

RESPONSES TO THE CHALLENGES OF DISPARITIES AND UNSUSTAINABLE USE OF NATURAL RESOURCES

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Contents

1. Global Crises: Natural and Social
 - 1.1. Relationships between Human Society and the Environment
 - 1.2. Natural Crisis: Unsustainable Resources Use
 - 1.3. Social Crisis: Increasing Disparities
 2. Relationships between Unsustainable Resources Use and Disparities
 - 2.1. The Story of the Poor
 - 2.2. The Story of the Rich
 3. Technological Responses
 - 3.1. Overall Strategies for Rational Resource Use
 - 3.2. Improvement of By-product Recovery, Recycling, and Reuse, and Raw Materials Use Reduction, Replacement, and Recycling
 - 3.3. National and Enterprise Innovation Systems
 - 3.4. Needs and Progress of Indicators Development
 4. Social and Economic Responses
 - 4.1. Taxation and Other Economic Incentives and Disincentives
 - 4.2. Changing Public Attitudes and Perceptions and Improving Education and Public Awareness
- Glossary
Bibliography
Biographical Sketch

Summary

Any economic system exists within, and is encompassed by, the natural world. The environment provides two kinds of services to human society: natural resources and environmental resources. On one hand, unsustainable resources use has resulted in a global crisis of nature; on the other hand, human society is facing a social crisis of increasing disparities. These two challenges are closely related under the head of sustainable development. Both the poor and the rich put pressure on the environment, but they act in different ways. Scientific advancement and technological innovation is the most direct approach to overcoming the problem of unsustainable resources use by

improving by-product recovery, recycling, and reuse, and by promoting raw materials reduction, substitution, and recycling. Technological innovation, to some extent, depends on social and economic support of institutional systems, such as national and enterprises innovation systems. To know whether responses of human society are taking effect, environmental and sustainable development indicators are necessary tools for policy makers. As responses to social crisis, taxation and other economic incentives and disincentives and non-economic instruments, such as changing public attitudes and perceptions, improving education, and public awareness are two categories of strategies to minimize social and economic disparities.

1. Global Crises: Natural and Social

1.1. Relationships between Human Society and the Environment

Human society is composed of individuals with certain social structures. Economic activity is the main activity individuals in society engage in. The economy is a collection of technological, legal, and social arrangements through which individuals in society seek to increase their material and spiritual well-being. Production and consumption are two elementary economic functions pursued by society. Any economic system exists within, and is encompassed by, the natural world. Its processes and changes are, of course, governed by the laws of nature.

Human society makes use directly of natural assets of all types. The natural world provides raw materials and energy inputs without which production and consumption would be impossible. Production and consumption activities also produce residuals, and sooner or later these must find their way back into the natural world. Thus, the system of human society affects nature in two ways:

- Drawing upon raw materials from nature to keep the system functioning.
- Discharging residuals to nature, which may lead to pollution or the degradation of the natural environment, depending on how they are handled.

The above two impacts are closely related. Many resource extraction processes, such as timber cutting and strip mining, have direct repercussions on environmental quality. In addition, there are many instances where environmental pollution or disruption has an impact on resource extraction processes. Estuarine water pollution that interferes with the replenishment of fish stocks is an example, as is air pollution that reduces agricultural yields. The relationships between human economic activities and the environment are shown as Figure 1.

With rapid growth of population and expansion of the global economy, human society has been facing global crises, not only natural but also social. Both the relationships between nature and human beings and the internal relationships of human society are

under stress.

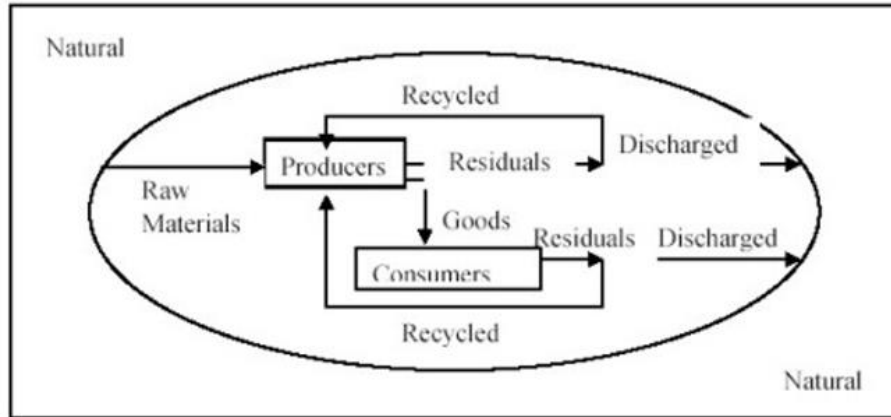


Figure 1. The economy and the environment
(Source: B.C. Field, *Environmental Economics: An Introduction* (New York: McGraw-Hill, 1997))

1.2. Natural Crisis: Unsustainable Resources Use

1.2.1. Definition and Characteristics of Natural Resources

Natural resources as defined by the United Nations Development Programme (UNDP) are environmental and natural factors that can be converted, at a certain time and space and under certain conditions, into economic value to improve human life at present or in the future. Natural resources are preserved in the form of either material or energy that can be utilized at present or in foreseeable future.

