

## Adoption Level of Camel Farming Practices in Arid Zone of Rajasthan, India

M.L. Meena

<sup>1</sup>SMS (Agricultural Extension), Krishi Vigyan Kendra, CAZRI, Pali-Marwar-306401, Rajasthan, India

Corresponding author e-mail : moti2007m@yahoo.co.in

### ABSTRACT

*This study was conducted in Pali district which was purposively selected for the study as the first phase of the project was in operation only in this district. The sample size was limited to 200 participants and 100 non-participants considering the time and other resources available for the study. The findings of the study that 46.50 and 40.00 per cent of the participant farmers were in the medium and high levels of adoption of recommended practices respectively, whereas 51.00 and 43.00 per cent of non-projected area were in the medium and low levels of adoption, respectively. The extent of adoption of project area was strikingly more than that of the non-projected area and there existed significant difference between the two groups. In the case of non-project area, majority of them were non-adopters of various recommended practices except in practices such as period of grazing and feeding of tree leaves in summer. Majority of the project area expressed that the reason for non-adoption of recommended practices were lack of knowledge, non-availability of inputs, lack of time and lack of veterinary services.*

**Key words:** Adoption, Camel farming, Technology, Rajasthan

World camel population is estimated to be around 25.89 million spread across 47 countries. About 85% of the camel population inhabits mainly eastern and northern Africa and rest in Indian subcontinent and Middle East countries. Somalia has the highest population of 7.00 million followed by Sudan 4.25 million, Ethiopia 2.40 million, Niger 1.65 million, Mauritania 1.49 million, Chad 1.39 million, Pakistan 0.95 and Kenya 0.94. India stands tenth in the world ranking with 0.51 million camels (FAOSTAT, 2012). India rank 7<sup>th</sup> in the world for camel population and in Indian camel population is mainly confined to the north-western part of the country. The state of Rajasthan has (0.498 million), Haryana (0.128 million), Punjab (0.043 million) and Gujarat (0.058 million) inhabitate almost 93.12% of Indian camel population, respectively. The density in 11 arid districts of Rajasthan was 2.72/km<sup>2</sup>. As per 17th Livestock Census 2007 overall camel population in India during 2007 livestock census showed a decline of 18.2% from 2003 population figures (Anonymous 2007). Breed wise census figures suggest that 269787- Bikaneri, 177151- Jaisalmeri, 29921-Kachchhi, 733 Mewari and 563-double humped camel are available of the total camel population of 516828 and the rest belong to other non-descript or crossbred camels (Anonymous 2012). Camel is one of the major livestock contributing to the livelihood security of farmers in Rajasthan. The farmers rear camel mainly in an extensive management system using common pasture land for grazing. Various improved camel management technologies related to breeding, nutrition, health care, reproduction and product management were developed at the National Research Centre on Camel, Bikaner to cater the needs of camel farmers.

The camel is an important animal component of the fragile desert eco-system. With its unique biophysiological characteristics, the camel has become an icon of adaptation to challenging ways of living in arid and semi-arid regions. The proverbial “Ship of Desert”

earned its epithet on account of its indispensability as a mode of transportation and draught power in desert but the utilities are many and are subject to continuous social and economic changes. The camel has played a significant role in civil law and order, defense and battle from the ancient times till date. The camel helped the engineers while constructing the Indira Gandhi Canal in western part of Rajasthan. Presently, the camel corps constitutes an important wing of Border Security Force of Indian Para-Military Services (Chand et al. 2010). Camel also easily accomplishes household needs, such as transport of water and other similar needs of normal houses. Camels are used widely as plough animals and seem to be equally efficient in producing draught as most other species. The camel has many unique qualities to survive and serve under harsh climate and utilize low quality feed resources which other species cannot consume. Use of camel bio-energy can save foreign exchange on the petroleum products because the camels are renewable natural source of power and require indigenous renewable natural resources to survive and substantiate. However, motivation of the people and proper policies can lead to even better development of this species and hence that of the camel keepers of this country.

In order to improve the socio-economic status of camel farmers, a novel project “Farming System’s Research for Improved Camel Production” (FSRICP), was conceived and launched in arid zone of Rajasthan in the year 2008. A systematic evaluation to understand the impact of the project in changing the knowledge and behavioural aspects of target farmers is essential which would form a basis for extending this project to the other target areas. Thus, present study was undertaken to measure the extent of adoption of camel farming practices and to ascertain the reasons for non-adoption of practices.

