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Migration pattern of *Raika* pastoralists of Marwar region in India

Deepak Chand Meena[1], Sanchita Garai[1]*, Sanjit Maiti[1], Suchandra Dutta[2], B. S. Meena[1] and K. S. Kadian[1]
[1]ICAR-National Dairy Research Institute, Karnal-132001, India
[2]Bidhan Chandra Krishi Viswavidyalaya, Mohanpur-741252, India
*Corresponding author e-mail: sanchita.bckv@gmail.com
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Abstract
Pastoralists of India are facing various challenges due to degraded and shrunken pastures in their native places as well as limited availability of feed and fodder resources throughout their migratory routes. Therefore, the present study was conducted in the six villages of Pali and Jodhpur district of Marwar region of Rajasthan among the 120 *Raika* pastoralists to map and document their migratory pattern. Study revealed that *Raikas* of Pali district migrated for eight months from October to May and covered almost 900 km towards Madhya Pradesh and used nine halting points. Whereas pastoralists of Jodhpur district had more dispersed migration towards Uttar Pradesh and Haryana by covering more than 1000 km and spent 8-11 months with 11 transit halts. Necessary interventions like rejuvenation of degraded pastures, animal and human health camps etc. may be arranged at the identified migratory routes and halting points to secure sustainable livelihood of the *Raika* pastoralists of Rajasthan.

Keywords: Marwar, Migration pattern, Pastoralist, *Raika,* Rajasthan

Introduction

India is the home of more than 200 pastoral communities that comprised about six per cent population of India (Khurrana, 1999). These pastoral communities inmate in places where cultivation of crops is very difficult. As about 60% of the world pastureland *i.e*., 2.2 million sq km is covered by different grazing system and the pastoral land use pattern has been changed in past years as the grazing distribution changed from localized to more distributed pattern (Gaur *et al.,* 2020). *Raika* is one of the biggest pastoral community in India (Köhler-Rollefson and Rathore*,* 2004a), residing in western districts of Rajasthan with a population of about 7 million and the largest group of livestock herders (Geerlings, 2001). Camel herding is the main livelihood and income source of many animal pastoralists like Raika of western Rajasthan (Chand *et al.,* 2018). *Raikas* are also living in neighbour states of Rajasthan like Gujarat, Haryana, Madhya Pradesh etc.(Singh *et al.,* 2014). Rajasthan is the largest geographical state of India located in western side of India and 55 percent of the total geographical area of the state is desert which is mainly confined in *Marwar* region of Rajasthan. It is quite impossible for crop cultivation in this region due to water scarcity, thus the contribution of livestock is very important for sustainable livelihood security. *Raikas* were forced to migrate from one place to another in search of fodder resources and water for their livestock. Erratic rainfall and severe drought account for the need to migrate pastoral *Raika* community along with their flocks. Maiti *et al.* (2014) also reported that climatic factors were the determinants of migration of the pastoral nomads of Arunachal Pradesh.

Nomadism and migration are the conspicuous features of livestock rearers in the arid and semi-arid region of western India (Solanki, 1990). Kantwa (2012) reported that *Raikas* stay in their home in rainy session; otherwise, they migrate almost six to nine months in a year from one place to another place. Sharma *et al.* (2003) reported that the pastoral livelihoods are seriously threatened by the problem of shrunken pasturage and disturbances in migratory routes. As a result, livelihood of the thousand of pastoralists faces difficulties due to the degraded pastures, non availability of basic facilities related to animal health care and human needs. Rahuhali *et al.* (2020) revealed that rangeland degradation was due to lack of knowledge of farmers of appropriate management practices and having large number of animals. Therefore, documentation of the migratory pattern of the pastoral nomads is the prerequisite to support pastoral livelihoods. With this backdrop, the present study emphasized to document the migratory pattern of the largest pastoral nomad of the country i.e., *Raika*.

