

Topics in environmental,  
resource and energy economics  
for less-developed countries

Introductory Lecture

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# What are the main issues of this course?

- The course aims to pull together three related but still separate topics, all of great importance to low- and middle-income countries (I will call these LICs in the continuation):
  1. Environmental impacts and quality.
  2. Natural resources and economic impacts.
  3. Energy: its importance and economic impact, and its relation to the two former topics.
- Essential features of the course:
  - To analyze these three areas and their management, their significance for LICs, and their relation to political and governance issues in LICs.
  - To contribute to the explanation why some countries are poor and other rich, via analysis of environmental, resource and energy problems.
  - To analyze issues within these areas which are specific to LICs.

# Is it correct to say that there is a brand of environmental, resource and energy economics, specific to LICs?

- No.
- But several problems in the management of these three areas, found also in rich countries (HICs), are magnified and accentuated in LICs, mainly due to their combination with associated governance problems. This makes the focus of analysis, within these areas, different in LICs, relative to HICs.
- Due to much more serious governance problems, inefficiencies and market failures are more numerous and deeper in LICs.
- Inability to adequately address these problems in LICs lead to severe problems for general development, and to an interaction between development and environmental, resource and energy issues.

# What are the types of problems to focus on, to be studied in this course?

- Pollution.
- Climate change and climate impacts on LICs.
- Climate policy issues: How do or will LICs meet the climate challenges?
- Resource degradation and management.
- Income from natural resources and development (the «resource curse»).
- Infrastructure quality and scarcity: Why is infrastructure often poor in LICs?
- Energy poverty, energy overuse, energy structure imbalances.

# Environmental economics of LICs: Fundamentals

- The most severe environmental contamination problems (air, water and soil pollution) in the world today are found in LICs.
- Pollution problems most severe in densely populated, rapidly growing, LICs (China and India).
- The problems are due to a combination of factors:
  1. Shifting of industrial capacity from HICs to LICs
  2. Rapid economic growth leading to a steep increase in environmental problems
  3. Less attention, by the public and authorities, to environmental concerns in LICs than in HICs; this concern is often low at the start of a major growth process.
- Impacts of climate change are to a large degree centered on LICs, where they are already severe many places, with increased frequency of severe storms, flooding and drought events, and higher average temperatures.

# Natural resources and LICs: Fundamentals

- A large part of the world's natural resources are located to LICs.
- There is a high potential for natural resources to be a positive driving force for (economic and social) development in LICs.
- Still, in many countries this force is not utilized.
- Instead, in a large number of countries, natural resource wealth has had serious *negative* consequences for the countries' development and economic progress.
- Net forest losses (virtually only in the tropics) are largely confined to LICs.

# Energy economics in LICs: Fundamentals

- Energy is an essential input into the economies of LIC countries, but is often produced and consumed inefficiently.
- For some countries (energy exporters) it represents a large potential resource which is often wasted to a large extent.
- For other countries (energy importers), energy represents a large cost and drag on the economy, as costs must be made up with hard-earned export revenues.
- Energy consumption leads to serious pollution problems, most importantly air pollution, with high negative welfare impacts.
- Some of the least developed LIC countries (in Africa and South Asia) still rely heavily on primitive energy sources (biomass), which can be even more polluting than fossil fuels.
- Still, modern low-emissions (renewable) energies have been developed only to a limited degree in most LIC countries, although this situation is now continually improving.

# Basic infrastructure in LICs: Fundamentals

- In many countries, coverage of basic infrastructure services to the population (electricity; water supply; sewage; paved roads) is still relatively low, although it has improved over the last 20-30 years. Today, such infrastructure quality is lowest in Sub-Saharan Africa, and in South Asia.
- Good coverage of these services is (in the view of many) an essential precondition for successful development, as the services correlate highly with health and education outcomes, and are highly related to the business climate of private enterprise in the countries.
- Public utilities in LICs are often run inefficiently and wastefully, and this can stand in the way of fruitful development paths.



# Basic governance issues in LICs interacting with poor environmental, resource and energy outcomes

- Many autocratic states: Government responds to only an elite (a «selectorate»).
- In democracies, government leaders still often represent only an elite (large parts of the populace is in reality outside of the political process).
- Short-run behavior of governments with insecure tenure. This can make it difficult for sitting governments to take the long-run positions necessary to make investments in infrastructure. These governments will instead often favor a sequence of short-run solutions, which are far from optimal.
- Corruption: Big parts of government revenues often goes to illicit parties, not to pay for common goods.
- Rent-seeking: Too much activity, and the best talent, goes to the highest-yield activities, which often involve corrupt and illicit behavior.

# Why have natural resources not contributed more to development of LICs?

- Difficulty to institute efficient tax regimes
- Corruption eats away much of revenues
- Investors unwilling to invest due to uncertainty e.g. due to “holdup”
- Misuse of funds that are in fact collected due to lack of fiscal discipline (most revenues often spent currently and not invested in productivity-enhancing infrastructure or other capital)
- Damaging procyclical swings in activity
- Dutch disease problems when foreign exchange revenues increase
- When large natural resources are at stake and not secure, it may be privately optimal to initiate conflict with the aim to grab the resources. Such conflicts can be more costly than the value of the resources.

## These lectures:

- I will cover important issues and problems raised for environmental, natural resource, and energy policy in LICs, and how these interact with the governance issues just raised.
- Not all important issues will be addressed. I will however try to focus on issues which are a) widespread and applying to many countries, and/or b) particularly important/crucial for particular important countries.
- The selection of topics will be flavored by my own research and interests; so there will be a bias in that direction.
- Global issues involving LICs, taken up in the environmental economics course, will be somewhat limited. (Two of these are global climate policies and agreements; and policies for reducing tropical deforestation).

Broad overview of the lectures (this may change as the course progresses; but the list roughly corresponds to the topics that will be discussed)

- Lecture 2: Basics relations between development and environment, and between development and energy consumption. Discussion of Environmental Kuznets (EKC) curves, which tell us how environmental quality can vary with development, and why
- Lecture 3: Pollution problems in LICs: Their magnitude, the problems they cause, and reasons for the problems. How to measure damage from pollution, and deriving relative measures of damage for different regions/countries.
- Lecture 4: Energy pricing in LICs, with emphasis on energy subsidies. What are impacts of energy subsidies. The political economy of energy subsidies.

## Broad overview of lectures (cont.)

- Lecture 5: Impacts of climate change with emphasis on LICs. Why are LICs impacted most by climate change. Adaptation to climate change.
- Lecture 6: Climate policy issues for LICs: Basics. Why would LICs take an interest in climate policy. Discussion of co-benefits. Discussion of the CDM under the Kyoto Protocol.
- Lecture 7: More on climate policy issues with the emphasis on LICs. The Paris Agreement, unconditional and conditional targets, how can the PA be implemented.
- Lecture 8: Further topics in international climate policy. How to raise climate finance for LICs. Climate policies for the international aviation and shipping sectors.

## Broad overview of lectures (cont.)

- Lecture 9: On rainforests, with focus on their value, and how to protect them.
- Lecture 10: Energy markets, renewable energy developments. Public utility service and urban transport in LICs.
- Lecture 11: More on public utilities in LICs. Infrastructure quality issues, with focus on political economy.
- Lecture 12: The electricity-groundwater nexus in India (special case theme)
- Lecture 13: Natural resource management in LICs; wrapping up the course.