ΠΕΓΑ: Βιοτικοί Πόροι-Τεχνικές Μελέτης και Αξιολόγησης

Διαχείριση τίνος πράγματος...

Ανδρέας Τρούμπης
Καθηγητής Οικολογίας
2014-2015

% Species conserved
Wealth (e.g. GDP/capita)
The rising limb
before crisis
Directionality:
after crisis

Η πράξη «Περιβαλλοντική Διαχείριση-Σύγχρονα Έργα», του Επιχειρησιακού Προγράμματος «Εκπαίδευση και Δια Βίου Μάθηση», συγχρηματοδοτείται από την Ευρωπαϊκή Ένωση (Ευρωπαϊκό Κοινωνικό Ταμείο-ΕΚΤ) και από Εθνικούς Πόρους.
An empirical story on Athens urban air quality

Athens, 1850-1920

Athens, 1980-1990: Photochemical smog

Athens, 2000-2008: Dust cloud from Africa

Athens, 2012-2013: Solid particulate "cloud"
The liberal narrative: Economic growth can contribute to enhancing environmental protection measures and to improving environmental quality ... Affluent societies seek to improve their quality of life and their living environments, and policies and regulations are developed to meet these goals ... (Nelson et al., 2005).
But, standard theory can’t predict or incorporate abrupt economic turn-downs, transient disruptions or extreme fluctuations in driving forces.

**Athens, 1980-1990:**
Photochemical smog

**Athens, 2012-2013:**
Solid particulate “cloud”

**Athens’ urban air quality is a dependent proxy of the economic status of a Nation:**

“Smog” is the indicator of growth, the “cloud” is the indicator of recession!
Are there lessons for the mainstream biodiversity conservation strategy from the Athens urban air quality story?

Biodiversity in Greece is under severe pressure.

Instability in open SES systems propagates effects in interconnected systems and other environmental fields.
Is there a simple exegesis of drivers of biodiversity misuse in disturbed SES?

![Graph showing growth, crisis, recession, and austerity with_cost and income over years (2005-2013) and ratio of minimum wage to heating gasoil over years 2005-2013.]

- Cost of 1000 l of house heating gasoil
- Minimum monthly wage
- Ratio [minimum wage/heating gasoil]
Elements and assumptions of the big compromise...

The elements

• Scientific selection of PAs

• Re-regulation of nature

• Commodification of biodiversity entities

The assumptions

• EKCs are applicable to conservation

• EKCs are unidirectional

• The bridging between neo-classical economic theory and biodiversity conservation techniques allows for optimization of policy making

• The institutionalization of conservation strategy secures its implementation
The essence of the compromise…

(a) the shift from ‘civilization’ to ‘development’ and currently to ‘growth’ as the overriding cultural ideal driving international relations during the postcolonial transition;

(b) the tactical recognition that government support for conservation can be strengthened if arguments are framed in terms consistent with economic development;

(c) the recognition by scientists that their ability to represent nature in units (species, habitats, etc.) creates the opportunity to integrate ecological theory with neo-classical economics.

This is because dividing nature into parts creates discrete units that can be assigned a monetary value, thereby creating the possibility of treating units of nature as commodities and aligning nature conservation with the free-market delivery of public benefits.
… and the elementary flaws

- The major failures, e.g. 2010 Year of Biodiversity

- The major disputes: the poverty entrapment of biodiversity (or the Third World/Tropics case)

- The scientific rejection on
  - EKC universality
  - EKC directionality
On the conservation EKCs and the mainstream assumption

- Less-developed Countries
- Developed Countries

Directionality:

- after crisis
- before crisis

% Species conserved vs. Wealth (e.g., GDP/capita)

The poverty trap

The rising limb
A hypothesis: the ‘true’ experiment on the validation of mbcs

• …is not the cross country/GDP comparison for conservation EKCs,

• but, the resilience of bc policies in a Western economy in crisis
An example: the case of hunting

The conventional mbcn narrative

# hunters/hunting pressure stabilizes at high GDP/capita

The crisis experiment

Direction of change during crisis
Resilience is an "old" concept in Ecology and Systems Theory, but is currently used extensively and often wrongly in mbcn narrative (especially by political scientists, economists, geographers...).

Economic crisis is a transient, disruptive shock, often exogenous.

Testing for mbc resilience means understanding terms and processes.
**STABILITY**

(steady state)

Endogenous, pressures

**RESILIENCE**

Exogenous perturbations or drivers

- Resistance
- Resilience
- Robustness

New Steady State?
Properties of Durability (endogenous) and Robustness (exogenous) arise from a systems response to a chronic or enduring pressure.

