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**CAMEL SURVEY RESULTS IN  
HIGHLAND BALOCHISTAN**

Assembled by

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A. Rodriguez

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## CAMEL SURVEY RESULTS IN HIGHLAND BALOCHISTAN

Assembled by

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### Abstract

Balochistan comprises less than 5 percent of the human population of Pakistan while the provincial share of camels is 36 percent (the highest amongst all provinces). Per capita camel availability is about 1 camel per 14 inhabitants. Agricultural economists and livestock specialists from AZRI conducted a descriptive, diagnostic and comparative survey on camel utilization for draft (field work) and transportation at the farm level in early 1989. An informal survey took place prior to the formal survey which comprised 136 questionnaires in three areas of highland Balochistan. Household profiles of the interviewed camel owners are included. The uses of camels, number of camels owned and land ownership are furnished by region and/or by camel age-group. Crop land farmed by traction types and farmers' preferences for these types of traction are analyzed by region. Detailed information was collected on camel demography, production and feeding constraints. Data on bullocks and tractors, the other major draft sources in highland Balochistan, is provided as well. Economic value of these means of traction is also included.

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## CAMEL SURVEY RESULTS IN HIGHLAND BALOCHISTAN

The camel population in Balochistan has increased very rapidly in the last 20 years, from 46,000 camels in 1965 to 349,000 camels in 1986. This increase has been the highest amongst Pakistan provinces listed in Table A. Balochistan with 4.9 million people comprises less than 5 percent of the human population of Pakistan<sup>1</sup> while the provincial share of camels is 36 percent. Per capita camel availability is about 1 camel per 14 inhabitants. It is apparent that camels are widely utilized for diverse farming activities and for transportation in the rural and urban areas. However, no quantification has been made about their economic role. The study by Heston et al.<sup>2</sup> aroused interest in obtaining more detailed provincial information. This camel survey was conducted by AZRI to provide base-line information about camel utilization for draft (field) and transportation at the farm level. This information will allow AZRI researchers to describe and diagnose the current situation in highland Balochistan.

Table A. Population of Arabian camels in Pakistan

Province	1962	1965	1972	1976	1980	1986 <sup>‡</sup>	Provincial share <sup>##</sup> (%)
	----- thousands -----						
Punjab	210	239	262	338	357	321	34
NWFP	27	45	17	95	176	70	7
Sindh	--	149	71	144	148	218	23
Balochistan	--	46	87	212	171	349	36
Total	237	479	437	789	852	958	100

Modified from Qureshi, M.H. "The Camel". Paper presented at the Seminar organized by Food and Agriculture Organization, 20-23rd October, 1986, Kuwait. 35 pp.

<sup>‡</sup>Government of Pakistan. "Pakistan Census of Livestock 1986". Agricultural Census Organization, Statistics Division, Lahore, June 1989.

<sup>##</sup>1986

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<sup>1</sup>Buzdar, N., Nagy, J.G, Sabir, G.F, Keatinge, J.D.H. & Mahmood, K. "Rainfed Agriculture in Highland Balochistan: A Farming Systems Perspective". MART/AZR Res. Rep. No. 54, ICARDA, Quetta, 1989.

<sup>2</sup>Heston, A., Hasnain, H., Hussain, S.Z. & Khan, R.N. "The Economics of Camel Transport in Pakistan". Economic Development and Cultural Change Vol. 34(1985): 121-141.

In June, 1989 agricultural economists and livestock scientists from AZRI conducted an informal survey and followed this up with a formal survey in September 1989 in three areas of highland Balochistan. A total of 136 camel owners and herders were interviewed, in area I (Kalat and Khuzdar districts), with 42 respondents; area II (Quetta, Kachi and Pishin districts), with 52 respondents; and area III (Zhob, Loralai and Killa-Saifullah) with 42 respondents.

This document offers a compilation of the data collected, as well as a preliminary analysis (grouped for those three areas and overall) of the results of the survey. As it stands presents the original grouping; however, alternative ways to group the survey results can be done for future work.

Readers interested only in general aspects of camel utilization will find enough information in Tables 1-6. These tables display the uses of camels in highland Balochistan for agricultural and non-agricultural activities, farmers' preferences for camel and other means of traction power; in addition, household profiles of the interviewed farmers are furnished, with description of the land owned, breakdown of cropped land by traction power and the number of camels owned.

Tables 7-10 provide information on economic transactions: the value of camels by age-group and sex, number of camels bought and sold, qualities looked for in male breeding camels and the income earned from camel services. Tables 11 and 12 present demographic information: births by age-group of camel cows and total deaths with their perceived causes. Tables 13-15 refer to feeding constraints and practices, supplementation schedules and specific types of supplement provided to camels.

Tables 16-21 present the management practices for camels used for agricultural and non-agricultural activities. Depending upon the camel utilization, specific training is required. Further, veterinary services available and working conditions of camels are presented. Finally, tables 22-26 provide information about the other alternative sources of draft power, namely, bullocks and tractors: ownership of bullocks by age-group, their value, their uses and rental rates, and lastly, renting frequency, rental rates and purpose of renting tractors are presented.

This document may have some inconsistencies in the data. Comments will be appreciated. Because of the preliminary nature of these results, tables should not be quoted without permission from MART/AZR.

