

Economic Downturn of Camel Herder in Cholistan Desert of Pakistan due to Climatic Change

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ABSTRACT

In Cholistan where the drought conditions are very common, camel is the best source of income and easily survives without food and water for longer period. Lack of proper management, marketing, disasters, drought conditions and lack of link between research institutes and camel farmers has brought the camel production to the edge of decline. Objective: The aim of study was to evaluate the effect of climatic conditions on camel production in tehsil Yazman. Out of 18 union councils of Yazman, 2 rural union councils were selected purposively depending on the camel population. Two villages from each union council were selected randomly, 30 respondents from each village were selected randomly, making a sample size of 120 respondents. The results of our study showed that 56.7%, 55.9% and 51.8% respondents supposed that sunlight, sand storm and warm temperature, respectively was the main factor which affect the camel production in Cholistan. According to 60.8% respondents, veterinary assistance has very high effect on camel production as followed by 55.9% and 52.5% respondents argument was about diseases and vaccination. Similarly, 90%, 82.5% and 81.7% respondents supposed that the squeezing of land, feed supplement and improvement of racing ability can enhance the camel production in Cholistan. It is concluded that specific guidelines should be established from Government to improve camel production.

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1. Introduction

The total camel population is 24 million globally. Pakistan ranks at 8th among the major camel raising countries in the world (Afzal, 2006). There are about 0.328 million households linked one way or another with camel production in Pakistan. Pakistan's camel

population is about 1 million with almost 20% of lactating camel producing around 0.6 million tons of milk annually (Kakar et al., 2008).

In Pakistan, there are 21 breeds of camel and two main breeds are, riverine and mountainous (locally known as Pahari or hilly camels). Mountainous camels are

found in Northern Punjab and hilly areas of Baluchistan and Riverine are found in deserts and irrigated plains of Punjab and Sindh (Ahmad et al., 2010). Within the existing socio-economic set-up of the three production systems, the camel plays a significant role as a riding and work animal. During the survey, it was also observed that soil ploughing by a camel varied from 0.5 to 1.0 ha depending upon the type of soil. In farming systems (both dry and irrigated) of Balochistan, farmers used more camels (55%) than bullocks and tractors (33%) and (12%) as traction power at their farms for performing various agricultural operations (Rees et al., 1988).

There is no marketing system; mostly open grounds are the sites for camel marketing. Sometimes the camel milk producers take their camels to major markets milked them and sold their milk to the end consumers. Less profit is due to poor marketing which encourages involvement of middle man (Mahood and Rodriguez, 1993). In Cholistan average rainfall is 180 mm but sometimes it becomes low as 2 mm. July and August are the peak months of rainfall when the average rainfall ranges from 38mm to 56 mm. Thus monsoon has least effect on this area, draught is very common in this area sometimes extending from 2 to 3 years which affect adversely on desert livelihood so it has ultimate effect on camel production and increase its sufferings (Chaudhary and Nasim, 1995). So, the main objective of this study was to evaluate the effect of climatic condition on camel production in Cholistan.

The situation in the Cholistan desert has become very complex, including pressure on pastoral lands, commercialization of the desert, faulty government policies, marketing issues and poor health cover. Socio-economic and environmental changes make pastoralism tricky throughout the world and Cholistan is one of the worst affected areas. The camel is most vulnerable to the effects of these changes. A new move in the region to bring more land under cultivation for cotton production is apparently very eye-catching, but there are many side effects of this practice. Land grabbing is one of the important issues, as the grazing lands are decreasing with the intensity of grabbing (Kakar et al., 2008).

A supplementary effect of feed resource stress is uncontrolled field and illegal privatization of public rangelands by different communities. In view of the trend towards rural systems, there is a critical call for to launch number of ways to civilizing the dietary conditions of the camels in order to increase milk production and thereby get better the life of camel producers (Maundu and Tengnas, 2005).

The main objective of this study was to determine the effect of climatic conditions on camel production in Cholistan, Pakistan.

2. Methodology

The research was conducted using a descriptive survey design. A survey is a means of gathering information about a particular population by sampling some of its members, usually through a system of standardized questions. In this study, the survey was conducted using questionnaires, focus on personal interview. Yazman is primarily called a gateway to the Cholistan Desert. Out of 18 union councils of Yazman, 2 rural union councils were selected purposively depending on the camel population. Two villages from each union council were selected randomly, 30 respondents from each village were selected randomly, making a sample size of 120 respondents. A pre tested and validated interview schedule has been used to collect the data. In pre testing 20 camel farmers has been interviewed.

3. Results and Discussion

Total annual income of camel herders in Cholistan:

According to our results, maximum (55%) camel herders described that their total annual income is less than 1 million. Furthermore, 40% camel herder's total income is 0.5 to 1 million. Only 5% respondents showed their total annual income more than 1 million (Table 1).

Distribution of respondents according to their herd size:

Table 2 showed the distribution of respondents according to their herd size. The results showed that 65% camel herder have up to 50 camels, as followed by 26.6% have 50-100 herd size. Only, 8.4% respondents pointed out the herd size is above 100.