Examples: Climate change (exogenous), evolution (endogenous)
A State-Pressure-Response framework for mbcs resilience in Greece

<table>
<thead>
<tr>
<th>Indicator (indictative)</th>
<th>Data availability (years)</th>
<th>Peak annual value</th>
<th>Trends in change</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic and social State</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual growth rate (%) GDP</td>
<td>['80s-2013]</td>
<td>5,9</td>
<td>-7,1</td>
<td>D</td>
</tr>
<tr>
<td>Aggregate growth rate (%) GDP</td>
<td>[2001-2013]</td>
<td>24,9</td>
<td>-26,2</td>
<td></td>
</tr>
<tr>
<td>Involuntary unemployment (%)</td>
<td>2001-2013</td>
<td>7,2</td>
<td>27,1</td>
<td>l</td>
</tr>
<tr>
<td>Minimum wage (€/month)</td>
<td>2001-2013</td>
<td>817</td>
<td>592</td>
<td>D</td>
</tr>
<tr>
<td>Extreme poverty (% general population)</td>
<td>2001-2013</td>
<td>&lt;2,2</td>
<td>&gt;14</td>
<td>l</td>
</tr>
<tr>
<td>Standard poverty (% general population)</td>
<td>2001-2013</td>
<td>&lt;19,4</td>
<td>&gt;44,3</td>
<td>l</td>
</tr>
<tr>
<td>Cost 1000 lt of house heating gasoil (€)</td>
<td>2005-2013</td>
<td>737,5</td>
<td>1336,5</td>
<td>l</td>
</tr>
</tbody>
</table>

State indicators: Examples of indicators on the nature and intensity of the exogenous disruptive shock
Pressure indicators: Examples of indicators on the nature and intensity of the Endogenous pressure upon biodiversity

<table>
<thead>
<tr>
<th>Pressure upon biodiversity (proxies)</th>
<th>['80s]-['10s]</th>
<th>&gt;230000 N/A</th>
<th>&lt;185000 270000 (±3%)</th>
<th>D</th>
<th>e</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) # hunters (legal)</td>
<td>['80s]-['10s]</td>
<td>&gt;230000 N/A</td>
<td>&lt;185000 270000 (±3%)</td>
<td>D</td>
<td>e</td>
</tr>
<tr>
<td>(ii) # illegal hunters (estimate)</td>
<td>2001-2011</td>
<td>2100</td>
<td>2101</td>
<td>l</td>
<td>f</td>
</tr>
<tr>
<td>(iii) Intensity of poaching (confirmed cases)</td>
<td>2001-2012</td>
<td>546</td>
<td>1964</td>
<td>l</td>
<td>g</td>
</tr>
<tr>
<td>(iv) Intensity of illegal logging (confirmed cases in 65 Local Forestry Offices)</td>
<td>2001-2012</td>
<td>546</td>
<td>1964</td>
<td>l</td>
<td>g</td>
</tr>
<tr>
<td>(v) Intensity of illegal logging (confirmed quantities, tons)</td>
<td>-2011</td>
<td>&lt;122</td>
<td>&gt;480</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coniferous species Broadleaved species</td>
<td>&lt;1446</td>
<td>&gt;8051</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(vi) # penalties for illegal fishing (days of ban for fishermen and boats)</td>
<td>2001-2011</td>
<td>20810</td>
<td>25460</td>
<td>l</td>
<td>h</td>
</tr>
</tbody>
</table>
A State-Pressure-Response framework for mbcs resilience (3)

<table>
<thead>
<tr>
<th>Response</th>
<th>PA/DDD cases</th>
<th>&gt;2010</th>
<th>?</th>
<th>+</th>
<th>sporadic</th>
<th>National Laws</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA Implementation efficiency (# PA Agencies)</td>
<td>1998-2011</td>
<td>29</td>
<td>14</td>
<td>F</td>
<td>National Laws</td>
<td></td>
</tr>
<tr>
<td>Public spending for the “Environment” (€/year)</td>
<td>2001-2011</td>
<td>30,485,000</td>
<td>478,927</td>
<td>D</td>
<td>g</td>
<td></td>
</tr>
<tr>
<td>Public spending for Forest Management/ Protection (€/year)</td>
<td>2001-2011</td>
<td>16,824,176</td>
<td>2,179,123</td>
<td>D</td>
<td>g</td>
<td></td>
</tr>
<tr>
<td>Land allocation for HF</td>
<td>?-2011</td>
<td>?</td>
<td>+</td>
<td>D</td>
<td>National Laws</td>
<td></td>
</tr>
<tr>
<td>Emergence of nature-scepticism</td>
<td>1998-2011</td>
<td>-</td>
<td>+</td>
<td>I</td>
<td>TV reports, Newspapers</td>
<td></td>
</tr>
</tbody>
</table>

Response indicators: Examples of indicators on the nature of Environmental Administration decisions
Two visions of resilience

Return to a previous state

Multiple attractors
Alternative new equilibria

Re-definition of mbc's: goals, targets, assumptions and processes
The official concept of biodiversity: the heart of the problem

Biodiversity is

• a scientific neologism
• a political construction
• a disruptive concept
• a boundary object
• a successful invader of public sphere/discourse
Biodiversity is losing speed in the public interest

Opinion polls or individual research results are snapshots

Big data on individual internet queries, e.g. *Google Trends*

Data on worldwide hits (1/2004-8/2014) for biodiversity: a proxy of interest
Is there an explanation for this trend?

Deviation in interest from Average (1/2004-8/2014)

Single event or Cycles?

Evolution of the comparative metric [Unemployment – Biodiversity]

Animal spirits and economy?
Hypothesis: interest in biodiversity is not implicit, but fluctuates in relation to economy

Two potential outcomes:

1. The slope is positive, then in the long run, BAU
2. The slope is negative, then a new mbcs is urgently needed