### METHODOLOGY

The study was conducted in Raipur block of

Pali district by incorporating a total 200 farmers from 20 villages in project area and 100 farmers from 6 villages of non-project area. In consultation with the FSRICP, fifteen technologies/practices in camel farming recommended were identified to study the adoption level among farmers. The respondents who had adopted the recommended practice were given two scores and for those not adopted were given zero score. The extent of adoption of recommended practices for each respondent was measured by using an adoption quotient developed by Gupta (1967) and adopted by Swaminathan (1986). Based on the adoption quotient, the respondents were classified into three categories as low, medium and high level of adoption. The total adoption score obtained by each respondent was sum total of the respondents for all the practices and the adoption quotient was worked out for each respondent by following method:

$$\text{Adoption quotient} = \frac{\text{No. of practices adopted} \times \text{No. of farmers}}{\text{Total no. of practices} \times \text{Total no. of farmers}} \times 100$$

## RESULTS AND DISCUSSION

The overall technology adoption rate revealed that 40.00 per cent and 46.50 per cent of the participants were high and medium adopters, respectively in project area compared to 06.00 per cent and 51.00 per cent in non-project area. This indicates that the extent of adoption of practices by beneficiaries was high in the project area than in the non-project area. This could be due to the utilization of services as rendered by the project officials in the project area. Besides these, increased awareness through mass media exposure and contact with extension personnel would have increased the level of adoption along with knowledge gain regarding camel husbandry practices. The non-availability of such services and facilities in the non-project area would be the main reason for considerable percentage of low adoption. The findings are in line with the findings of Mohan et al. (2005) and Suresh et al. (2008).

In project area, it was observed that out of 15 practices recommended by FSRISP in camel rearing, the practices namely selection and purchase of quality camel, provision of shelter for animals, feeding of colostrums to new born lamb, period of grazing, feeding of crushed prosopis pods and tamarind seeds, feeding of tree leaves in summer, deworming, vaccination of camel and marketing of ram lamb at 8 months of age were adopted by majority of the participant farmers (Tajane et al. 2005). The adoption level was poor for upgrading, ligation and disinfections of naval cord, weaning at 2 months of age, ectoparasiticide application, and castration of ram lambs at 2 months of age and isolation of sick animals to prevent spread of diseases.

In the case of farmers from non-project area,

period of grazing and feeding of tree leaves were the practices adopted by 84.00 per cent and 52.00 per cent of farmers, while majority of them were non-adopters to the remaining practices in camel rearing. This might be due to lack of knowledge and non-availability of suitable inputs. Similar findings were made by Kumaravel and Krishnaraj (2005).

With regards to practice of selection and purchase of quality animals, high cost of animals (67.70%) and non-availability of better breeds (32.30%) were the reasons expressed by the farmers for non-adoption of recommended practices. With respect to provision of shelter for animals, the participant farmers felt that for few animals the overhang in the house is enough (22.70%) and rest of them opined that construction of separate shed for providing shelter to the animals is a costly affair. With regards to upgrading, lack of knowledge about the scientific breeding practices (90.20%) and non-availability of quality rams (09.80%) were the reasons. In the case of colostrums feeding the farmers (68.70%) felt that feeding of colostrums immediately after birth will induce diarrhea and the animal may go down in condition. With regards to ligation and disinfection of naval cord, the non-adopters (86.7%) felt that the mother itself will lick the umbilical cord and will heal automatically and hence there is no need to cut and ligate the cord while 13.3% of the non-adopters expressed their lack of knowledge about this practice.

In the case of practice of weaning, lack of knowledge was expressed by 75.9% of the farmers. With regards to the feeding of the tree leaves in summer, some of the participant farmers expressed their lack of knowledge in feeding of suitable type of leaves, while the remaining felt that this practice is a time consuming affair.

In the case of deworming, lack of knowledge was expressed by majority of the non-adopters (88.90%) while the remaining 11.10 per cent of them stated that inadequacy of dewormers with the local veterinarian and link worker couples as the reason for non-adoption. With regard to ectoparasiticide application, majority (43.20%) of respondents cited lack of knowledge about the practice for their non-adoption. The remaining 30.20 and 26.70 per cent of non-adopters felt that the recommended practice is time consuming and is a costly method, respectively.

Lack of knowledge was the reason expressed by majority (87.20%) of non-adopters with respect to the practice, castration of ram lambs, followed by lack of veterinary services (12.80%) in their villages to perform this operation. With respect to the vaccination of camel 46.60 per cent of non-adopters expressed bitter experience of failure of vaccination leading to mortality of camel as the major reason, followed by lack of knowledge (44.80%) and wrong notion of deterioration in the condition of animals if vaccinated

(8.60%). With regard to isolation of sick animals, lack of knowledge (81.70%) and non-availability of isolation space (18.30%) were the reasons cited for non-adoption. In the case of marketing of ram lambs at months of age, the non-adopters expressed that lack of knowledge in organized marketing as the reason for non-adoption. It may be concluded that most of the participant farmers were having poor adoption in areas such as upgrading of animals, ligation and disinfection of naval cord, practice of weaning, ectoparasiticide application, and castration of ram lambs and isolation of sick animals. In case of non-participant farmers, majority of them were non-adopters of various recommended practices except in practices such as period of grazing and feeding of tree leaves in summer. Majority of the participant farmers expressed that the reason for non-adoption of recommended practices were lack of knowledge, non-availability of inputs, lack of time and lack of veterinary services. The findings confirm with the findings of Meena and Singh (2013), Tanwar and Rohilla (2011) and Sakthivel et al. (2011).