Materials and Methods

Locale of study and sampling plan: The majority of the *Raika* pastoralists are living in Rajasthan, therefore, the study was conducted in this state purposively. Two highest *Raika* populated districts of the *Marwar* region of Rajasthan *viz*., Pali and Jodhpur was selected purposely. One tehsil *i.e.,* Bali and Bilara were also selected purposively from Pali and Jodhpur districts, respectively due the *Raika* population. Further, three villages form each tehsil were selected randomly. Thus Mundera, Latara and Bijapur villages were selected from Bali tehsil of Pali district. Jaswantapura, Khejarla and Birwas villages were selected from Bilara tehsil of Jodhpur district. From each village, 20 *Raika* pastoralist respondents were randomly selected. Thus, a total 120 *Raika* pastoralists were selected as sample for this study.

Mapping of migratory pattern: In the present study, migration was operationalized as the movement of the *Raika* pastoralist during the last and/ or ongoing season with their livestock to maintain the sustainable productivity of their herd. Pilot study confirmed that *Raikas* of a village used to migrate together. Therefore, village wise focused group discussion was conducted among the 10-15 group of the *Raika* pastoralists from the period of October 2018 to January 2019. A total six FGD was conducted for this study. Out of six, four FGD was conducted during their migration routes and two FGD was conducted at village to acquaint with their village settlement. Indeed, focus group discussion was conducted to map the migration pattern covering different aspects like route, distance, season of migration: starting and finishing, duration (in months): starting and finishing, duration (in months): forward migration and backward migration, transit halts: number of transit halt used (in both forward and backward migration), duration of halt in each transits halt (for both forward and backward migration), group composition during migration and herd composition during migration. Finally, migratory routes were mapped with the help of google map better comprehension.

Results and Discussion

Socio-economic status of Raika pastoralists: The socio-economic status of the *Raika* pastoralists was recorded (Table 1). It clearly indicated that middle aged *Raikas* of both district Pali and Jodhpur were engaged in pastoralism. *Raikas* of Pali and Jodhpur district believed in nuclear family as they were having family size of 4-5. Family education status was measured as the average year of schooling by their family members and it was found that average year of formal schooling of the *Raika* family was only 0.47 and 0.76 for Pali and Jodhpur district, respectively which revealed poor educational status among the *Raika* pastoral nomads. Louhaichi *et al.* (2015) reported that most of *Raika* (above 90 per cent) was illiterate. Kachhawa *et al.* (2013) also recorded that among camel herders of *Raika* pastoralist, the average age of camel herders was 48.4 and family size was 5.8. In the present study, it was observed that for both districts of *Raika* there was very lower level of social participations. *Raikas* spent of their time in migratory routes, therefore, they had very little access to formal educational institutions and social organisations. But the community cohesiveness was extremely high and it was almost same for *Raikas* of both the districts. It was operationalized as the interaction among themselves and they used to migrate together as a group. *Raikas* did not have much access to the institutional extension services due to their migration (Table 1), but they had a strong

Table 1. District wise socio-economic profile (mean ± SE) of the *Raika* pastoralists of Marwar region of Rajasthan

Variables	Pali	Jodhpur
Age of the household head (year)	50.58±1.46	48.62±1.02
Family size (number)	4.78±0.12	4.63±0.10
Family educational status (year)	0.46±0.06	0.76±0.08
Social participation (number)	0.57±0.16	0.10±0.05
Community cohesiveness (score between 7 to 14)	12.22±0.09	12.23±0.10
Mass media exposure (number)	3.52±0.35	3.02±0.18
Extension contact (number)	0.25±0.07	0.55±0.12
Farmer to farmer extension contact (number)	0.85±0.05	0.78±0.05
Herd size (number)		
Sheep	98.90±0.86	105.19±0.82
Goat	20.38±0.37	19.13±0.35
Camel	20.93±1.18	21.82±1.39

farmer to farmer extension. *Raikas* are known for their affinity to camel and known as *Camel Man* and *Rebari* (Kothari and Sharma, 2013), but it was found that they also reared sheep and goats. They had average herd size of 102 sheep, 19 goats and 21 camels.