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Table 1. Farmers' preferences between using camel and other draft sources in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
----- # farmers (%) -----				
Does the farmer think that he will still be using camels/oxen for field work ten years from now?				
1. Yes	21(52)	9(43)	25(69)	55(57)
2. No	19(48)	12(57)	11(31)	42(43)
Total	40	21	36	97
Does the farmer prefer using camels for field work more than using oxen for field work?				
1. Yes	15(39)	2(13)	33(92)	50(55)
2. No	24(61)	14(87)	3(8)	41(45)
Total	39	16	36	91
For ploughing, planking and planting, what preference does the farmer have between using female or male camels?				
1. No preference	1(4)	1(10)	2(6)	4(6)
2. Prefers females	14(50)	1(10)	10(29)	25(34)
3. Prefers males	13(46)	8(80)	23(65)	44(60)
Total	28	10	35	73
Would the farmer prefer to use a tractor for field preparation work rather than using a camel/oxen?				
1. Already use a tractor	6(15)	14(67)	11(31)	31(32)
2. Yes	23(57)	3(14)	8(22)	34(35)
3. No	11(28)	4(19)	17(47)	32(33)
Total	40	21	36	97
Would the farmer prefer to use a tractor for planting rather than using a camel/oxen?				
1. Already use a tractor	2(5)	7(33)	2(5)	11(11)
2. Yes	15(36)	2(10)	1(3)	18(18)
3. No	24(59)	12(57)	33(92)	69(71)
Total	41	21	36	98
If farmer prefers tractor, why does the farmer not use tractor now?				
1. Not available	1(4)	0(0)	1(4)	2(3)
2. Too expensive/ha relative to the cost of camels	27(96)	5(100)	24(96)	56(97)
Total	28	5	25	58

Table 2. Household profile of respondent farmers; highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
<b>Respondents' age (years):</b>				
Average	41	42	40	41
Std. Dev.	14	17	17	16
Range	20-90	15-90	15-80	15-90
# Farmers	42	42	52	136
<b>Family Size:</b>				
Average	10	10	11	10
Std. Dev.	4	6	5	5
Range	2-20	3-27	3-30	2-30
# Farmers	42	42	52	136
<b>Respondent's position in household:</b>				
	----- # farmers (%) -----			
1) Household owner	28(67)	30(71)	32(62)	90(66)
2) Brother of owner	-	1(2)	2(4)	3(2)
3) Son of owner	14(33)	10(24)	18(35)	42(31)
4) Herder	-	1(2)	-	1(1)
Total	42	42	52	136

Table 3. Land ownership pattern of camel owners in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
	----- hectares -----			
<b>Khushkaba Land Owned:</b>				
Average	5.4	4.1	6.5	5.3
Std. Dev.	5	3.6	6.1	4.8
Range	0.8-18.2	0.4-12.6	0.8-20.2	0.4-20.2
# Farmers	23	13	14	50
<b>Sailaba Land Owned:</b>				
Average	6.5	7.3	8.5	7.7
Std. Dev.	8.1	7.7	14.6	11.7
Range	0.8-32.4	0.8-20.2	0.8-81	0.8-81
# Farmers	18	5	30	53
<b>Irrigated Land owned:</b>				
Average	2.8	2.4	3.6	2.8
Std. Dev.	1.6	2.8	1.2	2.4
Range	1.2-6.1	0.4-12.1	1.6-4.92	0.4-12.1
# Farmers	8	12	5	25
<b>Total Land owned:</b>				
Average	14.7	13.8	18.6	15.8
Std. Dev.	14.7	14.1	21.9	18.9
Range	0.8-32.4	0.4-20.2	0.8-81	0.4-81
# Farmers	49	30	49	128

Table 4. Crop land farmed by traction type in highland Balochistan; camel survey, 1989.

% of cropland farmed	Location								
	Area I			Area II			Area III		
	Cam <sup>1</sup>	Ox <sup>2</sup>	Tr <sup>3</sup>	Cam	Ox	Tr	Cam	Ox	Tr

----- # respondents (%) -----

Plowing and planking on Khushkaba land:

1) 0-25	2(17)	-	4(40)	1(10)	-	1(17)	-	-	-
2) 26-50	2(17)	2(20)	2(20)	1(10)	1(20)	1(17)	3(27)	1(50)	1(33)
3) 51-75	2(17)	1(10)	2(20)	-	1(20)	-	-	-	-
4) 76-100	6(50)	7(70)	2(20)	8(80)	3(60)	4(67)	8(73)	1(50)	2(67)
Total	12	10	10	10	5	6	11	2	3

Plowing and planking on Sailaba land:

1) 0-25	1(14)	2(20)	-	1(50)	-	-	1(4)	1(50)	-
2) 26-50	-	-	1(25)	-	-	-	2(8)	-	2(25)
3) 51-75	-	-	1(25)	-	1(50)	1(33)	-	-	2(25)
4) 76-100	6(86)	8(80)	2(50)	1(50)	1(50)	2(67)	21(88)	1(50)	4(50)
Total	7	10	4	2	2	3	24	2	8

Plowing and planking on irrigated land:

1) 0-25	-	-	1(33)	-	-	1(20)	-	-	-
2) 26-50	-	-	-	1(50)	1(13)	1(20)	2(67)	1(50)	1(33)
3) 51-75	1(33)	1(20)	-	-	1(13)	-	-	-	-
4) 76-100	2(67)	4(80)	2(67)	1(50)	6(75)	3(60)	1(33)	1(50)	2(67)
Total	3	5	3	2	8	5	3	2	3

Planting on Khushkaba land:

1) 0-25	1(8)	-	1(50)	1(9)	-	2(40)	-	-	-
2) 26-50	-	1(8)	-	2(18)	1(33)	-	1(8)	1(50)	-
3) 51-75	-	1(8)	1(50)	1(9)	-	-	-	-	-
4) 76-100	11(92)	10(83)	-	7(64)	2(67)	3(60)	12(92)	1(50)	-
Total	12	12	2	11	3	5	13	2	-

Table 4. (continued). Crop land farmed by traction type in highland Balochistan; camel survey, 1989.

