biological results: Usually poor,
Some exceptions (TACs)

Economic results: Uniformly very poor

Rights-based management

Definition: Fishers obtain clear rights (property rights) in the fishery

Emerged in the 1960s (TURFs) and 1970s (ITQs)

Adopted primarily as a practical administrative measure rather than academic recommendation

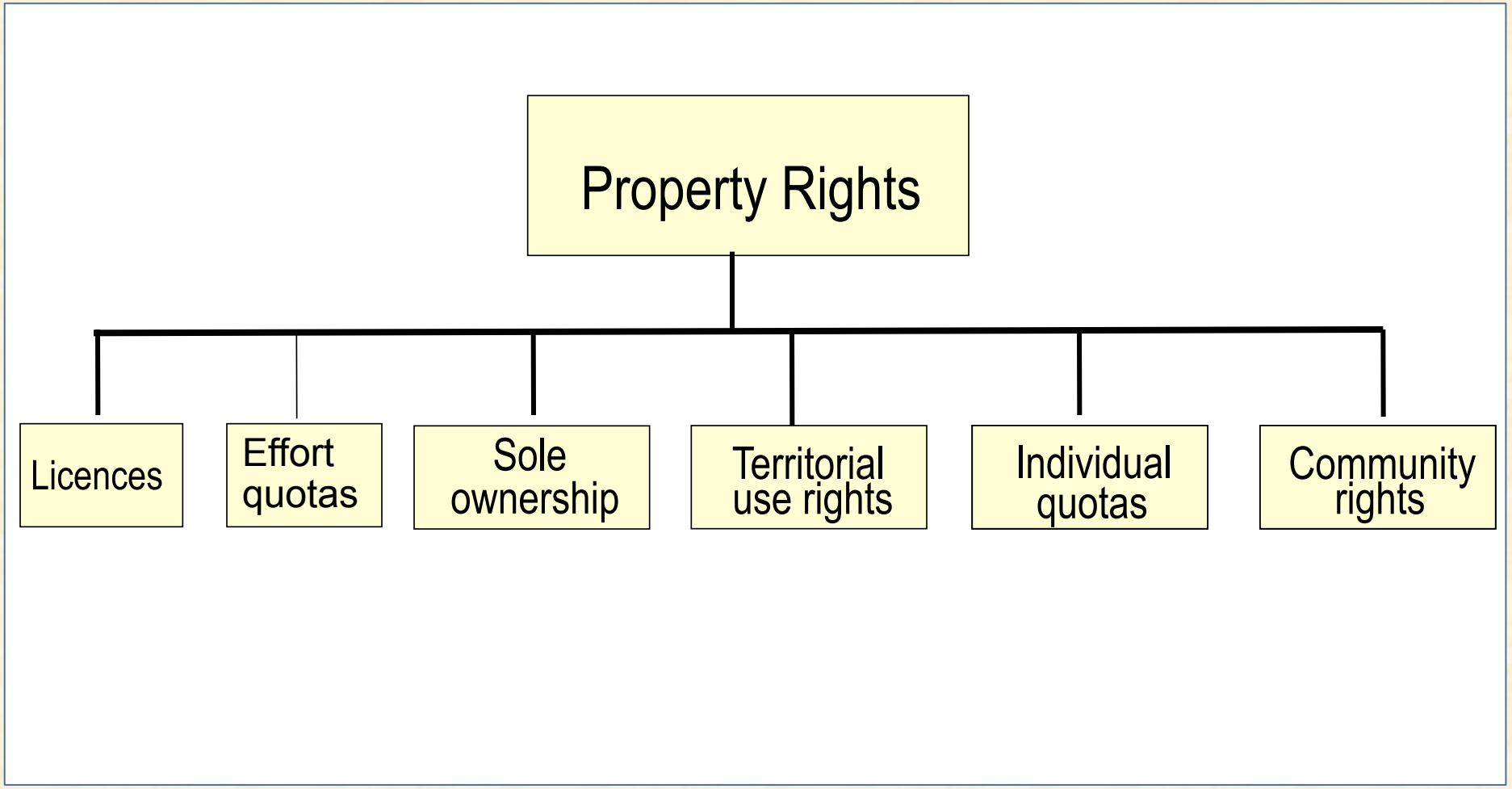
Example of practice preceding theory !

