TECHNISCHE UNIVERSITÄT BERGAKADEMIE FREIBERG

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

MBA-INTERNATIONAL MANAGEMENT OF RESOURCES & ENVIRONMENT
(IMRE)

Topic:

Economic Growth and Sustainable Development – A Case Study of Pakistan

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30 March, 2005

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Acknowledgements

The first person I would like to thank is my first supervisor Professor Dr. Jan C. Bongaerts because he provided a motivating, enthusiastic, and critical atmosphere during the many discussions we had. He made me aware of the purpose, structure and logic of this thesis. I am highly indebted to him for teaching me the interesting courses related to sustainable development because of which I decided to select a related thesis topic.

Thanks are due to Dr. Hermann Heilmeier, my second supervisor, who gave some very useful suggestions and new ideas during the course of this work. He was always available for counselling.

Needless to say, that I am grateful to our IMRE coordinator Stefan Dirlich for providing every kind of support to me during my course of studies in Freiberg. Help, cooperation and friendship of all of my IMRE classmates especially Samuel, Edmund and Petia at TU Bergakademie Freiberg is greatly appreciated.

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CHAPTER 1

1.0 Introduction

The extent of the problems currently besetting the environment and natural resources reflects the major socio-economic progress achieved in the 20th century, especially since the end of the Second World War. The world's population is set to double over the next 50 years, and this trend is likely to be accompanied by a five-to-ten-fold increase in the economic activity of sectors having a major impact on the environment, such as energy, transport, industry, construction and agriculture (Eurostat, 1997). Such developments pose a real threat to the environmental balance of the planet as a whole and of the individual regions.

In 1987 United Nations Commission of Environment and Development, chaired by Norwegian Prime Minister Gro Harlem Brundtland, coined the term sustainable development, referring not only to the survival of the human species, but also maintaining the productivity of natural, produced, and human assets from generation to generation.

Sustainable development has become one of the topics in modern economics. Many years ago the Club of Rome pointed to limitations of economic growth caused by shortage of natural resources as well as destruction of the environment (Anderson *et al,* 2003). Since then in western industrial countries many activities by nations and firms have been done to avoid these limitations and to establish conditions, which might ensure sustainable growth in an economical and ecological sense. This theory has been revived under the guise of sustainable development, calling for changes in virtually every aspect of our consumption and production.

While the concepts associated with sustainable development can be topics of heated debate, there is broad consensus on the importance of exploring these topics. Critical in these discussions are the linkages between economic development and environmental concerns. Environmentally sustainable economic development, meeting the needs of the present generation without depleting the future supply of resources from future generations, is one of the new, dynamic areas of the rapidly growing environmental and economic development curricula (Desta, 1999). Today it is no longer possible to design plans for developing countries without mapping out the effects of the environment on economic development.

1.1 Objectives

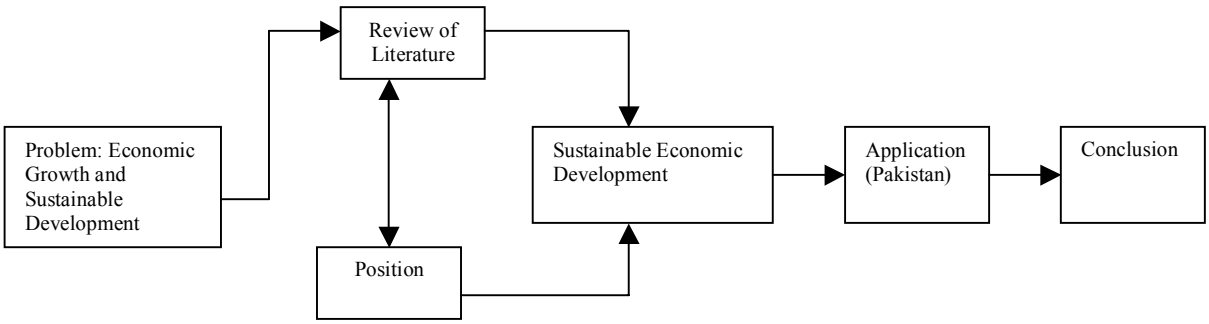
The objectives of this thesis are

1. To understand the meaning and importance of sustainable development and economic growth
2. To analyze the general interaction between sustainable development and economic growth
3. To examine the role of economic growth in sustainable development
4. To analyze the prevailing situation regarding economic growth and the sustainable development in Pakistan.

1.2 Methodology

The overall method of the thesis is derived from assessing a problem of sustainable development and economic growth and developing a solution to this problem. Figure 1, as shown bellow, illustrates the process:

Figure 1: Methodology of the thesis



The first component of this thesis is the literature review. This consists of information gathered and synthesized that pertained to sustainable development and economic growth. From reviewing the literature, a position is developed. The position is that economic growth is an important issue for sustainable development. The solution is a procedure, not a tool that nations can use to learn about economic growth and how it applies to sustainable development i.e. Sustainable Economic Development. In the last part of the thesis, the solution will be applied to Pakistan to draw the conclusions.

This thesis is structured as follows: the second chapter describes the sustainable development and the three pillars of sustainable development with a particular focus on economics. Moreover the indicators of sustainable development are highlighted in this chapter. The two different paradigms of sustainability i.e. strong and weak sustainability are also investigated thoroughly. The third chapter discusses a few of the major theories of economic growth. The chapter four of this thesis concerns about the interaction and linkages of economic growth and environment. Special focus is given on the impact of poverty on the environmental degradation. Chapter six contains the information regarding the economic growth and development challenges in Pakistan and will discuss the prevailing environmental issues of the country. The last chapter gives the conclusion of the study.

CHAPTER 2

2.0 Sustainable Development

The most widely used definition of sustainable development is the one by the Brundtland Commission (1987), which defines sustainable development as

"the development that meets the needs of present generations without compromising the ability of future generations to meet their needs."

Caring for the Earth defines sustainable development as "improving the quality of human life while living within the carrying capacity of supporting ecosystems" (IUCN; UNEP; WWF, 1991).

Rogers (1993) defines sustainable development as "development that does not destroy or undermine the ecological, economic or social basis on which continued development depends."

The Organization for Economic Cooperation and Development (OECD, 1990) defines sustainable development as "a concept that constitutes a further elaboration of the close links between economic activity and the conservation of environmental resources. It implies a partnership between the environment and the economy, within which a key element is the legacy of environmental resources which is not "unduly" diminished."

Sustainable development, as demonstrated by the United Nations Statistical Office (1992), means that economic activities should only be extended as far as the level of maintenance of man-made and natural capital will permit. A narrower definition of sustainability excludes the substitution between natural and man-made assets and requires maintenance of the level of natural assets as well as man-made assets. A sustainable development seems to necessitate especially a sufficient water supply, a sufficient level of land quality (prevention of soil erosion), protection of existing ecosystems (e.g. the virgin tropical forests) and maintaining air and water quality (prevention of degradation by residuals). In these cases, the sustainability concept should not only imply constancy of the natural assets as a whole (with some possibility of substitution) but constancy of each type of natural assets (e.g. of the specific ecosystems).

In the view of United Kingdom Government (2004), sustainable development "at its heart is the simple idea of ensuring a better quality of life for everyone, now and for generations to come."

According to Barbier (1987) "the concept of sustainable economic development as applied to the Third World... is therefore directly concerned with increasing the material standard of living of the poor at the "grassroots" level, which can be quantitatively measured in terms of increased food, real income, educational services, health care, sanitation and water supply, emergency stocks of food and cash, etc., and only indirectly concerned with economic growth at the aggregate, commonly national, level. In general terms, the primary objective is reducing the absolute poverty of the world's poor through providing lasting and secure livelihoods that minimize resource depletion, environmental degradation, cultural disruption and social instability.

Holdren *et al.* (1995) stated that "a sustainable process or condition is one that can be maintained indefinitely without progressive diminution of valued qualities inside or outside the system in which the process operates or the condition prevails."

2.1 Objectives and Dimensions of Sustainable Development

Although the idea is simple, the task is substantial. It means meeting four objectives that are identified in World Summit on Sustainable Development in 2002 (EU Online, 2002):

- Increased global equity and an effective global partnership for sustainable development
- Better integration of environment and development at the international level;
- Adoption of environment and development targets to revitalize and provide focus to the Rio process; and
- More effective action at national level with stronger international monitoring.

The term sustainability has been used in forestry and fisheries for about more than a century, however, since the World Commission on Environment introduced the concept of "sustainable development", the term now encompasses to the whole world. Perhaps the easiest way to begin discussing sustainability is to say first what it is not. Sustainability does not exist when something desired is in decline. There are examples everywhere: endangered

species, degraded habitats, disrupted ecological processes, declining local forest economies, increasing unemployment, increasing illiteracy rate and unprecedented population growth etc.

The history indicates that great civilizations in Mesopotamia, Greece, and Rome fell in part from a failure to live sustainably on the land. Growing populations and excessive consumption led to deforestation, soil depletion, watershed destruction, and the resulting problems of famine. All of which contributed to economic and social collapse. This same pattern repeated itself all over the world. When societies fail to live sustainably they come crashing down, even the greatest ones.

Goodland (1995) differentiated environmental sustainability, economic sustainability, social sustainability and sustainable development. Environmental sustainability is defined as maintenance of life-support systems (both sinks and sources). Economic sustainability is the economic tantamount of environmental sustainability, being defined as maintenance of economic capital. This definition of economic sustainability falls back on the Hicksian definition of income (Hicks, 1939): the maximum amount of income that can be spent without reducing real consumption in the future. Social sustainability is defined as maintenance of social capital i.e. human capital. Sustainable development should integrate the three types of sustainability and use them to start to make development sustainable.

Consider the three overlapping circles—one representing economic needs, one representing environmental needs and one representing community social needs.

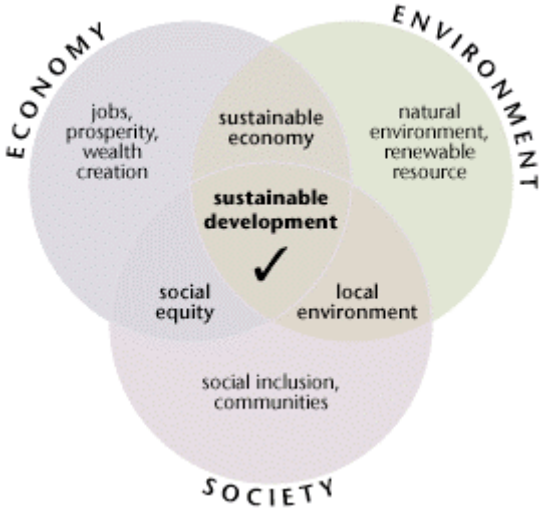


Figure 2: The interlinking themes of environment, economy and society that contribute to the Sustainable Development[1]

[1] Source: UK government Forestry Commission Website

The area where the three circles overlap is the area of sustainability, the area of livability where all the threads of quality of life come together.

For having sustainability it must be recognized that these three circles are not separate, unrelated entities. Rather they are the common desires and aspirations of everyone and the human beings must therefore strive to ensure that their efforts result in simultaneously meeting environmental, economic and community needs throughout the world.

