

ASSESSMENT OF INTENSITY OF AGRO-GRAZING ANIMALS IN IRRIGATED PUNJAB*.

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ABSTRACT

A study was conducted in the Department of Forestry, Range Management and Wildlife, University of Agriculture, Faisalabad, Pakistan during 2007-08. In this study intensity of agro-grazing animals was assessed in six grazing sites covering 35 districts in irrigated areas of Punjab. Six grazing sites located along streams and rivers, rail tracks and main roads, main canals and drains, forest/range and international border between India and Pakistan, in and around main cities, towns, agricultural farms and interior villages, respectively. Highest intensity (576 animal units (AU/1000 ha) and herd size (55.20 AU/ herd) of agro-grazing animals was found in sites located along streams and rivers whereas the lowest intensity (151.10 AU/1000 ha) and herd size (36.40 AU/herd) was noted in sites located along rail tracks/main roads and forests/range lands and international border, respectively. Grazing site showing low animal intensity carried maximum number (383285 AU.) i.e. 27.10 percent of agro-grazing animals and area (2537000 hectares) which was one third (35.8%) of total study area. Highest percentage of buffaloes (54.8), cattle (33.0), sheep (8.6) and goats (11.2) were found in grazing sites located along streams/rivers, forest/range lands/international border and canal/drains, respectively. Lowest percentage of buffaloes (47.6) and cattle (31.2) was found in grazing sites located along forest/range lands/international border, along canals/main drains and in around main cities and towns, respectively. Grazing sites giving highest percentage of buffaloes showed minimum percentage of sheep (5.0) and goats (8.3). Grazing sites located in and around main cities and towns were smallest (332000 ha - 4.7%) by area. It is concluded that grazing sites located along streams and rivers have high potential of agro-grazing livestock production.

Key Words: Grazing lands; livestock numbers; grazing intensity; Punjab; Pakistan.

INTRODUCTION

Livestock is an important sub-sector of agriculture and plays very important role in Pakistan's economy contributing 49.6 percent towards agricultural GDP (3). Animals provide 12.2 g/head/day protein which is an essential nutrient of our daily diet (15). So significance of livestock cannot be underestimated for any agricultural country like Pakistan (3, 10, 15, 16). It is the

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best companion of farmers and helps increase the fertility and productivity of their land, carry their agricultural production from field to sale points in markets (1). According to Government's economic survey, nearly 40 percent of rural population is engaged in livestock activities in Pakistan. A majority of poor households, especially those who are landless or small landowners, depend on livestock for income. Nazli (13) found that 47 percent of rural households depend either on farming or livestock for their livelihood while 13 percent households depend solely on livestock.

According to census population of livestock is increasing rapidly like human being in Pakistan. The livestock population has jumped to 143 million from 110 million heads since previous livestock census in 1996 (3). On the other hand, expansion of residential colonies, installation of industries and other essential infrastructure, salinity, water logging and other soil ailments have resulted in decreased cultivated land arable. Aridity and drought are also prominent limiting factors responsible for shrinking area under cultivation in the country. This situation has resulted in tough competition between food and fodder production from same piece of lands which has escaped from different soil ailments and unfavourable environmental problems. Under such desparate situation, food production for human population is preferred to animals. This is the reason that area under cultivation of fodder crops is decreasing drastically @ 2 percent or even more (17).

Increasing human and animal needs warrants to exploit all available resources for livestock production. There are two major ways for livestock production in the country viz. stall feed and open grazing. Each system support about 50 percent of total livestock of country (15). Animals are generally grazed and browsed on natural vegetation growing in non-cultivated areas like range lands and pastures covering two third area of Pakistan. These range lands support 27 percent of total wealth of livestock whereas rest 23 percent of open grazed animals use stubbles, other crop residue, natural forage plants like weeds, shrubs and trees growing in and around agricultural fields, farm paths and roads, village roads, waste areas, inter and intra city and towns roads, rail tracks, rivers, canals, distributaries, water channels, ponds, lakes and parks and waste lands of rural as well as urban areas. A certain number of animals can also be seen roaming in vegetable and fruit markets in search of their food. Some roaming and strolling animals in streets and bazaars are also seen scavenging filth depots to get their food. Some animals are given house refuse edible commodities. Animal production through grazing crop residues, forage plants and grasses growing naturally place to place in cultivated tracts cum consumption of rotten, stale and

refuseable food articles in rural as well as urban areas is referred to as "Agro-Grazing" (14, 15, 16).

