Land Degradation Control in North Africa

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North Africa Sub-region

Northern Africa
- Algeria
- Egypt
- Libyan Arab Jamahiriya
- Morocco
- The Sudan
- Tunisia

Western Africa
- Benin
- Burkina Faso
- Cape Verde
- Côte d’Ivoire
- Gambia
- Ghana
- Guinea
- Guinea-Bissau
- Liberia
- Mali
- Mauritania
- Niger
- Nigeria
- Senegal
- Sierra Leone
- Togo

Eastern Africa
- Burundi
- Djibouti
- Eritrea
- Ethiopia
- Kenya
- Somalia
- Rwanda
- Uganda

Western Indian Ocean
1. Background:

1.1. Topography and population

The North African sub-region include six countries, UNEP 2002, Egypt, Sudan, Libyan Arab Jamahiriya, Tunisia Algeria and Morocco, with vast total areas reaching 8.49 million Km2, the sub-region is endowed with extended strategic coastal lines extending over 6500 Km comprised of the southern coastal lines of the Mediterranean, in addition to coastal lines West of the Red sea and coastal areas over looking the Atlantic Ocean.

Total population of the six countries presently exceeds 180 million people with relatively high and varied annual rates of increase.

The North African sub-region represents the full range of aridity index, as extended areas of hyper-arid and arid climate with relatively limited areas of semi-arid and arid sub-humid conditions in the highlands of the sub-region. Northern Coastal areas are distinguished with moderate Mediterranean climate with higher rainfall and high relative humidity in the rainy seasons. Rainfall and relative humidity decrease rapidly towards in-lands while heat stresses increase in that direction (with the exception of high elevations).
1. Background:

1.2. Climatic variations:
The general range of rainfall extends from few mm/year up till 1500 mm/year; however, among the major issues of concern in the sub-region are the special and temporal variations of total rainfall, natural inter season and between seasons variability. Examples of such variations are presented in the following Figure and Table (1).

Most Northern African countries experience – in addition to highly variable rainfalls – recurrent drought spells of varied severity and length. Algeria, Tunisia and Jamahiriya experienced droughts in the late eighties till 1993. Morocco has experienced a drought in one year out of every three years over the past few decades, UNEP (2002). Northern Sudan experienced droughts in the seventies and the eighties along with sahel-Sahelian major drought events. Rainfall variability and drought spells would definitely have adverse impacts on Land productivity, enhancing erosion processes, degrading plant cover and other desertification processes.

Another significant climate issue is the potential scenarios of climate change, IPCC (1998), over the following few decades. Predicted impacts are of significance on natural resources, agriculture productivity, socio-economic implications and processes of desertification.
Climatic Variation in Sinai - Egypt
Inter-annual Variation of Rainfall – North Coast - Egypt

<table>
<thead>
<tr>
<th>Station</th>
<th>Number of Years of Observation</th>
<th>Annual average (mm)</th>
<th>IAV (mm)</th>
<th>Relative IAV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexandria</td>
<td>50</td>
<td>199</td>
<td>57</td>
<td>28.6</td>
</tr>
<tr>
<td>El Dabaa</td>
<td>38</td>
<td>141</td>
<td>57</td>
<td>40.4</td>
</tr>
<tr>
<td>Marsa Matrouh</td>
<td>40</td>
<td>140</td>
<td>67</td>
<td>47.8</td>
</tr>
<tr>
<td>Sidi Barrani</td>
<td>35</td>
<td>144</td>
<td>57</td>
<td>39.6</td>
</tr>
<tr>
<td>El Salloum</td>
<td>38</td>
<td>105</td>
<td>72</td>
<td>68.6</td>
</tr>
</tbody>
</table>
1. Background:

1.3. Land Use Categories and Water Resources:
Table (2) shows the major land use categories in North Africa. These figures show the scarcity of soil resource base, typical of arid regions. Data show also the vast disparity of distribution of land use categories among the countries of the sub-region. Arable lands are highest by far in Sudan and Morocco, followed by Algeria. Same trends are shown for rangelands and forests.

All land use categories are subject to several degradation processes as shown by country reports through the last four decades. Among the major pressures are rapid population growth, climatic stresses, human induced processes, inappropriate agricultural policies, certain land tenure systems and other pressures.

