

# Rangeland Production Systems in Balochistan, Pakistan

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## Introduction

Balochistan is the largest province of Pakistan, with 34.5 million ha (45% of the total area), 4.3 million people in 1981 and an estimated population of 7.1 million in 1990 (Van Giles and Baig 1991). It is located in the western part of Pakistan, sharing borders with Iran to the west and Afghanistan to the north (Fig. 1). Irrigated fruits and

million goats, 0.8 million cattle, and 0.24 million camels.

Of the 4.3 million people living in Balochistan in 1981, 16% were located in urban areas while the rest were in rural areas. Population growth has increased the already excessively high pressure on the rangeland resources, posing serious questions about the sustainability of the livestock sub-sector.

## Rangeland Resources and Property Regimes

The rangelands have been broadly classified into 'poor', 'medium', and 'high' potential areas, producing annually less than 50 kg, 60–190 kg and 200–250 kg dry matter per hectare, respectively. The rangelands classified as poor cover about 62% of the Province and are generally in the south, and those classified as medium (25% of the area) and high (13% of the area) potential areas are mostly on the highlands (Fig. 1) above 1,000 m. An unknown area within these classes is mountain sides and plateaux covered by thin soils usually inaccessible to grazing. The range vegetation types change from south to north as the rainfall decreases. In the south desert scrubs dominate; in the central area there is a shrub steppe of *Haloxylon* and *Artemisia* (sagebrush) species and in the north a perennial grassland based on species of *Cymbopogon* and *Chrysopogon*. Many of the native annuals have almost disappeared due to heavy grazing pressure (Thomson and Rodríguez 1994).

There are two types of rangelands in Balochistan, depending on property regimes: common and open rangelands. Common rangelands are traditionally owned by tribes, with customary institutional arrangements for their sustainability and effective management. Open rangelands have unrestricted access and are free to all and are usually deteriorated rangelands that used to be commonly owned. At some point in time, the group or tribe makes a decision as to whether a rangeland is so degraded that it should not be considered as a common rangeland. Open rangelands have been increasing in an area as the more exclusive common rangelands have lost the ability to sustain the animals' grazing needs and are abandoned by their owners (Buzdar et al. 1989).

Two factors have caused rangeland degradation: excessive population growth and external social and economic forces. For example: "In 1980, war in Afghanistan caused massive migrations to Pakistan. At least 3 million refugees fled into Pakistan with their livestock, 600,000 people with 4.8 million sheep and goats to Balochistan alone. Because they have largely concentrated in a number of camps along the border areas, their presence has resulted in extremes of degradation in the neighborhoods of their

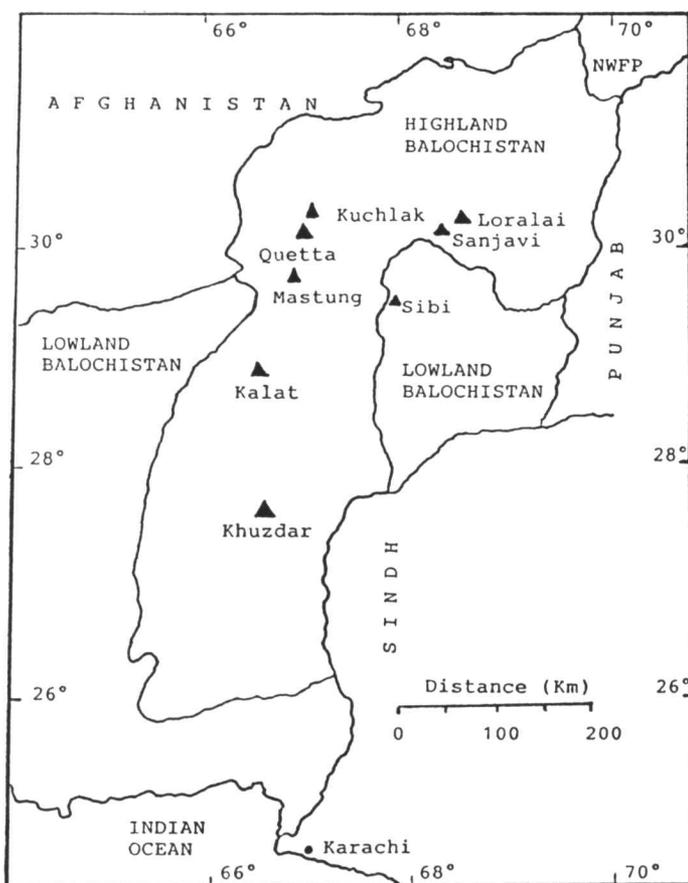


Fig. 1. Highland Balochistan (above 1,000 m altitude), Pakistan.

vegetables produce most of the agricultural value. While the value of crop production has been increased through use of irrigation, fertilizer, and pesticides, the value of livestock production has increased mainly because of the larger numbers of animals, mostly small ruminants and camels. Balochistan has 11.3 million sheep and 7.4

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camps in northern Balochistan. The effect of a sudden increase equivalent to 14% of the total livestock and human population in Balochistan on the already saturated and fragile environment has been drastic." (Cossins 1988).