**Table 1**  
**Practice wise adoption level of recommended technolog practices in camel**

S. No.	Technologies	Project area				Non-project area			
		Adopter		Non - adopter		Adopter		Non-adopter	
		No.	%	No.	%	No.	%	No.	%
1.	Selection and purchase of quality camel breed	155	77.5	45	22.5	08	8.00	92	92.00
2.	Provision of shelter for camel	112	56.0	88	44.0	40	40.00	60	60.00
3.	Upgrading	16	08.0	184	92.0	05	5.00	95	95.00
4.	Colostrums feeding	175	87.5	25	12.5	15	15.00	85	85.00
5.	Ligation and disinfection of naval	72	36.0	128	64.4	00	0.00	100	100
6.	Practice of weaning	13	06.5	187	93.5	00	0.00	100	100
7.	Period of grazing	195	97.5	05	02.5	84	84.00	16	16.00
8.	Feeding of crushed prosopis pods and tamarind seeds	150	75.0	50	25.0	14	14.00	86	86.00
9.	Feeding of tree leaves in summer	166	83.0	34	17.0	52	52.00	48	48.00
10.	Deworming	146	73.0	54	27.0	07	7.00	93	93.00
11.	Ecto-parasiticide application	54	27.0	146	73.3	03	3.00	97	97.00
12.	Castration of male camel	13	06.5	187	95.5	00	0.00	100	100
13.	Vaccination of camel	142	71.0	58	29.0	02	2.00	98	98.00
14.	Isolation of sick camel	20	10.0	180	90.0	00	0.00	100	100
15.	Marketing of camel calf at 3.5 years of age	135	67.5	65	32.5	33	33.00	67	67.00

**Table 2**  
**Reasons for non-adoption level of recommended camel rearing practices**

S. No.	Recommended practices	Non adopter	Reasons for non-adoption	No. (Per cent)
1.	Selection and purchase of quality animals	45	a. High cost b. Non-availability of breeds	30 ( 66.7) 15 (33.3)
2.	Provision of shelter for animals	88	a. Over hang in the house not sufficient b. Shed construction is costly	20 (22.7) 68 (77.3)
3.	Upgrading	184	a. Non-availability of quality male calf b. Lack of knowledge	18 (9.8) 166 (90.2)
4.	Colostrum feeding	25	a. Colostrum feeding will induce diarrhea b. Lack of time	17 (68.0) 8 (32.0)
5.	Ligation and disinfection of naval cord	128	a. Not necessary b. Lack of knowledge	111 (86.7) 17 (13.3)
6.	Practice of weaning	187	a. Lack of knowledge b. Male calf will feel lonely	142 (75.9) 45 (24.1)
7.	Period of grazing	05	a. Lack of knowledge	7 (100.0)
8.	Feeding of tree leaves in summer	34	a. Lack of knowledge b. Time consuming	16 (47.1) 18 (52.9)
9.	Deworming	54	a. Lack of knowledge b. Inadequacy of dewormers	48 (88.9) 06 (11.1)
10.	Ecto-parasiticide application	146	a. Costly method b. Lack of knowledge c. Time consuming	39 (26.7) 63 (43.2) 44 (30.2)
11.	Castration of male camel	187	a. Lack of veterinary services b. Lack of knowledge	24 (12.8) 163 (87.2)
12.	Vaccination of camel	58	a. Camel go down in condition b. Failure of vaccination c. Lack of knowledge	05 (08.6) 27 (46.6) 26 (44.8)
13.	Isolation of sick animals	180	a. Non-availability of isolation space b. Lack of knowledge	33 (18.3) 147 (81.7)
14.	Marketing of camel calf	65	a. Lack of knowledge	65 (100.0)

### CONCLUSION

It may be concluded that 46.50 and 40.00 per cent of the participant farmers were in the medium and high levels of adoption of recommended practices respectively, whereas 51.00 and 43.00 per cent of non-projected area were in the medium and low levels of adoption, respectively. The extent of adoption of project area was strikingly more than that of the non-projected area and there existed significant difference between the two groups. In case of non-project area,

majority of them were non-adopters of various recommended practices except in practices such as period of grazing and feeding of tree leaves in summer. Majority of the project area expressed that the reason for non-adoption of recommended practices were lack of knowledge, non-availability of inputs, lack of time and lack of veterinary services.

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