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Strong User Rights in Fisheries: Some considerations

Conference on Advantages and Disadvantages of
Strong User Rights in Fisheries

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Organization of talk

I. Property rights: Some fundamentals
II. User rights
III. Transition to SURFs
IV. An empirical example: LV fisheries

I
Property rights: Some fundamentals

Well-known economic result

Uncoordinated (competitive) utilization of common resources is economically wasteful

Often highly wasteful!

Reason:

No property rights => No prices =>No market coordination

(Sometimes referred to as externalities)

Two known remedies

1. Pigovian corrective taxation (positive or negative)
   – Central authority sets the appropriate prices

2. Establishment of (sufficiently strong) property rights
   – Appropriate prices will be generated by the market
   (These prices incorporate all the economically relevant information)
   ⇒ Market coordination will be restored!

Fundamental problems with Pigovian taxation

1. Virtually impossible for the central authority to set correct prices
   (Requires huge data collection/processing and continuous updating of prices => infeasible)
2. Pigovian taxation opens the door to rent seeking:
   (a) By outsiders (seeking to benefit from price setting or tax revenues)
   (b) By insiders (within central authority)
   - Tax revenue maximization
   - Misuse of funds collected

∴ Pigovian taxation is normally inferior to PRs!

But note: PRs are not a panacea

Technical limits on the establishment of property rights
(Do not know how to define strong PRs in certain resources e.g. fish , water masses, clean air etc.)

$\therefore$ Have to make use of imperfect PRs

Technical advances have overcome some of these limitations in the past and will probably do so in the future

…… especially if that is economically rewarding (profitable)!

II
User rights

User rights ⊂ Property rights

(Property rights assigned to or held by users)

Strong user rights ⇒ strong property rights

The term "*user rights*" may have been invented by the FAO as socio-politically more palatable term than "*property rights*"

Advantage of user rights

Avoids principal agent problems!

Since users hold the rights
$\Rightarrow$ reap what they sow (=> appropriate incentives)
+ short lines of communication

Of course, sometimes other benefits (e.g. returns to scale) exceed PA problems

Advantage of assigning rights to users

1. Close to being a Pareto improvement (compared to other assignments)
2. Minimizes subsequent transaction costs (if current users are efficient)
3. Encourages the discovery/development of new resources and resource use

If current users are inefficient,
assigning rights to them may not be most efficient

But

(i) How do you know?

(ii) Under imperfect knowledge, assigning rights to current users seems the best bet.

(iii) It is still a Pareto improvement.

In any case, the rights will gravitate (by trades) to the most efficient users

III
Transition to SURFs

Even when SURFs are ideal, transition to them is generally not a Pareto improvement

Introduction of SURFs:

- Many consequences,
- Affect many individuals in different ways

So, cannot avoid measurement

But perhaps, in fisheries, it turns out benefits greatly exceed losses

The nature of the problem

Consequence i for individual j at time t: $x(i,j,t)$

Vector shorthand: $\boldsymbol{x}(j,t)$

Utility: $U(\boldsymbol{x}(j,t),j;t)$

Strength of user rights: $Q \in [0,1]$

User rights (Q) to consequences: $\boldsymbol{x}(j,t) = \Gamma(Q, z; j,t)$

Impact of a change in SURFs from Q_0 to Q_1

$$\Delta V = \sum_{j=1}^{J} \int_0^T \left(U(\mathbf{\Gamma}(Q_1, z; j, t), t; j) - U(\mathbf{\Gamma}(Q_0, z; j, t), t; j) \right) \cdot \delta(t) dt$$

An immense measurement problem:

- Many consequences,
- Many individuals,
- Many unknown relationships

Assessment in practice

- Applying the full theory is not feasible
  - Empirical measurement problems
  - Theory is more like an ideal… a benchmark
- Practical approach: Cost-benefit analysis
  - Approximates the theory
  - Must rely on the Hicks-Kaldor criterion:

    "Can gainers compensate losers?"