Livestock production through agro-grazing is ignored and neglected in Pakistan which is very important and valuable source of livestock production particularly in Punjab. About one fourth (23%) of total animal population get their green forage through agro-grazing. The potential of agro-grazing was stressed by many workers (1, 5, 6, 11, 12, 14, 15, 16, 18).

During previous two decades, decrease in fodder area is estimated at 11.6%. Moreover, productivity of vast natural range lands had been deteriorated in the past due to over stocking rate and heavy grazing. Our range lands, able to support only 4.5 million animal units are being grazed by 12.0 million animal units. At present, these are producing only 10-50 percent of their potential. Availability of green fodder is only 0.74 tons/head/year in the country whereas annual demand is 20 tons/head/year for livestock (3). The acute shortage of green forage for ever-increasing livestock population was also pointed out by other workers (1, 2, 7, 9, 11, 12, 22). Moreover, current estimates of deficient nutrients based on livestock census 2006, were reported as 48.58 million tons of TDN and 6.99 million tons of DCP (2, 3, 21). If this gap is covered we can increase livestock production by nearly 50 percent in the country (3).

The present study was planned to assess intensity of agro-grazing animals in irrigated Punjab to find out potential of livestock production through agro-grazing.

MATERIALS AND METHODS

This study was undertaken in the Department of Forestry, Range Management and Wildlife, University of Agriculture, Faisalabad, Pakistan during 2007-08 to assess animal strength of different grazing sites in irrigated Punjab. Agro-grazing sites were confined to those areas where minimal animal grazing and intensive crop farming were over lapping each other to varying degrees at one time. The area was divided into following grazing sites, covering different cropping belts found in irrigated Punjab:-

1. Along streams and rivers.
2. Along rail tracks and main roads.
3. Along main canals and drains.
4. Along forest/range and international border between India and Pakistan.
5. In and around major cities and towns.
6. In interior farmlands.

Grazing sites were sampled through stratified random sampling and studied to assess their contribution in determining animal intensity in irrigated Punjab. Proportional stratified random sampling technique was adopted (8) to make study more meaningful and better representation of population of agro-grazing animals and herd size. Grazing sites in irrigated Punjab are a variable source of grazing and browsing for grazing animals (4). A self explanatory questionnaire was developed for agro-graziers to collect the required information and facts pertaining to study. Only those agro-graziers in irrigated tracts were interviewed who mostly depended upon grazing animals as their major source of livestock herd which was consisting of 15 or more animal units (AU). The agro-graziers as well as their locations (villages located in each grazing site) were selected randomly. Number of agro-graziers selected for interview to collect data was varied from site to site (Table 1).

Table 1. Number of agro-graziers selected for interview to collect data in different grazing sites.

	Name of grazing sites	No. of respondents
1	Along streams and rivers	30
2	Along rail tracks and roads	128
3	Along major canals and drains	74
4	Along forest and range lands and international borders	19
5	In and around cities and towns	18
6	In interior villages	91
	Total:	360

A total of 360 graziers (respondents) from all grazing sites were interviewed. The data collected were transferred to a tally-sheet, tabulated and averaged as suggested by Steel and Torrie (19) for results and interpretations.

RESULTS AND DISCUSSION

Maximum number (383285) and percentage of animal units (27.10) of agro-grazing livestock were found in grazing site located along railway tracks and major roads. Minimum number (74190) and percentage of animal units (5.20) of these agro-grazed animals were recorded in grazing site located along forest lands, range lands and international border between India and Pakistan.

Moreover, maximum and minimum herd size (55.2 and 36.4 AU/herd) was found in grazing sites located along streams/rivers and forest/range areas and international borders, respectively. The agro-grazing AU and herd size of these two grazing sites differed significantly from each other whereas a non-significant difference was observed in these parameters in other grazing

sites. Maximum AU and herd size can be explained by abundant supply of natural forage along rivers (bela forest)/streams grazing sites.