% of cropland farmed	Location								
	Area I			Area II			Area III		
	Cam <sup>1</sup>	Ox <sup>2</sup>	Tr <sup>3</sup>	Cam	Ox	Tr	Cam	Ox	Tr

# respondents (%)

Planting on Sailaba land:

1) 0-25	1(10)	-	-	1(50)	-	1(50)	-	-	-
2) 26-50	1(10)	1(10)	-	-	1(100)	-	1(3)	1(50)	-
3) 51-75	-	-	-	-	-	-	-	-	-
4) 76-100	8(80)	9(90)	-	1(50)	-	1(50)	28(97)	1(50)	-
Total	10	10	-	2	-	2	29	2	-

Planting on irrigated land:

1) 0-25	-	-	-	1(50)	-	1(33)	1(25)	1(50)	1(50)
2) 26-50	1(50)	1(17)	-	-	3(38)	-	1(25)	1(50)	-
3) 51-75	-	-	-	-	-	-	-	-	-
4) 76-100	1(50)	5(83)	-	1(50)	5(62)	2(67)	2(50)	-	1(50)
Total	2	6	0	2	8	3	4	2	1

- 1 Camel  
2 Oxen  
3 Tractor

Table 5. Number of camels owned by the farmers/herders in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
	# Camels			
<b>Camels owned, &lt;1 year:</b>				
Average	1	1.7	2.9	1.9
Std.Dev.	-	1	4	3
Range	1-1	1-3	1-13	1-13
# respondents	10	15	13	38
<b>Camels owned, 1-2 years:</b>				
Average	1	2.7	3.5	2.4
Std.Dev.	1	2	4	3
Range	1-2	1-11	1-10	1-11
# respondents	4	12	6	22
<b>Camels owned, 3-4 years:</b>				
Average	1.6	3.1	3.9	3.2
Std.Dev.	1	2	4	3
Range	1-3	1-10	1-16	1-16
# respondents	7	16	18	41
<b>Camels owned, 5-6 years:</b>				
Average	1.2	2.5	1.8	1.8
Std.Dev.	1	2	2	2
Range	1-3	1-11	1-19	1-19
# respondents	14	34	42	90
<b>Camels owned, 7-10 years:</b>				
Average	1.3	2.6	3.3	2.4
Std.Dev.	1	2	4	3
Range	1-3	1-12	1-21	1-21
# respondents	34	41	29	104
<b>Camels owned, 11-20 years:</b>				
Average	1.1	2.3	4	2.2
Std.Dev.	1	1	4	2
Range	1-2	1-5	2-13	1-13
# respondents	9	6	5	20
Camels owned/resp.	1.20	2.52	2.83	2.18
Avg. No. camels/owner	2.21	7.44	6.16	5.22

<sup>1</sup>Camels owned per respondent was multiplied by the ratio of total number of respondents in one area for all ages of camels to total number of farmers interviewed in that area (e.g., total number of respondents in area I was 78 out of 42 farmers interviewed, see Table 2).

Table 6. Uses of camels by age-group in highland Balochistan; camel survey, 1989.

	Location						# farmers (%)
	Area I		Area II		Area III		
	M <sup>1</sup>	F <sup>2</sup>	M	F	M	F	
Camel uses, 2-3 years:							
1) Plowing and planking	-	-	-	-	-	2(33)	
2) Planting	-	-	-	-	2(18)	3(50)	
3) Grain and straw hauling	1(50)	-	3(50)	2(40)	-	-	
4) 1, 2 & 4	-	-	-	-	1(9)	-	
5) Transportation	-	2(50)	2(33)	2(40)	2(18)	1(17)	
6) Riding	1(50)	2(50)	1(17)	1(20)	-	-	
7) Water hauling	-	-	-	-	6(55)	-	
Total	2	4	6	5	11	6	
Camel uses, 4-6 years:							
1) Plowing and planking	-	1(10)	1(4)	4(18)	1(3)	2(7)	
2) Planting	-	1(10)	1(4)	3(14)	1(3)	2(7)	
3) 1 & 2	-	-	3(12)	1(5)	1(3)	3(12)	
4) Grain and straw hauling	-	-	4(15)	7(31)	-	-	
5) 1, 2 & 4	-	-	-	-	2(6)	1(4)	
6) Transportation	2(29)	1(10)	12(46)	4(18)	3(10)	1(4)	
7) 1, 2, 4, & 6	-	1(10)	-	-	3(10)	7(26)	
8) Riding	2(29)	1(10)	5(19)	3(14)	10(31)	2(7)	
9) 1, 2, 4, 6 & 8	3(42)	5(50)	-	-	2(6)	2(7)	
10) Water hauling	-	-	-	-	9(28)	7(26)	
Total	7	10	26	22	32	27	
Camel uses, 7-10 years:							
1) Plowing and planking	-	-	-	-	-	4(17)	
2) Planting	-	-	-	-	-	3(13)	
3) 1 & 2	2(12)	8(35)	5(19)	12(63)	1(6)	2(9)	
4) Grain and straw hauling	1(6)	1(4)	2(7)	1(5)	-	-	
5) 1, 2 & 4	-	-	2(7)	-	2(11)	1(4)	
6) Transportation	5(28)	4(17)	11(41)	3(16)	2(11)	1(5)	
7) 1, 2, 4, & 6	-	2(9)	-	-	5(28)	6(26)	
8) Riding	1(6)	2(9)	7(26)	3(16)	2(11)	2(9)	
9) 1, 2, 4, 6 & 8	9(50)	6(26)	-	-	-	-	
10) Water hauling	-	-	-	-	6(33)	4(17)	
Total	18	23	27	19	18	23	

(con't)

Table 6. (continued). Uses of camels by age-group in highland Balochistan; camel survey, 1989.