To achieve sustainability all households – individual, community, national, and global – should be managed in a way that the economy and society can continue to exist in full harmony with the natural environment on which everyone depends.

For development to be sustainable, it must continue, or its benefits must be maintained, indefinitely. This means that there must be nothing inherent in the process or activity concerned, or in the circumstances in which it takes place, that would limit the time it can endure. Hence sustainable development is the complex of activities that can be expressed to improve the human condition in such a way that the improvement can be maintained (Trzyna, 1995).

2.2 Agenda 21

Agenda 21, was adopted by more than 178 Governments at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janerio, Brazil, 3 to 14 June 1992 (United Nations, 2004).

Agenda 21 explains that population, consumption and technology are the primary driving forces of environmental change. It lays out what needs to be done to reduce wasteful and inefficient consumption patterns in some parts of the world while encouraging increased but sustainable development in others. It offers policies and programs to achieve a sustainable balance between consumption, population and the Earth's life-supporting capacity. It describes some of technologies and techniques that need to be developed to provide for human needs while carefully managing natural resources.

Agenda 21 provides options for combating degradation of the land, air and water, conserving forests and the diversity of species of life. It deals with poverty and excessive consumption, health and education, cities and farmers. There are roles for everyone: governments, business

people, trade unions, scientists, teachers, indigenous people, women, youth and children. Agenda 21 does not shun business. It says that sustainable development is the way to reverse both poverty and environmental destruction.

A major theme of Agenda 21 is the need to eradicate poverty by giving poor people more access to the resources they need to live sustainably. By adopting Agenda 21, industrialized countries recognized that they have a greater role in cleaning up the environment than poor nations, who produce relatively less pollution. The richer nations also promised more funding to help other nations develop in ways that have lower environmental impacts. Beyond funding, nations need help in building the expertise — the capacity — to plan and carry out sustainable development decisions. This will require the transfer of information and skills.

Agenda 21 calls on governments to adopt national strategies for sustainable development. These should be developed with wide participation, including non-government organizations and the public. Agenda 21 puts most of the responsibility for leading change on national governments, but says they need to work in a broad series of partnerships with international organizations, business, regional, state, provincial and local governments, non-governmental and citizens' groups. As Agenda 21 says, only a global partnership will ensure that all nations will have a safer and more prosperous future.

2.3 Indicators of Sustainable Development

Indicators are central to the monitoring and reporting of progress towards sustainable development. They are also powerful tools, which can help focus public attention on what sustainable development means and to give a broad overview of whether we are achieving "a better quality of life for everyone, now and for generations to come" (UK Government, 2005). They cover the three pillars of sustainable development, namely economic growth, social progress, and environmental protection, including people's everyday concerns - like health, jobs, crime, air quality, traffic, housing, educational achievement, wildlife and economic prosperity.

Chapter 40 of Agenda 21 calls for the development of indicators for sustainable development. In particular, it requests countries at the national level, and international governmental and

non-governmental organisations at the international level to develop the concept of indicators of sustainable development in order to identify such indicators (United Nations, 2004).

An increasing number of organisations have responded to the challenge of Agenda 21 to develop indicators for sustainable development in the short-term. Some of this work is being undertaken around specific issues, such as health and the environment, or human settlements; others are attempting to define a full set of indicators. Such redundancy and overlap has been extremely valuable, since it has generated more creative thinking and a shared sense of purpose.

Economic indicators (e.g. GDP per capita, foreign direct investment etc.) have been used for many years at national, regional and international levels. Social indicators (e.g. health, education etc.) have also been developed over the past years and are widely used all over the world. It is feasible to select among the economic and social indicators those capture the specific issues most relevant to sustainable development. Environmental indicators (e.g. forest area as a percentage of land, emission of green house gases etc.) have been developed more recently. Recent initiatives include the environment statistics programme of the United Nations Statistical Commission, environmental indicators being developed by UNEP, the UN system-wide *Earthwatch*, the OECD, various relevant international legal instruments, and so forth.

2.3.1 Recently Developed Indicators

Growing realization of the failings of the conventional GNP and income as the primary indicators of economic progress has led to the development of alternative yardsticks. Two interesting recent efforts are the Human Development Index (HDI) devised by the United Nations Development Programme and the Index of Sustainable Economic Welfare (ISEW) developed by economist Herman Daly and theologian John Cobb. A third indicator, per capita grain consumption, is a useful measure of changes in well-being in low-income countries, where the data needed to calculate the more sophisticated indices are typically not available on an annual basis.

The **Human Development Index**, measured on a scale of 0 to 1, is an aggregate of three indicators: longevity, knowledge, and the command over resources needed for a decent life.

For longevity, the UN team uses life expectancy at birth. For knowledge, they use adult literacy and mean years of schooling. And for the command over resources, they use gross domestic product (GDP) per person after adjusting it for purchasing power. Because these indicators are national averages, they do not deal directly with inequalities in wealth distribution, but by including longevity and literacy they do reflect indirectly the distribution of resources. A high average life expectancy, for example, indicates broad access to health care and adequate supplies of food and safe drinking water.

Table 1: Rankings in the 2004 HDI

Top Ten		Bottom Ten	
Rank	**Country**	**Rank**	**Country**
1	Norway	168	Dem. Rep. of Congo
2	Sweden	169	Central African Rep.
3	Australia	170	Ethiopia
4	Canada	171	Mozambique
5	Netherlands	172	Guinea-Bissau
6	Belgium	173	Burundi
7	Iceland	174	Mali
8	United States	175	Burkina Faso
9	Japan	176	Niger
10	Ireland	177	Sierra Leone

Source: United Nations Human Development Report, 2004

The Human Development Report of the year 2004 indicates that some 55 countries are considered to have **"high"** human development, while 86 have **"medium"** human development — and 36 have **"low"** human development. Due to a lack of comparable data, 16 UN member countries are not included in the index. Norway has the highest overall ranking and is also the leading European country in the index. Germany — the largest Western European country — is ranked 19th. Japan has the highest rank among all Asian countries followed by Hong Kong (23) and Singapore (25). No African countries are among the 55 nations with a high human development score. The highest-ranking African country is Libya in 58th place. Of the 36 countries with a low human development score, all but three — Pakistan (142), Haiti (153) and Timor-Leste (158) — are located in Africa. Cuba (52) is considered to have high human development. In contrast, Russia (57), Brazil (72), Turkey (88), China (94), South Africa (119) and India (127) all are classified as medium human development countries.

While the HDI represents a distinct improvement over income figures as a measure of human well-being, it so far says nothing about environmental degradation. As a result, the HDI can rise through gains in literacy, life expectancy, or purchasing power that are financed by the depletion of natural resources, setting the stage for a longer term deterioration in living conditions.

The Daly-Cobb **Index of Sustainable Economic Welfare,** ISEW (1989), on the other hand, is a more comprehensive indicator of well-being, taking into account not only average consumption but also distribution and environmental degradation. To date, it has only been calculated for the United States. After adjusting the consumption component of the index for distributional inequality, the authors factor in several environmental measures, such as depletion of non-renewable resources, loss of farmland from soil erosion and urbanization, loss of wetlands, and the cost of air and water pollution. They also incorporate what they call "long-term environmental damage", a figure that attempts to take into account such large-scale changes as the effects of global warming and of damage to the ozone layer.

Applying this comprehensive measure shows a rise in welfare per person in the United States of some 42 percent between 1950 and 1976. But after that the ISEW began to decline, falling by just over 12 percent by 1988, the last year for which it was calculated. Simply put, about 15 years ago the net benefits associated with economic growth in the United States fell below the growth of population, leading to a decline in individual welfare (Daly & Cobb, 1989).

The principal weakness of the ISEW is its dependence on information that is available in only a handful of nations. For example, few developing countries have comprehensive data on the extent of air and water pollution, not to mention measurements of year-to-year changes. The same drawback applies to the HDI, since life expectancy data depend heavily on infant mortality information that, astonishing as it may seem, is collected at best once a decade in most of the Third World.

Per capita grain consumption, however, is a useful measure of well being in low-income countries that can be tracked on a yearly basis. This indicator captures the satisfaction of a basic human need, since people cannot survive if annual grain consumption falls much below 180 kilograms (about 1 pound a day) for an extended period. It is also less vulnerable to distortion by inequities of income and wealth. While the distribution of wealth between the

richest and poorest one fifth of a population can be as great as 20 to 1, as indeed it is in Algeria, Brazil, and Mexico, per capita consumption of grain by these same groups will not vary by more than 4 to 1 (Mannis, 2004).

One drawback with this indicator is that it says nothing about how much of the grain consumed was produced unsustainably - by eroding soils, depleting water supplies, and the like. Another is that at some point, higher per capita grain consumption starts to imply deterioration in human well-being rather than an improvement. Toward the top end of the scale people are consuming fat-rich livestock products known to increase heart disease and colon, breast, and other types of cancer, leading to an overall reduction in life expectancy. Per capita grain consumption is therefore best used as an indicator of well-being only in poorer countries.

2.4 Sustainability Paradigms: Maintaining Capital Stock

What form of capital should the current generation pass onto the next? Coal, petroleum, natural gas and minerals are examples of resources that are, by the nature, subject to exhaustion. If consumption continues at current rates, there will come a point in time when these resources are no longer available, although technological advances and new discoveries may delay their exhaustion. Obviously, sustainable development cannot imply that non-renewable resources are prevented from being depleted, or even kept at the current or some other level. It will be necessary eventually to replace the flow of services from non-renewable resources with services obtained from renewable ones. At the same time, it will be necessary to reduce input of natural resources and the environment per unit of standard of living, or output. This implies greater reliance on human capital (knowledge) and human-made capital, which are collectively referred to as reproducible capital. Reproducible capital is important, even though it is resource using, because it can substitute for natural capital to some extent; reproducible capital can reduce society's reliance on natural resources by increasing the usefulness of each unit of service provided by the non renewable and renewable stocks.

The degree of substitutability between natural capital (whether renewable or non renewable) and reproducible capital is the subject of considerable debate. There are two viewpoints regarding sustainability (Victor, 1991), which can be referred to as the ecological and the neoclassical paradigms – or strong and weak sustainability, respectively.

2.4.1 Strong sustainability: The ecological paradigm

Herman Daly and John Cobb (1994) favor strong sustainability for several reasons. First, some natural resources are essential for production, and their loss would constitute a catastrophic event. Second, even for production processes where natural capital is not yet an essential ingredient, substitutability declines as resource stocks are depleted. Finally, they argue that there are no substitutes whatsoever for many natural resources, especially wilderness – that the elasticity of substitution between natural and reproducible capital is zero, because of the unique character of some forms of natural capital. The implication is that certain stocks of so-called critical natural capital should be conserved, regardless of the opportunity cost of so doing.

The ecological position downplays the role of prices and technological change. Prices are considered to be imperfect signals of resource scarcity because of market imperfections brought about by "a preponderance of large companies or powerful resource-owning governments, or because the environmental effects of resource extraction are not reflected in resource process" (Victor, 1991). Prices do not capture the interests of future generations, and, because they reflect conditions at the margin, cannot be used to value entire stocks of the resource. Prices cannot be relied upon to signal scarcity because resource owners likely have too optimistic views on technological change; they will continue to supply scarce natural resources even as scarcity increases for fear of technical changes that will lower prices in the future. Further, private resource owners' time horizon causes too many natural resources to be supplied, consequently depressing prices. The ecological view is pessimistic about the future contribution of technological change, which is considered too uncertain to rely on for solving environmental problems.