<table>
<thead>
<tr>
<th>Country</th>
<th>Cultivated</th>
<th>Rangelands</th>
<th>Forest Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>7,876</td>
<td>34,362</td>
<td>3,861</td>
</tr>
<tr>
<td>Egypt</td>
<td>3,209</td>
<td>1,500</td>
<td>34</td>
</tr>
<tr>
<td>Libya</td>
<td>2,366</td>
<td>12,712</td>
<td>400</td>
</tr>
<tr>
<td>Tunisia</td>
<td>3,945</td>
<td>2,700</td>
<td>555</td>
</tr>
<tr>
<td>Morocco</td>
<td>9,545</td>
<td>21,000</td>
<td>17,25</td>
</tr>
<tr>
<td>Sudan</td>
<td>17,082</td>
<td>39,480</td>
<td>43,613</td>
</tr>
<tr>
<td>Total</td>
<td>44,023</td>
<td>111,754</td>
<td>65,714</td>
</tr>
</tbody>
</table>
1. Background:

1.3. Land Use Categories and Water Resources:
Wide spread land degradation processes are conducive to serious foregone economic returns, reduction in returns from capital investments, lower income of rural and bedwin households, spread of poverty and enhanced rural to urban migration.

Present and future scarcity of water resources is a common feature through the sub-region with the exception of Sudan, followed at a distance by Morocco. Variability in rainfall, as well as variability in flow of major rivers like the Nile, conveyance and on farm losses of water resources, inadequate water harvesting and spreading techniques, as well as, under exploiting of vast groundwater and non traditional water resources contribute to deficiency and inefficiency of water resources supply and utilization.
Future Water Scarcity in Sub-African Regions

Figure 5 Countries expected to experience water stress or scarcity in 2025

- Water scarcity: less than 1,000 m³/person/year
- Water stress: 1,000 to 1,700 m³/person/year

Source: UNEP 1999a
2. Human Induced Degradation Processes:

All countries reports and NAPs state similar human induced degradation processes including the following:

A. Rangelands:
1. Overgrazing of rangeland due to exceeding the proper carrying capacity for more income and meeting enhanced food demands.
2. Cultivation of marginal lands to increase the cereal production leading to destruction of plant cover, loss of valuable biodiversity while achieving marginal productivity.
3. Degradation of plant cover lead to enhanced soil erosion processes with adverse environmental impacts.
5. Introduction of water points and wells for watering herds. Use of trucks for herd moving and abandoning proper grazing practices including rotational grazing and adoption of proper range rest periods.
2. Human Induced Degradation Processes:

**B. Cultivated Lands:**

1. Inappropriate water management under conditions of irrigated lands lead to soil salinity, sodicity and water-logging.
2. Vast areas of irrigated lands suffer from pollution process including overuse of chemical fertilizers, pesticides and herbicides, industrial wastes and inappropriate soil amendments.
3. Overexploitation of irrigated arid lands beyond the low capacities and the fragile qualities of arid soils with low resilience, especially, at the early stages of reclamation.
4. Adoption of management practices including extensive tillage with heavy machinery, lack of proper crop rotations and integrated farming systems, cultivation of exotic crops with elaborate needs for nutrients and water.
2. Human Induced Degradation Processes:

C. Forestland:

1. Continued deforestation for different reasons including deforestation to convert to cultivated lands, fires leading to destruction of thousands of hectares every year (Algeria, Morocco) cutting trees and shrubs for fuel (representing 70% of energy needs in Sudan).
2. Mismanagement of forestlands leading to decline of their goods and services.
3. Conflicts and local wars within countries and between countries of the sub-region or neighboring countries.
4. Sand encroachment on productive lands, forest areas, rangelands and infrastructure.
3. Activities after UNCCD:

- The countries of the sub-region project scattered activities in the seventies and eighties to combat degradation in one or more of the land use categories. Activities were based on sectoral approach through governmental institutions and public authorities. Activities included surveys, studies, formulation of pilot programs, and execution of limited projects. Activities were of limited duration and discontinued nature.

- After the inception of UNCCD in 1996, all six countries ratified the convention and formulated their NAP’s. Through elaboration of the convention committees, meetings and guidelines, concerted efforts in the six countries took place to put the national activities on the right track. These efforts included coordination institutional setup, convening stakeholders workshops, involvement of NGOs and civil societies, defined roles for women and youth adoption of participatory approach, progressive awareness of the adverse impacts of desertification at varied levels, integration through development plans, execution of major projects with consultation and joint finance of regional UN organizations and established financial mechanisms, as well as, extensive discussions and meetings on sub-regional, regional and international activities.