Table 2. Migration pattern followed by the *Raika* pastoralists of Marwar region of Rajasthan

Village name	Route of migration		Distance covered during migration		Season of migration		Duration of migration	
	Forward	Backward	Forward (km)	Backward (km)	Forward	Backward	Forward	Backward
Mundera	Mundera - Rajsamand - Chittorgah - Ujjan - Khandwa - Harda -	Harda - Hatpipiliya - Ujjain - Neemuch - Chittorgarh - Mundera -	717	599	October to February	March to May	5 months	3 months
Latara	Latara - Rajsamand - Chittorgarh - Neemuch - Ratlam - Indore -	Indore- Ujjan - Nagda - Mahargarh - Chhitorgarh - Latara	492	484	October to February	March to May	4 months 15 days	2 months 15 days
Bijapur	Bijapur - Udaipur - Badi sadri - Pratapgarh - Nagda - Indore -	Indore - Ujjain - Nagda - Badi sadri - Udaipur - Bijapur -	493	494	October to March	March to May	5 months 15 days	2 months 15 days
Jaswantpura	Jaswantpura - Ajmer - Jaipur - Alwar - Rewari - Jhajjar - Rohtak - Panipat -	Panipat - Rewari - Jaipur - Merta - Jaitaran - Jaswantpura -	676	611	November to March	April to June	5 months 15 days	3 months 15 days
Khejarla	Khejarla - Ajmer - Tonk - Bharatpur - Agra - Mainpuri -	Mainpuri - Agra - Bharatpur - Jaipur - Ajmer - Khejrla	684	612	November to February	March to June	5 months	3 months
Birawas	Birawas - Bhilwara - Bundi - Kota - Guna - Bina - Gwailor - Kanpur -	Kanpur - Agra - Bharatpur - Jaipur - Ajmer - Birawas -	1192	772	October to March	April to August	6 months	4 months

Migration pattern of Raika pastoralists

Table 2. Migration pattern followed by the *Raika* pastoralists of Marwar region of Rajasthan

Village name	Transit halt				Group composition		Herd composition	
	No. of transit halt		Duration of halt in each transit					
	Forward	Backward	Forward	Backward	Sheepherd	Camel herd	Sheep	Camel
Mundera	5	4	25-28 days	15 days	12	8	3800-4000	200-250
Latara	5	4	25 days	15 days	10	7	3500-4000	250-270
Bijapur	5	4	30 days	15-16 days	13-14	7-8	4000-4500	240-250
Jaswantpura	7	4	20-25 days	15-16 days	12	7	4800-5000	200
Khejarla	5	4	30-35 days	20-25 days	13	8	4500	270
Birawas	7	4	35 days	20-22 days	12	8	4900	250

Migration pattern of Raika pastoralists of marwar region: *Raika* pastoral nomads of a village used to migrate together. At least 10-12 *Raikas* used to migrate together, one of each group had leader which is known as *Numberdar* in their society and some parts of Rajasthan that person is also known as Patel. Therefore, migratory pattern of the *Raikas* has been recorded and discussed village wise (Table 2). Migratory routes (separately forward and backward) along with haltings were mapped through Google map (Fig 1-12).

Raika pastoralists of Mundera village: Migratory pattern of the *Raika* pastoral community of Mundera village of Pali district was recorded as forward migration (Fig.1) and backward migration (Fig 2). *Raikas* of this village migrated up to Harda district of Madhya Pradesh. They followed different routes for forward migration and backward migration. They covered 717 km during forward migration and 599 km during backward migration. Similar findings were observed by Dhas *et al.* (2006) and they reported that *Dhangar* pastoralists of Maharashtra migrated after monsoon and covered almost 350 km in one time. There were five transit halts during forward migration and spent 25-28 days in each halting point. They also halted in five places during backward migration, but spent only 15 days in each halting point. *Raikas* of *Mundera* village migrated from October to May and rest of the months, they spent in their own village *i.e*., rainy season (June-September) due to availability of fodder for their animal in their village itself. George *et al.* (2011) also reported that pastoralists of Kenya migrated due to non availability of fodder and medicine. It was also found that during migration, 12 households having sheep and 8 households having camel migrated together (Table 2). But generally, they did not mix camel with sheep during migration and tried to migrate in two different groups as camel could not like stay at one place for long time and graze at ground.