Natural resources can be divided into *renewable resources* and *nonrenewable resources*, which can be further divided into *recoverable* and *non-recoverable* resources. Certain resources with extremely slow rates of replenishment are in effect nonrenewable over a relatively short period. The characteristics of natural resources can be summarized as follows:

- Integration: The earth is a large system as a whole, in which a lot of natural and ecological subsystems and sub-subsystems with complex interactions are integrated.
- Regional dependence: Natural resources exist in certain regions and different regions have inequality distributions of natural resources.
- Multi-purposes: Most natural resources can be used for different purposes.
- Dual functions: The environment has dual functions in providing raw materials and assimilating residuals discharged into the environment.
- Scarcity: Natural resources should be allocated rationally to maximize output of the economic system.

Although natural resources, to some extent, may be finite, or infinite in other cases, what really deserves people's special attention and efforts is what is called sustainability of resource use (i.e. how to ensure resources are used at a rate that can be maintained over the long run without impairing the fundamental ability of the natural resources base to support future generations).

1.2.2. Unsustainable Resource Use

In the past 200 years since the industrial revolution, human economic activities have had serious consequences for environmental and natural resources, neglecting the basic role of environmental and natural resources in the development of the economy. Some examples of global environmental problems widely noticed by the international community are:

- Reduction and degradation of arable land
- Deforestation and desertification
- Water pollution and resources shortage
- Habitat loss and species extinction
- Depletion of fossil energy and air pollution by its emissions
- Climate change resulting from fossil energy use, deforestation, and land-use change
- Ozone layer depletion
- Decline of fish stocks.

The above environmental problems have led to great damage to human health and well-being and threatened the economic and social development of human society.

1.3. Social Crisis: Increasing Disparities

Besides the natural crisis caused by unsustainable resource use, human society has to face great challenges of reducing poverty and narrowing increasing disparities—the social crisis.

In the 1990s, with the development of globalization, the economy has kept growing worldwide while social and economic disparities have increased not only in many developed and developing countries but also between these two groups. The reasons for increasing disparities are diverse, and include the following.

- During the process of social transition, disequilibrium of development has increased social and economic disparities between different regions and sectors. For example, since the early 1980s, with the policies of reform and open up in China, disparities are widening between the export-oriented provinces of the coast and the interior.
- When a crisis hits, the poor are likely to be the most vulnerable and most easily hurt without effective policy follow up and social safety nets. For example, during the

financial crisis in East Asia, the poor and vulnerable suffered greatly due to unemployment, rising cost of living, and cutting of public budgets on health, education, and public services.

- In international competition during the globalization age, developed countries gain more than developing countries because of their advantages in terms of the economy, technology, management, and so on.

As shown in the UNDP *Human Development Report 1999*, the income gap between the one-fifth of the world's population living in the richest countries and the one-fifth living in the poorest countries has increased to 74 to 1 in 1997, from 60 to 1 in 1990 and 30 to 1 in 1960. The world's 200 richest people have a net worth of more than US\$1 trillion. The assets of the top three billionaires are more than the sum of gross national product (GNP) of all of the least developed countries and their 600 million people.

Increasing disparities seem inevitably companioned with serious poverty, which is regarded as the greatest challenge to human society. The fact is that over 10 billion people cannot now meet even their most basic needs. Around 1.3 billion people, a quarter of the population in the world, had a living expense of no more than US\$1 per day, calculated on international prices, in 1985. Large quantities of poor people in developing countries lack access to safe drinking water, sufficient nutrition, basic education, and sanitation facilities.

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Biographical Sketch

Dr. Ying Chen was born in April 1969 and is now an associate researcher with the Institute of World Economics and Politics, Chinese Academy of Social Sciences. Dr. Chen graduated from the Chemical Engineering Department of Tsinghua University, Beijing, in July 1997 and she is now engaged in research of environmental and natural economics. Her areas of interest include global environmental problems, climate change economics, and sustainable development indicators.