

## DESERTIFICATION AND ECONOMIC GROWTH: A STUDY FOR THE LEADING FACTORS

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### ABSTRACT:

Desertification is a global process with serious local consequences, and it concerns everyone. Desertification directly affects population, the land area, productivity and consequently has a major socio-economic impact. This paper is aiming to review shortly, and to analyze the causes and main factors of desertification phenomenon. Furthermore it's aiming to examine the socio-economic effects in relation to growth and sustainable development.

### ΠΕΡΙΛΗΨΗ:

Η ερημοποίηση είναι ένα παγκόσμιο φαινόμενο με σοβαρές τοπικές διαστάσεις που αφορούν όλους μας. Η ερημοποίηση επηρεάζει άμεσα τον πληθυσμό, την έκταση της γης, τη παραγωγικότητα, και συνεπώς έχει σημαντικές κοινωνικό-οικονομικές επιδράσεις. Το άρθρο αυτό στοχεύει στο να κάνει μια σύντομη επισκόπηση και να αναλύσει τις αιτίες και τους κυριότερους παράγοντες του φαινομένου της ερημοποίησης καθώς επίσης και να εξετάσει τα κοινωνικό-οικονομικά αποτελέσματα σχετικά με την ανάπτυξη.

**KEYWORDS:** Desertification, degradation, Economic Policies, Growth, socio-economic effects.

JEL Classification: Environment.

### 1. INTRODUCTION

The word "desertification" stands for diminishing or vanishing productivity of agricultural, pastoral and forested lands of the arid, semiarid and dry sub-humid areas of the Earth. Therefore desertification does not result from increasing the extension of existing deserts. The decade of the 1950's witnessed the first worldwide effort to call attention to the problems and potentials of arid regions. Desertification of the arid lands of the world has been proceeding--sometimes rapidly, sometimes slowly--for more than a thousand years. It has caused untold misery among those most directly affected, yet environmental destruction continues. Nevertheless, it seems important to state that, in certain parts of the world, desertification processes (land degradation) operate in the absence of human activities, where such activities are negligible because of low population density. This paper reviewing the desertification phenomenon and also analyze the socio-economic impact, in relation to sustainable development.

### 2. THE ROLE AND THE MEANING OF DESERTIFICATION: DEFINITION OF TERMS

World Commission on Environment and Development (World Bank) concluded that:

- 70 percent of the world's dry lands used for agriculture is affected by various forms of land degradation (to some degree)
- land permanently degraded to desert-like conditions continues to grow at the annual rate of 6 million hectares, and that
- each year 21 million additional hectares provide no economic return because of the spread of desertification.

The Preface to the UNEP World Atlas of Desertification, (1992) provided the following commentary:

- one-sixth of the world's population is threatened by the effects of desertification

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■ in 1977, land degradation resulted in 57 million people no longer being able to produce enough food to sustain them, and by 1984, their numbers had risen to 135 million.

Desertification is a phenomenon affecting a large part of the arid regions of our planet. "Desertification" as the reduction or spatial reorganization of net primary production in arid and semi-arid lands. Land degradation has been defined as a reduction in the soil's capacity to produce in terms of quantity, quality, goods, and services.

Tables 1 and 2 indicating the areas affected by desertification, whereas figure 1 illustrates main causes of dryland soil degradation by region.

Table 1. Area of regions affected by or in danger of desertification

| Degree of Desertification risk | South America   |     | North and Central |      | Africa          |      | Asia            |      | Australia       |      | Europe          |     |
|--------------------------------|-----------------|-----|-------------------|------|-----------------|------|-----------------|------|-----------------|------|-----------------|-----|
|                                | Km <sup>2</sup> | %   | km <sup>2</sup>   | %    | km <sup>2</sup> | %    | km <sup>2</sup> | %    | km <sup>2</sup> | %    | km <sup>2</sup> | %   |
| Very high                      | 414195          | 2.3 | 163191            | 0.7  | 1725165         | 5.7  | 790312          | 1.8  | 307732          | 4.0  | 48957           | 0.5 |
| High                           | 1261235         | 7.1 | 1312524           | 5.4  | 4910503         | 16.2 | 7253464         | 16.5 | 1722056         | 22.4 | -               | -   |
| Moderate                       | 1602383         | 9.0 | 2854293           | 11.8 | 3740966         | 12.3 | 5607563         | 12.8 | 3712213         | 48.3 | 189612          | 1.8 |
| Extreme desert                 | 200492          | 1.1 | 32638             | 0.16 | 177956          | 20.4 | 1580624         | 3.6  | -               | -    | -               | -   |