Banks and raised river beds are the land locally known as 'bela' which supports excellent vegetation for grazing and browsing of livestock. These sites alongwith sides of five rivers in Punjab supported maximum number of animal units and herd size of grazing animals. Hence, on account of abundant forage availability, agro-graziers tended to keep big herds in these grazing sites as compared to other sites. Khan *et al.* (11) and Shahbaz *et al.* (18) also reported similar findings.

Table 2. Intensity of various types of animals in different grazing sites.

Grazing sites	AU(No)	AU(%)	Herd size (AU/herd)	AU/ (1000 ha)	Kinds of animals (%)				Total area (ha)
					Cattle	Buffaloes	Sheep	Goats	
Along streams/rivers	332308	23.50	55.20	576.0	31.5	54.8	5.0	8.3	577230 (8.2%)
Along rail tracks/ main roads	383285	27.10	37.40	151.1	31.7	52.4	6.4	9.5	2537000 (35.8%)
Along main canals/ drains	255726	18.10	37.40	175.4	31.2	50.3	7.3	11.2	1458000 (20.6%)
Along forest/range area/ along international border	74190	5.20	36.40	209.6	33.0	47.6	8.6	10.8	354000 (5%)
In and around major cities and towns	84344	6.00	38.20	254.0	31.2	50.1	7.4	11.2	332000 (4.7%)
In interior villages	284402	20.10	37.00	156.4	32.0	52.4	6.4	9.2	1819000 (25.7%)
Average			40.3	253.7	31.8	51.3	6.9	10.0	

Significant variation was observed in kinds of animals grazing on various sites. The highest percentage (54.8) of buffaloes was observed along streams and river banks as compared to 47.6 percent along forest/range areas and international border (Table 2). This was due to better forage availability along river sides in reverine forests and preference of agro-graziers to keep cattle and buffaloes herds for better economic return. The same opinion was expressed by Thompson and Nuthall (20).

The data further revealed that maximum number of animal units (576.0/1000 ha) were recorded in grazing site located along streams and rivers covering 577230 hectare (8.2% area) (Table 2), whereas minimum animal intensity (151.1 AU/1000 ha) was noted in grazing site located along rail tracks and main roads. High intensity of animal units along streams and rivers was due to abundance of vegetation available for grazing. Rivers of Punjab regularly spilled over their banks in rainy season due to shallowness of their beds and inundated low lying strips to the extent of many kilometers. The alluvial soil brought from up-streams settled each year in areas of grazing sites of streams and rivers during rainy season and developed them into productive

riverian grazing lands. These lands are well known for providing excellent grazing and browsing opportunities for animals and represent a picture of high diversity of plant species alongwith small timber and fire wood production. These belts between the rivers are considered home of many cattle and buffaloes breeds. The next highest intensity of animal units (254.0 AU/1000 ha) was found around major cities, because agro-grazing animals frequently visit fruit/vegetable shops and markets, filth depots, fruit and juice extraction shops, food grain markets and other such places where these animals easily find rotting over-ripe fruits, vegetables and fallen grains from grain markets. The lowest animal intensity (151.1 AU/1000 ha) was found in grazing sites along rail tracks and major roads. It was an interesting to note that in spite of low animal intensity this grazing site supported maximum number (383285 AU) and percentage (27.10) of grazing animal units as compared to other grazing sites. This was because of its largest area (2537000 ha -35.8%). In fact, area of grazing site and total number of animal of agro-grazing livestock determine animal intensity of any grazing site. The grazing site with more number of animal units with less area will give more animal intensity and vice versa. Any how, role of this site in supporting agro-grazing animals cannot be underestimated. These results are in line with the findings of Shahbaz *et al.* (18).

Overall animal intensity of study area (irrigated Punjab) was 253.7 animal units per one thousand hectares which is far below from desired excellent animal intensity. Major reasons include variability and frequent irregularities in fresh green forage supply, internal parasites as well as climatic extremes affecting agro-grazing livestock production on economic level, poor socio-economic conditions and unawareness of agro-graziers for modern techniques of profitable livestock production of quality animals. In addition, ignorance and lack of interest of administration also aggravating the situation. It is recommended that an effective government authority should be established and held responsible to conserve and utilize ignored forage resources for livestock production through improving socio-economic conditions and broadening vision of agro-graziers for improved quality animal production.

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