The Journal of Animal & Plant Sciences, 22(3): 2012, Page: 785-790
ISSN: 1018-7081

ANTICIPATING RANGE LAND DEVELOPMENT IN THAL (PUNJAB)

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ABSTRACT

A survey was conducted to assess the prospects of rangeland development in Thal tract of Punjab, Pakistan. At local level 64 respondents comprising 16 each of large, medium, small landholders and landless respondents were interviewed. Range personnel working in the tract were also interviewed. The number of livestock kept by respondents was highly correlated with the size of landholdings. Major source of income was livestock rearing. For grazing purpose, the dependence of respondents on vegetation of govt. rakhs varied from 94 to 100 percent. More than 41 percent forage requirements of livestock of all respondents remain unmet after grazing. Majority of graziers were facing problems like low carrying capacity of rakhs, lack of drinking water and protection measure forced by the Forest Department. The major constraints in range development efforts were lack of funds, and disinterest of range personnel working in the field. Other constraints were half hearted implementation of existing range management regulation and inadequate research.

Key words: Range management; Respondents; Range personnel; Grazing problems; Livestock feeding; Thal.

INTRODUCTION

The most serious problem for human being during the next 50 years would be the huge increase in population that can reach upto 11 billion before stabilizing (Chrispeels and Sadava, 1997). This accelerated population growth calls for development of resources including rangelands to cope with the increasing demands. Worldwide, rangeland contributes about 70% of the feed needs of domestic ruminants (Holechek *et al.* 1998). In African and South American countries, it provides over 85% of the total feed needs of ruminants (cattle, sheep and goats). In Ethiopia, it represents a valuable resource to the pastoralist and to the nation. Some indicators are that about forty percent of the national cattle, 50% of the small ruminants, and almost all camels are found in the pastoral areas (Hogg, 1997).In Pakistan, more than 60% livestock feed requirement are met from rangelands (Anon, 2010). Throughout the world, rangelands are the major source of feed for both domestic and wild ruminant animals and play an important role in supplying animal products to human population (Miller and Craig, 1997).

Rangelands in Pakistan occupy about 70% of total area of the country and are the mainstay of country's livestock industry. Livestock contribute 11.5 % towards GDP and affects the lives of 30-35 million people in rural areas (Government of Pakistan, 2010-11). Of this contribution, about 54 percent comes from livestock raised on rangelands (Muhammad, 1984). Thal tract of Punjab includes Mianwali, Bhakkar, Leiah, Muzzaffargarh districts and some parts of Khushab, Sargodha and Jhang districts stretching over an area of 2.5 million ha, extending North-West to South-West along the Indus and Jhelum river. Rangeland accounts for 60.8 percent of Tibetan Plateau, 19.4 percent of Pakistan, 9.7 percent of Afghanistan and 8.7 percent of India.

Since the Range Management has not been accorded adequate priority so far, great national loss is being suffered in form of poor livestock both in quantity and quality. This loss is also reflected in low living standard of rural people who depend mainly on these rangelands. Little information is available about the impact of rangelands on socio-economic condition of the stakeholders and prospects of their participation in rangeland development. This study was therefore conducted to anticipate rangeland development in Thal in accordance with the wishes and aspirations of the stakeholders.

MATERIALS AND METHODS

Two types of questionnaires were devised to obtain the required information of this study. Questionnaire No-I was used for local people residing in the vicinity of state-owned rangelands (rakhs) and Questionnaire No-II was used for range personnel working in Range Management Division Thal, Bhakkar. Prior to conducting the actual survey both the questionnaires were pre-tested and irrelevant questions were deleted. The categories of respondents were made for interview as shown in Table-1.

The detail of each rakh was obtained from the office of Divisional Forest Officer Range Management Bhakkar. Four rakhs namely Dagarkotly, Goharwalla,

Baba Hundalal and Chobara were randomly selected and visited. Near each selected rakh, the nearest 2 villages were surveyed, wherefrom sixteen local persons were interviewed. Of these sixteen respondents, four from each category were included. In this way, 64 respondents in total were interviewed from all the four rakhs. The data thus collected was compiled for interpretation of results.

