

Reading material for Second year economics students

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Chapter Two

Some Issues on the Environment and Development

Learning objectives

In this chapter you will discuss:

- some concerning issues that arise in achieving sustainable development
- the effects of population growth and economic growth on the environment, and
- some policy prescriptions to realize sustainable development

2.1 The Environment and Emerging Development Issues

In recent years, economists have increasingly focused on the important implications of environmental issues for the success of development efforts. Development is a noble aspiration which drives and inspires mankind to do something better than today. Our present state of human advancement or high standard of living due to economic development is a testimony to mankind's perennial endeavor to progress in all spheres of life. Every step of our progress is possible because we are exploiting environment's scarce resources bestowed upon us by Mother Earth for our benefit. After industrial revolution and colonization era, we have accelerated the pace of resource utilization by unimaginable amount and our greed for more economic growth has resulted into mankind's attempts to tame Mother Nature and tap all her resources unscrupulously, leading to grave damage to the environment.

No doubt our quest for development has brought about progress and prosperity by leaps and bounds in various dimensions, but it has come at a huge environmental cost and bereaved us with socio-economic inequalities. In this hasty quest, we have crossed the ecological limits and carrying capacity of nature and now started to borrow from the quota of resources which belongs to our posterity. Thus our development has been largely unsustainable and cannot continue in the long run if we continue our present levels of consumption of non-renewable natural resources. Global warming, climate change, desertification, ocean acidification, and mass coral bleaching, alarming levels of fatal pollution in air are the major challenges we have posed knowingly or unknowingly by our relentless pursuit for unsustainable economic development.

Burning of wood, coal and then oil, natural gases, petroleum products and haphazard use of water and land resources-all these continue to be our major basket of inputs to drive economic growth. Little did we realize in the beginning that guzzling of such scarce resources on large scale and using polluting technologies would cause irreparable damage to our environment. Humanity's ecological footprint is already more than 1.5. It means that we now require 50% more than the earth's area to sustain our consumption of natural resources. This forces many to think whether we should still continue our current pathways to drive economic growth and development which mainly depends on natural resources which are limited or focus all our efforts on saving and reviving our damaged environment.

Development and environmental concern were never meant to be antithetical to each other. In fact, they both can go hand in hand. It is not a choice that we have to make between development and environment. It is just the nature of economic activities after industrial revolution that we have been forced to choose polluting and resource-guzzling industries for our prosperity over environmental well being. But, thanks to nature's recurring wake-up calls; we now are developing technology, based on renewable and sustainable sources that can replace the technologies which damage the environment.

Many argue that not all the industries depend upon renewable energy. Industries such as mining, furniture, paper mills etc. have to depend on exploitation of natural resources. Also switching to renewable energy is currently a costly affair for many and only the rich and technologically advanced nations can afford it at present. Of course we cannot replace all the industries dependent on non renewable energy resources by renewable energy resources overnight. The transition has to be smooth enough to ensure that there are no fault lines occurring in the process. For such industries, the 3R principle is especially of prime importance i.e. reducing our energy and resource consumption, Reuse the resources and recycle of waste. We must strike the right balance of use between conventional and non conventional energy resources and ensure that we do not deprive our future generations of their rightful stake in the resource consumption for their own development.

Economic development is essential for the social uplift of masses and bringing billions of poverty-stricken people out of desperation and hunger to achieve global welfare. But we cannot

continue our current economic models that rely heavily on non renewable resources and cause grave social and economic inequality at the cost of environmental degradation. This is where the Sustainable Development Goals (SDGs) adopted by the world at united nations for a 15 years period i.e. from 2016-2030 will help create a synergy between development and environment.

With scarce water and land resources and ever exploding population we must concentrate all our efforts towards optimum and efficient resource use and conservation. Unfortunately, environment had taken a backseat for all these centuries in our myopic quest for climbing the band wagon of economic development and considering nature as our dumping yard for our waste product. Now it is high time that we centered our development around environment by sustainably consuming the resources.

Issues that define the environment development issues are; the concept of economic growth to attain sustainable development, population, and the nature and pace of greenhouse gas that induced climate change. We briefly discuss each in turn.

Global warming

It is an increasing average air and ocean temperatures. Used in reference to the trend that began in the mid-twentieth century and attributed largely to human industrial, forestry, and agricultural activities emitting greenhouse gases that affect development activities.