	Location					
	Area I		Area II		Area III	
	M <sup>1</sup>	F <sup>2</sup>	M	F	M	F
	----- # farmers (%) -----					
Camel uses, 11-20 years:						
1) Plowing and planking	-	-	-	1(12)	-	1(14)
2) Planting	-	-	1(25)	1(12)	-	1(14)
3) 1 & 2	-	4(45)	-	2(25)	-	-
4) Grain and straw hauling	-	-	1(25)	2(25)	-	1(14)
5) Transportation	1(50)	1(11)	1(25)	1(12)	2(40)	1(14)
6) Riding	1(50)	1(11)	1(25)	1(12)	-	1(14)
7) 1, 2, 4, 6 & 8	-	3(33)	-	-	-	1(14)
8) Water hauling	-	-	-	-	3(60)	1(14)
Total	2	9	4	8	5	7

<sup>1</sup> Male

<sup>2</sup> Female



Table 7. Value of male and female camels owned by farmers/herders in highland Balochistan; camel survey, 1989.

	Location					
	Area I		Area II		Area III	
	M <sup>1</sup>	F <sup>2</sup>	M	F	M	F
	(Rs)					
Age-group, <1 year:						
Average	1400	1250	1350	1311	971	933
Std.Dev.	473	332	848	722	76	103
Range (X 100)	10-20	8-15	8-30	8-30	8-10	8-10
# respondents	6	4	6	9	7	6
Age-group, 1-2 years:						
Average	3000	1800	1700	1357	1667	1833
Std.Dev.	-	346	837	378	289	764
Range (X 100)	30-30	14-20	10-30	10-20	15-20	10-25
# respondents	1	3	5	7	3	3
Age-group, 3-4 years:						
Average	3333	3750	2367	3450	3250	3383
Std.Dev.	289	500	683	1863	1255	681
Range (X 100)	30-35	30-40	12-30	20-80	20-50	25-50
# respondents	3	4	6	10	6	12
Age-group, 5-6 years:						
Average	4817	4875	4643	4677	4955	4825
Std.Dev.	1021	1529	1131	1200	1178	1115
Range (X 100)	35-60	30-80	30-70	35-80	30-75	30-70
# respondents	6	8	21	13	22	20
Age-group, 7-10 years:						
Average	6471	5529	5440	4563	6027	5056
Std.Dev.	1352	1138	1341	834	1637	784
Range (X 100)	40-90	40-80	25-80	35-65	40-10	40-65
# respondents	17	17	25	16	11	18
Age-group, 11-20 years:						
Average	5750	4643	6000	4625	6500	5333
Std.Dev.	2475	1029	1414	750	2121	1155
Range (X 100)	40-75	35-60	50-70	40-55	50-80	40-60
# respondents	2	7	2	4	2	3

<sup>1</sup> Male  
<sup>2</sup> Female

Table 8. Camels bought and sold during during one year period (Sept. 1988 to Sept. 1989) in highland Balochistan; camel survey 1989.

Age (yrs.)	Camels bought				Camels sold			
	Area			All Areas	Area			All Areas
	I	II	III		I	II	III	
1-2	-	1(17)	-	1(3)	2(18)	3(27)	2(29)	7(24)
3-4	1(8)	2(33)	1(5)	4(11)	2(18)	-	2(29)	4(14)
5-6	6(46)	1(17)	9(47)	16(42)	3(27)	3(27)	2(29)	8(28)
7-10	5(38)	2(33)	9(47)	16(42)	2(18)	3(27)	-	5(17)
11-20	1(8)	-	-	1(3)	2(18)	2(18)	1(14)	5(17)
Total	13	6	19	38	11	11	7	29
Average	3.3	1.5	6.3	7.6	2.2	2.8	1.8	5.8

Table 9. Qualities looked for in male breeding camels in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
	----- # farmers (%) -----			
Are male breeding camels run with female breeding camels?				
1) All year	3(9)	9(47)	18(69)	30(38)
2) Only in breeding months:	31(91)	10(53)	8(31)	49(62)
Total	34	19	26	79
Does the farmer select superior males to breed with females?				
1) Only superior males	33(92)	18(95)	28(88)	79(91)
2) No selection	3(8)	1(5)	4(12)	8(9)
Total	36	19	32	87
What qualities are most looked for in breeding males?				
1) Height, strength, color	35(85)	12(63)	13(42)	60(66)
2) Height, strength, good breed	-	1(5)	5(16)	6(7)
3) Strength, color, good breed	2(5)	-	-	2(2)
4) Height, strength, color and good breed	4(10)	6(32)	13(42)	23(25)
Total	41	19	31	91
Are young male camels castrated?				
1) Yes	-	2(5)	1(2)	3(3)
2) No	32(100)	38(95)	40(98)	110(97)
Total	32	40	41	113
At what age are young males castrated?				
Average	-	4	4	4
Std.Dev.	-	2	-	2
Range	-	1-5	4-4	1-5
# Farmers	-	2	1	3
If castration is not done, what are the reasons?				
1) A weaker draft animal	22(69)	35(92)	31(78)	90(82)
2) High death loss	7(22)	1(3)	1(3)	10(9)
3) Difficult operation-no vet. services available	3(9)	2(5)	6(15)	6(5)
4) Other	-	-	2(5)	4(4)
Total	32	38	40	110