Impacts of SURFs: Convenient classification

1. Economic
2. Environmental
3. Social (including political, cultural etc.)

Notable economic impacts

Increased profitability in fishing	+
More operational stability in the fishing industry	+
Increase in the market value of user rights	+
Alteration in the volume of fish supply	+/-
Higher quality and unit value of landings	+
Reduced input use in fishing	+/-
Costly implementation and enforcement of SURFs	(-)
Altered structure of the fishing industry	0
Altered geographical location of the fishing industry	-
Shift to a higher economic growth path	+
Unequal distribution of costs and benefits	-

Notable environmental impacts

Larger commercial fish stocks	+
Reduced fishing effort	+
Increased interest in aquatic health	+
Platform for fighting external pollution	+
Tendency to reduced biodiversity	+/-

Notable social impacts

Fewer, larger fishing companies	(-)
Geographical rearrrangement of the fishing industry	-
More technically advanced fishing industry	+/-
Increased income in fishing industry	+
Altered distribution of income	-
Altered power and social status relationships	-
Altered pattern of labor use	-
Contraction in the use of fishery inputs	-
Alteration in traditional fisheries culture	-
A period of social adjustments	-
Altered economic and social evolutionary path	(-)

Impacts of SURFs (relative to WURFs)

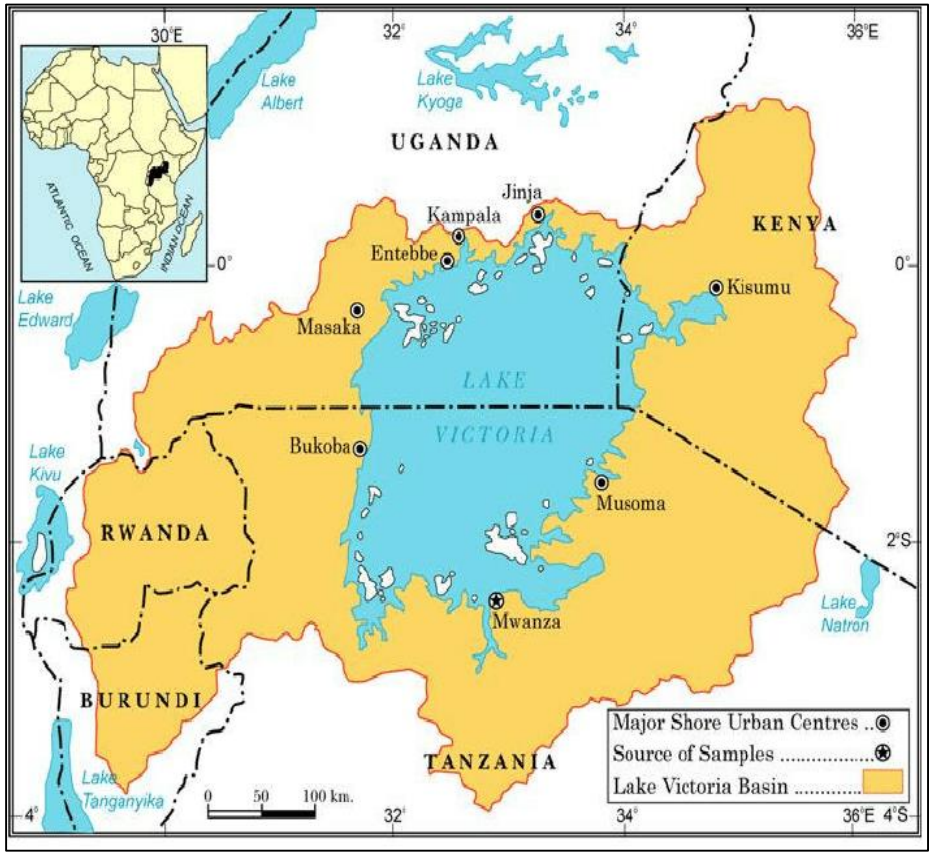
Summary

1. Economic impacts: Largely positive
2. Environmental impacts: Mostly positive
3. Social impacts: Largely negative

∴ Cannot assert shift to SURFs is desirable!

