

7 Land Degradation and Desertification

Introduction

In September 2000, UN member countries pledged to meet the 8 Millennium Development Goals by 2015, including ensuring environmental sustainability.

On the agricultural side, this concept involves issues of ecosystems stability and protecting natural resources, which will be attained through good governance of these resources.

This chapter deals with the state of land resources and their management as well as the challenges they encounter and exerted efforts towards achieving good governance which will be reflected on the state of environment and human health, figure (7-1).

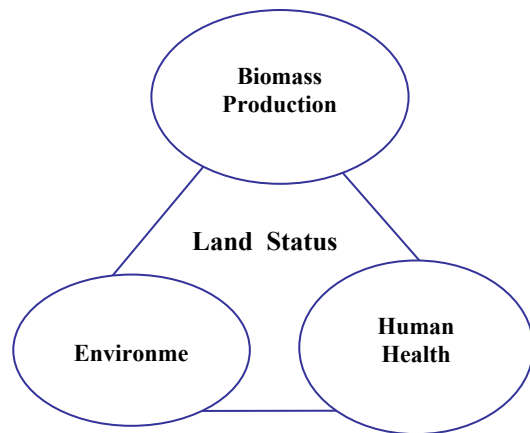


Figure (7-1) Land Status and related biomass production, environment and human health

Current Status of land in Egypt

- 1- The total area of Egypt amounts to one million square kilometers or the equivalent of 238 million feddans – of which the populated area is estimated to be

around 14 million feddans, i.e., less than 6% of the state total area. The agricultural lands area in Egypt is estimated to be about 8.2 million feddans, i.e., 3.45% of the state total area; with 5.7 million feddans of old irrigated lands in Delta and the Valley, 2.2 million feddans reclaimed and irrigated lands and about .,3 million feddans of rain-fed cultivations in both western and eastern coasts.

Hence, the agricultural lands per capita is about - , 0.115 feddans (485 square meters).

The disintegration of agricultural ownership and limited farms sizes was negatively reflected on issues of access to and transfer of technology or adopting advanced techniques in land sustainable management and maintenance. Data of Council of Ministers Information Center (2002) points out that nearly 73% of agricultural holdings is less than one feddan and about 91% of the holdings is less than 2 feddans and more than 95% is less than 5 feddans, while 95.5 of farmers own 65.4% of the agricultural land area in Egypt as shown in table (7-1). Limited areas are still owned by some business sector firms.

The current usage of the agricultural lands in Egypt is characterized by being among most intensive agricultural systems in the world. It may reach three crop cultivations a year – this extensive usage under the circumstances of demographic growth pressures, necessitates resorting to additional vegetation production inputs, i.e., irrigation, fertilization and pesticides ...etc. This have led to a clear unbalance between production and land maintenance, especially that most of the farmers as mentioned above are small holders who are unable to

Table (7-1) Distribution of Agricultural Lands Ownership

Size of Ownership	Percentage of Land-lords		Percentage of owned Area	
	Accumulative percent	Category percent	Accumulative percent	Category percent
Less than 1 feddan	72.8	72.8	29.38	29.38
Less than 2 feddans	91.2	18.4	47.93	18.55
Less than 5 feddans	95.5	4.3	65.40	17.47
Less than 10 feddans	96.7	1.2	74.70	9.3
Less than 20 feddans	97.85	1.15	82	7.3
Less than 50 feddans	99.2	1.35	88.4	6.4
Less than 100 feddans	99.9	0.7	94.9	6.5
More than 100 feddans	100	0.1	100	5.1

use effective means of maintenance to protect their lands.

- 2- In addition to the cultivated lands, Egypt has considerable rangeland areas estimated to be 4 million hectares or about 9.5 million feddans according to the National Program for Combating Desertification⁶, including 5.5 million feddans in northwest coast region, 2.6 million feddans in scattered areas of Sinai peninsula i. e., northern plains, inner valleys in north, center "middle" and southwest Sinai and 1.4 million feddans in Halayeb – Shalateen triangle.

The current situation of the range lands in Egypt is tending to be extremely limited as far as grazing is concerned. Nearly 50% of these lands are rated very poor, about 35% are fair and 15% are good.

Major Pressures on Land Resources in Egypt

Productive land resources in Egypt are under multiple pressures and factors leading

to soil degradation and prevent the sustainable development which secures a good quality for environment human health. Main factors and operations leading to desertification and soil degradation are the following:

1- Urbanization

The urban encroachment over the fertile agricultural lands is considered one of the most serious desertification processes – as it is from an agricultural view – a complete and total impairment of the basic function of the land which is the biomass production, including food, clothing and medicine. This phenomenon has been addressed by new legislations, where the ratio of urban encroachment over the fertile agricultural lands decreased from nearly 30.000 feddans in the year to 5000 feddans in 2005.

2- Water logging and soil salinity

The water logging and soil salinity is one of the most eminent processes of agricultural lands degradation in Egypt due to poor water management in the domain of agriculture which follows the conventional surface irrigation system with an efficiency of no more than 60% in the vast majority of the irrigated lands of the countries in addition to reusing the agricultural drainage water containing a high ratios of saline in irrigation by mixing it with canals water used in irrigation. Also the extreme drawing of underground water in the reclaimed areas, sea water intrusion in coastal areas and lack of adequate agricultural draining system in large areas of the irrigated lands.