Table 10. Income earned from camel services in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
In past year, how much you earned by wood transport (Rs):				
Average	4,912	12,425	4,556	8,353
Std.Dev.	4,954	9,138	4,379	7,984
Range (X 100)	900-16800	2400-30000	1200-12000	900-30000
# Respondents	9	16	9	34
In past year, how much you earned by crop transportation (Rs):				
Average	1,935	2,000	-	1,948
Std. Dev.	2,098	2,000	-	1,818
Range	200-4500	2000-2000	-	200-4500
# Respondents	4	1	-	5
In past year, how much you earned by human transportation (Rs):				
Average	250	-	-	250
Std.Dev.	250	-	-	-
Range	250-250	-	-	250
# Respondents	1	-	-	1
In past year, how much you earned by plowing (Rs):				
Average	-	900	-	900
Std.Dev.	-	566	-	566
Range	-	500-1300	-	500-1300
# Respondents	-	2	-	2
In past year, how much you earned by planking (Rs):				
Average	-	900	-	900
Std.Dev.	-	566	-	566
Range	-	500-1300	-	500-1300
# Respondents	-	2	-	2
In past year, how much you earned by sowing (Rs):				
Average	-	900	-	900
Std.Dev.	-	566	-	566
Range	-	500-1300	-	500-1300
# Respondents	-	2	-	2
In past year, how much you earned by different work <sup>1</sup> (Rs):				
Average	2,800	8,133	1,000	5,640
Std.Dev.	2,800	6,697	1,000	5,873
Range	2800-2800	400-12000	1000-1000	400-12000
# Respondents	1	3	1	5

<sup>1</sup> Dirt moving, fruit, grocery, flour and hand made mats transportation for selling in the nearest towns.

Table 11. Camel births by age-group during 1987-89 (Dec-Mar) in highland Balochistan; camel survey, 1989.

Area	1987			1988			1989		
	I	II	III	I	II	III	I	II	III
Age of camel cow	# of camel cows (%)								
3-6	1(50)	-	-	1(20)	3(13)	4(14)	2(18)	3(20)	11(26)
7-10	1(50)	11(92)	14(74)	2(40)	9(39)	19(32)	6(55)	8(53)	26(60)
11-20	-	1(8)	5(26)	2(40)	1(4)	5(18)	3(27)	4(27)	6(14)
Total	2	12	19	5	13	28	11	15	43
Avg.	1.0	1.0	9.5	9.5	4.3	7.7	3.7	5.0	14.3

Table 12. Camel deaths and causes of deaths during 1987 and 1988 in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
<b>Camel deaths in 1987:</b>				
Total	15	15	13	43
% of total owned:	16	5	4	6
Average	1.2	1.5	1	1.4
Range	1-2	1-4	1-5	1-5
# farmers	13	10	7	31
<b>Frequency</b>				
(by age-group)	----- # camels (%) -----			
1-10	13(87)	11(73)	8(62)	32(74)
11-20	2(13)	4(27)	5(38)	11(26)
Total	15	15	13	43
<b>Camels deaths in 1988:</b>				
Total	21	13	26	60
% of Total owned:	22	4	8	8
Average	1.5	1.2	2	1.6
Range	1-3	1-2	1-7	1-7
# farmers	14	11	13	38
<b>Frequency</b>				
(by age-group)	----- # camels (%) -----			
1-10	18(86)	10(77)	17(65)	45(75)
11-20	3(14)	3(23)	9(35)	15(15)
Total	21	13	26	60
<b>Causes of camel deaths in 1987:</b>				
1) Slaughtered	-	-	-	-
2) Broken leg	-	3(20)	-	3(7)
3) Old age	-	-	-	-
4) Plants	1(7)	-	-	1(2)
5) Unknown	6(40)	4(27)	10(77)	20(47)
6) Accidents	2(13)	-	1(8)	3(7)
7) Diseases	6(40)	8(53)	2(15)	16(37)
Total	15	15	13	43
<b>Causes of camel deaths in 1988:</b>				
1) Slaughtered	-	2(15)	1(4)	3(5)
2) Leg broken	2(10)	-	-	2(3)
3) Old age	1(5)	-	-	1(2)
4) Plants	-	2(15)	7(27)	9(15)
5) Unknown	6(28)	3(23)	15(58)	24(40)
6) Accidents	-	-	2(7)	2(3)
7) Diseases	12(57)	6(46)	1(4)	19(32)
Total	21	13	26	60

Table 13. Camel feeding and feed supplementation in highland Balochistan; camel survey, 1989.

	Location					
	Area I		Area II		Area III	
	M <sup>1</sup>	F <sup>2</sup>	M	F	M	F
	----- # farmers (%) -----					
Feeding regime of camel, <1 year:						
1) grazed on rangelands	1(20)	-	4(57)	6(60)	3(43)	4(67)
2) grazed and supplemented	1(20)	1(33)	3(43)	4(40)	-	-
3) grazed, crop residues and some suppl. feed	3(60)	2(67)	-	-	4(57)	2(33)
Total	5	3	7	10	7	6
Feeding regime of camel, 1-2 years:						
1) grazed on rangelands	-	-	4(80)	4(67)	1(34)	2(67)
2) grazed and supplemented	-	-	1(20)	2(33)	-	1(33)
3) grazed, crop residues and some suppl. feed	1(100)	1(50)	-	-	2(66)	-
4) 2 & 3	-	1(50)	-	-	-	-
Total	1	2	5	6	3	3
Feeding regime of camel, 3-4 years:						
1) grazed on rangelands	-	-	2(33)	6(55)	3(60)	6(50)
2) grazed and supplemented	1(33)	1(25)	3(50)	4(36)	-	-
3) grazed, crop residues and some suppl. feed	2(67)	3(75)	1(17)	1(9)	2(40)	6(50)
Total	3	4	6	11	5	12
Feeding regime of camel, 5-6 years:						
1) grazed on rangelands	-	-	9(43)	8(62)	3(13)	4(21)
2) grazed and supplemented	1(17)	1(11)	3(14)	3(23)	4(17)	5(26)
3) grazed, crop residues and some suppl. feed	5(83)	7(78)	9(43)	2(15)	16(70)	10(43)
4) 2&3	-	1(11)	-	-	-	-
Total	6	9	21	13	23	19

(con't)

Table 13. (continued). Camel feeding and feed supplementation, in highland Balochistan; camel survey, 1989.