Why are fishing rights a good idea?

1. Reduce the common property problem
   - Thus encourage economic efficiency in fishing
2. Encourage conservation and accumulation of natural capital
   - Since this benefits the rights-holders

In short they produce the right incentives!

Key Property Rights in Fisheries



Adoption of ITQs Worldwide

- Since the late 1970s, ITQs have been adopted in the world's fisheries at an increasingly fast rate.
  - Currently, ITQs are employed in hundreds of fisheries worldwide.
  - At least 22 fishing nations employ ITQs in their fisheries management.

    (New-Zealand, Australia, USA, Canada, Greenland, Iceland, Holland, Norway, Denmark, Sweden, Estonia, Germany, UK, Portugal, Spain, Russia, Morocco, Namibia, South Africa, Chile, Peru, Falkland)
  - Close to 25% of the global catch is taken under ITQs!

ITQs worldwide:
Speed of adoption

Decade	Adoption of ITQs: (no. of countries)	Approximate volume of harvest (m. metric tonnes)
1970-79	2	0.2
1980-89	5	2.8
1990-99	8	9.0
2000-09	7	10.0
Total	22	22.0

Outcomes of ITQs
- Generally quite positive -

- Biological (weakly positive)

  ITQs generally halt and often reverse stock declines

  Reason: Fishers' incentives to enhance stocks (resource stewardship)

- Economic (strongly positive)

  (1) Reduction in fishing effort (usually immediately)

  (2) Fishing capital declines (but usually slowly)

  (3) Unit price of landings increases (often substantially)

  (4) Profitability increases (often substantially)

  (5) Quotas become valuable (quickly!)

In spite of their success, ITQs have come in for a good deal of criticism

Criticisms of ITQs

1. Increase discarding (Not true)
2. Lead to industry concentration (Some truth)
3. Induce regional changes (Some truth)
4. Alter prod. structure/methods (Largely true)
5. Benefits only/primarily go to ITQ-holders

Some factors promoting wider distribution of ITQ benefits

1. Share of labour in profits
2. Increased demand $\Rightarrow$ higher incomes
3. Taxes
4. Investment and growth
5. More favourable exchange rates

Share of labour in profits

ITQs generally lead to higher income for fishing labour

Two main reasons:

1. Crew share in value of landings
2. Higher marginal profits of labour

In most fisheries the crew receives a share of the value of landings

$\Rightarrow$ the crew will benefit from higher income per unit effort

A little model to explain this

Crew share = α

Reduced costs per unit catch = ϕ

Reduced labour = β

Assumptions:

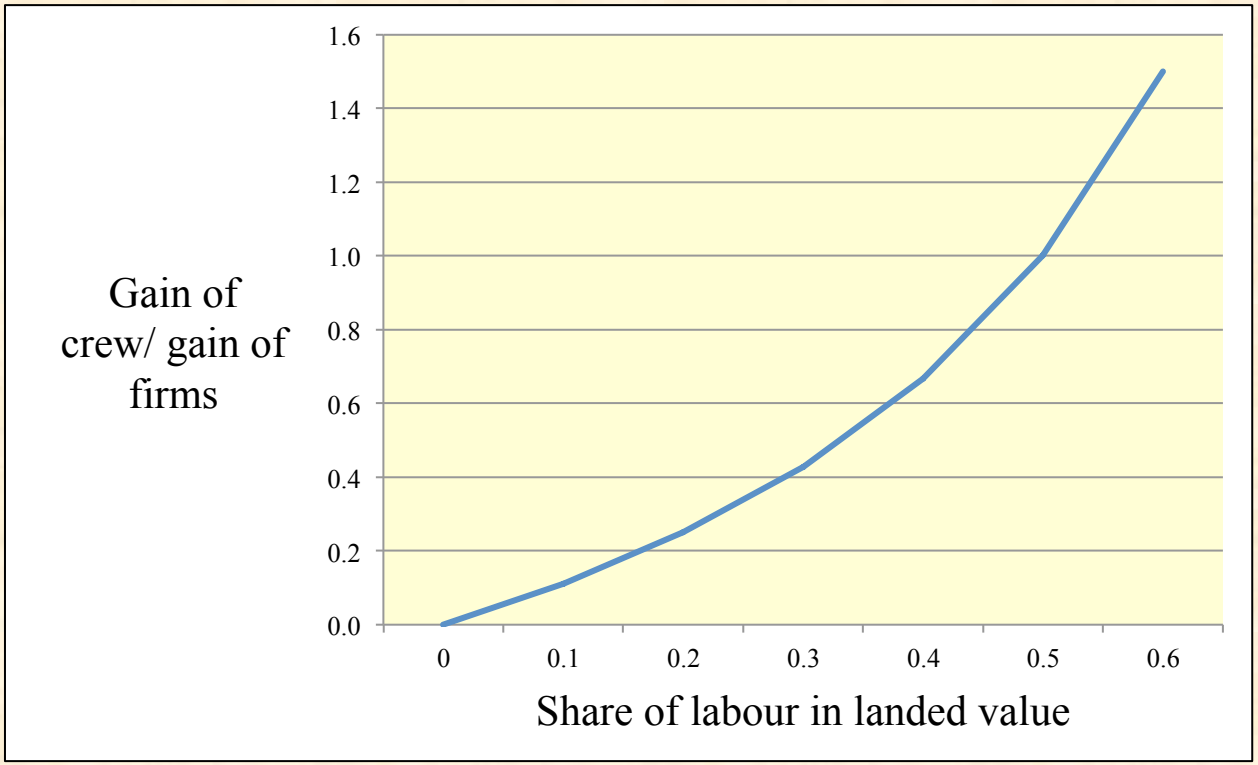
(1) Laid off crew receive unchanged income (normal wage)

(2) No increase in value of landings

$$\therefore \quad \frac{\text{Gain of crew}}{\text{Gain of firms}} = \left(\frac{\alpha}{1-\alpha}\right) \cdot \left(\frac{1-\beta}{1-\phi}\right)$$

An example

(Simplification $\beta = \phi$)



α=0.30 ⇒ gain of crew/gain of firms = 0.43
α=0.35 ⇒ gain of crew/gain of firms = 0.54
α=0.40 ⇒ gain of crew/gain of firms = 0.67

Higher marginal profits of labour

Follows from increased profitability in fishing

$\Rightarrow$Wage of labour should increase correspondingly

$\Rightarrow$At least labour is in a strong position to get a raise

Increased demand

Higher profits/income in fisheries

⇒ Increased demand for goods and services

⇒ Higher profits and wages in other sectors of the economy

- The size of this effect depends on conditions
  - but could be significant

Taxes

In most countries a substantial part of increased income is paid to the government in the form of taxes