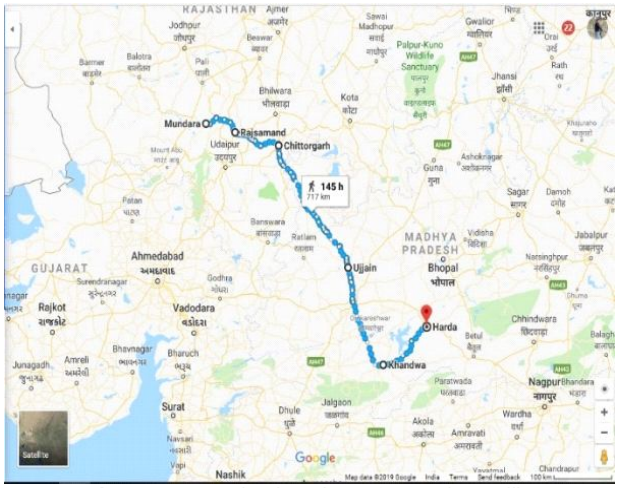

Fig 1. Forward migration of Mundera village

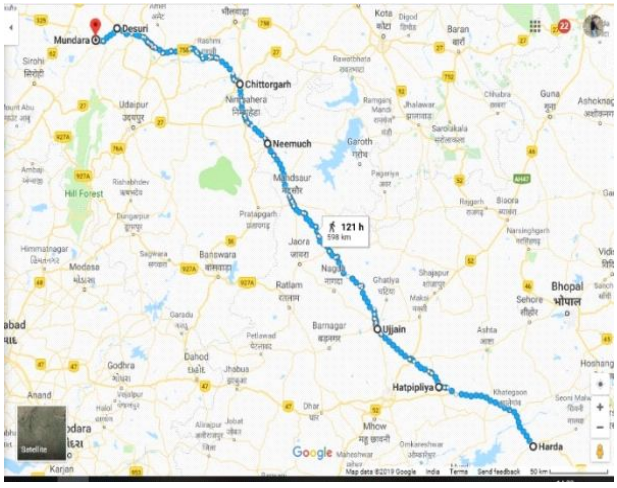

Fig 2. Backward migration of Mundera village

Raika pastoralists of Latara village: Migratory pattern of *Raika* pastoral community of Latara village of Pali district was recorded as forward migration (Fig 3) and backward migration (Fig 4). They migrated up to the Indore district of Madhya Pradesh and followed different routes during forward and backward migration (Table 2).

Louhaichi *et al.* (2014) revealed that *Raikas* used to migrate to maintain their livestock herders and to get fodder resources from neighbouring states like Haryana, Madhya Pradesh and Uttar Pradesh. *Raikas* of Latara village started forward migration in October and covered 492 km with five transit halts and spent on an average 25 days in each transit halt. Earlier studies recorded such kind of findings among *Godwar Raika*, who migrated towards Madhya Pradesh after Diwali (mid October) and used crop residues of *kharif* crops as fodder for their animals. They started backward migration in March and covered 484 km with the four transit halts and spent 15 days in each transit halt. *Raikas* took less time during backward migration because they had to reach their native village before onset of rainy season. They lived at their respective villages during June-September due to the availability of feed and fodder. They migrated during October to May when feed and fodder resorces were not available in their native village. A group of 10 shepherds migrated together, while a group of 7 camel herders migrated together. However, shepherds and camel herders did not migrate together.

