

THE EFFECT OF LIVESTOCK PRODUCTION SYSTEM ON THE NATURAL ENVIRONMENT OF DISTRICT BARKHAN BALOCHISTAN, PAKISTAN

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ABSTRACT: The study results showed that due to advent of market economy the resource system changed from range based livestock production and rain fed agriculture to irrigated mode of agriculture supported by tube well/dug well and sedentary and household level livestock production systems. This triggered changes in the settlement pattern in human communities from nomadic and transhumant to resident communities. With this change in the settlement pattern, the earlier prevalent joint family system gave way to the extended family system. Similarly the human behavior also changed with increasing territoriality, weakening of social bonds and communication, lowering levels of altruism and a multiplier effect reflected in the adoption of new innovation. These changes also brought about alterations in the physical environment i.e. natural resources being used in the resources system. Rangelands of the area, previously protected/managed for community livestock use assumed the role of open to grazing areas and were invaded by herders/nomads from outside. Livestock of nomads grazing the rangelands brought with them new ecto/endo parasites which not only infected the local livestock populations but were also source of pollution in the water. Rangelands also showed signs of deterioration due to overstocking and heavy/overgrazing. Based upon study results it is recommended that introduction of new resource process in a stable resource system needs careful thinking so that not only the human – environment relationship could be maintained in a harmonious manner but also support the existing social order.

KEYWORDS: Livestock, System, Natural, Environment, Barkhan

1 INTRODUCTION

The livestock is major provider of livelihoods for the largest part of the world's poor people; 1.3 billion people globally and directly support the livelihood over 600 million poor small holders' farmers in developing world [1], of the 565 million livestock keepers living in absolute poverty line, and 75% (estimated) of the poor live in rural areas of tropical developing countries [2]. Livestock is also important provider of nutrients, dietary protein and energy (Meat), food energy (Milk, Cheese, Butter, etc), its products contribute 17% to kilocalories consumption and 33% to protein consumption globally [3], provide manure, blood and bones as a fertilizer, provide power traction for growing crops in smallholder systems for that more people keep livestock which is known as most important asset of the poor as it brings income the livestock is now recognized the fastest growing part of the agriculture sector. The consumption of livestock products is growing even faster than the increase in world population. Human population in 2050 is estimated to be 9.15 billion, with a range of 7.96-10.46 billion [4]. Most of the increase is projected in the cities of the developing countries [5], more people now live in urban setting than in rural area this urban populations need more animal products than those of rural areas and the main livestock products to serve the world are meat, milk and egg etc [6].

Industrialization and green revolution have enhanced the future demand for livestock to be another revolution that may be called as livestock revolution, and it is capable to provide an engine for sustainable intensification of small-scale farming as well as marketing. It can play a crucial role in reduction of poverty and hunger worldwide [7].

In the perspective of climate change, environment may have significant effects on the global livestock production system, [7], but another side livestock sector stresses many ecosystems and contributes to the world most pressing environmental problems, including global warming, land degradation, air, water pollution and loss of biodiversity [8].

This situation encouraged me to find out the settlement pattern of people in study area in which their livelihood are completely or partially dependent on livestock rearing and their relationship with natural environment for livestock and agriculture production system and to see the changes through external factor in production system which arising changes in natural environment out of human exploiting of natural resources for sustaining livelihood.

2 MATERIALS AND METHODS

Five sources, fecal, water, soil, blood and external parasite samples were selected to study the effect of livestock parasitic on natural environment of Barkhan.

2.1 FECAL SAMPLES

Fecal samples were collected from the rectum and freshly passed deposit on ground. An appropriate 10 g sample size was taken in zip-lock plastic bag and container. The samples were sent to lab in cooled chain condition within 24 hours. The microscopic examination of faeces samples were performed by indirect method (concentration method), which give more accurate results because there is no chance of false negative results. Even mild infections can be detected by floatation method.

2.2 WATER SAMPLES

500ml water samples were collected from rivers, ponds and well in sterilized bottle. The samples were sent to lab in cooled chain condition within 24 hours. The microscopic examination of water samples were performed by indirect method.

2.3 SOIL SAMPLES

25g soil samples were collected from the depth of 10 cm rangeland in sealed plastic bags and the samples were sent to lab in cooled chain condition within 24 hours. The microscopic examination of soil samples were performed by indirect method (concentration method), which give more accurate results because there is no chance of false negative results. Even mild infections can be detected by floatation method.

2.4 BLOOD SAMPLES

3ml blood samples were collected from different flock in sterilized tube which contained anticoagulant. The samples were sent to lab in cooled chain condition within 24 hours. The microscopic examination of blood samples were performed under compound microscope.

2.5 EXTERNAL PARASITE IDENTIFICATION

The ticks were identified by their shape of the capitulum and mouthparts.

3 RESULT

A drastic shift from nomadic and transhumant production systems towards sedentary and household level production observed in this study reflects changes in the settlement patterns of farming communities over the years (Table-1). In the past agriculture production was predominantly rain fed while livestock production has been rangeland based with limited crop residual support during winter. After cultivating their rain fed agriculture the farmers used to move their livestock far away from agriculture areas and returned back to their permanent settlements at the time of crop harvest and during winters.