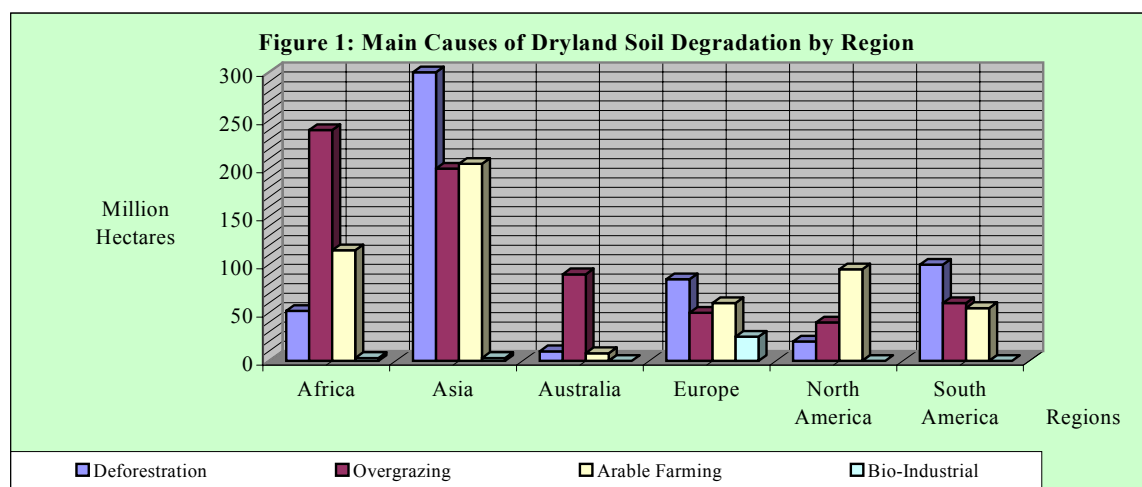
Source: FAO/Unesco/WMO. World Map of Desertification, 1977.

Table 2. Areas likely to be affected by desertification (classified by bioclimatic zone)

| Degree of Desertification risk | Hyper-arid      |   | Arid            |      | Semi-arid       |      | Sub-humid       |      |
|--------------------------------|-----------------|---|-----------------|------|-----------------|------|-----------------|------|
|                                | km <sup>2</sup> | % | km <sup>2</sup> | %    | km <sup>2</sup> | %    | km <sup>2</sup> | %    |
| Very high                      |                 |   | 1110477         | 6.4  | 2180546         | 12.1 | 158528          | 1.2  |
| High                           |                 |   | 13439968        | 77.3 | 2440098         | 13.6 | 579717          | 4.3  |
| Moderate                       |                 |   | 2105167         | 12.1 | 12452272        | 69.4 | 3172905         | 23.3 |
| Extreme existing Desert        | 7991710         |   | 16655612        |      | 17072916        |      | 3911150         |      |

Source: FAO/Unesco/WMO. World map of desertification, 1977.

Half the countries on earth lie partly or entirely in the arid and semiarid zones, which cover one-third of the planet's land surface, 44 percent when the subhumid zone is included. In 1950, the population of these countries was 76 million; in 1985, population reached 205 million. The United Nations Environment



Program brings some perspective to this debate. It estimates that:

- some 30 percent of the earth's land area suffers slight, moderate, or severe desertification, with
- an additional six percent classified as "extremely, severely desertified" land which cannot be recovered. (UNEP, Nairobi 1984)

### **3. FEATURES AND ASPECTS OF ECONOMIC POLICY ON DESERTIFICATION**

Economic and Social policies are the main factors which directly determine the desertification and sustainable development. Monetary policy involves changes in the monetary base (i.e. currency plus bank reserves) accomplished through open market operations. In practice, central bank implements monetary policy using the interest rates, incentives for investment and credit policy as the main policy instruments. Monetary policy including investment and incentive policy, and credit policy. Monetary policy determines the quantity of the monetary base, and, as by product establishes the aggregate amount of credit that the Central Bank will extent. Credit policy is a part from monetary policy involves the choice of central bank assets, i.e. the allocation of credit. Central bank credit policy determines how the given aggregate amount of credit will be allocated across alternative assets.