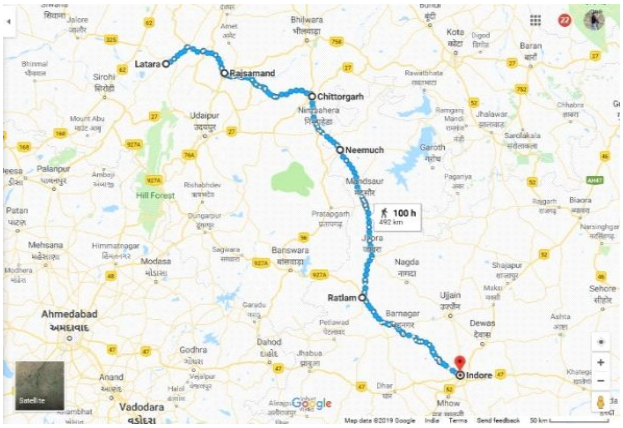

Fig 3. Forward migration of Latara village

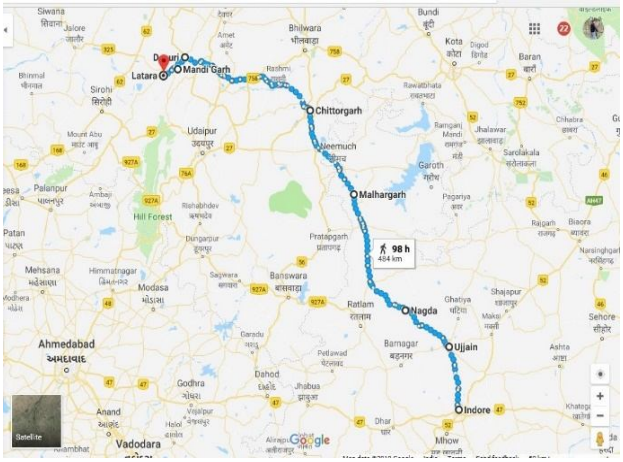

Fig 4. Backward migration of Latara village

Raika pastoralists of Bijapur village: Migratory pattern of the *Raika* pastoral community of Bijapur village of Pali district was recorded (Fig 5-6). *Raikas* of Bijapur village started their forward migration during October and covered 493 km and reached to Indore district of Madhya Pradesh (Table 2). During forward migration, they halted in 5 transit camps and spent on an average 30 days in each transit point. They started their backward migration during March and reached Bijapur village in May. They covered 494 km during backward migration and had four transit halts. They spent 15-16 days in each transit points. They were living remaining period of the year *i.e.,* June to September in their own village. A group of 13-14 shepherds migrated together, while 7-8 camel rearers migrated as one group. But the shepherds and camel rearers did not migrate together.

