

Rangeland of Saudi Arabia and the "Tragedy of Commons"

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Saudi Arabia covers an area approximately 2.25 million km² in which 70% or about 170 million hectares can be classified as rangelands (Alsakhan 1997). Grazing has traditionally been the pattern of life in the country where communal pastoral system (Nomads or Bedouins) of grazing existed. Before the turn of the century, a delicate balance existed between the components of the rangeland systems. Pulses of boom and bust occurred in the dynamics of animals' production. Overstocking of the range was followed by a reduction in available feed resources coupled with low and erratic rainfall which resulted in substantial reduction in livestock population during unfavorable years. The natural pendulum pattern of resources balance was often combined with judicious tribal ownership and management of range resources by protection of certain grazing areas (Hema) at certain times of the years (see Draz 1978 for the Hema description).

Current State of Rangeland

Today, rangelands throughout the country are declining in both condition and productivity (Figure 1). Many species are becoming rare and many have disappeared or are on the brink of extinction (Figure 2) (Mirreh 1996). The hazards of climate can hardly be disregarded in a country where the lean years are more common than the fat ones. Dry weather and draughts have been a pattern in this part of the world for countless ages. The political, economic and cultural evolution which have occurred in the country over the last half century have upset the balance between the nomadic people and the desert environment.

The present cause of rangeland deterioration can be attributed to many factors. For centuries, the nomadic people have developed a sustainable use through regulations to control rangeland use (Hema system). However, this nomadic system has broken down after a government decree in 1953 to abolish the old nomadic hema system leading to open access to all rangelands, thus uncontrolled livestock grazing. Overgrazing is a product of many factors such as the rapid increase in the number of animals to meet the demand for red meat of a growing human population (Figures 3 and 4). To meet the enormous demand for red meat, the government instituted a program of financial incentives for sheep and camel producers. This program encouraged flocks expansion and the total population of sheep in the country increased by many folds. The rapid build up of animal population put pressure on rangelands causing a problem of inadequate forage, a result of overstocking leading the nomadic people to shift to other feed sources, mainly barley grain. In 1980, the government replaced the financial



Fig. 1. A common overgrazed rangeland where perennial species have disappeared (A) and species recovery and increase in productivity after protection (B). Photo (B) taken by H.O. Al Hassan.

incentive program by a grain subsidy program (MAW 1984). Likewise, high subsidies for feed grain resulted in livestock population densities many times higher than the carrying capacity of the land. In addition to its two million tonnes of barely production per year, Saudi Arabia is one of the largest barely importing countries in the world (barely imports have surged from 1.2 million tons in 1980 to above 5 million tons by 1996 valued at about SR 2.8 billions in 1996 (\$1 = 3.75SR)). Over 80% of the grain imported to the country is barley. Dependency on it ranges from 55% to 90% of the time on an annual basis.

In the past, one abiding rule was to follow the rain, to seek out fresh pastures. Regular movement of the Bedouins was to where forage and water were available for their animals. However, availability of supplement feed, trailers and water tankers (Figure 5) allow quick movement and access to remote areas often allowing for long period of stay, thus accelerating range deterioration. In addition, new political borders after 1950's between countries have changed the old pattern of nomadic migration or move-

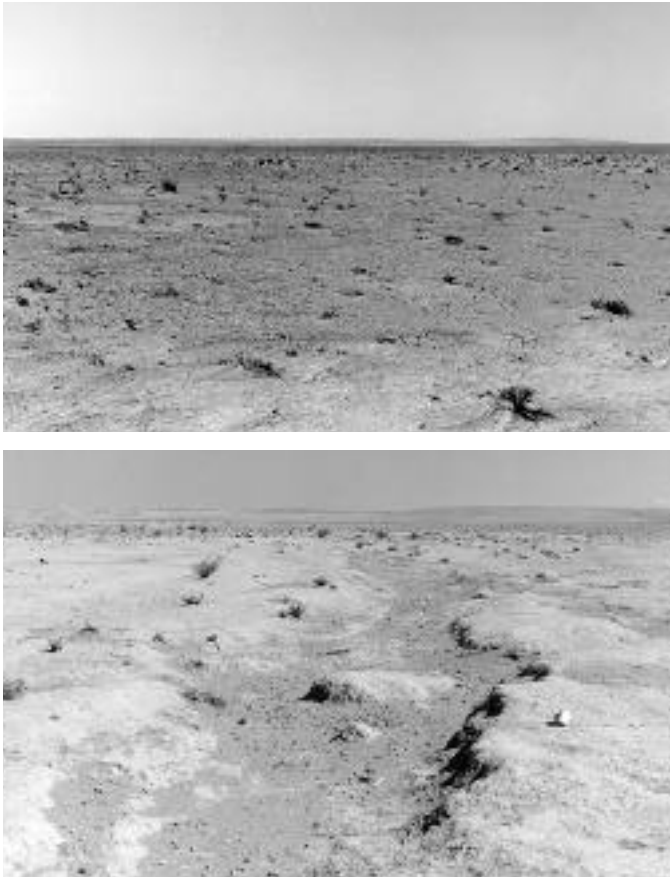


Fig. 2. Wide spread rangeland deterioration led to a decline in both productivity and perennial species and an increase in soil erosion.

ment. The greater distance that used to be traveled and the wide area of nomadic space have shrunken.