	Location					
	Area I		Area II		Area III	
	M <sup>1</sup>	F <sup>2</sup>	M	F	M	F
	----- # farmers (%) -----					
Feeding regime of camel, 7-10 years:						
1) grazed on rangelands	2(11)	-	2(9)	9(56)	1(8)	6(32)
3) grazed and supplemented	1(5)	2(13)	6(26)	5(31)	2(17)	1(5)
4) grazed, crop residues and some suppl. feed	16(84)	12(80)	15(65)	2(13)	9(75)	12(63)
5) 2 & 3	-	1(7)	-	-	-	-
Total	19	15	23	16	12	19
Feeding regime of camel, 11-20 years:						
1) grazed on rangelands	-	-	-	2(50)	2(100)	1(50)
2) grazed and supplemented	1(50)	-	-	2(50)	-	-
3) grazed, crop residues and some supplement	1(50)	7(100)	1(100)	-	-	1(50)
Total	2	7	1	4	2	2

<sup>1</sup> Male  
<sup>2</sup> Female



Table 14. Period when supplemental feed is given to camels in highland Balochistan; camel survey, 1989.

	Location					
	Area I		Area II		Area III	
	M <sup>1</sup>	F <sup>2</sup>	M	F	M	F
	----- # farmers (%) -----					
1) Dec. - Feb.	17(49)	17(47)	16(50)	15(60)	21(60)	26(72)
2) March - May	-	-	-	-	-	-
3) June - Aug.	-	-	-	-	-	-
4) Sept - Nov.	-	-	-	-	1(3)	1(2)
5) All year	7(20)	7(19)	6(19)	1(4)	7(20)	5(14)
6) When doing work	3(9)	4(11)	1(3)	1(4)	1(3)	-
7) 1 & 2	1(3)	3(8)	-	-	1(3)	2(6)
8) 1 & 4	3(9)	3(8)	6(19)	8(32)	4(11)	2(6)
9) 1 & 5	4(11)	2(6)	3(9)	-	-	-
<b>Total</b>	<b>35</b>	<b>36</b>	<b>32</b>	<b>25</b>	<b>35</b>	<b>36</b>

<sup>1</sup>Male

<sup>2</sup>Female

Table 15. Type of supplement fed to camels by age-group in highland Balochistan; camel survey, 1989.

	Location					
	Area I		Area II		Area III	
	M	F	M	F	M	F
	----- # farmers (%) -----					
Supplement type; camels <2 years:						
1) lucerne	-	-	1(11)	1(10)	-	-
2) wheat straw	4(40)	2(33)	3(33)	3(30)	3(37)	1(50)
3) barley straw	3(30)	1(17)	-	-	-	-
4) grain	1(10)	2(33)	2(22)	3(30)	-	-
5) mungbean	-	-	1(11)	1(10)	3(37)	-
6) maize or sorghum <sup>1</sup>	2(20)	1(17)	2(22)	2(20)	2(25)	1(50)
Total	10	6	9	10	8	2
Supplement type; camels 3-10 years:						
1) lucerne	3(8)	2(7)	1(3)	1(6)	2(7)	1(3)
2) wheat straw	14(35)	8(28)	9(23)	6(33)	11(39)	12(32)
3) barley straw	2(5)	3(10)	3(8)	-	-	-
4) grain	7(17)	6(21)	9(23)	3(17)	5(18)	5(14)
5) mungbean	3(8)	3(10)	5(13)	2(11)	4(14)	3(8)
6) maize or sorghum	11(28)	7(24)	12(31)	6(33)	6(21)	16(43)
Total	40	29	39	18	28	37
Supplement type; camels > 11 years:						
1) lucerne	-	1(14)	-	-	-	-
2) wheat straw	1(33)	2(29)	1(33)	1(33)	-	-
3) barley straw	-	1(14)	-	1(33)	-	-
4) grain	-	1(14)	-	-	-	-
5) mungbean	1(33)	1(14)	1(33)	-	1(50)	1(50)
6) maize or sorghum	1(33)	1(14)	1(33)	1(33)	1(50)	1(50)
Total	3	7	3	3	2	2

<sup>1</sup> Green fodder of maize or sorghum

Table 16. Breeding practices of camels in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
	----- # farmers (percent) -----			
In which months do most camels mate?				
1) September-October	-	-	1(2)	1(1)
2) November-December	33(79)	16(38)	16(32)	65(48)
3) January-February	5(12)	9(21)	22(44)	36(27)
4) 2 & 3	4(9)	17(41)	11(22)	32(24)
Total	42	42	50	134
In which months are most foals born?				
1) January-February	4(11)	17(77)	12(32)	33(34)
2) February-March	6(16)	1(4)	19(50)	26(26)
3) March-April	-	-	1(3)	1(1)
4) November-December	2(5)	-	-	2(2)
5) December- January	26(68)	3(14)	3(8)	32(33)
6) 1 & 2	-	1(4)	3(8)	4(4)
Total	38	22	38	98
Age (years) at which young females are exposed to breeding males for first time?				
Average	5	5	5	5
Std.Dev.	4	1	1	3
Range	3-3	4-6	4-6	3-5
# farmers	39	21	35	95
If the farmer only owns females, what is the cost (Rs) of obtaining breeding services?				
Average	85	45	55	71
Std.Dev.	28	18	20	30
Range	20-150	1-60	30-100	1-150
# farmers	31	8	15	54
If the farmer only owns females, are there problems of timeliness or availability in obtaining breeding services?				
1) No problem	39(100)	17(100)	33(100)	89(100)
2) Availability problem	-	-	-	-
3) Timeliness problem	-	-	-	-
4) Other	-	-	-	-
Total	39	17	33	89

