PRESENT POSITION AND RECOMMENDATIONS FOR LIVESTOCK PRODUCTION IN NORTHERN AREAS

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Abstract

Livestock Production is the biggest land use in Northern Areas. There is a great variety of rangelands including foot-hill ranges, dry temperate ranges and alpine pastures. In cultivated fields shaftal, lucerne, aftermath of agricultural crops, fodder trees and leaf fall of fruit trees are important sources of livestock feed. The availability of winter feed is a limiting factor in the production of livestock. In Northern Areas 100,125 metric tonnes of air dry feed is available annually against a requirement of 1,212,439 metric tonnes. The harvesting and storage practices are faulty. Soil erosion is common on steep slopes. Scare scientific data is available and no organisation for the management of rangelands exists. The livestock breeds, disease control and marketing are primitive. The important recommendations given include comprehensive survey, formation of grazing cooperatives, preparation of range management plans, chopping of maize stalks, harvesting of grass at boot stage, seeding and planting of desirable adaptable species, soil and water conservation, range suitability classification, crossing local cattle with yak, preventive medication, increasing off takes and extension practices.

Area

Northern Areas cover about 69,930 square kilometers. The tract is bounded by Afghanistan, Peoples Republic of China and Indian held territory of Kashmir on its north, Chitral on its west; Kohistan areas of Swat and Hazara in the southwest and south. Kaghan and Azad Kashmir share the southern borders whereas south eastern, eastern and north eastern borders are contiguous with Indian held territory of Jammu and Kashmir. The tract is extremely mountainous varying in elevation between 1,000 and 8,000 metres. Slopes are steep to precipitous except in the interior of the valleys. Most of the area above 4,800 metres elevation remains under snow. Glaciers and land slides are frequent in the high reaches.

Soil is loamy and fairly deep on gentle to moderate slopes. It is, however, shallow with out-crops of the parent rock on steeper areas and ridges with scanty tree growth. Generally the soil is fertile, porous and also has humus, though in small quantity, where tree growth exists. It is however, highly susceptible to erosion, a phenomenon which is taking place incessantly without drawing much attention. The climate ranges from dry sub-tropical through temperate to alpine, depending upon elevation above mean sea level. The average temperature and rainfall data for Gilgit and Skardu are given in Table 1.

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Table 1

Temperature (centigrade) and Rainfall (centimetres) of Principal Stations in Northern Areas

Month/Station	Gilgit			Skardu		
	Mean Maxi-mum	Mean Mini-mum	Mean Rain-fall	Mean Maxi-mum	Mean Mini-mum	Mean Rain-fall
January	8.0	0.0	0.7	0.9	8.6	2.3
February	11.0	3.0	0.7	3.4	7.1	1.8
March	17.0	7.0	2.0	10.2	0.2	2.5
April	22.0	12.0	2.5	17.1	5.8	0.2
May	28.0	28.0	2.0	22.6	9.6	2.0
June	33.0	19.0	0.9	27.3	13.3	0.6
July	35.0	22.0	1.0	30.9	16.0	0.0
August	34.0	22.0	1.4	31.0	16.0	0.0
September	28.0	7.0	1.0	26.0	12.0	1.0
October	23.0	1.0	0.6	19.0	5.0	0.4
November	17.0	5.0	0.1	12.0	2.0	0.2
December	10.0	1.0	0.3	5.0	6.0	1.0
Annual	22.0	11.0	13.0	17.0	5.0	16.0

Relative humidity is low all the year round.

Introduction

Out of 6.94 million hectares total land area of Northern Areas, rangelands comprise about 3.6 million hectares, forests cover about 0.3 million hectares and cultivated land consists of about 0.7 million hectares. Range Management therefore, is the biggest land use in this area. The present main objective of range management being persued in these areas is production of sustained yield of livestook products. However, no one is either familiar or responsible for proper management of rangelands. The benefits expected to acrue from the scientific management of rangelands in these areas include supply of meat, milk and milk products to balance the diet of local people, increase earning of foreign exchange through export of hides, skins, wool and bones, increase job oppertunities, improve watershed values, check soil erosion and enhance scenic value. The availability of winter feed is a limiting factor in the production of livestock. This feed comes from agricultural aftermath of cultivated land, lopping of olive and oak forests and hay made from the rangelands. Scare sofentific data is available on vegetation, livestock or socio-economic conditions prevalent in this region. At present no organisation for

the management of rangelands exists and not a single person trained in range management is available.