Table-1: Livestock production systems of the study area

Livestock Production System	Previous study percentage	At present
Nomadic	30 %	Nil
Transhumant	60 %	28 %
Sedentary	10 %	61%
House hold level production	0 %	11 %
FAO 1983		

The negative growth in the population of pack animal, camels reflects the use of mechanization in agriculture production practices and availability of modern means of transport. While very high rate of growth in cattle and buffaloes’ during the period has been due to change in livestock production system towards household level production (Table-2).

Table-2: Comparison of animal population and growth trends

Censes	Cattle	Buffalos	Sheep	Goats	Camels	Horses	Mules	Asses
2006	117286	2005	413840	155581	3930	2127	150	9507
1996	57047	1243	350810	144703	5046	635	16	3617
Difference	60221	762	63030	10878	-1116	1492	134	5890

The comparative growth trend in cattle & buffaloes as compared with other species has been quite significant from 1996 to 2006 in spite of long spell drought (1998 – 2004) in the province. During interviews and group discussing at all the study sites majority of the respondents confirmed that the continued drought from 1998 to 2004 resulted in crop failure of rain fed agriculture and drying up of large number of orchards supported through irrigation sources. Thus they were forced to invest their earnings and savings in milch animals so as to have a sustainable livelihood source. The higher growth trend in cattle and buffaloes since 1996 census (figure-1) has therefore been due to investment of farming community of study area in livestock sector. Another reason for comparative growth trend reflected particularly for sheep during this very period is incoming of these this species from other very arid parts of province to Barkhan and adjacent areas that fall in semi arid climatic zone. Due to its location in the semi arid climatic zone, Barkhan receives monsoon showers. During drought period unlike other parts of the province falling in hyper arid and arid zones, the district received some showers that encouraged the grass and shrub growth in the area. This attracted the livestock from other area.

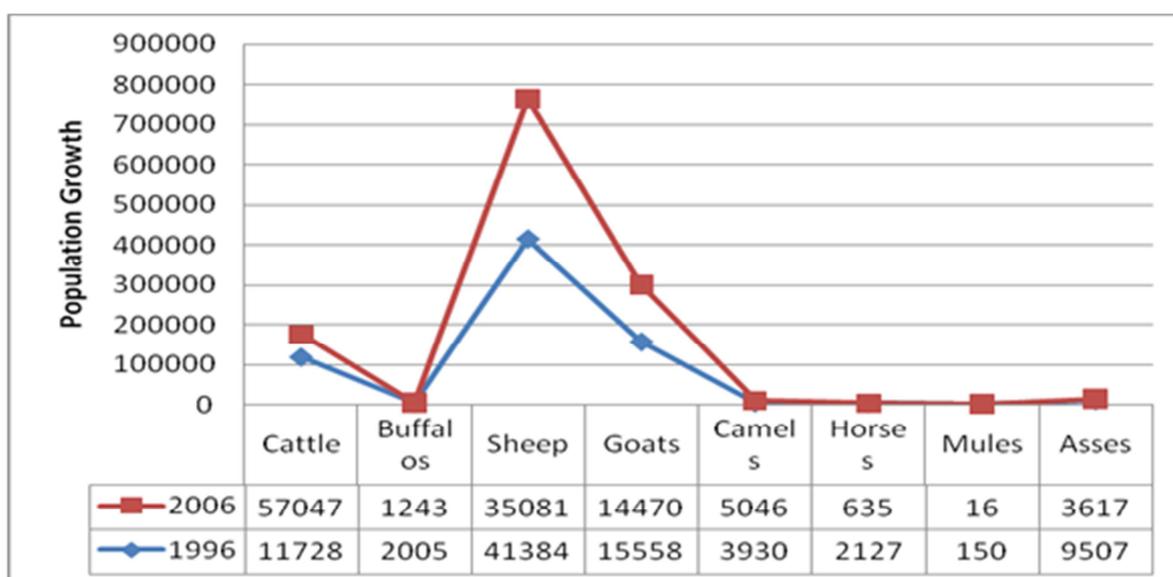


Figure-1: Trend in Population growth in small ruminant in Barkhan

The laboratory analysis of samples collected from study sites revealed that 87% animals were infested with one or another type of parasite or even having multiple types of parasites. The stages in the life cycle of identified parasites, Larval stage was highest (44%) followed by (37%) Cestodes and (12%) nematodes. The coccidiosis were found in 29% of the samples (Figure-2). Findings of present study are quite in line with the earlier research studies conducted in the developed world (Barrell, 1997) having findings that the parasitic load of animals depends on many variables, such as stocking density, time of the year, the reproductive status of the animals etc. since at the time of study the rangeland has been dry leading to less availability of nutrition, more stocking density of livestock on the available rangelands and reproductive status of animals as in the study area breeding starts from mid of September.