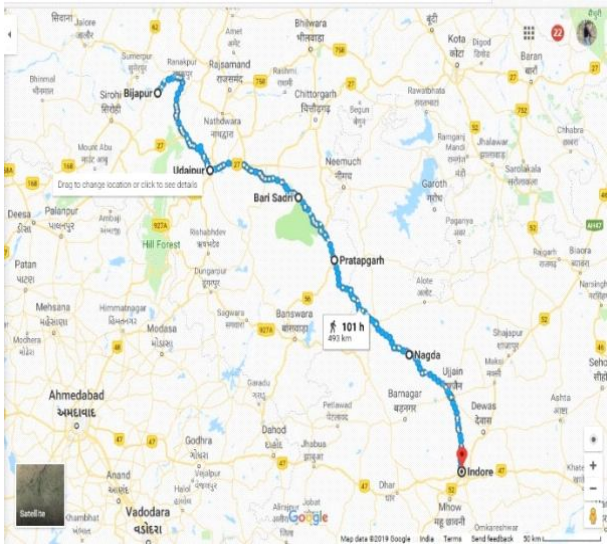

Fig 5. Forward migration of Bijapur village

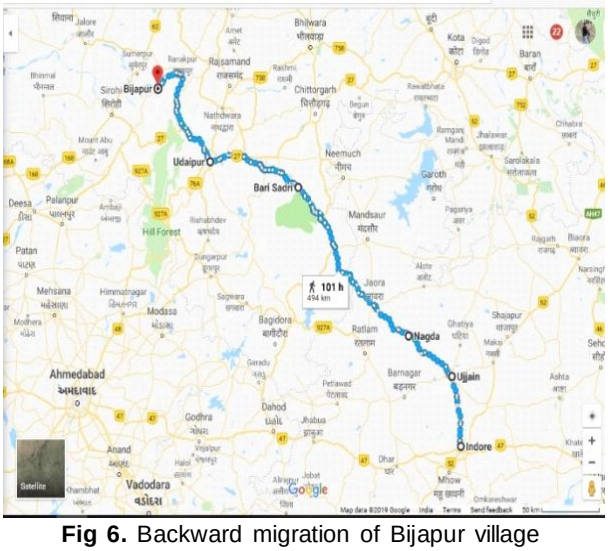

Fig 6. Backward migration of Bijapur village

Migration pattern of Raika pastoralists

Raika pastoralists of Jaswantpura village: Migratory pattern of the *Raika* pastoral community of Jaswantpura village of Jodhpur district was recorded (Fig 7-8). They started forward migration in the month of November and finished during March at Panipat district of Haryana by covering 676 km. Kantwa (2013) also reported that shepherds of Rajasthan migrated towards Haryana for 6-9 months. There were seven transit halts in forward migration and they spent 20-25 days in each halting point. They started backward migration from Panipat district of Haryana during April and came back to their own village during June. They covered 611 km in backward migration and used 4 transit halts and lived 15-16 days in each transit halt. Remaining period of the year *i.e*., July to October, they lived in their own village. A group of 12 shepherds migrated together. But only 7 camel herders moved together (Table 2).

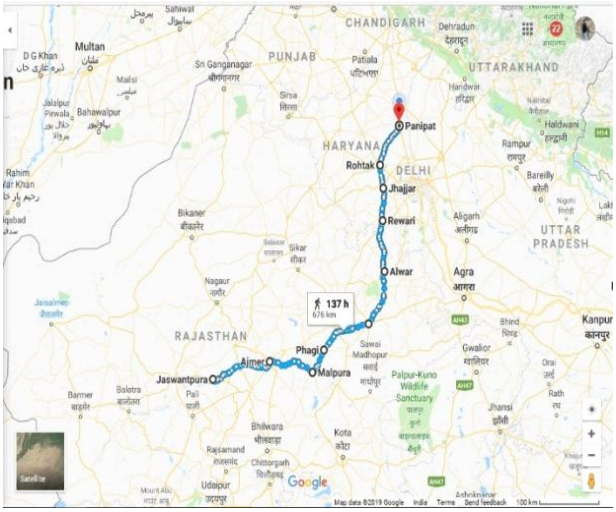

Fig 7. Forward migration of Jaswantpura village

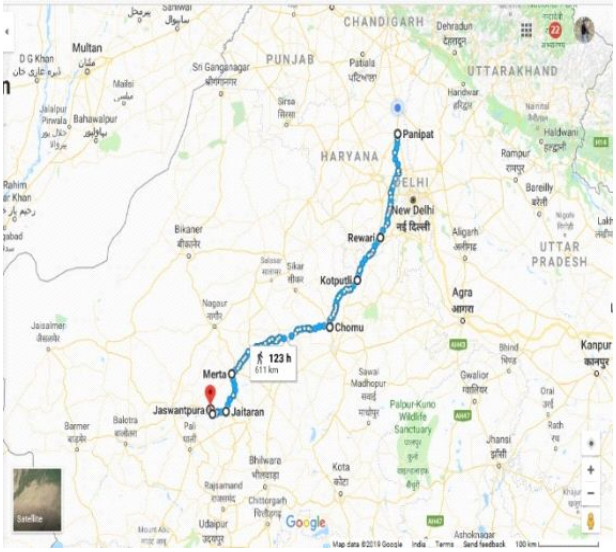

Fig 8. Backward migration of Jaswantpura village

Raika pastoralists of Khejarla village: Migratory pattern of the *Raika* pastoral community of Khejarla village of Jodhpur district of Rajasthan was recorded (Fig 9-10) as forward and backward movement, respectively. *Raikas* of Khejarla village started their migration during November and went up to Mainpuri district of Uttar Pradesh in February by covering 684 km (Table 2). During this forward migration, they used 7 halting points and spent nearly 30 days in each halting point. They started backward migration from Mainpuri district during March and reached their native village in June. They covered nearly 612 km in backward migration and used 4 transit halts and spend nearly 20 days in each transit point. Kothari and Sharma (2013) also reported that Raika pastoralists migrated up to nine month and covered almost 1200 km journey. During rainy season *i.e*., July to October, there were abundant availability of grasses and they lived during this period in their native village. Casimir (1996) also recorded similar findings in Kutch area of Gujrat among the shepherd who migrated in summer season in search of grasslands for sheep and came back in rainy season in their native places. Shepherds and camel rearers of the Khejarla village migrated separately. A group of 13 shepherds migrated together, whereas group of eight camel rearers migrated together (Table 2).