Effect of climatic conditions: The maximum (56.7%) respondents reported that there is very high effect of sunlight on camel production. Similarly, 30% respondents reported highly effect of sunlight and only 2.5% respondents reported very low effect on camel production. Sun light was the main factor (Rank 1), which effect the camel production in Cholistan. Similarly, water scarcity is another factor with rank 2 and weighed score 435.6 which also play an important role in the camel production. The less rain fall was observed at rank 3 with 384 weighed score as followed by warm temperature (rank 4, weighed score 382). The sand storm and global warming was at rank 5 and 6 respectively which have less effect on camel production according to response of camel herders. Water scarcity problems for camel herders in

Table 1. Distribution of respondents according to their annual income

Annual income (million)	Frequency	Percent
>1	6	5.0
0.5-1	48	40.0
<1	66	55.0
Total	120	100

Table 2. Distribution of respondents according to their herd size

Herd size (number)	Frequency	Percent
Up to 50	78	65.0
50-100	32	26.6
>100	10	8.4
Total	120	100

Table 3. Effect of climatic conditions on camel production according to their rank

Climatic conditions	Mean±SD	WS	Rank
Sun light	4.33±0.97	5162	1
Water scarcity	3.63±1.10	436	2
Less rainfall	3.20±0.96	384	3
Warm temperature	3.17±1.01	382	4
Sand storms	2.47±0.64	297	5
Global warming	1.85±0.92	222	6

Table 4. Effect of festivals and selling choice on camel production according to their rank

	Mean±SD	WS	Rank
Selling choices	1.7583±0.86962	210	14
Season of camel sale	1.9333±0.67030	232	13
Festivals	2.9417±0.98130	353	6

Table 5. Regression model for the main factors which effect the camel production and the total income of respondents

Predictors	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	2.332	.394	5.918	.000**
Age of the respondents	.197	.074	2.677	.000**
Educational level of the respondents	.226	.041	5.464	.000**
Water scarcity	-.144	.044	-3.287	.001**
Sand storms	-.228	.081	-2.809	.006**
Watering frequency	.079	.046	1.708	.090 ^{NS}
Diseases	-.122	.048	-2.558	.012*
Season of camel sale	-.055	.077	-.722	.472 ^{NS}

* showed significance at $P < 0.05$, ** showed highly significance at $P < 0.001$, NS showed non-significant result

Cholistan are very high. The 40.8% camel herders showed that waters scarcity highly affects camel production and 22.7% respondent's argument was about very high effect of water scarcity in camel production. Only, 4.1% camel herder's opinion was that water scarcity has very low effect on camel production. The opinion of respondents about the effect of sand storm on camel production was observed. The results showed that maximum camel herder (55.9%) think that there is a very high effect of sand storm on camel production as followed by 35.8% respondent's argument was about highly effect of sand storm in camel production. Only, 8.3% camel herder showed that the medium effect of sand storm in camel production (Table 3).

Camel herders were also questioned whether festivals effect the camel production and the results are given below. According to results, 36.7% respondents thought that there is highly effect of festivals on camel production as followed by 34.2% respondents reported very high effect of festivals on camel production. Camel herders were also asked, is there any effect of selling choices on camel production and the results are given below. According to results, 46.7% respondents thought that there is low effect of selling choices on camel production as followed by 36.7% respondents reported medium effect of selling choice on camel production. Similarly, season of camel sale has no significant effect on camel production. The results showed that, 55% respondents reported that there is low effect of camel sale season on camel production as followed by 25.8% respondents reported very low effect. Main occasions of camel sale were the monsoon and then Eid-ul-Azha at in

Cholistan (Table 4).

The regression model showed that 0.197 million increase in total income with unit change in age if all other variables were kept constant. Similarly, the unit change in educational level will lead to an increase of 0.226 million in total annual income. The regression equation showed that there will be 1.44 million decrease in total income with a unit change in water scarcity and 0.228 million will be decrease with unit increase in sand storm if all other variables were kept constant. Similarly, with unit increase in disease there will be 0.122 million increased in total income of camel herders. Watering frequency and season of camel sale were observed non-significant at $P=0.90$ and $P=0.472$ respectively (Table 5).

Livestock production is affected by climate change. Additionally, to the physiological effects of higher temperatures on individual animals, the concerns of climate change are likely to contain increased risk that geographically restricted rare breed populations will be badly affected by disturbances. According to our results, rainfall affects the production of camels in Cholistan zone of Pakistan. The average rainfall is 180 mm but it may be as low as 2 mm. The peak rainy months are July and August with the rainfall ranging from 38 to 56 mm (Chaudhry and Nasim, 1995). The distribution of camel herders about the effect of warm temperature on camel production was observed. The results showed that 51.8% camel herder reported that there is a very high effect of temperature on camel production. Around the month of March to April, nomadic household move towards surrounding irrigated areas faced there by rising temperature in the desert and depleted feed and

water resources (Akhter *et al.*, 1997). Major source of income for most of the camel herders were sale of milk and meat and sale of animals (Ahmed *et al.*, 2010). The prices of a camel vary according to its health, quality and milking capacity of she camel. The price for the trained and racing camels may range between Rs. 1,50,000 and 2,00,000 (Jabar *et al.*, 1997; Knoess *et al.*, 1986). But the climatic change badly affects the production of camels which alternatively decreased annual income of camel herders in Cholistan.

Similarly, the water scarcity and sand storm were two main factors having significant importance in economic downturn of camel herders. The water scarcity and sand storm is found to have a negative impact on economic losses. Better management techniques should be adopted for these climatic changes to over the economic losses. Ruegg (2001) and Kamber *et al.* (2001) also concluded that the preventive measures were more cost effective and also decreases the economic losses faced by camel herders.

4. Conclusion

It can be concluded from the study that camel would be a future animal to produce high milk and meat and more compatible with climatic changes as compared to other livestock species. In the near future it can be predicted that camel would survive in adversities. So it is highly recommended that research on camel should be enhanced on national and international level. International agricultural agencies, government and other stakeholders should keep in focus the camel, camel herders and Cholistan area in Pakistan.

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