The policy adopted by a government for raising revenue to meet expenditure and for influencing the level of business activity. Fiscal policy finds expression in the annual budget. Fiscal policy including the tax-policy, the public finance system and public expenditure policy. Taxes can be classified as direct taxes (taxes on wealth and income) and indirect taxes (surcharges on prices, which are paid eventually by consumers, like VAT and excise taxes). Trade Policy is undertaken in pursuit of the government overall macroeconomic objectives available to a country that seeks to restrict or modify the pattern of its international trade in some way.

Sectoral policy is a supplementary important tool for sustainable development and furthermore for economic and social cohesion. Sectoral policy including agricultural and industrial policies. The agricultural policy is very important for the union. Industrial policy can be defined as government actions to influence industry and thus considered as state interventionist policy.

Economics plays a major role in the sustainability and desertification. In order to be sustainable, agriculture must be economically viable. That is not to imply that all producers or all forms of production must be viable in any region at a particular time. Variations in the returns are necessary and indeed desirable. They stimulate change in the mix of products produced, thereby achieving consistency with the demands of the market. The emphasis on grain production on the prairies combined with the associated dependence on export markets has rendered the prairie region highly susceptible to changes in the world economy. Trade policies of other nations can and do impact severely on the region. In consequence, government has been moved to alleviate the ensuing distress through various programs of assistance.

### **4. THE MAIN CONSEQUENCES OF DESERTIFICATION**

The consequences of desertification - the phenomenon of land degradation - depend on four factors that vary by region, country and year:

- the seriousness and extent of land degradation;
- the severity of climatic conditions at the lime (especially annual rainfall);
- the number and diversity of affected populations; and
- the level of development of the country involved.

By improving the natural potential of the ecosystems, desertification also reduces agricultural yields, making them more unpredictable. It therefore affects the food security of the people living in the affected areas. The people develop a survival strategy in order to attend to their most urgent requirements, and this in turn helps to aggravate desertification and hold up development.

Desertification also leads to a positive change in certain behaviour patterns. These include, in particular, the attitude of the women who have to cope with the problems caused by the absence of the men, who have to leave to

seek work elsewhere. The extra burden of work and the responsibilities which the women have to undertake are having two consequences:

- women are now demanding greater ease of access to the land, particularly the land they manage themselves.
- women are becoming increasingly aware of the need to space births.

The effects of desertification are extremely serious and often dramatic for the poor populations of developing countries. By limiting natural potential desertification reduces production and makes it increasingly precarious. Forced to attend to the most urgent things first, populations resort to survival strategies that unfortunately make desertification worse and prevent any development.

While desertification has brought about a sharp reduction in agricultural equipment, it has also helped to multiply and broaden technical knowledge, especially on the environment and its conservation. The environment is increasingly being conceived as:

- a sensitive area that has been overneglected and overexploited, requiring work and management efforts to repair the results of past mistakes and precipitate action; and
- belonging to the rural peoples, whose wish to appropriate land and organize themselves into groups, cooperatives, village development associations, autonomous local associations, etc., is evolving and augurs well for the future.

This is perhaps the most serious consequence of desertification. Desertification combined with long periods of drought result in reduction in food productivity and the constant threat of famine. The livelihoods of an estimated 1.2 billion people worldwide will be affected by desertification by the year 2000, one-fifth of the global population of 5.5 billion. Many will become environmental refugees, further swelling congestion in the cities.

#### **(A). INCOME LOSS**

In terms of income lost, this destruction of productive capacity costs the world some US\$42.3 billion annually (in 1990 prices):

- US \$ 9,296 million in Africa
- US \$ 20,913 million in Asia
- US \$ 3,136 million in Australia
- US \$ 1,488 million for Europe
- US \$ 4,784 million in North America, and
- US \$ 2,691 million in South America.