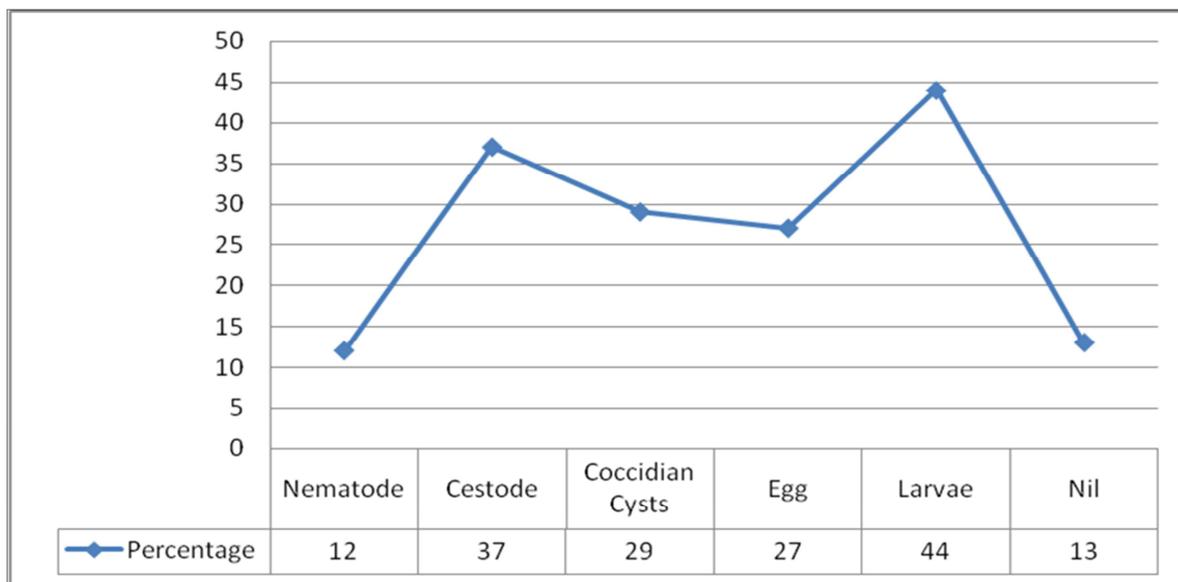


Figure-2: Percentage of internal parasitic infestation

In addition introduction of animals from arid conditions during drought period of 1998-2004 also contributed towards higher rate of parasitic infestations in area of this study. During focus group discussion the community members at large were of the opinion that animals introduced from arid zones were physically quite weak with poor immunity and were thus easily overwhelmed by worms.

Good nutrition plays a big part in how well the animal's immune system mounts the proper defenses, and in the animal's overall ability to tolerate the presence of some worms. Healthy and well-nourished animals will be able to develop resistance and resilience to worms and other parasites much better than thin animals that do not have good availability of quality feed. Resistance is the ability of an animal to prevent the establishment and maintenance of a parasite population within the gastrointestinal tract. Some individuals and some breeds show more resistance to parasitic infection than others. Research to identify characteristics in such individuals is a hot area. Culling susceptible animals can take advantage of this. Resilience is the ability of an animal to reduce production loss during a parasite infestation. Both of these traits are being looked at as ways of selecting animals that will be less susceptible to parasite effects. Animals that possess some genetic resistance or resilience can still be infected with worms. Therefore, you must keep in mind that this is just one more measure that will help control worm problems, not a cure by itself.

The water and soil samples collected from various sources of all the study sites were found contaminated with parasites thus contributing towards high rate parasitic infestation in the sheep population of the area of study. The external samples collected from all sites flocks were found positive and having, Ixodae Ricinus, Dermacentor Albipictus while blood samples have no parasite.

4 CONCLUSION

Livestock provides the basic security to the rural poor society for food and hard cash. Consequently the grazing pressure leads to the degradation of the rangeland. The number of livestock is a serious constraint for the conservation and

sustainable use of rangeland. Because of the socio-economic factors, the number are not likely to come down without developing socially acceptance, economically viable and environmentally safe alternative means of sustainable livelihood.

As far as the natural resources in the system are concerned, in the unstable resource use system these also followed the path of degradation. Changes in settlement pattern and livestock and agriculture production system triggered changes in natural resource use such as the rangeland/grazing lands. In the past, rangelands/grazing lands were important in the community for livestock grazing and maintained through closure and opening for grazing requirements of local community livestock. However, in the newly established unstable resource system these rangelands were suddenly left unattended. This act of human community towards rangeland use attracted other resource users from outside to fill out this niche. In the absence of any resource use norm, as prevalent in the past, the area was subjected to overgrazing due to heavy stocking rate resulting in rangeland degradation on one hand and introduction of new strains of livestock diseases, heavy parasitism among local livestock and contamination of drinking water sources on the other hand. The local livestock having poor immunity against these new diseases proved very vulnerable to their spreading with escalated mortality rate on one hand and weight loss on the other.

ACKNOWLEDGMENTS

I am very thankful to Center for Advanced Studies in Vaccinology and Biotechnology University of Balochistan for providing financial support for this study. I would also like to appreciate greatly Dr Alam Mangle, Mr Ghulam Mohammad and Dr Sadullah for their valuable and constructive suggestions during the planning and conduction of this research work.

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