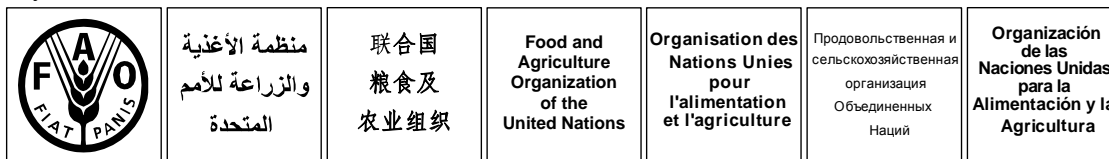


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# FAO REGIONAL CONFERENCE FOR THE NEAR EAST

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**REDUCING THE NEGATIVE IMPACT OF DESERTIFICATION ON  
AGRICULTURAL PRODUCTION**

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## I. SUMMARY

1. Desertification is widespread in the Near East (NE) region and caused mainly by human intervention, poor grazing, crop production techniques, great increases in the number of livestock, and is probably intensified by climate change. Slowing down desertification or rehabilitation of desertified land would involve extensive reduction in livestock population to relief pressure on grazing land. This would however, have considerable socio-economic manifestations as sizeable population depend on animal husbandry for their livelihoods; and combating desertification in this manner would require finding displaced people other employment and sources of revenue. On the other hand, providing feed and fodder from outside sources would only allow more stock to pass the lean season and would eventually increase desertification. Revegetation is difficult and uneconomic for grazing but may be justified when protecting infrastructure from runoff.

## II. INTRODUCTION

2. Desertification is defined by the United Nations Convention to Combat Desertification (UNCCD 1994)<sup>1</sup> as "land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities". Drylands occupy approximately 40 % of the Earth's land area, and it has been estimated that 10–20% of those drylands are already degraded, and as much as 6 to 12 million square kilometres are being affected by desertification.

3. Much of the agricultural land in the NE region is drylands, and desertification is a long-standing, widespread and serious problem in the region (*Annex 1*). Desertification does not only affect users of the affected lands but also leads to increased runoff and erosion, causing damage to infrastructure lower in the catchment area by flash floods and silt. Rangelands, in addition to providing grazing and crop production, are habitat for wildlife and the *in situ* conservation of plant genetic resources, and may also provide recreation and tourism, which would all be impacted by rangeland degradation and by desertification.

## III. CAUSES OF DESERTIFICATION

4. Desertification in the NE region is caused by many factors. Mismanagement of rangeland is serious throughout the area and ranges are overstocked to the extent that more of the biomass is removed than is replaced by regrowth. The traditional systems of land use, which allowed seasonal resting of parts of the range, have broken down leading to continuous grazing with little opportunity for regrowth. Population increase, on the other hand, leads to higher livestock numbers since households require a certain number of stocks to assure their livelihoods. Previously herd migration patterns were partly governed by seasonal water supply; however provision of water points and the use of trucks to transport water, made it possible to graze where any herbage still remains. The lean-season carrying capacity of the range used to define herd size, but since the nineteen-sixties, the availability of cheap, and sometimes subsidised fodder, has reduced this restraint on overstocking. The contribution of natural grazing to livestock feed in some countries of the region has been estimated between 10 and 80 percent (*Annex 2*).

5. The last thirty years have seen considerable expansion in the number of livestock over almost all NE countries, as seen in *Annex 3*, and some of the overgrazing must be attributed to this phenomenon. Region-wise, camels have increased by more than 75% over the thirty years from 1979 to 2008, while sheep and goats increased by 84% and 109%, respectively over the same period.

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<sup>1</sup> United Nations Convention to Combat Desertification (1994) Text of the United Nations Convention to Combat Desertification

These are the main range species and of course many small stock are kept in arable lands, some intensively reared commercially with some cattle using extensive grazing.

6. Other causes of desertification include deforestation for firewood, uprooting of shrubs for fuel, soil tillage for crop production, particularly, but not only, cultivation of sub-marginal range and use of unplanned roads and tracks. Climate change and variations in weather patterns also affect land degeneration in drylands. Areas of low precipitation are generally characterised by high variability in annual total and periodic droughts. However, drought has always been present in drylands and must be taken into account when planning for their management.

7. Desertification is not limited to developing countries with subsistence farmers. The ploughing up of grasslands in areas of marginal rainfall led to the “dust bowl” in the USA during the early twentieth century<sup>2</sup>. Overstocking, by sheep, desertified much of Australia in the late nineteenth and early twentieth century and much of it has yet to recover<sup>3</sup>. Patagonia likewise was desertified by overstocking with sheep in the late nineteenth century<sup>4</sup>. Vast tracts of the Russian steppe were destroyed by soil tillage based cropping in erosion prone land during the Soviet era<sup>5</sup>. In commercial systems the management of desertifying lands is usually modified or they are put to other uses as output and profitability fall: grazing land may be used for wildlife, tourism or hunting, arable land put under pasture or forest or conservation agriculture. In subsistence agriculture, however, the population rarely has the means to change land use, or find other sources of livelihood, so the problem continues.