Climate change

Non-transient altering of underlying climate, such as increased average temperature, decreased annual precipitation, or greater average intensity of droughts or storms. It is used in reference to the impact of the global warming phenomenon. Note the distinction between changes in weather and changes in climate that alter underlying probabilities of weather outcomes.

Sustainable Development and Environmental Accounting

The term sustainability reflects the need for careful balance between economic growth and environmental preservation. Although many definitions exist, sustainability generally refers to “meeting the needs of the present generation without compromising the needs of future generations.

Sustainable development can be studied using long-standing concepts of economic analysis. These include three tools: using an appropriate valuation of future social benefits (generally placing more weight on the future than does the market); paying proper attention to market failures (focusing on externalities and public goods); and explicitly valuing natural resources as a form of capital stock rather than just a stream of consumption. We turn first to the problem of properly valuating the environment in national income accounting.

Environmental accounting

It refers to the incorporation of environmental benefits and costs into the quantitative analysis of economic activities. In a classic definition, a development path is sustainable “if and only if the stock of overall capital assets remains constant or rises over time. But in this regard, natural resources and other forms of capital are substitutes only at a limited scale and to a limited degree. Rather, after the environment has been degraded to some extent, natural resources and other forms of capital likely act as complements. Manufactured capital is generally unproductive without a minimum of available environmental services. While future technological fixes may be imagined, there is certainly no guarantee that they will emerge.

Implicit in these statements is the fact that future growth and overall quality of life are critically dependent on the quality of the environment. The natural resource base of a country and the quality of its air, water, and land represent a common heritage for all generations. To destroy that endowment indiscriminately in the pursuit of short-term economic goals penalizes both present and, especially, future generations. It is therefore important that development policymakers incorporate some form of environmental accounting into their decisions. For example, the preservation or loss of valuable environmental resources should be factored into estimates of economic growth and human well-being. Alternatively, policymakers may set a goal of no net loss of environmental assets. In other words, if an environmental resource is damaged or depleted in one area, a resource of equal or greater value should be regenerated elsewhere.

2.2 Population Growth and the Environment

A projection to 2030 shows that, world population will reach 9-10 billion; where more than 95 percent of this increment will occur in developing nations. Such population growth raises the question of whether the world can feed itself or not. Historically, population growth has been seen as a major source of environmental degradation especially when it is coupled with poverty.

Food supply should grow significantly faster than population to feed the ever increasing population. Increase in global food production in return necessitates intensification of production (higher food output per acre of land) which imposes impact on land and water supplies (degradation, soil erosion, depletion). Agricultural intensification also requires increased chemical fertilizer usages which produce harmful environmental pollution, opening of jungles for farm land and results in deforestation, other chemical runoff like pesticides and herbicides to increase production that result in air and soil pollution. To address these problems focus on productive capacity alone is insufficient. Hence, resource and environmental factors will be central in responding to the challenge of feeding much larger populations with limited resources.

Expanding populations require more space for urban, residential, and industrial development. These will encroach on farmland, forests, and natural ecosystems. In less densely populated areas also, land use remains a central environmental issue due to increasing pressure from suburban developments on farmland and natural areas continual conflict between large scale agriculture or forestry and wildlife preservation. Migration to marginal lands can be problematic as well. Generally those lands are available for a reason. Many of them are highly erodible, which means that they degrade over time as the topsoil and the nutrients it contains are swept away. Migration to coastal river deltas may initially be rewarded by high productivity of this fertile soil, but due to their location, those areas may be vulnerable to storm surges resulting from cyclones.

As it explained before, increase in population size results in

- ***Rise the demand for energy: which leads to*** waste generation and pollution (solid, liquid, heat,...nuclear)
- ***High Competition for land resource:*** (urbanization, industrialization, environmental degradation, soil erosion, pollution...)
- ***Excess resource extraction:*** growing scarcity of non-renewable natural resources, *low regeneration of renewable resources, decline in stock or extinction*

These in turn surround the question of future population and economic growth (the argument of the Limits to Growth). But, the critics of the theory argue that, new technologies for extraction and the development of substitute resources, and expanded recycling can address the problem.

But there are also environmental impacts of increased resource recovery (mining, extraction, recycling of resources) for economic use. Mining operations for example damage the earth and the environment. Recycling also requires high energy to process used and waste industrial products.

Up to this point we have considered the effect of population growth on economic development. We now have to examine the converse relationship: Does economic development affect population growth? Evidences suggest that it may, since the higher-income countries are characterized by lower population growth rates. This suspicion is reinforced by some further evidence. Most of the industrialized countries have passed through three stages of population growth. The conceptual framework that organizes this evidence is called the theory of demographic transition. This theory suggests that as nations develop, they eventually reach a point where birthrates fall.