Typical taxes

1. Income tax
2. Value-added tax
3. Duties and excise taxes

These taxes often amount to 40-60% of income

An example

Income tax rate: 0.4

Domestic consumption out of income: 0.6

Value-added tax: 0.25

Duties and excise tax rates: 0.08

$\Rightarrow$ Total tax as % of income = 52%

Income tax rate: 0.30 $\Rightarrow$ total tax = 44%

Income tax rate: 0.45 $\Rightarrow$ total tax = 56%

Economic growth

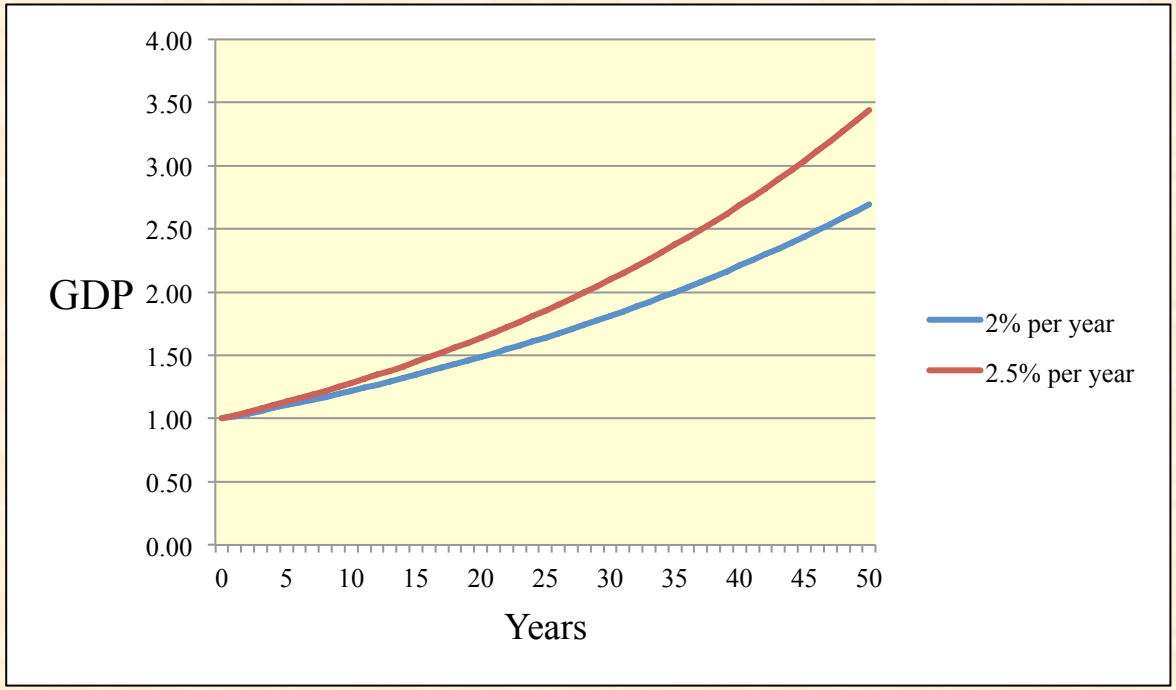
- The added income from ITQs probably increases investment

$\Rightarrow$ Economic growth rates increase

- This benefits all sectors of the economy

GDP and economic Growth

(0.5% higher growth rate)



Difference in GDP:	
After 10 years	5.0%
After 20 years	10.3%
After 50 years	27.7%

Exchange rates

In many countries the fishing industry exports most of the products and imports part of the inputs

$\Rightarrow$ ITQs lead to stronger exchange rates

This reduces fishing industry profits and benefits consumers of imports

An example

Increase in fish exports:	0.0
Cost reduction in fishery:	0.5
Share of imports in costs:	0.4
Share of fishery in total export earnings:	0.4
Elasticity of exchange rates:	$E(g,q)$

$E(g,q)=0.5 \Rightarrow$ exchange rate increase +4%
$E(g,q)=1.0 \Rightarrow$ exchange rate increase +8%
$E(g,q)=1,5 \Rightarrow$ exchange rate increase +12%

Conclusions

- Gains from ITQs flow to other sectors of the economy in many ways
- In the short run:
  - Common economic magnitudes suggest that much of the initial gains are quickly captured by other sectors
    - Share of labour, taxes, demand effects and exchange rates
- In the longer run:
  - The benefits are enhanced and more widely spread through increased economic growth
- These results are in accordance with the historical observation that high profits in certain sectors generally improve living standards in the economy as a whole.

END