An implication for management is that it is not aggregate capital that should be maintained, but rather natural and reproducible capital separately. Even within the strong sustainability tradition, there are different views about whether natural capital is too broad category. Some advocate maintaining each separate element of the natural capital stock, or even all components and the structural relationships among them (Wackernagel & Rees, 1997). Another position is that only specific, critical elements of the natural stock should be protected, while permitting substitutions among others (Pearce & Atkinson, 1995). When substitution between different sub-classes of natural capital is allowed, however, one encounters an aggregation problem. Is it possible to compensate for SO_2 emissions in excess

of critical loads by having a moratorium on herring harvestion? Is it meaningful to aggregate fish stocks, biodiversity and *in situ* exhaustible resources in physical units? Should monetary units be used instead? Depending on one's view with respect to substitution possibilities, management rules for biological assets can be formulated to correspond more or less to economic efficiency criteria.

2.4.2 Weak Sustainability: The neoclassical paradigm

The neoclassical paradigm is the antithesis of the ecological view that natural capital imposes severe constraints on growth and economics collapse might be brought about by ecosystem collapse. The neoclassical view is that, as resources become scarce, their relative prices will rise, which leads to conservation and substitution towards alternative resources and the development and use of new technologies (Scott & Pearce, 1992). Rising relative prices cause substitution away from those resources that are becoming scarce. Neoclassicals point to empirical evidence indicating that this is exactly what has happened in the past and continues today. For instance, the technology to produce electric automobiles that are capable of traveling distances of 150 to 300 kilometers on a single charge is already available, but the adoption of such technology is prevented by the relatively low prices of gasoline.

The neoclassical view is that the elasticity of substitution between natural capital and reproducible capital is high, with some even going so far as to suggest that it is infinite (Simon, 1996). Neoclassicals point out that there are two possibilities for sustaining growth. First, there is likely sufficient substitutability between reproducible capital and the non-renewable resource so that economic growth can be sustained while generating a continuous decline in the non-renewable resource stock. In the case of petroleum resources, this will be true if economies become more reliant on public transportation or people purchase only the most fuel-efficient vehicles. Second, technological change will inevitably enable society to shift from reliance on one non-renewable resource to another (e.g. trains converted from coal to oil), and finally to a renewable resource (e.g. solar energy). Although not denying that it is difficult to assess exactly how past technological advance has affected the elasticity of substitution between natural and reproducible capital, economists point to the undeniable impact that technological advance has made. As a result, they are optimistic about the potential for technological change in the future.

The neoclassical economists' view on sustainability of resource capital pertains to the flow of income from capital. The objective is to maximize the annual income that can be derived from the natural resource over all remaining time-forever. For example let's take the case of the concept of *user cost* of a mine. The user cost of removing ore from a mine today is the benefit one obtains from removing that same ore at some future date, appropriately discounted. Since the mine will eventually be depleted, it is useful to consider the sustainability of the resource revenue from that mine. El Serafy (1989) argues that the net revenue R from a non-renewable resource should be allocated into an income component and a capital component. The capital component is to be set aside and invested at the real rate of discount. The amount of revenue allocated to the capital as opposed to income component is determined as follows: once the mine is depleted, the capital component will need to generate an annual income in perpetuity that is equal to the income made available during the period the mine is in operation. The implicit assumption is that natural and reproducible forms of capital are infinitely substitutable, so that the economy does not collapse when the mine is exhausted.

Weak and strong sustainability are normally considered as opposing paradigms. This is mainly a consequence of different ethical and philosophical perspectives, different axiomatic foundations of the models that are used, and different constraints that are either made explicit or implicit (Hediger, 2004). Hence, questions arise about consequences of these assumptions and whether sustainability and economic growth foreclose each other. According to Brekke (1997):

"A development is … said to be *weakly* sustainable if the development is non-diminishing from generation to generation. This is by now the dominant interpretation of sustainability."

Dominant, per se, is among economists, not ecologists and most other natural scientists. In economic theory sustainable development is regarded as intergenerational equity. Pezzey (1989) has proposed that the **intergenerational equity** criterion should be formulated so that the future utility should be non-decreasing. This is quite a strict criterion, as any temporary decrease in welfare implies unsustainable development. Pezzy has therefore referred to "sustainedness" in this respect, since such a pattern can be assessed only after the fact.

As an alternative objective Pezzey refers to "survivability", under which it is allowed to undergo a reduction of welfare as long as the level of consumption exceeds some subsistence level. A special case is where consumption rather than utility is required to be constant or increasing over time i.e. Hicksian "sustainability."

Moreover, for example Page (1983), Norton (1984) and Randall (1986) suggest a *two-tier constraint approach* to resource use: minor and likely to be reversible degradation of natural resources should be subjected primarily to the conventional economic efficiency criteria while large-scale, less reversible threats should be addressed as strict constraints

Weak and strong sustainability are defined in terms of whether reproducible and natural capital are to be kept intact together (weak sustainability) or separately (strong sustainability). Weak sustainability requires a high degree of substitutability between reproducible and natural capital, while strong sustainability "assumes that they are complements rather than substitutes in most production functions" (Daly & Cobb, 1994). Weak sustainability is also defined as " As long as the natural capital, that is being depleted is replaced with even more valuable human-made capital, then the value of the aggregate stock – comprising both human made and the remaining natural capital – is increasing over time" (Barbier et al , 1994). Whereas strong sustainability stresses that there are limits to substitutability between natural and reproducible capital; it "suggests that it is difficult to ensure that future economic opportunities are maintained without imposing some conditions on the depletion of natural capital" (Barbier & Folke, 1994).

2.5 Summary

The literature on the concept of sustainability and sustainable development is extensive. Sustainable Development was popularized by the 'Brundtland Commission' which defined the term as "the development that meets the needs of present generations without compromising the ability of future generations to meet their needs". There are huge differences in extant interpretations of the sustainability concept. This is due to differences in ethical position and opinions about what to sustain. Further, the underlying assumptions often determine model outcomes, thus driving management prescriptions. Ultimately, however, it is an empirical matter as to which assumptions are correct.

CHAPTER 3

3.0 Theories of Economic Growth

To many people, a theory is a contention that is impractical or has no factual support. Someone who says that free migration to the United States may be all right in theory, but not in practice, implies that instead of the merit of the idea, it would be impractical. In the same way the statement that the idea of lower wealth taxes in India stimulates economic growth is just a theory show an unverified hypothesis.

However, for the economist, a theory is a systematic explanation of interrelationships among the different variables. Usually a theory is used not only to understand the world better, but also to provide a basis for policy. In any event, theorists cannot consider all the factors influencing economic growth in a single theory. They must determine which variables are crucial and which are extraneous. However, reality is so complicated that a simple model may omit critical variables in the real world (Kindleberger, 1997).

This chapter discusses some important models on economic growth. The first two models of economic growth discussed – that of the English classical economists, and of their foremost critic, Karl Marx – were developed more than a century ago, at the time of early capitalist development in Western Europe and the United States. Despite this focus on Developed Countries (DC) growth, the theories have some application today in Least Developed Countries (LDCs).

The next theories presented in this chapter, largely formulated since World War II, concentrate on the experience of developing countries. During the 1980s and early 1990s, a period of economic conservative governments in much of the West and Japan, a leading approach among development economists was neoclassicism, an economic theory and policy that stressed freedom from the state's economic restraint.

3.1 The Classical Theory of Economic Stagnation

The classical theory based on the work of nineteenth-century English economists David Ricardo, "Principles of Political Economy and Taxation" (1817) was pessimistic about the

possibility of sustained economics growth. For Ricrardo, who assumed little continuing technical progress, growth was limited by land scarcity.

The classical economists – Adam Smith, Thomas R. Malthus, Ricardo, and John Stuart Mill – were influenced by Newtonian physics. Just as Newton posited that activities in the universe were not random but subject to some grand design, these economists believed that the same natural order determined prices, rent, and economic affairs.

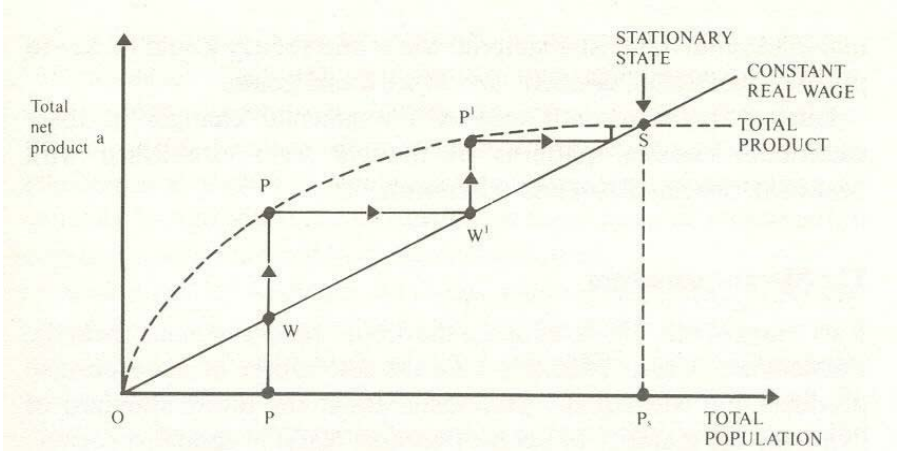
In the late eighteenth century, Smith (1937) argued that in a competitive economy, with no collusion or monopoly, each individual, by acting in his or her own interest, promoted the public interest. A producer who charges more than others will not find buyers, a worker who asks more than the going wage will not find work, and an employer who pays less than competitors will not find anyone to work. It was as if an **invisible hand** were behind the self-interest of capitalists, merchants, landlords, and workers, directing their actions toward maximum economics growth. Smith advocated a **laissez-faire** (government not interference) and free-trade policy except where labor, capital and product markets are monopolistic, a proviso some present-day disciples of Smith overlook.

The classical model also took into account (1) the use of paper money, (2) the development of institutions to supply it in appropriate quantities, (3) capital accumulation based on output in excess of wages, and (4) division of labor (limited primarily by the size of the market). A major tenet of Ricordo was the **law of diminishing returns**, referring to successively lower extra outputs from adding an equal extra input to fixed land. Diminishing return set in not so much because of absolute scarcity but because the available land varies in quality and society is forced to move on to successively less productive land (Pearce & Turner, 1990).

Figure 3 summarizes the main Ricardian analytics. The model assumes that the entire economy operates like a giant farm producing a crop by applying homogenous doses of capital and labor to a fixed supply of land of varying quality. With population at level OP, the wages bill is PW and farmer profits will be WP, which induces investment and consequent rise in the market wage rate. Population growth serves to force down wages back towards subsistence. Over time profits are squeezed to W^1 P^1 etc. until all investment and growth ceases at the stationary state point, S.

It is important to note that the lack of technical progress in the model means that the total product curve (subject to diminishing returns) remains fixed. Technical innovation (e.g. artificial fertilizers, irrigation and deeper drainage, etc.) would shift the total product curve upwards, increasing output per unit of input and offsetting, but not eliminating, the tendency towards diminishing returns.