During Stage 1, the period immediately prior to industrialization, birthrates are stable and slightly higher than death rates, ensuring population growth. During Stage 2, the period immediately following the initiation of industrialization, death rates fall dramatically with no accompanying change in birthrates. This decline in mortality results in a marked increase in life expectancy and a rise in the population growth rate. In Western Europe, Stage 2 is estimated to have lasted somewhere around 50 years.

Stage 3, the period of demographic transition, involves large declines in the birthrate that exceed the continued declines in the death rate. Thus, the period of demographic transition involves further increases in life expectancy, but rather smaller population growth rates than characterized during the second stage. This implies, economic development reduces population size.

2.3 Economic Growth and Environment

As a general consensus, economic growth requires further exploitation of natural resources, and high energy consumption which causes the depletion of those natural environmental resources and causes environmental damages. This is because; economic growth as it is essential for development entails some essential factors. These include energy (oil, natural gas, and coal, and other sources of energy for production, supply of land and other natural resources (environmental capital) as inputs for production. but land by its nature fixed in supply and human technology

cannot create more land. As economic activities proceed, there will be high competition for land for agricultural production, industrial development, and residential uses (urban). Technological advancement and the use of high yielding inputs are also essential to achieve economic growth and thereby development. However, these activities deplete natural resources and emit high pollutants to the environment.

If, in fact, it is possible to reduce environmental destruction by increasing the incomes of the poor, is it then possible to achieve growth without further damage to the environment? Evidence indicates that the very poor cause considerable environmental destruction as a direct result of their poverty. It follows that increasing the economic status of the poorest group would provide an environmental windfall. However, as the income and consumption levels of everyone else in the economy also rise, there is likely to be a net increase in environmental destruction. Meeting increasing consumption demand while keeping environmental degradation at a minimum will be no small task.

At one point, it was widely believed that as per capita incomes rose, pollution and other forms of environmental degradation would first rise and then fall in an inverted-U pattern. (This idea is referred to as the environmental Kuznets curve because of Kuznets's hypothesis that inequality would first rise and then fall as incomes increased, also traces such an inverted-U pattern. According to the theory, as incomes rise, societies will have both the means and the willingness to pay for environmental protection. Indeed, there is evidence that this inverted-U relationship holds for at least some local pollutants, such as particulate matter in the air, sulfur dioxide, and nitrogen oxides. Other environmental problems, such as unsafe water and poor sanitation, begin to improve as income rises even from very low levels.

These are average patterns that vary across countries. And to the extent an income-pollution relationship holds, the patterns by themselves are not informative about causality. Environmental pollution itself may cause slow economic growth; or third factors, such as bad institutions, can lead to both high pollution and low income per capita. Moreover, better environmental regulation does not spring into existence automatically with higher income; this largely depends on the political process. Nevertheless, whatever the shape — inverted - U, or falling, or even rising — more effective environmental policies can shift the pollution curve downward (illustrated for the case of the inverted - U pattern in Figure bellow).

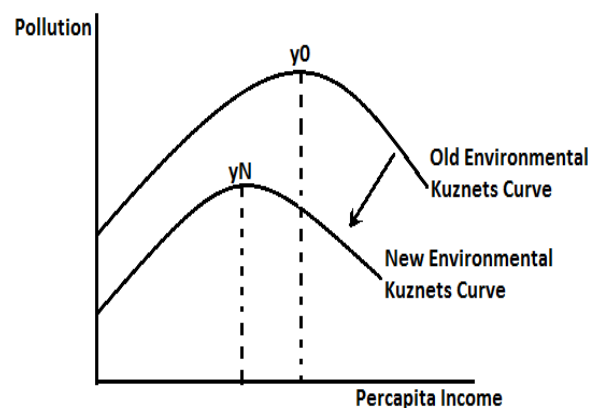
Moreover, we note that there is no convincing evidence that other environmental damage decreases with higher incomes. As we will see, this is a particular problem when it comes to global public goods, such as greenhouse gases.

Finally, even if the inverted-U environmental Kuznets curve relationship does hold for such global public goods in the very long term, some damage, such as loss of biodiversity, may well prove to be irreversible. Active international policy will be needed.

Environmental Kuznets curve

Environmental Kuznets curve is a graph reflecting the concept that pollution and other environmental degradation first rises and then falls with increases in income per capita. This is due to the fact that, the society will willing to pay for the mitigation of pollution and other environmental damages as their income rises.