#### IV. COMBATING DESERTIFICATION

8. Concerted, systematic and coordinated development actions were long recognised essential in controlling dryland degradation and desertification. The key aspects for dryland development strategies set out by FAO<sup>6</sup> as provided below, are quite relevant to Near East region:

- *Preconditions for Development*, involving, “Relief of population pressure, political commitment and marketing and rural infrastructure”.

- *Organizing and Targeting of Development*, involving “Organisational and staff efficiency; community participation; security of tenure; research; and development planning”.

- *Food production and Range Resource Management*, involving “Drought and food security; soil and water conservation; livestock and range management; and fuel and agro-forestry”.

9. These key aspects are not listed in order of priority but according to extent of applicability. For instance, range management may appear low on the list, considering that less than 10% of the drylands are cropped. However a large part of rangelands are extremely arid and no more than 10% of the total dryland population are pastoralists. It is for national authorities to establish priorities among these elements, whilst bearing in mind that all aspects are potentially important and that a systematic approach is essential.

##### A. Soil and Water Conservation

10. Great efforts were made over the years to diminish soil damage and reduce erosion by terracing, contour cultivation and other mechanical interventions. These approaches were costly, laborious and have not been very successful. Contour cultivation in areas where ploughing is mechanised is limited to gentle slopes where wheeled tractors can safely drive along contours. A more

<sup>2</sup> Pieper, R D 2005. Grasslands of Central North America. In: Grasslands of the World by Suttie, Reynolds and Batello. FAO Rome.

<sup>3</sup> McIvor, J G 2005. Australian Grasslands In: Grasslands of the World by Suttie, Reynolds and Batello. FAO Rome.

<sup>4</sup> Cibils, A F and P R Borrelli 2005. Grasslands of Patagonia In: Grasslands of the World by Suttie, Reynolds and Batello. FAO Rome.

<sup>5</sup> Boonman J G and S S Mikhalev 2005. The Russian Steppe. In: Grasslands of the World by Suttie, Reynolds and Batello. FAO Rome.

<sup>6</sup> FAO 1993. Key aspects of strategies for sustainable development of drylands. FAO AGP Rome Italy

integrated, agronomic approach is now used, “*Conservation Agriculture*”, which is strongly supported and recommended by FAO<sup>7</sup>.

### **B. Management of Grazing Land**

11. The condition of rangeland, and the stock raised on it, is greatly influenced by the grazing systems used as specific to the lands involved. All grazing resources have to be taken into account for improving management of grazing lands including water which is a major determining factor in stock management in rangelands. In areas dependant on seasonal surface water, availability of this resource is an important factor in determining many migration patterns in mobile systems. Other resources comprise woody vegetation for browse, shade and shelter, timber and firewood; access to veterinary care which is not strictly a grazing resource but is closely associated thereto and even essential in some areas; natural salt licks; access for stock movement, marketing of livestock and procurement of necessities.

### **C. Improved Grazing Systems**

12. The rangelands of NE region had traditional, sustainable grazing systems, which have been described, notably by Omar Draz<sup>8</sup>, who recommended their re-adoption. However, due to changes in economic and political conditions these traditional systems were no longer attractive to the pastoral population.

13. The principles of grazing management are well known but in subsistence systems their application may be difficult since poor households can not afford to reduce stock numbers, and with many small herds having access to the local grazing land, considerable community cohesion and decision making is necessary.

### **D. Herder Organization and Community Participation**

14. The frequent political changes in the region have in many situations disrupted old herder groupings and hierarchies and left a disorganized pastoral sector. If semi-arid ranges are to be managed sustainably, planning is necessary at the landscape scale. Rural development should also be led by the ultimate users. To augment community participation, herders have to organize themselves into groups for deciding herding policy, discussing with authorities and sharing herding tasks. Technical range interventions (apart from veterinary care) can only be useful once the tenure situation is clarified.

### **E. Range Rehabilitation**

15. Once rangeland is degraded, it is difficult to return to its former condition other than by removing the causes of damage for a considerable period. Improvement of range vegetation should be through manipulation of grazing pressure. The main tool in rehabilitation, therefore, is reduction of grazing periods to allow for recovery of the vegetation and eventually of stock numbers which may affect household livelihoods. Closure of areas to grazing for longer or shorter periods may improve

<sup>7</sup> Friedrich, T, A. Kassam Shaxon F 2010. Characteristics of conservation agriculture. Agriculture for Development; summer 2010.

<sup>8</sup> Draz, O., 1971 An approach for the settlement of nomads through (revival of the ancient hema system of range reserves in the form of cooperatives within an integrated programme of range improvement in Syria); FAO Expert Consultation on the Settlement of Nomads in Africa and the Near East, Cairo 4-12 Dec 1971.