Rangelands

There is a great diversity of rangelands but for the sake of simplicity these can be divided into the following three categories.

Foothill ranges occur upto about 1,500 metres elevation. These are much deteriorated rangelands with heavy grazing pressure throughout the year. Usually the herbaceous cover consists of undesirable invader plant species. Vast stretches of these rangelands are Artemisia Steppe while on higher and moisture parts *Haloxylon griffithii* mixed with *Artemisia* species is also found. There are some stretches of Aristida and also *Tamarix dioica*. At some moist places *Erianthus* and *Arundo donax* are met. Along the nullahs olive forests and oak forests containing *Fraxinus* species are also met with. The ground cover contains very little of grasses and those also usually annual and unpalatable. The average forage production of these rangelands is about 300 kg per hectare. The once ungrazed wolf plants of *Artemisia* and *Haloxylon* remain unutilized year after year. While other plants are grazed continuously. These rangelands serve as winter grazing grounds for the migratory livestock. Oak trees near houses are reserved and not cut except during emergency and are therefore in better condition than those farther apart. The plantations of *Elaeagnus, Robinia* and poplars raised by the Forest Department in this zone also provide fodder to the livestock.

Dry temperate ranges lie between 1500 – 3500 metres elevation. These are moderately deteriorated. Most of these, except highest parts, are grazed year long. They contain desirable grasses, forbs, shrubs and trees. The *Artemisia* Steppe extends into this zone and vast stretches of Artemisia mixed with more of *Haloxylon* are found here. Major oak forests and also conifer forests occur here. The average forage production of these rangelands is 350 kg per hectare. Wolf plants of Artemisia also occur here. Oak trees, here, also serve as the only green fodder during winter. Reservation of oak trees near habitation, and hay-making are also practised in this region. The plantations raised by Forest Department also provide leaves to be consumed by livestock. The areas earmarked for future cultivation are protected from grazing for a few years during which time Hippophae shrub establishes itself there. It provides very good browse for next 10 years. At the same time Hippophae enriches soil with nitrogen fixation which produces better crops when cultivated.

Alpine pastures exist above 3,500 metres elevation. These are better stocked and are only used during summer. These pastures are characterised by dominance of alpine forbs and shrubs and absence of temperate grasses. At higher altitudes the topography becomes too rugged to graze, excepting the acrobatic goats. The average forage production of these rangelands is 1,000 kg. per hectare. Most of the species occurring in these pastures produce excellent forage except for *Juniperus communi* and *Betula utilis*. Afforestation is not possible here.

Cultivated Land

The only important fodder crops in the region are Shaftal (*Trifolium resupinatum*) and lucerns (*Medicago sativa*). Maize, wheat, rice and pulses are grown primarily for seed but their stalk in also a good source of feed for the livestock. There is an extremely inefficient use of the aftermath of agricultural crops because of leaving very high stubbles and feeding the whole stalks. In addition to the aftermath of agricultural crops and ofdder crops, fodder trees on the cultivated land like *Elaeagnus angustifolia* and *Robinia pseudoacacia* and leaf-fall in autumn from all the fruit trees are an important source of livestock feed. The average forage production of cultivated land is 3,000 kg per hectare.

Position of Feed

The number of livestock in Northern Areas in 1976 was 2,08,731 cattle, 3,20,884 sheep, 5,61,771 goats, 2,891 buffaloes, 19,827 asses, 7,098 horses, 188 mules and 24 camels, which comes to 474,536 animal units. The total amount of air dry forage required annually for the livestock is 12,12,439 metric tonnes against which 10,01,250 metric tonnes of air dry forage is available from cultivated land, forests and rangelands of Northern Areas. The livestock are, therefore, being underfed which is a very infficient way of livestock production.

Both cultivated fodder and range forage in the protective reserves is cut at a very late stage when lot of nutrients have already leached. In addition to wrong stage of harvesting very high stubbles of agricultural crops are left, as they have no choppers to chop these stubbles and the stubbles as such cannot be consumed by the livestock. The hay and aftermath of crops is stored in the open on roof tops and on trunks and branches of the trees.

Nutritious green forage is available in spring months only except for the olive and oak forests and alpine pastures. Grazing at times of initiation of growth in March/April can do the most damage to the plants. The second critical period falls in August/September when seed formation and maturity is common among forage species.