Table-1. Categories of respondents interviewed in order to access the rangeland development in Thal (Punjab)

S. No	Category No.	Respondents
Questionnaire No-I		
1	I	Large farmers (Land holding 80 Ac and above)
2	II	Medium farmers (Land holding 41-80 Ac)
3	III	Small land owners (Land holding upto 40 Ac)
4	IV	Landless persons
Questionnaire No-II		
1	I	Range Forest Officers (3 No)
2	II	Foresters (7 No)
3	III	Forest Guards (29 No)

RESULTS AND DISCUSSION

General information about the area: The area under study is located in Bhakkar and Leiah districts of the Punjab province. It lies between 31º 22' N to 31º 58' N latitudes and 70º 49' E to 71º 26' E longitudes with the elevation ranging from 190 to 195 meters. Geo-morphologically, the tract can be classified into sand ridges, abundant channels and flood plains. The soil of the area is alluvial and sand dunes cover 50-60%. State owned rangelands in this tract are 0.064 million ha. This area is distributed in the form of 9 rakhs. The climate of the tract is classified as Arid Sub-Tropical Continental. Annual rainfall varies from 133 mm in the Southern to 300mm in the North Eastern region of the tract, most of which falls during Monsoon season. The mean daily summer and winter temperatures are 34.1°C and 15.5°C respectively and it shoots upto 50°C during summer and reaches freezing point in winter.

Natural vegetation of the area includes *Saccharum munja* (Sarkanda), *Desmostachaya bipinnata* (Dab), *Salvadora oleoides* (Wan), *Cynodon dactylon* (Khabal), *Aerua javanica* (Bui), *Zizyphus numularia* (Ber), *Acacia fernesiaria* (Walaiti kikar), *Dalbergia sissoo* (Shisham), *Tamarix aphylla* (Frash) and *Prosopis cineraria* (Jand). Other flora belongs to species of Haloxylon, Calligonum, Cymbopogon and Capparis. Thal Range Management Division Bhakkar is entrusted the development of these rakhs under the administrative control of Conservator of Range Management Circle, Lahore. Since independence, efforts are being made by the Government to develop these rakhs but their major part is still undeveloped. Due to misuse and negligence, these rangelands are producing only 10-50% of their potential.

Literacy level and family size: It was found that 66.6 percent landless respondents were illiterate (Table 2). Regarding small, medium and large landholders, illiteracy rates were 62.5, 43.75 and 37.5 respectively. It revealed that illiteracy rate was maximum in small landholders and minimum in large landholders. This might be due to the better economic resources possessed by large farmers for education. Average size of family of large, medium, small landholders and landless respondents was 8.0, 9.0, 10 and 10 respectively. All the respondents were of the view that more hands earn more and this was the reason of big family size.

Table-2 Literacy level and family size of respondents assessed during anticipating rangeland development in Thal (Punjab)

Farmers	Illiterate (%)	Primary (%)	Middle (%)	Metric (%)	Intermediate (%)	Family size	
						Male	Female
Large	37.50	25.00	19.50	12.50	5.50	4	4
Medium	43.75	25.00	12.50	12.00	6.75	5	4
Small	62.50	31.25	6.25	0	0	6	4
Land less	66.66	20.83	8.33	4.18	0	6	4

Sources of income and water: Major source of income of all categories of respondents was livestock rearing. Share of livestock in their income was 62-77.5 percent. Secondary source of income in case of large, medium and small landholders was agricultural crops. Labour work was the secondary source of income of small land owners and landless respondents (5 & 16.5% respectively). Business was another source of income for large farmers and landless respondents. The dependence of respondents on livestock increased from large to small farmers (Table-3). Landless respondents were depending more on

livestock which constituted 77.5 percent of their total income. More income from livestock was due to prevalent conducive conditions for livestock rearing in the area. Majority of the respondents were using hand pumps for water requirements of their households and livestock while large (10%) and medium (6.25%) landowners were also using wells for their water requirements.

Table-3 Sources of income and water found during the assessment of rangeland development in Thal (Punjab)

Categories (Farmers)	Source of income				Source of water	
	Livestock %	Agri. crops %	Labour %	Business/ others %	Hand Pump for human being + Livestock	Well for human being+ Livestock
Large	62	30	-	8	90	10
Medium	73	25	-	2	93.75	6.25
Small	76	18	5	1	100	-
Landless	77.5	-	16.5	6	100	-

Size of land holdings: Average size of land holding of Large, Medium and Small landholders was 118, 39 and 15 acres respectively (Table 4). Large, Medium and Small farmers had 79.83, 82 and 90 percent of their average holdings under agricultural crops respectively and their land under fodder crops was 6.3, 3.85 and 6.67 percent respectively. On the average, grazing land comprised 13.86, 14.1 and 3.33 percent of average holding of Large, Medium and Small farmers respectively. The correlation coefficient between the average size of land holdings and average number of livestock kept by the respondents was 0.991. It indicated that both these variables were highly correlated with each other i.e. greater the size of land holding, the greater was the number of livestock.