- Draz, O. 1980. Rangeland development in the Arabian Peninsula based on Syrian experience through UNDP/FAO/WFP assistance (English), In: Rainfed agriculture in the Near East and North Africa. Proceedings of the FAO Regional Seminar on Rainfed Agriculture in the Near East and North Africa, Amman, Jordan, 5-10 May 1979; FAO, Rome (Italy). Land and Water Development Div.; FAO, Cairo (Egypt). Regional Office for the Near East, 1980, p. 291-303

- Draz, O 1969 The /hema/ system of range reserves in the Arabian Peninsula - Its possibilities in range improvement and conservation projects in the Near East., FAO 1969 -

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vegetation locally, but unless the stocks are housed during this period or otherwise controlled, closure would only shift the problem by causing worse overgrazing elsewhere.

#### **F. Fodders Fallows and Crop Residues**

16. These are all valuable lean-season feeds. It should however be noted that while improving feed supply in times of scarcity and improving livestock production hitherto, use of these residues could increase the dangers of desertification by allowing larger numbers of stock to survive hard times and by degrading croplands. Fodder crops are not usually widely grown in drylands prone to desertification for they give their best economic returns with dairy stock and are ideally suited to the irrigated tracts. Fallows provide valuable grazing where cereal-fallow rotations are used and are particularly productive in areas of mild winters where spontaneous annual legumes and grasses provide a productive sward. Stubbles provide summer grazing. Residues from field crops are coarse roughages but are a valuable resource for large ruminants.<sup>9</sup>

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<sup>9</sup> These are discussed in Suttie J M. 2000. Hay and Straw Conservation for Small-scale farming and pastoral conditions. FAO. Rome

**Annex 1**  
**Estimated desertified rangelands, Irrigated, and Rain-fed areas in NE countries**  
**(1,000 hectares)**

Country	Total Rangeland	% desertified	Total Irrigated	% desertified	Total Rainfed	% desertified
Algeria	38120	90	338	15	6934	93
Egypt	2604	81	2486	30	10	10
Libya	17172	80	234	24	1659	35
Morocco	36693	90	525	10	7484	69
Tunisia	7968	85	215	33	4258	69
Bahrain	50	-	1	0	-	-
Iraq	38395	90	1750	71	1950	72
Jordan	6862	90	43	30	375	56
Kuwait	2306	-	1	0	-	-
Lebanon	688	90	86	7	214	61
Oman	19642	90	41	27	6	50
Qatar	876	90	0	0	4	25
Saudi Arabia	112345	80	415	63	760	61
Syria	12945	90	652	17	4971	70
UAE	1008	-	5	40	-	-
Yemen	32590	80	309	16	1209	65
Iran	90000	70	-	-	-	-
<b>TOTAL</b>	<b>330633</b>	<b>85</b>	<b>7372</b>	<b>37</b>	<b>29981</b>	<b>73</b>

Source: Calculated from UNEP (1996) and Dregne, H. E., and N-T. Chou., Global Desertification Dimensions and Costs. In Degradation and Restoration of Arid Lands. Lubbock: Texas Tech. University, 1992.

## Annex 2

### Contribution of Rangelands to Livestock Feed in Some Countries of the Region

Country	Percentage Contribution	Source
Iran	39	Badripour, 2007
Libya	20	Sbeita, 2005
Oman	40 – 75	Al-Mashaikhi and Koll, 2006
Sudan	65 – 80	Zaroug & Mirreh 2009
Syrian steppe	10 – 40	Zaroug & Mirreh 2009
Tunisia	10 – 25	Nefzaoui and Hamrouni, 2002
Yemen	40	Al-Abssi, 1995

## Annex 3

### Evolution of small ruminants and camel numbers over thirty years in NE region

Countries	Camels		Goats		Sheep	
	2009	1979	2009	1979	2009	1979
Algeria	295000	149650	3800000	2817710	20000000	12222700
Bahrain	930	728	19000	14513	40000	6549
Egypt	110000	88270	4550000	1426680	5500000	1678520
Iran	152000	110000	25500000	16757000	53800000	35219000
Iraq	58293	69562	1550000	2060000	7800000	9775000
Jordan	8000	11300	919740	573000	2070940	924000
Kuwait	5800	5000	145000	307239	900000	245849
Lebanon	450	50	450000	390000	330000	165000
Libya	50000	134283	2500000	1463080	6500000	5445000
Mauritania	1495000	729000	5600000	2537000	8860000	4900000
Morocco	50000	100000	5251200	5702440	17475500	13500000
Oman	127000	32000	1684000	570000	381000	111656
Qatar	34000	10875	140000	55511	148000	49915
Saudi Arabia	260000	282000	4300000	2270610	8000000	3981000
Sudan	4521000	2524000	43270000	12246000	51555000	17143000
Syria	32494	7595	1508030	999204	21700000	8129340
Tunisia	235000	175000	1454640	755000	7361620	4251000
UAE	380000	50000	1710000	320000	620000	125000
Yemen	383533	168000	8883320	2855000	9087220	2823000
<b>TOTAL</b>	<b>8 198 500</b>	<b>4 647 313</b>	<b>113 234 930</b>	<b>54 119 987</b>	<b>222 131 289</b>	<b>120 695 529</b>

Source: FAOSTAT 2011