On the other hand, if there is an improvement in technology or if there is the development of new production technology that emit less pollutant, then the environmental Kuznets curve shift downward; implies, less amount of pollutants will be emitted at the same level of income.

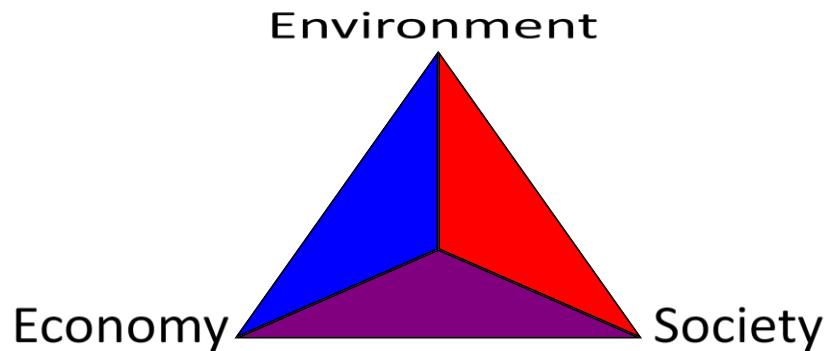


As it discussed in the above topics, many goals on the international environmental agenda are very much in harmony with the three objectives of development (increase the availability and widen the distribution of basic life-sustaining goods such as food, shelter, health, and protection, raise levels of living, including, higher incomes, the provision of more jobs, better education, and greater attention to cultural and human values, all of which will serve not only to enhance material well-being but also to generate greater individual and national self-esteem, and expanding the range of economic and social choices available to individuals and nations by freeing them from servitude and dependence, not only in relation to other people and nation-states, but also to the forces of ignorance and human misery.

2.4 Sustainability and Economic Policies

Sustainability implies meeting the *needs of the present generation without compromising the ability of future generations* to meet their own needs and it consists three basic elements.

According to world commission on environment and development (1987), our common future or sustainability has three pillars environment, economy, and society.



World Commission on Environment and Development, 1987

Environment: consists of Biodiversity, Materials/resources, Energy, and Biophysical interactions which are essential for life to exist.

Economy: requires Capital accumulation (human capital, material capital, and environmental capital), Employment to generate income, Poverty reduction, Technological growth so as to enhance production and productivity, and Investment for further capital accumulation.

Society: encompasses Diversity (cultural, linguistic, ethnic....), needs for Equity, Quality of life, and requires institutional structures and organization, and Political structures. Thus, sustainable development requires the interaction of these three elements so as to meet the objectives of eliminating pressures on the environment, economic growth, and better living standard simultaneously.

Although the environmental costs associated with various economic activities are disputed, development economists agree that environmental considerations should form an integral part of policy initiatives. Damage to soil, water supplies, and forests resulting from unsustainable methods of production can greatly reduce long-term national productivity but paradoxically can show up as having a positive impact on current GNI figures. It is thus very important that the long-term implications of environmental quality be considered in economic analysis. Rapid

population growth and expanding economic activity in the world are likely to do extensive environmental damage unless steps are taken to mitigate their negative consequences. The following are the key environmental problems that associated with rapid population and economic growth.

- Depletion (exhaustion) of limited resources: fuels, soil, minerals, species, etc
- Over-use of renewable resources – depletion of renewable natural resources: forests, fish, wildlife, soil, etc
- Environmental Pollution: air, water, soil, global warming, and climate change
- Inequity, poverty, and exclusion (economic, political, social, gender)
- Species loss (Endangered species and spaces....)

The following are the possible policy measures to address these problems.

- Policies/Incentives for cyclical material use
 - emulate natural cycles or 3R's (reuse, reduce, recycle)
 - price incentives to reduce pollutants (tax or other regulatory mechanisms)
- Policies and incentives for improved livelihoods/welfare
 - Employment, and poverty and inequality reduction
- Policies/Incentives for safe and reliable energy
 - conservation, renewable energy use, substitution, technological innovation, etc
- Policies/incentives for life-based interests
 - healthy, creativity, coordination, cooperation, learning, intellectual and spiritual development

Discussion Questions

1. Discuss the linkages between population growth and environment, and explain the reality and applicability of the Kuznets curve to the environmental issues. (Your own explanation is crucial than copying).
2. What measures do you suggest to ensure environmentally friendly economic activities?