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Natural Resources and Pro-Poor Growth: The Economics and Politics

PART I

Chapter 2

Some Unique Features of Natural Resources*

This chapter provides an overview of the various forms and functions of natural resources. It highlights why the unique features of natural resources pose special challenges to their effective management.

* This chapter draws on material from Ahrend (2006).

2.1. The varied forms and functions of natural capital

While natural capital assets are not created by human activity, their quality and capacity to yield goods and services – and therefore their value as productive inputs – are affected by it. In many cases, for example agricultural land, the relevant input into production can best be viewed as a combination of natural elements (soil and water) and man-made components (irrigation and transport infrastructure). It is, however, still useful to maintain the conceptual difference between natural and man-made capital.

Natural capital can be either *renewable* (such as land, water resources and forest) or *non-renewable*, including, for example, fossil fuel and mineral deposits. Natural capital is renewable if the resource can restock itself by natural processes. If the rate of extraction respects the limitations of reproductive capacity, renewable natural capital can provide yields over an infinite period of time. Non-renewable capital cannot regenerate at a rate that is comparable to the rate of extraction. Therefore the extraction of non-renewable resources is necessarily finite.

Renewable capital produces a flow of both *goods* and *services*. The two are often compatible. Goods produced from renewable natural capital include timber and non-timber forest products, catches of wild fish, etc. Goods produced from non-renewable natural resources are mainly oil and minerals.

Some of these goods are traded in formal markets and therefore accounted for in national economic statistics. They include, for example, timber and fish harvested by formal-sector operators as well as fossil fuels (oil, gas and coal) and important minerals. But many are consumed locally and do not enter formal markets. They include wild fruits, mushrooms or herbs, wild fish caught by small-scale fishermen, "bush meat", palm, timber and non-timber forest products, among others.

Services produced from natural capital include, for example, water filtration and purification services provided by wetlands, regulation of water cycles provided by watersheds, etc. These services are generally not marketed and are invisible in standard economic statistics.

2.2. Measuring and monitoring natural resource stocks

Sustainable management of resources rests on a capacity to monitor the evolution of stocks and take corrective action in cases of significant degradation or decline.

In the case of man-made physical assets, the cost of maintaining, renewing, expanding and improving the capital stock is an explicit part of production costs (capital depreciation is accounted for as an expense). For natural resources, this is not always the case. The value of natural capital is often not accounted for at the level of the individual firm or in national accounts. This implies that neither their contribution to growth nor the extent and impacts of their degradation or depletion are fully measured and recognised by policy makers. Hence, measuring and monitoring natural resource stocks accurately is a serious challenge.

In the case of *non-renewable resources*, such as minerals or fossil fuels, stock depletion is inevitable in the long run. In the formal sector, the value of the remaining stock (*i.e.* mineral or oil reserves) is estimated as accurately as possible and is an important factor conditioning the market value of the firm relying on a particular resource stock. An appropriately designed fiscal regime can make sure that stock depletion is recorded and thus made visible both at the level of the firm and at the aggregate level.

This does not apply in the case of informal-sector exploitation of "open access" resources. Where artisanal mining is significant or even predominant, for example, it is difficult to monitor the value created by the industry and the rate at which existing deposits are depleted, and to formulate corresponding policies. These issues are discussed in greater detail in Chapter 11.

Renewable natural resources can, in principle, be maintained in perpetuity so long as their rates of use do not exceed their rates of regeneration. However, a continued draw-down of the stock above a certain level may be unsustainable and lead to permanent reduction of the stock and to lower reproductive capacity. There is, however, no market mechanism to make this reduction in capital stock visible to users or policy makers.

Standard economic statistics can even provide a misleading picture of the performance of a natural resource-based sector. In the case of fisheries, for example, a high level of "gross value added" is consistent with poor economic performance if there is excess fishing capacity. In such a case, removing capacity from the sector will result in increased overall production.

Similarly, ecosystems may be degraded to the point where they are no longer able to provide a range of services. Because these services are not bought and sold in markets, this development is not directly visible through market mechanisms but may lead indirectly to increasing costs or decreasing outputs in related or dependent sectors. Specific mechanisms are needed to monitor both the level of stocks and their quality in terms of capacity to deliver both goods and services.