### Grazing Systems

The three major grazing systems in Balochistan are nomadic, transhumant, and sedentary; these depend on the lifestyle of the animal owner and the rangeland property regime.

#### *True Nomadic Grazing Systems*

The true nomads follow the seasonal patterns of forage production, spending the summers in the cold highlands in Central Asia and winters in the warmer lowlands of Pakistan and India. They move across the open rangelands where they spend a few days, or sometimes weeks if range vegetation is abundant. They can pass through the tribal common rangelands, but cannot prolong their stay. In the lowlands of the Indus valley they have contacts with local farmers, from whom they buy stubble grazing rights, straw, and other feed for their animals and sell their own labor, animals, and animal by-products. Their arrival in the lowlands must coincide with the harvesting season so they can sell their labor and buy cheap feed for their animals. Likewise, their return to the highlands in the spring and summer must coincide with the growth of palatable forage resources and with seasonal labor requirements (Buzdar et al. 1989).

Thirty percent of the small ruminants in Balochistan are reared under this type of grazing system (FAO 1983). Nomadic families own 80–100 head of sheep and goats, with about 20 animals per male family member. Three or four families keep their livestock together, making up flocks of about 300 animals. A nomadic flock of 100 animals, of which 85 are sheep and 15 are goats, usually has 45 breeding ewes and 8 does (FAO 1983). The estimated daily income of one adult in 1992 rupees was Rs13 per day, which was one quarter of the urban daily wage of Rs55. Data on health and education are not available from these nomads, but it is easy to deduce that basic services are not available or are well below the provincial average. Given this extreme poverty, it seems unrealistic to design livestock development schemes before greatly improving the welfare of this sector of the population.

#### *Transhumant Grazing Systems*

Buzdar et al. (1989) distinguished between transhumants with land ownership (semi-sedentary transhumants) and those without it (semi-nomadic transhumants). The semi-sedentary transhumants raise rainfed crops, mainly winter wheat. Each winter they move from the central highlands of Balochistan to the warmer areas of the Indus valley. When they are in the lowlands, they behave like the nomadic population, selling their labor, animals, and by-products to the crop farmers and buying from them grains and feed for their animals.

The semi-nomadic transhumants are almost completely



**Fig. 2.** *Nomadic pastoralists on the move in the Quetta valley.*

dependent on their small ruminants. They are co-owners in the common tribal rangelands, and in most cases their movements take place only within the limits of their tribal lands. They move from commonly owned rangelands to the open rangelands as forage availability fluctuates, and they usually return to their permanent dwellings in the rangelands during the summer months. In years of drought, some of them take their families and animals to the nearby agricultural valleys, where the family sells its labor, and their animals graze stubble or grasses in and around the fields. They possess camels and donkeys, which are used for transportation of crops and other goods. They earn enough money by these means to buy wheat grain and other supplies (Buzdar et al. 1989). Transhumant flock sizes range from 20 to 80 sheep and goats. Sixty-five percent of the sheep and 50% of the goats are managed as transhumant flocks (FAO 1983).

#### *Sedentary Grazing Systems*

Most of the people living in the agricultural villages in Balochistan raise a few animals. This supplementary animal raising sometimes accounts for a major portion of the household income and helps increase farm productivity. Women play a major role, not only in the raising of these animals, but also in converting their by-products into food and saleable items like carpets. Usually a shepherd is employed to take care of all the animals in a village as a single flock. As the agricultural villages are normally inhabited by members of the same lineage or clan group, they have use rights over the rangelands adjacent to the village (Buzdar et al. 1989).

Since the mid 70's there has been a steady decrease in the number of transhumant herds; many flocks are becoming increasingly sedentary as communities settle

around the permanent water from new tubewells, and as former shepherds increasingly find alternative work opportunities (Cossins 1988). The presence of irrigation water in certain areas of Balochistan has encouraged an increase in the livestock population through the availability of stubble and fodder. At the same time, when the stubble and fodder are not available for grazing or foraging, the animals are turned out on the common or open rangelands without appropriate management. Depletion of the vegetation cover has reduced the ability of the watersheds to retain rainfall, and this in turn leads to less recharging of ground water. Extraction of water has increased greatly for irrigation and for the growing towns and villages. For example, the Water Power Development Authority estimated that the annual decline in the water table in the Quetta valley was 0.15 m during 1900–1960, 0.24 m during 1960–1980, and 3.05 during 1980–1990 (Van Giles and Baig 1991).

Socio-economic influences might change the structure of Balochistan society in the coming years and allow more control over rangelands, but this change may not occur fast enough to slow down the degradation of the range vegetation (Nagy et al. 1991). The only examples of sustainable range management with the traditional tribal structure are under conditions of low population pressure (Buzdar et al. 1989), which are now almost non-existent in Balochistan.