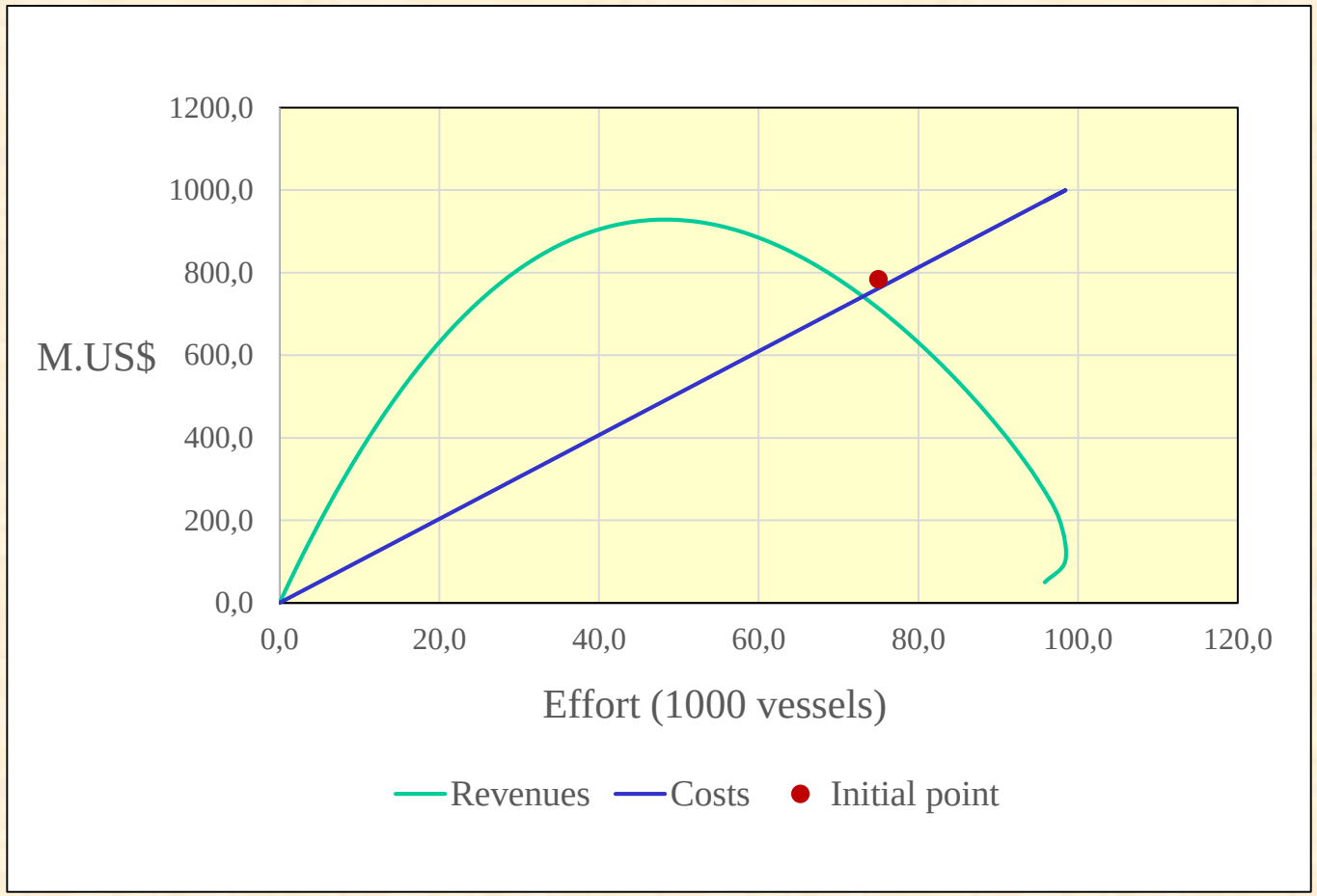
To determine that is an empirical problem

IV
An empirical example: Lake Victoria fisheries



- Four species (Nile perch, tilapia, dagaa, haplocromides)
- MSY about 850K mt
- Typical open access fishery
- Currently overexploited and depressed stocks

Current and sustainable fishery



Transition to SURFs in Lake Victoria

- Been suggested to introduce community SURFs
- Communities receive shares in TACs for main species
- TACs set by the central authority (LVFO)
- Community landings will be monitored and enforced
- Communities will manage their own fishers and coastline

This FMR is very much like the usual I(T)Q system!