2.3. The natural resources "curse"

It is often suggested that natural resources are a curse rather than a benefit as a result of several unique factors:

- The finite nature of the non-renewable resources, which leaves producers vulnerable once stocks are depleted (*i.e.* natural resources are "dead end" sectors).
- The low growth potential of natural resource sectors, arising from the fact that they are "low tech" activities which do not stimulate productivity increases and a shift towards higher value-added products.
- Vulnerability to "boom and bust" cycles as a result of the volatility of commodity prices on international markets, which leaves exporters particularly vulnerable to external shocks (this applies to mineral resources, some renewable resources and a wide range of agricultural commodities).
- Vulnerability to the so-called "Dutch disease".

Each of these is addressed below.

2.3.1. Natural resources are a "dead end"

This argument must be qualified. While non-renewable natural resources are ultimately finite, this issue becomes relevant during the decades immediately prior to their total depletion. What is important is the quantity of known natural resource deposits that can be exploited profitably at current technology levels and expected long-term average prices. Moreover, technological progress in resource extraction often means that more can be extracted from existing reserves and new reserves become worth exploiting.

2.3.2. Natural resources are "low-tech"

This argument must also be qualified. Some natural resources require very high technology techniques (*e.g.* offshore oil) and/or call for increasingly advanced technologies as stocks become depleted. To the degree that one of the main economic explanations for a resource curse rests on the "low-tech" character of resource extraction, it is therefore doubtful whether there really is an inevitable economic resource curse. On the other hand, the "high-tech" or capital-intensive nature of extraction can itself lead to another problem, namely "enclave" types of economies around a particular deposit with few or no links with the local or national economy.

Poor economic performance in many natural resource-rich economies may have been caused not by resource abundance as such but by the weak institutions for resource management, structures of ownership and control, notably state-owned or state-controlled monopolies.

2.3.3. Vulnerability to "boom and bust" cycles

Compared to economies with diversified economic structures, resource-based economies are particularly exposed to large terms of trade shocks caused by sharp falls in the prices of their main export commodities. Good macroeconomic management and fiscal discipline cannot eliminate these risks but can significantly mitigate them. Conversely, fiscal irresponsibility, in any case, will tend to magnify, rather than smooth out, the effects of commodity price movements, contributing to "boom and bust" cycles.

2.3.4. Vulnerability to Dutch disease

The term "Dutch disease" is used to describe a situation in which a country suddenly discovers large quantities of natural resources and starts exporting them. However, Dutch disease can also become a pressing problem for a country if the weight of an existing resource sector in exports increases relatively fast. In either case, the increased resource wealth tends to raise the exchange rate and/or general wage levels, thereby putting pressure on the competitiveness of the other tradeable sectors in the economy.

Having a higher exchange rate is not all bad news, as it increases the purchasing power of the population (as imported goods become cheaper) and therefore raises living standards. The ensuing stronger consumption usually also boosts production in the non-tradeable sector. The drawback, however, is that the competitiveness of the non-resource based tradeable sectors comes under threat. To be able to continue exporting, or at least to withstand import competition, these sectors must therefore increase productivity sufficiently fast to keep their international competitiveness.

While productivity increases as such are obviously welcome, a potential problem is that the strong pressure from the appreciating exchange rate on the non-resource

tradeable sectors may ultimately affect employment levels. The resource sector usually provides relatively little employment itself. Therefore, if resource-based currency strength leads to a more capital- and less labour-intensive production pattern in other industrial sectors, it risks contributing to reductions in industrial employment.

This may not be a problem if growth in non-resource based activities is strong enough to create the necessary jobs. An expansion of the service sector, in particular, could compensate for lost industrial jobs, but a significant part of the potential employment opportunities in the service sector may be of rather low productivity, which would imply comparatively low wages. This could therefore give rise to social tensions, or, in countries where large wage inequality is socially and politically unacceptable, the service sector may fail to generate a significant part of potential employment.

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