Figure 3: Ricardo's simple commodity production model (Source: Pearce & Turner, 1990). Simple commodity production, i.e. production for sale by independent producers in which labor power is a commodity (a measure and a source of value); but capitalist institutions and activities treated as external to the model



[a] Total product subject to the axiom of diminishing returns minus rent accruing to non-productive landlord class; workers are paid wages, farmers gain profits and undertake productive investment. No technical progress assumed.

Ricardo believed that technological change or improved production techniques could only temporarily check diminishing returns, increasing capital was seen as the only way of offsetting this long-run threat. His reasoning took the following path. In the long run, the natural wage is at subsistence – the cost of perpetuating the labor force (or population, which increases at the same rate). The wage may deviate but eventually returns to a natural rate at subsistence. On the one hand, if the wage rises, food production exceeds what is essential for maintaining the population. Extra food means fewer deaths, and the population increases. More people need food, the average wage falls. Population growth continues to reduce wages until they reach the subsistence level once again. On the other hand, a wage below subsistence increases deaths and eventually contributes to a labor shortage, which raises the wage. Population decline increases wages once again to the subsistence level. In both instances, the tendency is for the wage to return o the natural subsistence rate.

With this iron law of wages, total wages increase in proportion to the labor force. Output increases with population, but other things being equal, output per worker declines with diminishing returns on fixed land. Thus the surplus value (output minus wages) per person declines with increased population growth, since land becomes more scarce relative to other factors.

The only way of offsetting diminishing returns is by accumulating increased capital per person. However, capitalists require minimum profits and interest payments to maintain or increase capital sock. Yet since profits and interest per person decline and rents increase with population growth, there is a diminishing surplus (profits, interest, and rent) available for the capitalists' accumulation. Ricardo feared that this declining surplus reduces the inducement to accumulate capital. Labor force expansion leads to a decline in capital per worker or a decrease in worker productivity and income per capita. Thus the Ricardian model indicates eventual economic stagnation or decline.

3.2 Marx's Historical Materialism

Karl Marx's views were shaped by radical changes in Western Europe: the French Revolution; the rise of industrial, capitalists production; political and labor revolts; and growing secular rationalism. Marx opposed the prevailing philosophy and political economy, especially the views of utopian socialists and classical economists, in favor of a world view called historical materialism (Nafziger, 1997).

Marx wanted to replace the unhistorical approach of the classicists with a historical dialectic. Marxists consider classical and later orthodox economic analysis as a still photograph, which describes reality at a certain time. In contrasts, the dialectical approach, analogous to a moving picture, looks at a social phenomenon by examining where it was and is going and its process of change. History moves from one stage to another, say, from feudalism to capitalism to socialism, on the basis of changes in ruling and oppressed classes and their relationship to each other. Conflict between the forces of production (the state of sciences and technology, the organization of production, and the development of human skills) and the existing relations of production (the appropriation and distribution of output as well as a society's way of thinking, its ideology, and world view) provide the dynamic movement in

the materialist interpretation of history. The interaction between forces and relations of production shapes politics, law, morality, religion, culture, and ideas.

Accordingly, feudalism is undercut by (1) the emigration of serfs to the town, (2) factory competition with handicraft and manorial production (3) expanded transport, trade, discovery and new international markets on behalf of the new business class, and (4) the accompanying rise of nation-states. The new class, the proletariat or working class, created by this next stage, capitalism, is the seed for the destruction of capitalism and the transformation into the next stage, socialism.

Capitalism faces repeated crises because the market, dependent largely on worker consumption, expands more slowly than productive capacity. Moreover, this unutilized capacity creates, in Marx's phrase, *a reserve army of the unemployed*, a cheap labor source that expands and contracts with the boom and bust of business cycles. Furthermore, with the growth of monopoly, many small business people, artisans, and farmers become property less workers who no longer have control over their workplaces. Eventually, the proletariat revolts, takes control of capital, and establishes socialism. In time socialism is succeeded by communism, and the state withers away.

3.3 Rostow's Stages of Economic Growth

People existed for centuries with little change in their economic life. When major changes occurred, as in the last 500 years or so, they took place abruptly. In *The Stages of Economic Growth*, Walter W. Rostow (1961), an eminent economic historian, sets forth a new historical synthesis about the beginning of modern economic growth on six continents.

3.3.1 Five Stages

Rostow's economic growth theory consist of five stages i.e (1) the traditional society, (2) the preconditions for takeoff, (3) the takeoff, (4) the drive to maturity, and (5) the age of high mass consumption.

Rostow has little to say about the concept of traditional society except to indicate that it is based on attitudes and technology prominent before the turn of the eighteenth century. The work of Isaac Newton ushered in change. He formulated the law of gravity and the elements of differential calculus. After Newton, people widely believed "that external world was

subject to a few knowable laws, and was systematically capable of productive manipulation" (Rostow, 1961).

3.3.2 Precondition Stage

Rostow's precondition stage for sustained industrialization includes radical changes in three non-industrial sectors: (1) increased transport investment to enlarge the market and production specialization; (2) a revolution in agriculture, so that a growing urban population can be fed; and (3) expansion of imports, including capital, financed perhaps by exporting some natural resources. These changes, including increased capital formation, require political elite interested in economic development. This interest may be instigated by a nationalist reaction against foreign domination or the desire to have a higher standard of living.

3.3.3 Takeoff

Rostow's central historical stage is the takeoff, a decisive expansion occurring over 20 to 30 years, which radically transforms a country's economy and society. During this stage, barriers to steady growth are finally overcome, while forces making for the widespread economic progress dominate the society, so that growth becomes the normal condition. The takeoff period is a dramatic moment in history, corresponding to the beginning of the Industrial Revolution in late eighteenth century Britain; pre-Civil war railroad and manufacturing development in the United States; the period after the 1848 revolution in Germany; the years just after 1868 Meiji restoration in Japan; the rapid growth of the railroad, coal, iron, and heavy engineering industries in the quarter century before the 1917 Russian Revolution; and a period starting within a decade of India's independence (1947) and the Communist victory in China (1949).

Rostow indicates that three conditions must be satisfied for takeoff.

1. Net investment as a percentage of net national product (NNP) increases sharply – from 5 to 10 percent per year. If an investment of 3.5 percent of NNP leads to a growth of 1 percent per year, then 10.5 percent of NNP is needed for a 3 percent growth (or a 2 percent per capita increase if population grows at 1 percent).
2. At least one substantial manufacturing sector grows rapidly. The growth of a leading manufacturing sector spreads to its input suppliers expanding to meet its increased demand and to its buyers benefiting from its larger output. In the last three decades of

the 1700s, for instance, the cotton textile industry in Britain expanded rapidly because of the use of the spinning jenny, water frame, and mule in textiles and the increased demand for cotton clothing. The development of textile manufactures, and their exports, had wide direct and indirect effects on the demand for coal, iron, machinery, and transport. In the United States, France, Germany, Canada, and Russia, the growth of the railroad, by widening markets, was a powerful stimulus in the coal, iron, and engineering industries, which in turn fueled the takeoff.

3. A political, social, and institutional framework quickly emerges to exploit expansion in the modern sectors. This condition implies mobilizing capital through retained earnings from rapidly expanding sectors; an improved system to tax high income groups, especially in agriculture; developing banks and capital markets; and in most instances, foreign investment. Furthermore, where state initiative is lacking, the culture must support a new class of entrepreneurs prepared to take the risk of innovating.

3.3.4 Drive to Maturity

After takeoff there follows the drive to maturity, a period of growth that is regular, expected, and self sustained. This stage is characterized by a labor force that is predominantly urban, increasingly skilled, less individualistic, and more bureaucratic and looks increasingly to the state to provide economic security.

3.3.5 Age of High Mass Consumption

The symbols of this last stage, reached in the United States in the 1920s and in Western Europe in the 1950s, are the automobile, sub urbanization, and innumerable durable consumer goods. In Rostow's view, other societies may choose a welfare state or international military and political power.

3.4 Vicious Circle Theory

This theory states that a country is poor because income is too low to encourage potential investors and generate adequate saving. The vicious circle theory indicates that poverty perpetuates itself in mutually reinforcing vicious circles on both the supply and demand sides. (Nafziger, 1997).

3.4.1 Supply Side

Because incomes are low, consumption cannot be diverted to saving for capital formation. Lack of capital results in low productivity per person, which perpetuates low levels of income. Thus the circle is complete. A country *is* poor because it *was previously* too poor to save and invest.

Japan's high savings rates during periods of rapid economic growth during the 1950s, 1960s and 1970s, and the high saving rates of the Asian tigers, Malaysia and Thailand imply the other side of the coin of the vicious circle. As countries grow richer, they save more, creating a **virtuous circle** where high savings rates lead to faster growth (Edwards, 1995).

3.4.2 Demand Side

Furthermore, because incomes are low, market size (for consumer goods, such as shoes, electric bulbs, and textiles) is too small to encourage potential investors. Lack of investment means low productivity and continued low income. A country *is* poor because it *was previously* too poor to provide the market to spur investment.

3.5 The Neoclassical Growth Theory

Robert Solow (1956) won a Nobel Prize for his formulation of the neoclassical theory of growth, which stressed the importance of savings and capital formation for economic development, and for empirical measures of sources of growth. In his theory, Solow allowed changes in wage and interest rates, substitutions of labor and capital for each other, variable factor proportions, and flexible factor prices. He showed that growth need not to be unstable, since as the labor force outgrew capital, wages would fall relative to the interest rate, or if capital outgrew labor, wages would rise.

In other words, a sustained increase in capital investment increases the growth rate only temporarily: because the ratio of capital to labor goes up (there is more capital available for each worker to use) but the marginal product of additional units of capital is assumed to decline and the economy eventually moves back to a long-term growth path, with real GDP growing at the same rate as the workforce plus a factor to reflect improving "productivity". A "steady-state growth path" is reached when output, capital and labor are all growing at the same rate, so output per worker and capital per worker are constant.

Neo-classical economists believe that to raise an economy's long-term trend rate of growth requires an increase in the labor supply and an improvement in the productivity of labor and capital.

Differences in the rate of technological change are said to explain much of the variation in economic growth between developed countries. The neo-classical model treats productivity improvements as an "exogenous" variable meaning that productivity is assumed to be independent of capital investment.

3.6 Summary

A number of Economists put forth their theories to explain the pattern of economic growth. English classical economist David Ricardo feared eventual stagnation from slow capital accumulation, and diminishing returns from population growth on fixed natural resources. Marx saw historically dialectically – as progressing from feudalism to capitalism to socialism on the basis of class conflict. The oppressed classes overthrow the classes controlling the prevailing means of production. Rostow's economic model has five stages; its central historical stage is the take-off, a decisive period of increased investment, rapid growth in leading sectors, and institutional change during which the major blocks to steady growth are finally overcome. The vicious circle theory contends that a country is poor because income is too low to encourage potential investors and generate adequate saving. Moreover, the Neoclassical growth theory emphasizes the importance of increased saving for economic growth.