### Resource Endowment of Livestock Producers

Over 90% of the farms in Balochistan range between 1–20 ha in size (GOP 1981 Census of Agriculture, as reported by Massod et al. 1988). The average number of sheep per household in Balochistan is 60 sheep and 32 goats. A few owners possess flocks of more than 400 head (GOP 1989). Thirty percent of sheep and 20% of goats are used for household consumption, or social purposes such as gifts to relatives, bridal prices, or sacrifices (Buzdar et al. 1989). Most of the goat hair and about 55% of the wool is used at home, usually to make carpets, and the rest of the fleeces are marketed.

The percentage of income (cash and credit) from sheep and goats as a percentage of agricultural income ranges from 40–50% in the northern areas of highland Balochistan to 70–60% in the southern areas (Nagy et al. 1991). Off-farm income is also becoming more important for farm families and there is a trend of increasing migration to larger centers, and even for men to go to work in the Persian Gulf. The importance of off-farm income is strongly related to the weather conditions. In good rainfall years 10–15% of the total income is off-farm, but in bad rainfall years the off-farm income ranges from 35 to 65% (Rees et al. 1987).

Credit could be used by livestock producers for diverse purposes: to offset the effects of poor agricultural years, to improve animal husbandry practices, to improve the rangeland condition (deferred grazing), to initiate four-wing saltbush (*Atriplex canescens*) fodder banks, to shorten the marketing chain, or to fulfill social obligations.

Credit is not readily available for small land-owners, and only 12% of the households had borrowed from the Agricultural Development Bank. Large land-owners took 38% of the loans while farmers with 5–20 ha were granted 62% of the loans (Massod et al. 1988). Small producers overcome this by using their sheep and goats as collateral to obtain credit from money lenders. When cash is required, usually in poor agricultural years or for special social occasions, money is borrowed and paid back in kind (sheep or goats) in better agricultural years. Interest, if calculated on money borrowed against live animals, can be excessive and much greater than the interest charged at banks. However, farmers indicated that they do not trust banks. Bank regulations dictate foreclosure when a farmer cannot pay back the loan, whereas money lenders are more lenient. Also, banks do not take small ruminants as collateral (Nagy et al. 1991).

### Marketing of Livestock, Meat and Skins

Not many producers can afford to travel long distances, ranging from 20–50 km to intermediary markets or 40–150 km to terminal markets, to sell their livestock. Most of them do not have money for transportation, and they lack the connections or information that could help them to take advantage of the supply and demand situation when the decision to sell is made. About 69% of the retail value of small ruminants (meat, and edible and non-edible by-products) is received by the producers in highland Balochistan, while the remaining 31% represents the value of the services provided by village dealers, commission agents, *beoparis* (wholesalers), and butchers involved in the marketing chain from producer to consumer (Mahmood and Rodríguez, 1993).

Livestock and meat grading is absent, but there is government regulation of retail prices. Thus, consumers do not have ways to convey their degree of dissatisfaction to producers through the intermediaries in the marketing chain. This major structural problem at the provincial and national level does not encourage production and market efficiency. The intricate marketing chain could be improved for the benefit of producers and consumers; overall volume of the market could be higher, the quality of the meat could be improved, and some marketing costs could be reduced (Mahmood and Rodríguez 1993).

After mutton (meat from either sheep or goats), skins are the second major source of wealth in the small ruminant component of the livestock subsector. Balochistan ships approximately 2.9 million skins to tanneries in Punjab and Sindh provinces. Because of cuts and tears the skins do not fetch the higher prices they could command if they were handled more carefully. Indeed, skins of better quality are being imported from neighboring countries to meet the demand from the Pakistani leather industry.

A major question is how the livestock producers can take advantage of the potential production and market opportunities. Deficient extension services and generalized poverty explain why there has been little progress with livestock producers. Extension services, when avail-

able, have focussed on the biological aspects of production (flushing, vaccination, supplementation, breeding, etc.) while neglecting the social and economic aspects of production and marketing. There are no easy ways to improve the welfare of the livestock producers. Institutional research requires better financial support to carry out a comprehensive agenda on livestock development. Perhaps the most important deficiency among government agencies and the international donor community is that there is no strategic social or economic planning which addresses the needs of pastoralists and agro-pastoralists based on livestock farming systems studies.

### Conclusions

The value of Balochistan's annual offtake is not likely to increase in the near future. Forage resources are deteriorating due to demographic pressures and deficient range management. There are no market incentives for livestock producers to improve offtake since there is a ceiling price for mutton and there is a lack of livestock grading systems.

Nomadic pastoralists with no grazing rights respond to fluctuations in forage resources and cope with the risk of droughts by moving. In contrast, transhumant pastoralists and sedentary livestock producers have allowed their flocks to grow close to or above the feeding capacity of rainfed cereal crops. These livestock producers, who have grazing rights, are responsible for the conversion of common rangelands into less productive open rangelands.

The population growth in the tribes of Balochistan, along with external economic and social forces, has played an important role in the weakening of the traditional system of common property range management. This weakening needs to be taken into consideration in

designing operational alternatives for Balochistan's pastoralists to help them to take advantage of techniques of range management or to recreate traditional management schemes.

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