These costs include decreases in agricultural production due to land degradation and

expenditures that are needed to rehabilitate desertified land. What are the costs associated with arresting or reversing this loss of income? The UNEP maintains that the costs for rehabilitating desertified land would amount to US\$10.6 billion per year, out of which US\$6.5 is needed to combat desertification in developing countries. These figures are based on the total cost of a 20 year rehabilitation programme, which would include:

- protective measures in non-affected or slightly affected lands
- corrective measures in moderately affected lands,
- and the rehabilitation of severely (and very severely) damaged lands.

More than 80 of the 100 countries affected by desertification are developing ones. Desertification is most destructive in the dry lands of South America, Asia, Europe, and Africa. For these three areas combined, 18.5 percent of productive lands are severely desertified.

#### **(B). A SPREADING PROBLEM**

In addition to the areas of the world being immediately affected by desertification, nearby regions are impacted by changes in water regimes which encourage soil erosion and siltation. This in turn can create difficult problems in waterways. The result can be the siltation and pollution of:

- inland and international waterways, and
- sensitive habitats (e.g. coral reefs in coastal areas downstream).

### **(C) . LOSS OF BIODIVERSITY**

The impact on the world's biodiversity is also a very serious concern. The activities of people have:

- modified the environment
- reduced biological diversity and productivity, and
- caused serious breakdowns in essential ecological processes.

### **(D) . CONSEQUENCES AT THE GLOBAL LEVEL**

Desertification also has consequences at the global level, primarily because of the influence on carbon exchange. Another consequence of desertification at the local and global level is the reduction in biodiversity, since it contributes to the destruction of the habitats of animal and vegetable species and micro-organisms. It encourages the genetic erosion of local livestock and plant varieties and species living in fragile ecosystems. Reducing the biodiversity directly affects the food and health of the local people who rely on a large number of different animal and vegetable species. But it is also a loss to the whole of mankind.

## **5. CONCLUSIONS**

"Desertification" is progressive loss and spatial redistribution of primary productivity and is the dominant process of land degradation of arid and semi-arid landscapes. It is a complex, non-linear phenomenon influenced by physical, ecological, and human systems and processes. Desertification is a world-wide phenomenon which causes the earth's ecosystems to deteriorate. It affects about two-thirds of the countries of the world, and one-third of the earth's surface, on which one billion people live, namely, one-fifth of the world population.

The seriousness of desertification depends on factors which vary from one region, country or year to another. These factors include:

- the severity of the climatic conditions in the period considered (particularly in terms of the annual rainfall);
- population pressure and the standard of living of the people involved;
- the level of the country's development, and the quality of the preventive measures established there.

Desertification is a global process with serious local consequences, and it concerns everyone. Some because they actively or passively cause it or aggravate it, others because, directly or indirectly, they suffer its consequences. The international community has long recognised that desertification is one of the most serious problems facing the planet, since it has clear social, economic and environmental implications. Insofar as desertification and drought affect around 1/6 of the world population and a total surface area of around 3.6 million hectares (i.e., approximately 30% of the continental zones of the planet), they have become a burning question calling for urgent measures to combat them.

The consequences of desertification - the phenomenon of land degradation - depend on four factors that vary by region, country and year:

- the seriousness and extent of land degradation;
- severity of climatic conditions at the time (especially annual rainfall);
- number and diversity of affected populations; and
- level of development of the country involved.

The poorer the peoples and the less developed the countries involved, the more profound will be the future effects of desertification, and the greater the potential for tragedy when natural conditions, especially climatic, become difficult.

#### ➤ **Desertification affects:**

- One sixth of the world's population (900 million people);
- One fourth of the world's total land area;
- Seventy per cent of all drylands, amounting to 3.6 billion ha.

#### ➤ **Desertification degrades:**

- Seventy-three per cent of the drier rangelands, amounting to 3.3 billion ha;
- Soil fertility and soil structure of 47 per cent of the dry land areas constituting marginal rainfed cropland;
- Irrigated cropland, amounting to 30 per cent of the dry land areas with a high population density and agricultural potential.

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