Several studies indicated that about 30% of the irrigated lands in Egypt are salt affected soils with different ratios⁽⁴⁾.

3- Pollution

Pollution is among the most serious factors of lands degradation in Egypt as it threatens large areas of agricultural lands and consequently human beings and animals as a result of poor lands and water management, and human behavior in the rural community. Pollution comes from the fact that the Nile water –the main source of irrigation in the Egyptian lands- contains high concentrations of pollutant materials and elements in addition to reusing agricultural drainage water- containing residues of fertilizers and pesticides as well as using treated sewage water in irrigation.⁽²⁾

4- Soil Fertility Depletion

Intensive agriculture and excess quantities of irrigation water, given the lack of Nile alluvium with what it carries of basic nutrient (alimentary) elements for vegetation after building the High Dam and lowering organic fertilizing ratios, particularly in reclaimed lands (estimated to constitute about 40% of the total irrigated lands in Egypt. All this led to clearly shown degradation of soil fertility and levels of vegetation production from land were in most cases inadequate to the levels of production inputs and do not respond to be increased. Lack of agricultural production in lands deficient in concentrations of basic nutrient (alimentary) elements and clear degradation of their fertility

reached nearly 15%.⁽⁴⁾

5- Land Physical Degradation

Excess exploitation occurred as a result of intensive agriculture in agrarian lands aiming at performing most service operations i.e., surface plowing, agriculture, pest control and harvesting under unsuitable conditions and mostly with unfitting tools. All this led to clear degradation of soil structure and appearance of plow pans limiting the growth, deepening the growing plant roots and reducing the efficiency of agricultural drainage, especially in some areas of north and northeast Delta and production decrease in these sites is estimated as a result to be about 8%.⁽⁵⁾

6- Soil Erosion

Given that Egypt is located in the severely dry region extended from North Africa to West Asia, the wind erosion is considered one of the important land desertification processes in areas exceeding 90% of the state area in western desert, eastern desert and particularly Sinai. These areas are characterized by a fragile ecosystem, scarcity of vegetation cover and severe drought.

Studies indicate that wind erosion ratio in Egypt is about 5.5 ton/hectare a year in oases areas in western desert and 71-100 ton/hectare a year in areas of rain-fed agriculture on northwest coast showing wind erosion risks in these areas wavering between moderate and severe.⁽⁷⁾

During rain falling periods in winter season, the water erosion in north coast, Red Sea, Aqaba Gulf and south Sinai

coasts and some of eastern desert valleys areas, is considered one of the most grave desertification processes in these areas as studies are indicating that water erosion impact in Egypt on lands is low to severe.⁽²⁾

7- Sand Dunes

Sand dunes and piles/heaps are most vulnerable areas to wind erosion and sedimentation. Thus they severely jeopardize all activities of agricultural development and urban communities both rural and urban. Sand dunes cover an area more than 166.000 square kilometers or 16.6% of the total area of state. Most dangerous are the active dunes which are threatening development in areas of west delta (255 square kilometers), in Fayoum and Wadi Al Rayan (880 square kilometers), in western grooves of Minya, Assyout and Beni Swaif governorates (350 square kilometers), in El-Kharja oases (400 square kilometers) and in northwest High Dam lake (800 square kilometers) in addition to other areas in east delta and north Sinai, particularly in some sites around the path of Al Salam canal.



Picture (7-1) sand dunes jeopardizing establishments and infrastructure

Main Challenges to Land Resources in Egypt

Lands status in Egypt and their degradation because of logging, salinity and pollution of surface and underground water in addition to losing fertility, physical degradation of the irrigated lands and soil erosion indicate that the current techniques of lands management are not sustainable. The excess usage may not ensure development of productivity or even its stability (in presence of the same production inputs). It does not provide the environmental dimension in protecting the natural resources, in terms of preventing water and land degradation and maintaining the quality of products and hence human health and prosperity. All this necessitates designing and implementing clear programs for addressing the situation.

In this respect, Egypt has more than 5 million feddans of pasture lands suffering from several degradation factors. No doubt, that the rehabilitation of such pasturelands, their development, preservation, sustainable management and organizing grazing on them, are very important and necessary prerequisites for developing local communities in these areas. Also they are important to increasing national income and creating new urban communities to alleviate unemployment and contribute to the stability of the community. Hence, it was necessary, to adopt and implement an integrated program containing all executive, institutional and legislative aspects needed for managing pasture (range) lands.

State Efforts in the Area of Fighting Land Degradation

The state exerts serious efforts to address agricultural land degradation and mitigate

pressures to which it is exposed. The general policy adopted by Egypt of combating land degradation and desertification are based on two trends:

First Trend:

It aims at controlling land degradation factors and reducing their risks and implications. Basic features and activities are highlighted in the framework of this trend as follows:

1- Pollution Reduction

- a. Implementation of integrated agricultural pest control program and using hormones for biological resistance of agricultural pests, have led to rationalization of using chemical pesticides in resisting agricultural pests. This resulted in reducing their use with more than 80%.
- b. Implementation of using treated sewage water for afforestation in targeted areas of nearly 400 thousand feddans – to prevent getting rid of it in the Nile or agricultural drains.
- c. Removal of subsidies allocated for commercial fertilizers led to raising their prices, helped in reducing their waste ratios and hence helped in reducing water and land pollution.