CHAPTER 4

4.0 Sustainable Economic Development

Sustainable economic development can be defined as a long-term objective that ensures continuous economic development in which the quality of the environment is not negatively affected by the use of mankind to pursue economic growth (Blowers, 1993).

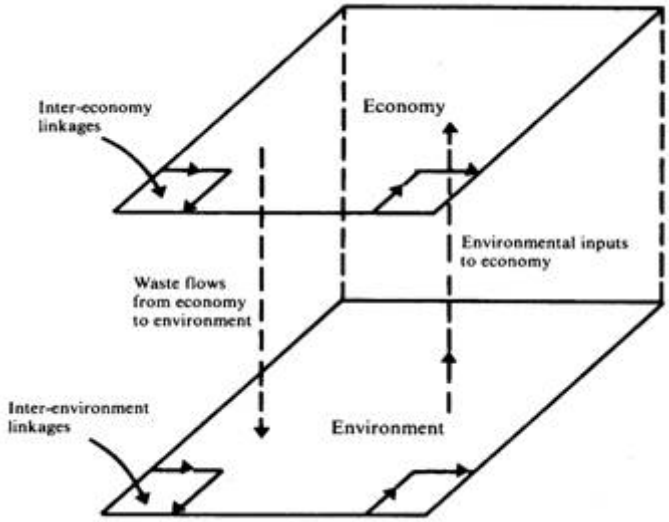
This chapter shows how the main body of economic thought can be used to derive important propositions about the linkages between the economy and the environment.

4.1 Narrow and Holistic Views of Economies and Environment

Figure 4 shows a stylized picture of economy and environment interactions (Pearce & Turner, 1990). The upper square, or 'matrix', shows the economy. The consideration here shortly is what might enter into this matrix but the point for a moment is that economics textbooks are primarily concerned with that matrix only. For example, economics will be concerned only with the way in which the various component parts of the economy interact – how consumer demand affects steel output, how the production of automobiles affects the demand for steel, how the overall size of the economy can be expanded, and so on. The lower square shows the environment. This consists of all *in situ* resources – energy sources, fisheries, land, the capacity of the environment to assimilate waste products, and so on. Clearly, there are interactions within this matrix as well. Water supply affects fisheries, forests affect water supply and soil quality, the supply of prey affects the number of predators, and so on. Just as within the economy matrix the relationships studied are between economic entities, so within the environment matrix the entities studied appear to have no economic dimensions.

Environmental economics is concerned with both matrices in Figure 4. Moreover, it concentrates on the interactions between the matrices – how the demand for steel affects the demand for water, how changing the size of the economy (economic growth) affects the functions of the environment, and so on. Environmental economics thus tends to be more *holistic* than economics as traditionally construed – it takes a wider, more all-encompassing view of the workings of an economy (Pearce & Turner, 1990).

Figure 4: General environment-economy interaction



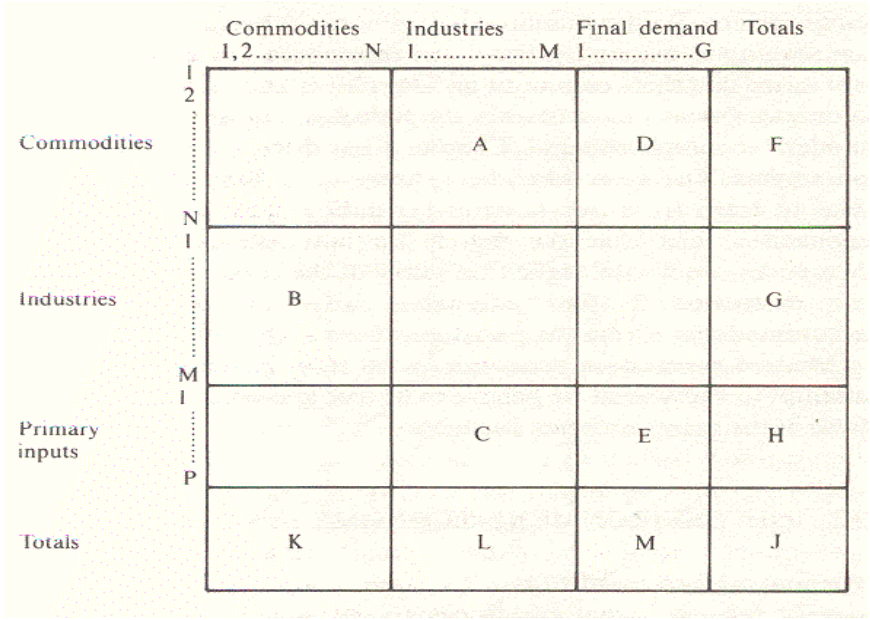
Source: Pearce & Turner, 1990

4.2 Environment-Economy Interaction

What interactions take place within economies, environment and between economies and environment? Figure 5 pictures the economy as a set of relationships between inputs and outputs. The diagram looks a little complicated but it is fairly easy to follow. It is a big box, or matrix, made up of a series of smaller boxes or matrices. Notice that two of the categories on the vertical axis – commodities and industries – also appear on the horizontal axis.

The terms used need to be defined first. A 'commodity' is anything that is processed, exchanged and produced in the economy – a factory is a commodity, so is a machine, so is a TV set or take-away meal. Coal in the ground is not a commodity because it has not been processed nor yet subjected to any exchange within the economy. Industries have a familiar meaning; they are simply the institutions that undertake economic activity in the form of production or providing a service. Figure 5 also contains an entry for 'primary' inputs. This refers to labor and capital, but not to land which we treat separately when this figure is developed further. 'Final demand' refers to the set of demands in the economy by final consumers, e.g. households. These demands are assumed to be determined by factors outside the model – they are said to be 'exogenous'. The numbers in each small matrix simply remind us that each matrix has a number of component parts – for example there are M industries, N commodities, G final demands, and so on. The other numbers are not relevant to this discussion.

Figure 5: An input-output table without environment



Source: Pearce & Turner, 1990

The relevant matrices have been labeled. Matrix A shows the *input* of commodities to industries. So for a given industry, say steel, this matrix explains how much is required of each other commodity used in the production of steel. Matrix B shows the *output* of each commodity by each industry. Matrix C shows how much each industry spends on primary inputs – labor and capita. Matrix D shows the final demand for commodities, i.e. how much of each commodity is required to meet each type of final demand. Matrix E shows the expenditure on each primary input according to each category of final demand.

This provides the column and row titled 'totals'. These are not actually matrices in the sense, which have been used earlier. For example, box F shows the total demand for commodities and this is made up of industrial demand for commodities (matrix A) and final demand for commodities (matrix D). But it will appear as a single list of demands classified by the *N* commodities. This list is known as a 'vector'. So, it might appear as *x* units of commodity 1, *y* units of commodity 2, *z* units of commodity 3 and so on. Box G shows the total outputs of each industry. It too is a vector. Vector H shows the total expenditure on primary inputs and is found by summing the elements in C and E. Vector K is the total output of commodities, vector L shows total inputs to industry, and vector M shows total expenditure on all inputs by category of final demand. The last box is J and that shows the total expenditure on all commodities and all primary inputs. It is neither a vector nor a matrix but a single number – a 'scalar'.

What is the use of constructing the figure 5? First, there is the need to observe a particular form of an *input-output table.* By showing the interactions within an economy, input-output tables have considerable potential value for planning purposes. If, for example, the government decides to expand final demand by inflating the economy, it is helpful to know what this will mean for the demand for labor, the demand for steel, the demand for coal and so on. Second, it is possible to modify input-output tables in such a way that price impacts of changing certain key features in the economy can be estimated. If it is decided to raise the energy prices, for example, the impact on the costs of energy-using industries can be shown. This might not seem to require an input-output table. For example, if steel uses *X* tonnes of oil and the price of oil rise it must surely be the case that the cost of producing steel rises by *X* times the increased price of oil. But the fact, which is overlooked here, is that there are other inputs to making steel, e.g. coke, which also require energy, so its price will rise too. Input-output, or I-O analysis, helps trace these second-order effects. It is even possible to say by how much the living costs of the average family will rise, and so on.

But the interest here is in environment. If it were possible to introduce environmental functions into the picture then it could be seen that how much each economic change would impact on the environment. Figure 6 expands figure 5 in order to show this by adding an extra row and an extra column.

Figure 6: An extended input-output table with environmental commodities

	Commodities	Industries	Final demand	Total	Waste discharge to environment
Commodities		A	D	F	N
Industries	B			G	O
Primary inputs		C	E	H	
Totals	K	L	M	J	P
Environmental commodities	Q	R		S	

Source: Pearce & Turner, 1990

The extra row is 'environmental commodities'. This refers to all natural resources – classified here as land, air, water and biota. In land natural commodities such as coal and oil, fish and

forests are included. The environmental commodity flow will basically show how the environment supplies *inputs* to the economy. The column that is added is the same – land, water and air – but this time it will show how these resources act as *receiving media* for the waste products that flow from the economy.

Now there are some extra boxes to explain. One thing to note is that all the economy boxes in Figure 5 were in money terms – that is, if such as table had actually constructed it would show, for example, the money value of steel as an input to $1 of automobile output. Although major advances have been made in putting money values on some of the functions of environment, in terms of figure 21, it must be recognized that the new row and column will be in physical terms, i.e. tonnes of sulphur oxide, tonnes of coal etc.

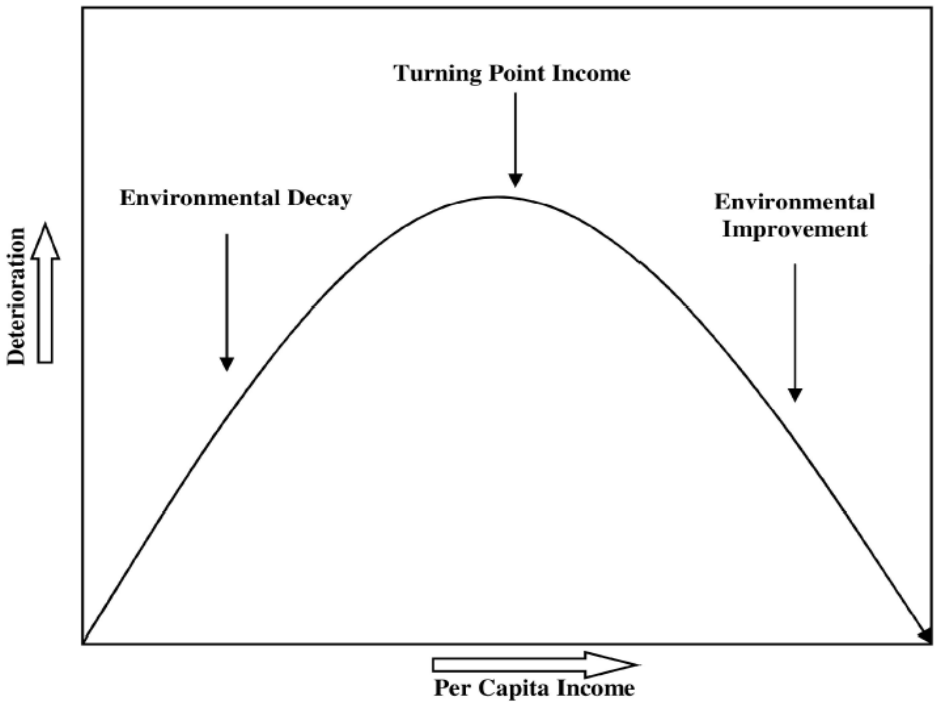
Matrix N now shows the amount of waste discharged as a result of final demand for commodities measured in box F. Matrix O shows the discharge of waste products by each industry. Box P will be a vector and will show the total amount of waste discharged by the economy, classified by type of waste. Matrix Q shows the inputs of environmental commodities to economic commodities – e.g. how much water is used, how much land is used, and so on. Matrix R shows the inputs of environmental commodities to industries and box S will show the total input of environmental commodities to industrial and final demand.