Table-4 Size of land holdings belonged to farmers of various categories revealed during assessing rangeland development in Thal (Punjab)

Categories (Farmers)	Average size of landholding (Ac)	Area kept for crops (Ac)	Area under fodder(Ac)	Area under grazing land(Ac)
Large	119	95	7.35	16.5
Medium	39	32	1.2	5.5
Small	15	13.5	1.0	0.5
Landless	-	-	-	-

Number of livestock kept: Animals kept by respondents are shown in Table-5. Average number of livestock kept by large, medium and small farmers was 127, 89, and 66 respectively. This number in case of landless respondents was 59. Of the total number of livestock in each category of the respondents, goats were the highest in number i.e. more than 75 percent of the entire local livestock followed by sheep, cattle, camel and buffalo.

Feeding sources: Feeding resources of the respondents have been shown in Table-6. Results revealed that the dependence of landless and small farmers on the vegetation of rakhs was more than other respondents. Large and medium farmers depended 94-96 percent on vegetation of these rakhs while small farmers and landless respondents were depending solely on them. More than 40 percent forage requirements of livestock of all respondents remain unmet after grazing at rakhs because of poor carrying capacities and other factors. While grazing the livestock at rakhs, the respondents did not care about the protection measures advised by the forest department. They were using continuous grazing system.

The data revealed that 93, 62 and 43.7 percent of the small, large and medium farmers were stall feeding their livestock. In case of landless respondents about 29 percent were practicing stall feeding. The data indicated that small farmers used this practice more as less area was assigned for fodder crops.

Grazing problems: The major problems faced by the graziers included low carrying capacity of rakhs, lack of drinking water for their domestic as well as livestock, lack of shady plants, presence of unpalatable species and unfriendly protection measures of forest department.

Marketing facilities and livestock health care: Majority of the large and medium farmers sold their livestock in markets. The roads leading to such markets were 85 percent Kacha and 15 percent Pakka. The 43.7 percent large farmers and 66.6 percent landless respondents sold their livestock in villages. Reverse was the case with small farmers and landless respondents who sold their livestock in villages and hamlets (chahas). Table-6 revealed that the percentage of respondents selling their livestock in villages increased from large farmer to all other respondents. The average distance of the nearest livestock market was 19.4 km.

The data revealed that the large and medium farmers benefited from veterinary, Hospitals/ dispensaries more than the small farmers and landless respondents.

This might be due to their social status and personal contacts. Average distance of the hospitals/dispensaries from the residential places of respondents was 16 Km (Table-8) which was too long to reach them conveniently. Overall, the respondents availed the veterinary facilities 32-87.5 percents.

Table-5 Number of livestock kept by respondents of the categories large, medium, small and landless farmers in Thal (Punjab)

Categories (Farmers)	Livestock species					Total
	Sheep	Goats	Cattle	Camels	Buffaloes	
Large	95	17	11	2	2	127
Medium	67	13	6	2	1	89
Small	49	10	5	1	1	66
Landless	45	9	3	1	1	59

Table-6 Sources of livestock feeding in Thal (Punjab) used by large, medium, small and landless farmers

Categories (Farmers)	Feeding method			Grazing system		Unsatisfaction after grazing %
	Grazing at Govt. rakhs	Grazing at self owned rakhs	Stall feeding	Rotational	Conti-nous	
Large	84.6	5.4	10	0	100	43.8
Medium	89.3	3.7	7	0	100	41.5
Small	75	0	15	0	100	40.6
Land less	93	0	7	0	100	41.0

Table-7 Grazing problems of Thal (Punjab) faced by large, medium, small and landless farmers

Categories (Farmers)	Grazing Problems				
	Low Carrying Capacity	lack of water	Lack of Shady Plants	Unpala-table spp.	Protection Measures of Forest Department
Large	38.25	30.5	13.75	5.0	12.50
Medium	40.25	28.5	10.00	2.5	18.75
Small	31.25	25.0	20.50	4.5	18.75
Land less	39.75	26.5	11.00	1.5	21.25

Table-8 Marketing and Treatment facilities for livestock enjoyed by the farmers in Thal (Punjab)

Category (Farmers)	Marketing Facilities			Treatment Facilities			
	Selling in market	Selling in village	Average distance of nearest market	Availability of medicine	Occasionally medicine available	Medicine not available	Average distance from hospital/ dispensary (Km)
Large	56.25	43.75	19.4	62.50	25.00	12.50	16
Medium	62.50	37.50	19.4	56.25	18.75	0.25	16
Small	18.75	81.25	19.4	31.25	-	68.75	16
Landless	50	55.25	19.4	12.50	18.75	88.25	16

Assistance needed by the respondents: Financial assistance in form of loan was the major assistance needed by the respondents. The average demanded amounts of capital needed by large, medium, small farmers and landless respondents were Rs.1500000, Rs.950000, Rs. 820000 and Rs. 610000 respectively. The main purpose of grant/loan was to install tube wells in case of large, medium, and small landowners. Landless respondents required loan/grant for the purchase of livestock. The capital requirement was found directly related to the size of holdings. Other needs included developing the vegetation of government rakhs, establishment of markets for livestock and provision of good breeds of livestock for getting maximum production/benefits from them.