Table 17. Management practices of camel cows with foals in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
----- # farmers (%) -----				
Are the breeding males kept separate from the camel cow with young foals?				
1) Yes	19(51)	-	2(6)	21(24)
2) No	18(49)	19(100)	31(94)	68(76)
Total	37	19	33	89
If yes to above, how old are the foals when breeding males are allowed to run with the herd?				
	----- # days -----			
Average	26	-	12	25
Std.Dev.	21	-	-	21
Range	10-90	-	12-12	10-90
# farmers	19	-	2	21
Are foals kept apart from the camel cow when she is grazing?				
	----- # farmers (%) -----			
1) Yes	11(32)	6(33)	1(3)	18(22)
2) No	23(68)	12(67)	29(97)	64(78)
Total	34	18	30	82
If yes to above, for how many hours a day:				
	----- # days -----			
Average	4	2	2	3
Std.Dev.	2	1	-	2
Range	1-6	1-2	2-2	1-6
# farmers	11	6	1	18
At what age are foals allowed to run all day with the grazing camel cow?				
	----- # days -----			
Average	18	9	12	14
Std.Dev.	12	5	7	10
Range	7-60	3-20	4-30	3-60
# farmers	34	18	30	82
Do foals suffer continuously from diarrhoea?				
	----- # farmers (%) -----			
1) Yes	-	-	-	-
2) No	34(100)	18(100)	30(100)	82(100)
Total	34	18	30	82

Table 18. Weaning practices of foals and milking regime of camel cows in highland Balochistan, camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
<b>At what age are the foals weaned?</b>				
	----- # months -----			
Average	11	8	12	11
Std.Dev.	4	2	1	3
Range	6-24	5-12	8-18	5-24
# farmers	34	18	30	82
<b>Number of camel cows milked by the farmer:</b>				
	----- # female camels -----			
Average	1	2	4	3
Std.Dev.	1	1	6	4
Range	1-2	1-4	1-21	1-21
# farmer	7	8	10	25
<b>What happens if a lactating cow's foal dies?</b>				
	----- # farmers (%) -----			
1) The camel cow is milked	2(6)	-	-	2(2)
2) The camel cow does not allow other foals and dried	32(94)	18(100)	30(100)	80(98)
Total	34	18	30	82
<b>Who milks the camel cow?</b>				
1) The farmer	16(62)	1(7)	11(65)	28(48)
2) The women of household	10(38)	14(93)	6(35)	30(52)
Total	26	15	17	58
<b>When are the camel cows milked?</b>				
1) At night only	5(19)	1(7)	1(6)	7(12)
2) In the morning only	18(69)	7(47)	6(35)	31(53)
3) In the morning and at night	2(8)	7(47)	8(47)	17(29)
4) At mid-day only	1(4)	-	2(12)	3(5)
Total	26	15	17	58
<b>What is the milking regime?</b>				
1) Camel cows' udder bagged	24(92)	15(100)	8(47)	47(81)
2) Foals are kept in corral	2(8)	-	3(18)	5(9)
3) Foals are first weaned & then mother is milked	-	-	6(35)	6(10)
Total	26	15	17	58

Table 19. Training of camels for field work and baggage hauling in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
<b>Who trains the camel?</b>				
	----- # Farmers (%) -----			
a) Farmer	42(100)	42(100)	51(98)	135(99)
b) Hired specialist	-	-	1(20)	1(1)
Total	42	42	52	136
<b>How many days does it take to train a camel for?</b>				
	----- # days -----			
1) Field work	16	4	6	10
2) Baggage hauling	111	106	82	99
<b>How old are camels when they are first trained?</b>				
	----- # years -----			
1) For field work	5	5	5	5
2) For baggage hauling (ave)	5	4.5	4.5	4.6

Table 20. Veterinary services available for camels in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
	----- # Farmers (%) -----			
When a camel gets sick, does the farmer:				
1) Use home remedies only	21(50)	19(45)	33(72)	73(56)
2) Always calls a veterinarian	3(7)	2(5)	1(2)	6(5)
3) Calls a vet. only after home remedies do not work	18(43)	21(50)	12(26)	51(39)
Total	42	42	46	130
If a farmer never calls a veterinarian, what are the reasons?				
1) Not available in the area	11(31)	21(78)	35(83)	67(64)
2) Too expensive	16(46)	6(22)	2(5)	24(23)
3) Poor results from veterinary service	8(23)	-	5(12)	13(13)
Total	35	27	42	104

Table 21. Working conditions of camels during fall and spring seasons in Highland Balochistan; camel survey, 1989.