Effectively, what Figure 6 does is to formalize the general relationships introduced in Figure 4. If it were possible to quantify the various relationships between environmental commodities and the economy, then the idea of how economy and environment interact would have been clearer. Some efforts have been made to do exactly this and treatment here has followed that of Victor (1972), which showed how the interactions occur in the Canadian economy. However, the purpose of introducing the idea of input-output analysis is rather different. The concern here is not how far one can quantify the interlinkages in detail. The basic aim has been to show that economy and environment are linked in various ways and that, in principle at least, it is possible to model these linkages by extending a piece of analysis – input-output – that was initially developed for purposes quite unrelated to the environment (Pearce & Turner, 1990).

4.3 The Environmental Kuznets Curve

A relatively recent phenomenon in environmental economics is the so-called environmental Kuznets curve (EKC) hypothesis (Kuznets, 1955). According to this hypothesis, environmental damage first increases with income, but after a "turning point" declines. The hypothesis proposes an inverted U-shape relation between damage and per capita income (Fig 7). It would be a comforting idea that environmental quality will, in the long run, improve as economies grow, with strong implications for policy makers. The implications for sustainable development run counter to the central hypothesis of the "limits to growth" research (Nafziger, 1997). Obviously, the EKC concept is meaningless where there is a great potential for irreversibility of some environmental good (e.g. extinction of species or, perhaps, depletion of old-growth forests).

Figure 7: The environmental Kuznets curve[1]



According to Grossman (1995), the effect of economic activity on the natural environment can be decomposed into three components. First is the 'scale effect' that features prominently in the limits to growth tradition. This effect captures the simple intuition that more output, *ceteris paribus*, results in faster depletion of reserves and increases pollution. However, EKC

[1] Source: http://www.macalester.edu/courses/econ231/Yandleetal.pdf

adherents, who believe that the second and third mechanisms offset the scale effect, debate the ceteris paribus assumption. The second mechanism is the 'composition effect', which refers to the possibility of a decline in environmental damage when the share of pollution intensive activities in GDP decreases over time. That is, the structure of the economy, or the goods and services produced, changes over time (International Bank for Reconstruction and Development, hereafter IBRD, 1992). The third mechanism is the 'technique effect' that refers to potential changes in methods of production. The World Bank points out that enhanced efficiency, substitution and the introduction of clean technologies and management practices play an important role in determining the environmental impact per unit of economic activity (IBRD, 1992).

The extent to which the composition and technique effects offset the scale effect is determined by incentives. As per capita income rises, the demand for environmental quality may increase, resulting in an "induced policy response" (Grossman & Krueger, 1995). Hence, environmental regulations are expected to tighten as wealth (and education and awareness) increases. In addition to this effect, environmental quality may improve because there are more resources available for investment in clean production when income is higher (IBRD, 1992). Further, as pointed out by Perman et al. (1996), while many forms of regulation or control may benefit society, the initial resource cost could be prohibitively high for some economies.

The foregoing implies that economic growth is sometimes considered part of the solution rather than the source of environmental problems. Some researchers have been very optimistic about this finding. Beckerman (1992), for example, argues that "in the end, the best and probably the only way to attain a decent environment in most countries is to become rich". On the other hand, Stern et al. (1996), and Arrow et al. (1995) have been more careful and emphasized the role of proper policies. The empirical work indeed suggests that "becoming rich" will not be a panacea for environmental quality. Shafik and Bandyopadhyay (1992) argue that, while it is possible to "grow out" of some environmental problems, there is nothing automatic about doing so.

Some support for the EKC hypothesis comes from work by Shafik and Bandyopadhyay (1992) and Grossman and Krueger (1995). The results of Grossman and Krueger (1995) indicate that, at high-income levels, further increases in income may be detrimental to the

environment. Hence, instead of an inverted U, environmental damage may describe an N shape – a re-linking of damage and economic growth after a period of de-linking. Most empirical work typically consists of fitting a single regression equation between degree of air pollution and income (Grossman & Krueger, 1995), but the hypothesis has also been tested in the case of deforestation and urban sanitation-clean water (Shafik & Bandyopadhyay, 1992). The results do not point in a single direction, but indicate that environmental improvement is more likely to occur when it concerns a local environmental problem (viz. sanitation), where there is a clean link between cause and effect (Beckerman, 1992). Other problems, notably those with large-scale effects that occur in a relatively distant future (e.g. global warming) are more difficult to put into an EKC framework.

One approach to improving EKCs is searching for important omitted variables. Boyce (1994) and Torras and Boyce (1998), for example, argue that in addition to income levels, the distribution of income and measures of civil rights may be important in explaining environmental degradation. Access to information about environmental pressure and valuing of environmental degradation are likely affected by the degree of inequality in an economy. Considering the "induced policy response", one can expect that the demand for environmental amenities and the political will to respond to this demand are affected by income distribution. A more equitable distribution of income may lead more people to demand a cleaner environment, thereby giving a larger effective voice favoring higher environmental quality. It may also bring about a social harmony that is more conducive to the long-term prospective necessary to make investments in environmental quality (Sandler, 1997). Scruggs (1998) is cynical about this line of reasoning, arguing that the effects of distribution are ambiguous; depending on the distribution of preferences across groups in society and the institutional rules, a more equitable income distribution may both enhance and mitigate environmental pressures.

Most studies examine the EKC hypothesis are fraught with problems. Regression analyses tend to be biased and inconsistent due to simultaneity problems. Feedbacks exist between the state of the environment and economic growth (e.g. because a lower-quality environment results in higher costs associated with illness and lower productivity of workers), and regression models fail to capture this source of bias. Another problem is related to international trade. While the data provide some evidence for a structural change in the economies of developed countries, this does not imply that a similar option exists for

developing countries. Stern *et al.* (1996) cite evidence that the energy intensity of US imports has increased over time, with imports having, to a certain extent, taken the place of domestic production. As the structural change in the USA may have been "partly accomplished through specialization towards activities with lower energy and resource intensities, it is not clear that the world as a whole can achieve a similar transformation" (Stern *et al*,1996).

Estimated EKCs are sometimes used to project environmental damage in the medium term. Since the so-called turning points of many statistical EKCs lie in the vicinity of current mean income levels (turning point estimates range from several hundred US dollars to $12,000, with many outcomes close to $5,000), further economic growth seems to contribute to higher incomes and a cleaner environment. But an implicit assumption underlying this claim is that incomes are normally distributed. Stern et al. (1996) argue that the global distribution of income is highly skewed, with much larger numbers of people below world mean income per capita than above it. To evaluate the effect of economic growth on the environment, median rather than mean income may be relevant, and median income is not close to estimated turning points. Taking estimated EKCs as given and simulating the impact of economic growth on the environment, these authors demonstrate that matters could become worse before they get better. They conclude that EKCs are no justification for policy inaction. For sensible courses of action concerning the trade-offs that arise when sustainable development is pursued, however, policy makers will find little guidance in EKC relationships.

4.4 Poverty and Environmental Stress

Grinding poverty and impatience spur people to strive for immediate gain, forgetting long-term social sustainability. In order to survive, impoverished people degrade and destroy their immediate environment, cutting down forests for fuel wood and export earnings, overusing marginal agricultural land, migrating to shrinking areas of vacant land, and destroying habitat for biological species essential for pharmaceuticals and seed varieties (Norgaard, 1992). Additionally they forgo maintenance of vegetation, forests, and the biosphere. At subsistence levels of living, when people's survival is at stake, hand-to-mouth economics prevail in which the future is infinitely discounted; people overexploit natural resources and underinverst in conservation and regeneration, leading to resource depletion and species loss. In this economic climate, people make irreversible decisions, foreclosing options by logging and mining of rainforests and other economic options that reduce species (Panayotou, 1993).

More than 100 million people in Less Developed Countries (LDCs) experience acute firewood shortages. In the late 1980s, a study of Nepalese hill villages with severe deforestation indicated one-quarter of the household labor normally devoted to agriculture was diverted to fuel wood collection (Mink, 1993).

The World Bank lists the following adverse effect of environmental degradation on health and productivity (World Bank, 1992):

1. Water pollution contributes to more than 2 million deaths and billions of illnesses a year; water scarcity to poor household hygiene, added health risks, and limits on economic activity; and water pollution and scarcity to declining fisheries, municipal and rural household costs of providing safe water, and aquifer depletion leading to irreversible compaction

2. Excessive urban particulate matter is responsible for 300 to 700 thousand premature deaths annually and for half of childhood chronic coughing; smoky indoor air affects 400 to 700 million people, mainly women and children in poor rural areas; and air pollution has many acute and chronic health impacts, restricts vehicle and industrial activity during critical episodes, and affects forests and water bodies through acid rain

3. Solid and hazardous wastes acutely increase health risks locally, such as diseases spread by rotting garbage and blocked drains; and pollute groundwater resources

4. Soil degradation reduces nutrition for poor farmers on depleted soils and increases susceptibility to drought, while decreasing field productivity in tropical soils, contributing to offsite siltation of reservoirs, river transport channels, and other hydrological investments

5. Deforestation leading to localized flooding, contributing to death and disease; and losing sustainable logging potential, erosion prevention, watershed stability, and carbon sequestration provided by forests

6. Reduced biodiversity, contributing to loss of new drugs and genetic resources, and reduced ecosystem adaptability

7. Atmospheric changes, shifting vector-borne diseases, increasing risks from climatic natural diseases, and increasing diseases from ozone depletion (estimated to contribute to as much as 300 thousand additional cases of skin cancer and 1.7 million cases of cataracts a year worldwide).

Poverty and insecurity contribute to lack of capital and labor to conserve the environment. Poor, landless people are forces to cultivate marginal lands, lacking other alternatives. Low-income countries will pay little, if any, to avoid climatic and biological resources degradation.

4.5 Summary

Sustainable development supplements conventional analysis of economic development by the inclusion of the interaction between economic activity and the natural resource base composed of inputs to the production process and an absorber of waste generated by that process. Sustainable development also broadens conventional development objectives by including the preservation of the natural resource base to enable future generations to carry on the economic activity. Poverty is a major cause and effect of environmental problems. Poverty, which denies poor people the means to act in their own long-term interest, creates environmental stress (such as deforestation, soil erosion etc.) leading to resource degradation and growing associated problems.

CHAPTER 5

5.0 Country Profile - Pakistan

Located in South Asia, Pakistan shares an eastern border with India and a north-eastern border with China. Iran makes up the country's south-west border, and Afghanistan runs along its western and northern edge. The Arabian Sea is Pakistan's southern boundary with 1,064 km of coastline. Pakistan has a total area of 803,940 km^2 with a land area of 778,720 km^2 and water area 25,220 km^2 (CIA World Factbook, 2004).