Rangeland conversion into agriculture area or farmland is another cause of the present poor status of the rangelands. After the economic improvement of the country in the second half of this century, the government gave agriculture a high priority. Lands were distributed free to citizens to cultivate with interest free loans and subsidy. Within twenty years, farmland went from 150 thousand hectares in 1975 to over 1.6 million hectares in 1995 and over 28 billion



Fig. 5. Availability of supplement feed (seen here a trailer with barley and alfalfa) and water tanker allow longer stay out on the range.

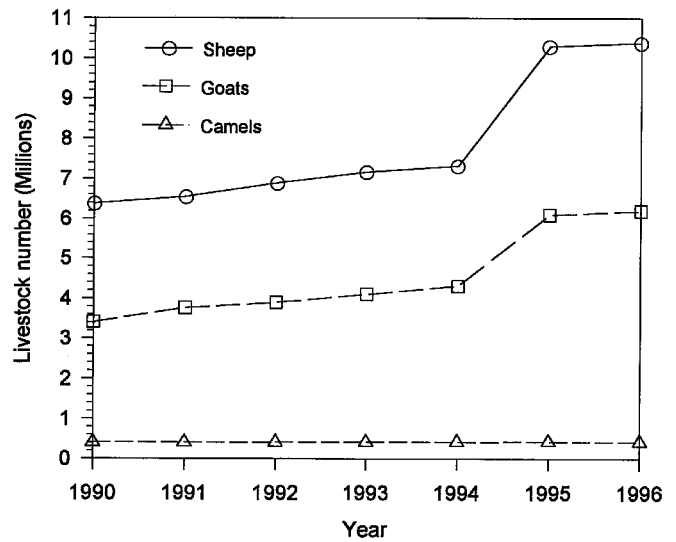


Fig. 3. Livestock number in the country between 1990-1996 (From MAW 1998; Assaeed 1997).

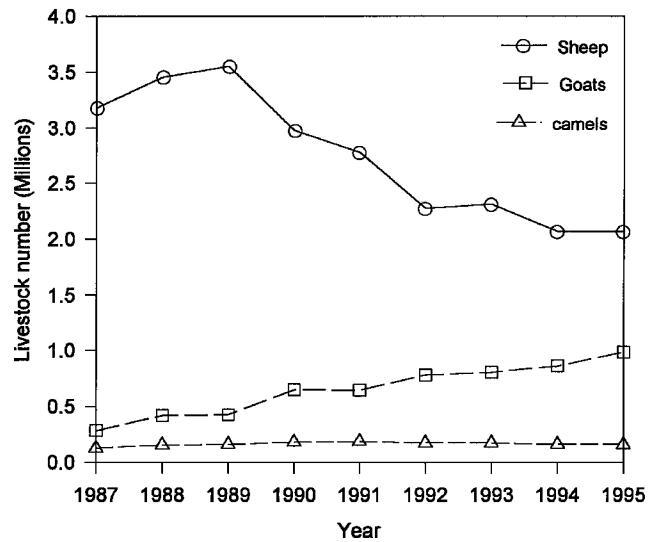


Fig. 4. Total number of slaughtered livestock between 1987-1995. Numbers do not include animals slaughtered during pilgrimage time or private houses (From MAW 1998; Assaeed 1997).





Fig. 6. Gathering commercial fire wood and plants uprooting are an increasing practice in degraded rangeland.

Saudi Riyals of free interest loans from the Agricultural Bank (MAW 1998). Progress of cultivation on the edge of the desert has led to the shrinking of the wide area that used to be roamed by nomadic people.

Gathering of commercial firewood and uprooting of plants (Figure 6) and soil disturbance by vehicles contribute significantly to the degradation of rangeland. In a country where a small pickup load of firewood of *Haloxylon persicum* or *Calligonum comosum* is sold for about 600 S.R., over 120 thousand hectares of trees and shrubs are being cut for fuel each year (Al Hassan 1992).

Uncontrolled gravels removal (Figure 7) or mining for construction from valleys bottom or wadies is another problem leading to many rangeland sites degradation. There is no law governing or requiring companies to revegetate or at least level a site after abandoning it.

Attempts were under taken by the government to reverse rangeland deterioration, but met with little success. The



Fig. 7. Uncontrolled gravel removal for construction from wadi bottoms or low area is another factor of many rangeland degradation.

rangeland destruction in this part of the world is complex and not easily resolved. Responsibility for a sustainable rangeland resources falls upon the shoulder of the nomadic people and producers who graze it and upon the government, thus the whole nation. I think, the greatest problem to overcome range degradation is not the technical knowledge, but lies in the political field which is complicated by traditional and tribal social and cultural interrelationships.

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