	Location			
	Area I	Area II	Area III	All Areas
How many hours/day does the farmer work his camel at field preparation and planting time?				
	----- # of hours -----			
Average	7	7	7	7
Std, Dev.	2	2	2	2
Range	4-10	3-9	4-12	3-12
# Farmers	28	12	34	74
In what condition are working camels in the fall (Sept-Oct) planting time?				
	----- # Farmers (%) -----			
1) Poor and weak	8(19)	3(7)	8(16)	19(14)
2) Satisfactory	28(67)	24(59)	37(73)	89(66)
3) Satisfactory but could be better with supplementary feed	6(14)	14(34)	6(12)	26(19)
Total	42	41	51	134
In what condition are working camels in the winter (Jan-Feb) Planting time?				
1) Poor and weak	24(57)	29(69)	36(70)	89(66)
2) Satisfactory	11(26)	5(12)	7(14)	23(17)
3) Satisfactory but could be better with supplementary feed	7(16)	8(19)	8(16)	23(17)
Total	42	42	51	135
Is the farmer satisfied with the traditional plough-planter?				
1) Yes	14(67)	3(7)	32(94)	49(51)
2) Yes but improvements could be made	7(33)	39(93)	2(6)	48(49)
Total	21	42	34	97
Is the farmer satisfied with the present camel harness?				
1) Yes	20(95)	3(7)	32(94)	55(57)
2) Yes but improvement could be made	1(5)	39(93)	2(6)	42(43)
Total	21	42	34	97



Table 22. Ownership of bullocks by age-group in highland Balochistan; camel survey, 1989.

Bullock age-group	Location			All Areas
	Area I	Area II	Area III	
	# bullocks (%)			
1-2 years:				
1) One bullock	1(100)	-	1(100)	2(100)
2) Two bullocks	-	-	-	-
Total	1	-	1	2
3-4 years:				
1) One bullock	-	1(100)	1(100)	2(100)
2) Two bullocks	-	-	-	-
Total	-	1	1	2
5-6 years:				
1) One bullock	4(29)	3(33)	1(100)	8(25)
2) Two bullocks	10(71)	14(67)	-	24(75)
Total	14	17	1	32
7-10 years:				
1) One bullock	4(40)	2(100)	1(25)	7(44)
2) Two bullocks	6(60)	-	3(75)	9(56)
Total	10	2	4	16

Table 23. Value of bullocks by age-group in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
	(Rs)			
<b>Bullock age-group:</b>				
<b>1-2 years:</b>				
Average	2000	-	2000	2000
Std.Dev.	-	-	-	-
Range	2000-2000	-	2000-2000	2000-2000
# respondents	1	-	1	2
<b>3-4 years:</b>				
Average	-	2000	2000	2000
Std. Dev.	-	-	-	-
Range	-	2000-2000	2000-2000	2000-2000
# respondents	-	1	1	2
<b>5-6 years:</b>				
Average	8757	7000	4000	7900
Std. Dev.	3389	3051	-	3340
Range	3000-15000	3000-11000	4000-4000	3000-15000
# respondents	14	9	1	24
<b>7-10 years:</b>				
Average	9900	4250	8250	8781
Std. Dev.	4332	354	3304	4135
Range	3000-15000	4000-4500	5000-12000	3000-15000
# respondents	10	2	4	16

Table 24. Uses of bullocks by age-group in highland Balochistan; camel survey, 1989.

	Location			
	Area I	Area II	Area III	All Areas
	----- # farmers (%) -----			
Bullock age-group:				
3-6 years:				
1) Ploughing, planking, planting, grain & straw hauling	13(93)	5(56)	1(100)	19(79)
2) Planting, grain and straw hauling	1(7)	4(44)	-	5(21)
Total	14	9	1	24
7-10 years				
1) Ploughing, planking, planting, grain & straw hauling	9(90)	1(50)	3(75)	13(81)
2) Ploughing, planking grain and straw hauling	-	-	1(25)	1(6)
3) Planting, grain and straw hauling	1(10)	1(50)	-	2(13)
Total	10	2	4	16

Table 25. Rental rates of bullocks between 3-6 years of age in highland Balochistan; camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
<b>Number of bullocks rented:</b>				
	----- # farmers (%) -----			
1) One	-	3(75)	-	3(50)
2) Two	1(50)	-	-	1(17)
3) Three	1(50)	-	-	1(17)
4) Six	-	1(25)	-	1(17)
Total	2	4	-	6
<b>Length of rental:</b>				
	----- # days -----			
Average	16	8	-	11
Std.Dev.	6	6	-	7
Range	12-20	2-15	-	2-20
# respondents	2	4	-	6
<b>Bullock's rental rate per day:</b>				
	----- (Rs) -----			
Average	50	50	-	50
Std. Dev.	-	-	-	-
Range	50-50	50-50	-	50-50
# respondents	2	4	-	6

Table 26. Renting frequency, rental rates and purpose of renting tractors in highland Balochistan, camel survey, 1989.

	Location			All Areas
	Area I	Area II	Area III	
<b>Last year how many time did you rent the tractor?</b>				
	----- # farmers (%) -----			
1) Once	8(47)	1(7)	3(25)	12(28)
2) Twice	4(23)	7(50)	6(50)	17(40)
3) Three times	2(12)	6(43)	3(25)	11(26)
4) More than 3 times	3(18)	-	-	3(6)
Total.	17	14	12	43
<b>What did you pay per hour for the tractor rented?</b>				
	----- (Rs) -----			
Average	71	62	68	67
Std.Dev.	8	5	37	7
Range	60-90	50-70	60-70	50-90
# farmers	17	14	12	43
<b>For what purpose did you rent the tractor?</b>				
	----- # farmers (%) -----			
1) Cultivation and land preparation	17(80)	12(86)	11(91)	40(93)
2) Threshing	-	2(14)	1(9)	3(7)
Total	17	14	12	43
<b>In last year, how many hours did you rent the tractor?</b>				
	----- # hours -----			
Average	44	10	22	37
Std.Dev.	78	6	15	56
Range	3-450	3-19	2-50	2-450
# respondents	17	14	12	43