Figure 8: Map of Pakistan

Source: CIA World Factbook, 2004

Pakistan is divided into four provinces viz. Sindh, Punjab, North West Frontier Province and Balochistan. It consists of such physical regions as a) the western offshoots of Himalayas which cover its northern and north western parts of which the highest peak K-2 rises to 8611 meters above sea level b) the Balochistan plateau c) The Potohar Plateau and salt range and d) The Indus plain, the most fertile and densely populated area of the country. It gets its sustenance from the Indus River and its tributaries.

5.1 Economic Growth and Development Challenges in Pakistan

In Pakistan, with a population of nearly 144 million, poverty remains one of the biggest concerns. With a per capita gross national income (GNI) of US$ 520, poverty rates, which

had fallen substantially in the 1980s and early 1990s, started to rise again towards the end of the decade. Though Pakistan has grown much more than other low-income countries, but has failed to achieve social progress commensurate with its economic growth. The educated and well-off urban population lives not so differently from their counterparts in other countries of similar income range. However, the poor and rural inhabitants of Pakistan are being left behind. For example, access to sanitation in Pakistan is 23 percent lower than in other countries with similar income (World Bank, 2005).

The declining trend in poverty in Pakistan during the 1970s and 1980s was reversed in the 1990s. Most of this increase in poverty in Pakistan has taken place after Fiscal Year (FY) 97, coinciding with the onset of a period of slow growth in the country. The last four decades can be grouped into two broad periods with respect to poverty trends. The first period is from FY64 to FY88, while the second covers the years from FY88 to FY99 (the last year for which data is available). During the first period, poverty declined in the urban areas until FY70, but increased in the rural areas leading to an increase in overall poverty in the country. Subsequently, between FY70 and FY88, poverty declined in both rural and urban areas (ADB, 2002). A number of factors, including the green revolution, increase in employment due to a boom in the housing and construction sectors, as well as rapid expansion of the public sector, and the inflow of workers' remittances from the Middle East contributed to poverty reduction during this period.

Table 2: Poverty Trends in Pakistan in the 1990s

% below poverty line

Year	Amjad and Kemal	Ali and Tahir	Jafri	FBS	Arif et al.
FY91	22.1	23.0	26.1	-	-
FY93	22.4	28.1	26.8	26.6	27.2
FY94	-	27.9	28.7	29.3	27.4
FY97	-	-	-	26.3	29.6
FY99	-	-	-	32.2	35.2

Source: Amjad and Kemal (1997) Ali and Tahir (1999) Jafri (1999) Arif et.al (2000) FBS (2001)

During the second period, data from various studies indicates that the incidence of poverty increased from 22 - 26 percent in FY91 to 32 - 35 percent in FY99 as shown in Table 16. As mentioned earlier, most of the increase in poverty in this period seems to have taken place between FY97 and FY99, a period of slow growth and macroeconomic instability in Pakistan.

Since FY99, growth has slowed even further, the fiscal squeeze has intensified, development spending has declined, and the country has experienced a severe drought (ADB, 2002).

The overall performance of the economy during FY02 was quite encouraging under the circumstances; real gross domestic product (GDP) grew by 3.6 percent compared to 2.5 percent in FY01, and was not very far from the 4.0 percent growth target for the year, despite the impact of economic shocks emerging from September 11 events. The agriculture sector recorded a growth of 1.4 percent against the 2.6 percent negative growth in FY01. The manufacturing sector fared better in FY02, recording a substantial 4.4 percent growth. However, it was the services sector that overshadowed the overall GDP growth profile in FY02, rising 5.1 percent during the year vs. a target growth of 4.4 percent (BOI, 2005).

According to the latest figures (for 2000-2001), as measured by Pakistan's poverty line, 32 percent of the population is poor. More importantly, differences in income per capita across regions have persisted or widened. Poverty varies significantly among rural and urban areas and from province to province (World Bank, 2005).

5.1.1 Combating Poverty

There are several ongoing projects and programs aiming at poverty eradication in Pakistan. There is a great deal of cooperation among various sectors of economy towards poverty alleviation in Pakistan. This is due to high priority given by the government to reduce poverty in Pakistan. Therefore, all national, provincial and district governments are committed to cooperate at all levels to eradicate poverty from the society. Moreover, various NGOs and private sector is also involved in the poverty eradication program in Pakistan.

5.2 Population Growth

Pakistan's population in mid-2004 is estimated at 148.72 million - 1.9 percent higher than last year. It was only 32.5 million at the time of independence but 116 million more people were added during the last 57 years. Pakistan's population has been growing at a decelerating pace. Population growth has decelerated from 3.06 percent in 1981 to 1.9 percent in 2004 (Table 3). It took almost 23 years for population growth to decline by almost 1.2 percentage points. Decline in mortality rate owing to the elimination of epidemic diseases, improvement in medical services and the invention of good medicines on the one hand and a modest –decline

in fertility rate until the end of the 1980s on the other resulted in negligible decline in population growth (Government of Pakistan, 2003-04).

Recent influential study on fertility in Pakistan suggest that a decline in fertility began to be witnessed by the fag end of the 1980, and proceeded apace through 2000. The total fertility rate (TFR) remained constant at 6.8 children per woman since early 1960s and until the end of 1980s. The TFR began to decline thereafter and during 1996-2000 it was estimated at 4.8 children per woman. The same study suggests that at a rate of 1.8 children per woman per decade, fertility in Pakistan has declined more rapidly than in many countries in East and Southeast Asia, and much faster than in other countries in South Asia. The study concluded that for this reason there would be a relatively sharper decline in population growth during 2000-2004 (Feeny & Alam, 2003)

Table 3: Population Growth (1983-2004)

Mid Year	Total Population (Million)	Growth Rate (%)
1983	90.30	2.99
1984	92.96	2.95
1985	95.67	2.90
1986	98.41	2.86
1987	101.18	2.82
1988	103.99	2.77
1989	106.84	2.73
1990	109.71	2.69
1991	112.61	2.63
1992	115.54	2.60
1993	118.50	2.56
1994	121.48	2.51
1995	124.49	2.47
1996	123.87	2.47
1997	126.90	2.45
1998	129.97	2.42
1999	133.01	2.34
2000	135.90	2.20
2001	140.36	2.06
2002	143.17	2.00
2003	145.95	1.94
2004 (E)	148.72	1.90

Source: Government of Pakistan, Economic Survey of Pakistan 2003-04
E: Estimate

The growing population is also adding to the number of illiterates in the country, which have more than doubled from 22 million in 1961 to 54 million in 2001. The numbers of unemployed have increased six folds from 0.4 million in 1970-71 to the current level of more than 2.42 million. Thus, creating the need for increasing jobs by 69% only maintains the

unemployment rate at its existing level. Although, Pakistan's GNP has increased from US$ 2.6 billion in 1950 to US$ 61.8 billion in 2000, yet per capita incomes have not increased substantially with the result that 44 million people are living below the poverty line. In fact, per capita GNP is likely to fall if the present population growth rate is not controlled. Given the present population growth rate, the national income would have to rise by US$ 40.0 billion by the year 2020 just to maintain the present level of per capita incomes (United Nations, 2002).

The influx of Afghan Refugees into Pakistan started in 1979 and peaked at 3.7 million in June, 1990. Data for Afghan Refugees reveals that Pakistan is still hosting around 2.2 million Afghan Refugees during January, 2001. For more than 22 years, Pakistan has generously hosted refugees affected by the civil war in Afghanistan. Apart from exerting pressure on the tight labor market in Pakistan, Afghan refugees have inflicted considerable economic loss and ecological damage in the country (Government of Pakistan, 2001).

5.2.1 Population Control Measures

Although Family Planning Programs have been pursued in the country, frequent changes in strategies and inconsistent political support have acted as a hindrance in their successful implementation. One of the 14 core programs of the National Conservation Strategy (NCS) of Pakistan is integrating population and environment. Therefore, an important operational principle of the NCS is to reduce the rate of population growth as quickly as possible, while simultaneously improving the quality of the human resource base. Many facts are being used in the approach to solve the problem, including education, health, family planning, reproductive health and programs for women etc.

5.3 Investment Liberalization

The investment and savings rates have remained low despite of an impressive economic growth in Pakistan. In the 1970's and 1980's, investment as proportion of the GDP fluctuated between 13 and 19 percent (Table 4). However, investment as percentage of GDP recorded an increase in the early 1990s but since 1992-93, it has a declining trend reaching to its lowest level 14.8 percent in 1998-99, which is largely attributable to decline in the public sector investment. The declining trend in investment has contributed to the deceleration of growth in the 1990s (Government of Pakistan, 2001). This shows the fact that the country will have to

increase its investment rate, if it has to achieve a sustainable higher economic growth, which is possible only by means of attracting foreign investment.

Table 4: Savings Investment Gap

At current prices						
Million Rupees				As Percent of GDP		
Years	Savings	Investment	S-I Gap	Savings	Investment	S-I Gap
1972-73	7,213	8,647	-1,434	10.7	12.8	-2.1
1973-74	6,179	11,614	-5,435	7.0	13.2	-6.2
1974-75	6,655	18,218	-11,563	6.0	16.4	-10.4
1975-76	14,672	24,057	-9,385	11.3	18.5	-7.2
1976-77	18,451	28,856	-10,405	12.3	19.3	-6.9
1977-78	25,525	31,505	-5,980	14.5	17.9	-3.4
1978-79	23,847	34,876	-11,029	12.9	18.9	-6.0
1979-80	32,060	43,345	-11,285	13.7	18.5	-4.8
1980-81	42,070	52,207	-10,137	15.1	18.8	-3.6
1981-82	46,254	62,447	-16,193	14.3	19.3	-5.0
1982-83	61,947	68,462	-6,515	17.0	18.8	-1.8
1983-84	63,220	76,701	-13,481	15.1	18.3	-3.2
1984-85	61,056	86,525	-25,469	12.9	18.3	-5.4
1985-86	76,608	96,545	-19,937	14.9	18.8	-3.9
1986-87	97,195	109,540	-12,345	17.0	19.1	-2.2
1987-88	92,062	121,666	-29,604	13.6	18.0	-4.4
1988-89	108,398	145,570	-37,172	14.1	18.9	-4.8
1989-90	121,514	162,076	-40,562	14.2	18.9	-4.7
1990-91	144,773	193,447	-48,674	14.2	19.0	-4.8
1991-92	206,809	244,059	-37,250	17.1	20.1	-3.1
1992-93	182,004	277,744	-95,740	13.6	20.7	-7.1
1993-94	246,205	305,477	-59,272	15.7	19.4	-3.8
1994-95	269,872	346,508	-76,636	14.3	18.4	-4.1
1995-96	249,842	403,417	-153,575	11.7	18.8	-7.2
1996-97	286,074	436,043	-149,969	11.6	17.7	-6.1
1997-98	385,029	468,008	-82,979	14.1	17.1	-3.0
1998-99	363,588	446,872	-83,284	12.0	14.8	-2.8

Source: Government of Pakistan, Economic Survey of Pakistan, 2000

Historically, there have been restrictions on foreign direct investment for many years but these restrictions have declined sharply since the late 1980s (Government of Pakistan, 1990/99). In the early 1990s, the government took a number of policy and regulatory measures to improve the business environment so as to attract Foreign Direct Investment (FDI) (Anwar, 2001).