- Such activities were more pronounced and elaborate in some countries (Tunisia and Morocco) more than others. Executed activities generated positive impacts, diversified returns, success and failure stories, gained experiences, testing of technologies and improved national capacity building.
3. Activities after UNCCD:

Some of the successful activities projected in the countries reports could be quoted as follows:

- Most governments adopted reform policies. Greater attention was given to indicators and benchmarks, establishing of more climate stations for recording and analysis of climatic parameters. Formulation of legislations geared towards conservation of natural resources and environmental protection. Enhanced establishment of protective belts of trees and shrubs. Encouraging research activities to varied extents.
- Improved management of watersheds through establishment of water spreading harvesting and storage facilities as well as the use of supplementary irrigation techniques to improve and develop rain-fed agriculture.
- Measures were taken to curtail losses of conveyance and on-farm use of irrigation water. Increased use of groundwater resources, in addition, to more considerations to the use of nontraditional water resources under conditions of irrigated lands.
- Implementing projects for better management of rangeland and forests, establishing nurseries for replanting trees and shrubs of appropriate traits, and enhancing forage productivity.
4. Combating Land Degradation – The Way forward:

The execution of the aforementioned activities does not replace the significance of adoption of newly developed and innovative approaches for the comprehensive achievement of UNCCD goals. Most of all to curtail and holt the advance of desertification processes still in progress. The Way Forward to combat desertification requires emphasis on the following:

- Contrary to the sectoral systems a more wholestic approach evolving from bottom-up development and geared towards ecosystem integrated approach is a must to achieve meaningful progress.
- Activities of synergies among the major three environment Conventions, i.e., UNCCD, CBD and UNFCCC is of high priority to prevent duplication of activities, achieve efficiency of funding, elaborate needed capacity building at the various levels and coordinate the use of human resources and facilities.
- Elaboration of thematic databases, to address gaps and achieve proper processing of available data. This would lead to activation of meaningful and unified networking for all six countries of the sub-region for efficient exchange knowledge, experiences and lessons learned.
- Establish and activate ample considerations of potential change of climate. Investigate possible impacts and formulate plans for mitigation and adaptation activities, with special reference to impacts on the lengthy coastal areas.
Predicted Climate Change Impacts on Northern Delta - Egypt
4. Combating Land Degradation – The Way forward:

- As drought spells are among the most significant factors of desertification in the sub-region it is of significant need to join and participate in establishing Drought Early Warning Systems and encourage pertinent investigations and research activities. In addition, arrangements of national and sub-regional preparedness measures including reserve feed and food, seeds stocking of vital crops, breading of new appropriate varieties, institutional setup and proper allocation of funds are among the needed significant measures.

- Due to the high aridity prevailing in the sub-region the establishing of genebanks to conserve, propagate and use of indigenous plant species adapted to drought, heat stress salinity and other adverse conditions. The use of bio-technologies and agro-biodiversity technologies should be among research and demand driven research activities.

- Formulate guidelines for the rational use and proper management of vast but mostly non-renewable groundwater resources, available in huge aquifers, with varied water qualities. Proper guidelines are badly needed to achieve the benefits and curtail the constraints and misconceptions pertinent to the use of such important resources.
4. Combating Land Degradation – The Way forward:
4. Combating Land Degradation – The Way forward:

- Coordination among the varied institutions at the national level is needed including assignment of specific and coordinated role for each.

- Despite the large numbers of research institutions present in the sub-region yet demand driven research is minimal at best, while, exchange of knowledge, results and outcomes of investigation of research efforts needs to be widened and enhanced.

- Compilation, documenting and processing of indigenous knowledge at the national and sub-regional levels are minimal at best. The use of such knowledge for proper planning and implementation of varied activities to combat desertification should be encouraged.

- Transfer of needed technologies and support of capacity building by national, regional and international authorities need to be coordinated and developed.

- Conflicts and wars within countries and among countries of the sub-region present major factors for desertification of resources, formidable constraints for rehabilitation and limitation of sustainable development.
Thank you