Key economic and environmental impacts

	Units	Current	Optimal	% difference
Fishing effort	1000 vessels	75.0	35.2	-53%
Biomass	1000 mt	1581.5	3668.4	132%
Economic surplus (profits)	M.US$	22.0	495.4	2152%

Attempt at valuating the impacts

(Annual valuation, M. US$)

	Annual valuation M.US$	
	Low	High
I. Economic impacts	**391**	**570**
Increased profitability	434	562
Other benefits	2	182
Total economic benefits	436	744
Labor adjustment costs	35	124
System operation and enforcement	10	50
Total economic costs	45	174
II. Environmental impacts	**26**	**215**
Increased fish stocks	25	210
Other net environmental benefits	1	5
Economic & environmental impacts	**417**	**785**

Transition to SURFs in the Lake Victoria fisheries appears hugely beneficial.

Net benefits ≈ 400 to 800 million US$ annually

Note: This ignores certain potentially high social costs

- However, these need to be very high to reverse the outcome!

Do these results generalize to other fisheries?

END

Transition to SURFs in the Lake Victoria fisheries appears hugely beneficial.

Annual net benefits : 400 to 800 million US$.

Note: This ignores certain potentially high social costs

- However, these need to be very high to reverse the outcome

Largest benefits: Profits, economic growth effects and environmental improvements

Largest costs: Adjustment costs (redundant economic resources) and enforcement

$\Rightarrow$ These items should be focus of empirical research

Strength of PRs (Include?)

Property rights: Bundle of rights:
Exclusivity, Durability, Security, Transferability

Strength of PR is increasing in all attributes

$$S=F(E,D,S,T)$$

Two key theorems:

1. The stronger the PRs the more efficient is the resource use
2. The stronger the PRs the more efficient is the market guidance?

Even when SURFs are ideal, transition to them is generally not a Pareto improvement

SURFs →many consequences, affect many individuals in different ways

The Hicks-Kaldor criterion (Foundation of C-B analysis)

- Can the gainers compensate the losers?
- Need measurement to know this (Cost-benefit analysis)

So, cannot avoid measurement

But perhaps, in fisheries, it turns out benefits greatly exceed losses

Notable economic impacts

Impact	Evaluation
Increased profitability in fishing.	+
Alteration in the volume of fish supply	+/-
Higher quality and unit value of landings	+
More operational stability in the fishing industry	+
Increase in the value of the user rights.	+
Reduced input use (capital/labor) in fishing	+/-
Costly implementation and enforcement of SURFs	**(-)**
Altered structure of the fishing industry	**0**
Altered geographical location of the fishing industry	-
Shift to a higher economic growth path	+
Unequal distribution of benefits and costs*	-

Notable environmental impacts

Impact	Evaluation
Reduced fishing effort	+
Larger commercial stocks	+
Increased interest in aquatic health	+
Platform for fighting external pollution	+
Tendency to reduced biological diversity (the farming effect)	-

Notable social impacts

Impact	Evaluation
Fewer, larger fishing companies.	(-)
Geographical rearrangement of the fishing industry	-
More technically advanced fishing industry	+/-
Increased income in fishing industry and fishing communities.	+
Altered distribution of income	-
Altered power and social status relationships	-
Altered pattern of labour use	-/+
Contraction in use of fishery inputs (labor & capital)	-
Shifts in traditional fisheries culture	-
A period of social adjustments	-
Altered economic & social evolutionary path	(-)