- The requirement for government approval of foreign investment was removed with the exception of few industries
- Foreign equity participation of up to 100 percent was allowed and foreign investors were allowed to purchase equity in existing industrial companies on repatriable basis
- Foreign investors were also allowed to negotiate the terms and conditions of payment of royalty and technical fee suited to them as well as acceptable to the multinationals for technology transfer
- The government also liberalized the foreign exchange regime. Foreigners were allowed to bring in, possess and take out foreign currency and to open accounts and hold certificates on foreign currency. Remittance of principal and dividends from FDI and from portfolio investment made by foreign investors were also allowed without prior permission or clearance from the State Bank of Pakistan
- The government also gave an extensive set of investment incentives including credit facilities, fiscal incentives and visa policy.

5.4 Environmental Issues in Pakistan

Ineffective natural resource management over many years coupled with the population growth have had a negative impact on Pakistan's environment. Agricultural runoff exacerbated by ongoing deforestation and industrial runoff have polluted water supplies, factory and vehicle emissions have degraded air quality in the urban centres. Similar to other developing countries, Pakistan has focused on achieving self-sufficiency in food production, meeting energy demands, slowing population growth, and increasing economic growth rather than on curtailing pollution or other environmental hazards. As a result, "green" concerns have not been the government's top priority. The following major environmental concerns are discussed below briefly:

5.4.1 Forest Conservation and Desertification

Forest covers 4.6 million ha which accounts for 5.2 % of the land territory (Table 5). Production forest accounts for 27.6 % while conservation forest 72.4 %. Most of the conservation forest is for social and water conservation objectives. It is estimated that the forest area has decreased from 141,530 km^2 in 1880 to 67,310 km^2 in 1980. Annual decrease of the forest area during 1979 and 1985 is 1.8%, while 12.8% during 1985 to 1988 (Sheikh, 2000).

Table 5: Forest Area by Province (1,000 Hectare)

Province	Total	Forest	Percentage
North-West Frontier	10,170	1,410	13.9
Punjab	20,630	630	3.1
Sind	14,090	680	4.8
Baluchistan	34,720	720	2.1
Northern Areas	7,040	770	10.9
Asad Kashmir	1,330	360	27.1
Total	87,980	4,570	5.2

Source: Sheikh, 2000
Note: The Total area includes the area of Asad Kashmir

The main issues related to desertification in Pakistan include: water erosion, wind erosion, depletion of soil fertility, deforestation, livestock grazing pressure, loss of biodiversity, water-logging and salinity, drought and flooding and socio-economic constraints. About 11 million hectares are affected by water erosion and 3-5 million hectares by wind erosion. The amount of soil removed by wind is about 28% of total soil loss. Due to deforestation, forest cover is shrinking by 3.1% and woody biomass by 5% annually (7000-9000 ha taken away annually). Free grazing of livestock, aridity and prolonged drought in arid lands have affected the biodiversity in various regions. About 15.5 million ha are affected by water-logging and 5.0 million ha by salinity/sodicity (Pakistan Agriculture Research Council, 2002).

5.4.1.1 Combating Deforestation and Desertification

The government banned logging in the North-West Frontier Province in 1992, which was the first official measure against deforestation. In 1995, logging ban was imposed also to the hilly areas of Murree and Kahuta. At present, forest conservation projects are underway in Dir, Swat, Sirin Valley, Kohistan and other areas of Punjab and NWFP.

Some technological interventions to address the issues of desertification have been successfully implemented in different parts of Pakistan. Some of these include; Rangelands Utilization Model in Pothohar Plateau, Gully Land Management through Soil Conservation and Water Harvesting, Range Improvement through Community Participation, Salinity Control and Reclamation of Affected Areas, Rehabilitation of Desert Ranges through Reseeding, Forage Reserve Establishment in Arid Highland Balochistan, Reclamation of salt-effected areas, Desertification Control in Cholistan and Restoration of Land Productivity in Barani (Arid) Lands.

5.4.2 Air and Water Pollution

Data on air pollution in Pakistan is insufficient. Concentrations of the pollutants are measured in Lahore, Rawalpindi, Islamabad, and Peshawar for only short duration, and total amount of pollutants is estimated only for Lahore and Peshawar. It is reported that motor vehicles are major sources of the pollutants, which account for 90 % of total emission of hydrocarbons, aldehydes and carbon monoxide and 3/4 of SO_x and NO_x but the evidence for it is not shown (Sheikh, 2000).

Urban excreta flow into the sewerage with domestic wastewater through roadside and waterways. Human excreta are a major source of water-born diseases. Gastrointestinal diseases account for 25 – 30% of hospital cases. 60% of infant deaths are due to infectious and parasitic diseases most of which are water-born (Sheikh, 2000).

Only three sewerage treatment systems exist, of which two operate just intermittently. Most of the untreated wastewater flows into stream, rivers and irrigation canal.

5.4.3 Solid Waste Management

It is estimated that 47,920 tons of solid waste is generated in a day, that is, 17.5 million tons per year, and only about a half is collected (Sheikh, 2000). Collected waste is dumped only onto low-lying land without sanitary method. Another half is disposed of at vacant areas, gutters or sewerage system. Toxic and hazardous industrial waste is considered to be dumped into the same land area, or where adjacent to factories. Scavengers collect valuable material at the dumping sites and contribute to recycling in a sense. Medical waste is also disposed f in the same area and it imposes health risk to the scavengers.

Local governments collect and transport domestic waste. City Development Authority (CDA) in Islamabad, Rawalpindi Municipal Corporation (RMC) and Rawalpindi Cantonment Board (RCB) and Lahore Municipal Corporation (LMC) are the examples.

5.5 Pakistan's National Conservation Strategy

In Pakistan, efforts are now underway to facilitate the design and implementation of sustainable development initiatives by the state authorities as well as the local people.

Pakistan's Agenda 21 is the National Conservation Strategy (NCS), which was approved by the Government of Pakistan on March 1, 1992. All reports regarding strategies, policies and programmes for sustainable development are to be drawn up on the basis of the NCS. This 406-pages document was prepared by a team of experts over a three-year period under the supervision of the Deputy Chairman of the Planning Commission of Pakistan. It describes the stark reality of the country's deteriorating resource base and its implications for what is still largely a natural resource-based economy. It sets forth the beginnings of a plan to integrate environmental concerns into virtually every aspect of Pakistani economic life. The Strategy has three overriding objectives: conservation of natural resources, sustainable development, and improved efficiency in the use and management of resources. Reaching these goals depends in turn on three operating principles (Environment Division, 1992):

- Achieving greater public partnership in development and management;
- Merging environment and economics in decision making;
- Focusing on durable improvements in the quality of life of Pakistanis.

The NCS recommended the following 14 core programme areas for priority implementation: -

1. Maintaining Soils in Cropland
2. Increasing Irrigation Efficiency
3. Protecting Watersheds
4. Supporting Forestry and Plantation
5. Restoring Rangelands and Improving Livestock
6. Protecting water bodies and Sustaining Fisheries
7. Conserving Biodiversity
8. Increasing Energy Efficiency
9. Developing and Deploying Renewables
10. Preventing/Abating Pollution
11. Managing Urban Wastes
12. Supporting Institutions for Common Resources
13. Integrating Population and Environment Programs
14. Preserving the Culture Heritage

Following the National Conservation Strategy (NCS), provincial strategies adopted many process innovations such as round table workshops, working with contact people in line agencies, and subsequently initiating district strategies The lower the level, the more clearly

are sustainable development and livelihood trade-offs having to be addressed (OECD, 1990). The challenge recognized in Pakistan is now to develop channels for information and demands to be expressed from district, to provincial, to national levels. It is therefore proposed that NCS-2 should focus on national level concerns and national institutional roles, rather than prescribing everything right down to the village level. But it will also recognize encourage and support provincial, district and other demand-driven strategic approaches based on local realities consonant with the devolution plan.

5.6 Summary

In Pakistan poverty along with population growth remain the major concerns. The country data showed that 35% of the population was under poverty line in the year 1999. However the recent years showed a substantial economic growth despite of some negative impacts. The government policies (such as open trade, and investment liberalization) have drastically changed in the recent past to improve the economic growth in the country. However, despite numerous highly attractive incentives offered to foreign investors, the country's performance in attracting foreign investment has been poor. The major environmental concerns in Pakistan are deforestation, water and air pollution and solid waste management. The National Conservation Strategy of which is the agenda 21 of Pakistan focuses these aspects comprehensively. There are a number of ongoing projects and programs that focus to combat the prevailing economic, social and environmental problems in Pakistan. However, there is still a dire need of greater co-operation on both national and international level in order to bring the sustainable development in Pakistan

Summary & Conclusions

- The literature on the concept of sustainability and sustainable development is extensive. Sustainable Development was popularized by the 'Brundtland Commission', which defined the term as "the development that meets the needs of present generations without compromising the ability of future generations to meet their needs". There are huge differences in extant interpretations of the sustainability concept. This is due to differences in ethical position and opinions about what to sustain. Further, the underlying assumptions often determine model outcomes, thus driving management prescriptions. Ultimately, however, it is an empirical matter as to which assumptions are correct.

- A number of Economists put forth their theories to explain the pattern of economic growth. English classical economist David Ricardo feared eventual stagnation from slow capital accumulation, and diminishing returns from population growth on fixed natural resources. Marx saw historically dialectically – as progressing from feudalism to capitalism to socialism on the basis of class conflict. The oppressed classes overthrow the classes controlling the prevailing means of production. Rostow's economic model has five stages; its central historical stage is the take-off, a decisive period of increased investment, rapid growth in leading sectors, and institutional change during which the major blocks to steady growth are finally overcome. The vicious circle theory contends that a country is poor because income is too low to encourage potential investors and generate adequate saving. Moreover, the Neoclassical growth theory emphasizes the importance of increased saving for economic growth.

- Sustainable development supplements conventional analysis of economic development by the inclusion of the interaction between economic activity and the natural resource base composed of inputs to the production process and an absorber of waste generated by that process. Sustainable development also broadens conventional development objectives by including the preservation of the natural resource base to enable future generations to carry on the economic activity.

- Poverty is a major cause and effect of environmental problems. Poverty, which denies poor people the means to act in their own long-term interest, creates environmental stress (such as deforestation, soil erosion etc.) leading to resource degradation and growing associated problems.

- In Pakistan poverty along with population growth remain the major concerns. The country data showed that 35% of the population was under poverty line in the year 1999. However the recent years showed a substantial economic growth despite of some negative impacts. The government policies (such as open trade, and investment liberalization) have drastically changed in the recent past to improve the economic growth in the country. However, despite numerous highly attractive incentives offered to foreign investors, the country's performance in attracting foreign investment has been poor.

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- There are a number of ongoing projects and programs that focus to combat the prevailing economic, social and environmental problems in Pakistan. However, there is still a dire need of greater co-operation on both national and international level in order to bring the sustainable development in Pakistan

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