2- Land Improvement and upgrading its productivity:

- a. National program of agricultural drainage in cooperation with the World Bank and other institutions besides private sector contribution in some areas. By the end of current five year plan 2002-2007, the introduction

of tiled drainage in about 5.75 million feddans shall be completed.⁽¹⁾

- b. Agricultural land physical properties improvement program, where the state established the Executive Authority of Projects for Land Improvement to initiate soil laser leveling operations aiming at raising the efficiency of distributing and using the irrigation water, sub-soiling to disintegrate plow pans and adding agricultural gypsum to treat the soil alkalinity.

Second Trend:

The state strategy which is built on minimizing land degradation would be extended to the desert in order to increase the populated area to 50-60 million feddans or 25% of total area of the state where new urban communities shall be established.

The state pays this trend a great heed and dedicates a large part of consultations to this discipline. Apparent examples on this trend are the following:

1. The electoral program of the President of the Republic included reclaiming and cultivating one million new feddans during the present presidency term of office (6 years).
2. The present government has adopted a project for establishing 400 villages in the desert lowland/hinterland areas between Beni Swaif and Aswan governorates.
3. Implementation of a number of national mega projects for expansion and comprehensive development in the depth of the desert – on top of them South Egypt Development Program known as Tushki Project (540 thousand feddans in Tushki desert west the High Dam

Lake) and East Ouyanat Project (another 500 thousand feddans east Ouyanat and south the oases of the western desert) irrigated by underground water.

The other national project is Al Salam Canal project targeting cultivating and developing 600 thousand feddans, about 400 thousand feddans in north Sinai and the rest west Suez Canal. This project is dependant on irrigation by mixed Nile water with agricultural drainage water.

4. The state also pays a great heed to developing and upgrading Egyptian agricultural areas with a view to expanding sustainable development, establishing urban communities and development activities in these areas. Most important activities in such rainfed areas, are as follows:

- a. Matrouh resources development project which contributed in upgrading and developing pastures animal wealth, rain water harvesting and increasing productivity of horticulture and field crops.
- b. Joint projects with German Aid Agency (GTZ) targeting the development of local communities and promoting indigenous knowledge besides identifying the development needs in these areas.
- c. National project for Sinai development involving modernization of fruits cultivation, valleys development and stabilization of sand dunes in the north part of Sinai.

National Program of Action of the Arab Republic of Egypt Designed to Fight Desertification

In 1994, Arab Republic of Egypt signed the UNCCD (United Nations Convention on Combating Desertification) and was ratified by the Republican decree No. 155 of 1995. In 2001, the state assigned the implementation of the convention to the Ministry of Agriculture and Land Reclamation and mandated Desert Research Center to be the national coordinator of the convention.

Egypt implemented all the commitments and obligations stated by the convention and prepared the National Action Program for Combating Desertification – together with the necessary legislations and institutions for its implementation. The concerned authorities approved the program activities and the program was submitted to UNCCD secretariat in October 2005.

The Egyptian National Program on Combating Desertification included five major programs of which emanate a number of projects for combating desertification various agricultural environmental regions, summarized in the following:

1. Principal programs, including:
 - a. Evaluating and monitoring desertification.
 - b. Capacity building.
2. Pastures Improvement programs, including:
 - a. Rehabilitating degraded pasture/range lands.
 - b. Preserving land and water resources.
 - c. Managing natural grazing lands.
3. Sand dunes stabilization programs, including:

- a. Protecting Nasser Lake shores against sand dunes.
 - b. Stabilizing sand dunes in Siwa oasis.
 - c. Stabilizing sand dunes in north Sinai.
4. Irrigated agriculture programs, including:
 - a. Improving and modernizing irrigation techniques.
 - b. Integrated management of irrigation projects.
 - c. Managing and improving lands.
 - d. Treating soil and water pollution.
 - e. Treating environmental pollution in Wadi Al-Rayan pan/Depression.
 5. Rainfed agriculture programs, including:
 - a. Planning land usage in the north coast.
 - b. Improving animal wealth.
 - c. Improving small ruminant animals productivity in the north part of Sinai.
 - d. Limiting soil erosion.

Future Plan 2007-2012

Given that the soil quality is the main prerequisite to reach the rational agriculture development, hence the next five year plan targets establishing a unit for evaluating soil quality in the Environment Affairs Authority. Its mandate would be monitoring soil quality, its degradation factors, its causes and solutions to be used to minimize them.

Next five year plan 2007-2012 will aim at implementing the projects and activities to which the state is committed in the National Action Program of Combating Desertification – on top of them the multi sector basic domains i.e., evaluating the desertification implications, building capacity in the field of combating desertification and

activating the civil society role of participation in implementing and monitoring those activities.

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