Erodibility

In the areas below alpine pasture the soil erosion is common on steep slopes because of year long grazing and on cultivated land because of defective terracing and cropping patterns. In alpine pastures the soil is often friable due to frost heaving and is easily dislocated by hoofs of livestock.

Livestock

The livestock breeds are primitive with extsemely low productivity except for some parts of Baltistan where yaks are kept for breeding cattle. There is a no medical cover provided to the livestock in alpine pastures and the control of livestock diseases even in the villages is nominal. There is enough veterinary staff with hospitals and dispensaries but without medicines.

The livestock marketing facilities are non-existent except for the livestock of Bakarwals who dispose off their livestock in Azad Kashmir, N.W.F.P., or Punjab.

Recommendations

A comprehensive survey of range, livestock, socio-economic conditions, required and available livestock feed and marketing facilities should be carried out. The grazing cooperatives should be formed of the local graziers who are willing to adopt the scientific range management practices and graze their animals as advised by the range extension staff. These cooperatives should own the range and livestock resources. Deferred rotational grazing programme, designed to provide periodic rests during critical periods and intensive stocking rates over short periods of time to ensure proper range use, should be adopted.

A range management plan should be prepared for each operational project undertaken by the Forest Department. In operational projects the external boundary should be selectively fenced on sensitive places only where there is frequent danger of encroachement from the outside livestock. The internal fencing should only be nominal. The optimum ratio of different kinds of livestock based on range suitability classification should be determined for each range operational project and be strictly followed by increasing the off-take of animals which are in excess of the required ratio and vice-versa. Seeding and planting of desirable indigenous and adapted exotic grazing-tolerant species should be carried out on suitable sites with appropriate technology. The seed of the selected species should be multiplied locally. Seeded and planted areas should be protected from grazing for two growing seasons. In areas deficient in stock water, development of watering points should be carried out. Salting grounds should be established away from the watering points for proper distribution of livestock over the whole range area and making good for the deficiency of nutrients in the forage. The *Artemisia* steppe and scrub forests should be managed as rangelands. The level grounds in *Artemisia* steppe where water is available for irrigation, should however be cultivated and agricultural crops and fruit plants should be raised on them. The deodar/Chilghoza subzone should be primarily managed as forests. However in selection forests the grazing can be incorporated at the time of exploitation. Alpine pastures are ecologically stable rangelands and should be managed as such. The wildlife, watershed and recreation management should be integrated with range and forest management.

The acreage under fodder crops should be increased. The fodder crops should also be fertilized. The leaves of deciduous trees fallen in autumn should be collected and saved for use during winter. The efficiency of utilization of agricultural crops should be increased by chopping the material before feeding to the animals. The utilization of wolf plants of *Artemisia* and *Haloxylon* should be enhanced by concentrating livestock on small portions of ranges turn by turn. The practice of enriching the areas earmarked for cultivation with nitrogen fixed by *Hippophae* plants, which also serve as good fodder near habitations, should be continued, strengthened and expanded. The harvesting of grass should be done at boot stage and the cut grass should be properly conditioned, dried and stored under roof with open sides for ventilation.

In order to check the soil and water losses and to reverse the degradation process soil conservation and watershed practices including silt trapping through construction of spillways, check damming, gully plugging, contour ridging and contour trenching should be adopted.

A very healthy practice of crossing local cattle with yak should be continued and be expanded to other areas. Good quality males of other livestock species, brought from livestock farms, should replace the local ones. Old, diseased, shy or otherwise defective animals and surplus males should be culled gradually. Concerted efforts should be made to minimize death losses by administering preventive medicines and intensive care of the young ones. The local people should be trained in controlling diseases and provided with medicines. The animal off-takes should be increased through organising livestock markets on cooperatives basis.

Range extension should be done through educating councillors and local people in range management practices, demonstrating the results of good range management practices, helping in preparation of the grazing plans, advising on feeding of animals and curing the animal diseases. Various modes of propaganda should also be used.

Facilities should be provided for sending two Divisional Forest Officers and 5 Forest Rangers to foreign universities for obtaining M.S. and short duration training respectively. Competent Officers should be sent to refereher courses in the Pakistan Forest Institute and also to see range management research and operational projects in Pakistan. Two posts of Divisional Forest Officers (Range Management), one at Astore and the other at Khaplu with necessary supporting staff should be created for the proper management of rangelands in those areas.