The major suggestion given by all the respondents was regarding vegetation and water availability in rakhs. The percentage of respondents giving suggestions increased

from landless to large farmers. This might be due to somewhat better literacy level and economic conditions of the respondents.

Table-9 Assistance needed and suggestions given by the farmers of Thal for rangeland development

Categories (Farmers)	Assistance in terms of capital				Other assistance		Suggestions For Range Development		
	No. of persons in need	Av. Amount (Million)	Purpose		Vegetation and vet.health cover	Market	Vegetation improvement	Water Development	Both
			L/S Purchase	Tube well Purchase					
Large	93.75%	1.5	18.75%	75%	87.5%	12.5%	37.5%	18.75%	43.75
Medium	87.5%	0.95	25%	62.5%	93.75%	6.25%	50%	18.75%	25%
Small	75%	0.82	18.75%	56.25%	62.5%	25%	25%	43.75%	18.75%
Land less	75%	0.61	75%	-	79.16%	20.83%	25%	37.5%	4.16%

Constraints in the way of range land development: The most important constraints pointed out by forest staff (100% forester/forest guard) were lack of funds, lack of interest by range personnel and lack of strict range management policy (Table 10). At the time of this study the basic requirement for the recruitment of the forester and forest guards was matriculate. Out of total 36 foresters and forest guards 17.7 percent were intermediate and 82.3 percent were matriculate having 5 to 25 years experience. The divisional forest officer and the range forest officers were M. Sc. and B. Sc. in Forestry respectively. They had average experience of 10-30 years. The above qualification of the range personnel indicated that none of them was especially trained in the field of range management. It was revealed that range personnel in Punjab dislike the services conditions in range management and try to transfer to territorial forest divisions. Other constraints were lack of application of strict range management laws and initiation of range research. Some respondents also pointed out constraints like lack of adequate forest staff and non cooperation of local people. It was reported that 40-70 percent of the graziers were non-cooperative with range personnel. Such graziers were unlawfully grazing their livestock when and where they wanted. The major reason for this non-cooperation was low carrying capacity. In spite of all these constraints reseeding, tree plantation and removal of unwanted plant species in rakhs were claimed as the major development made by foresters and forest guards. The divisional forest officer chalked out the rotational grazing programme in rakhs in addition to other works.

Table-10 Constraints in the way of Rangeland Development in Thal proposed by Forest staff

Category	Lack Of Stock Water Resources	Lack Of Funds	Lack Of Interest Of Range Personnel	Lack Of Strict Management Policy	Lack Of Research	Lack Of Staff And Non Cooperation Of People
Forest Guard	67 %	100 %	90 %	100%	30%	65%
RFO/SDFO	65%	100%	100%	100%	60%	40%
DFO	100 %	100%	100%	100%	80%	35%

Strategies for range land development:

Creation of an independent range management department: All of the foresters supported this idea while 82.7 percent of the forest guards were also of this view. The Divisional Forest Officer and Range Forest Officers strongly favoured this idea for proper development of rangelands in the tract as well as in the country. This has, from time to time, also been stressed by other agencies that an independent range development department in Pakistan should be created to achieve the desired progress in the field.

Provision of sufficient funds: 100% of the forest staff demanded more funds.

Research and Scientific range management: Divisional Forest Officer and Range Forest Officers were of the view that field oriented research is needed and management of these lands must be on scientific lines.

Involvement of local people/ Formulation of grazing committees: All range personnel working in Thal tract were in favour of formulating grazing committees by involving local communities for getting sustained yields from these lands.

Conclusion: The study concluded that 94-100 % of respondents of all categories grazed their livestock in state-owned rangelands of the Thal tract. In spite of

having low carrying capacity, this tract met 59% of feed requirement of their livestock. Formulation of community organization is pre-requisite for development of this area. However, the following recommendations were made after completion of the study.

- An independent cadre for Range Management must be created at provincial level with adequate technical personnel.
- Efforts should be made to increase carrying capacity by reseeding palatable and high yielding exotic and indigenous grasses and shrubs.
- Field oriented research should be initiated in rangelands.
- Formulate grazing management committees for implementation of proper grazing system.
- All stakeholders should be involved in all developmental activities carried out in this tract.
- More veterinary facilities for livestock should be provided.
- For creating a sense of ownership, frequent meetings with local people should be arranged.

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