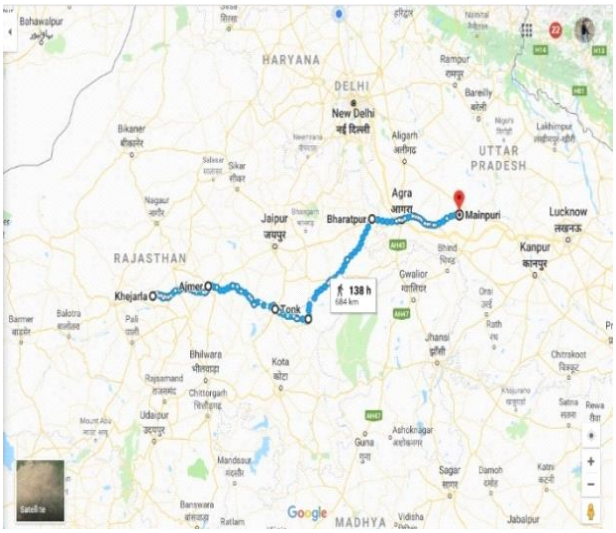

Fig 9. Forward migration of Khejarla village

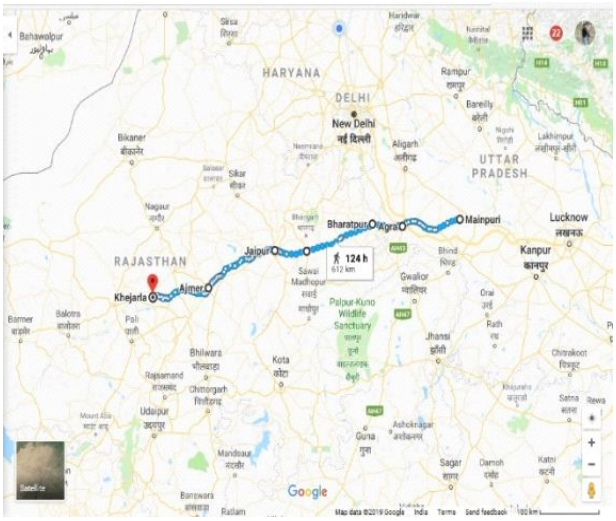

Fig 10. Backward migration of Khejarla village

Raika pastoralists of Birawas village: Migratory pattern of the *Raika* pastoral community of Birawas village of Jodhpur district was recorded (Fig 11-12; Table 2). They started forward migration in October and reached Kanpur district of Uttar Pradesh in March by covering 1192 km. Rao *et al.* (2011) also recorded similar findings among shepherds of Andhra Pradesh who used to migrate in mid-December to mid-July towards Orissa state border. During forward migration, *Raikas* of Birwas village used 7 transit halts and spent nearly 35 days in each transit point. They started backward migration in April and reached native village in August by covering 772 km. Total 4 transit halts were used by them in backward migration and spent 20-22 days in each halting points. They spent September month in their own village. During migration, 12 shepherds moved together and 8 camel rearers migrated together, but they never moved together.

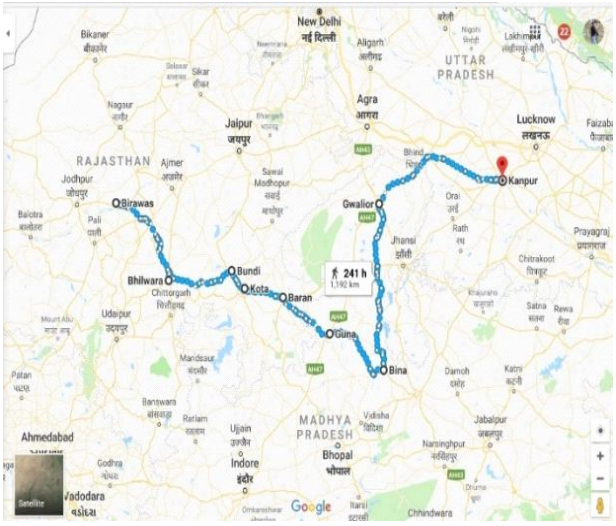

Fig 11. Forward Migration of Birawas village

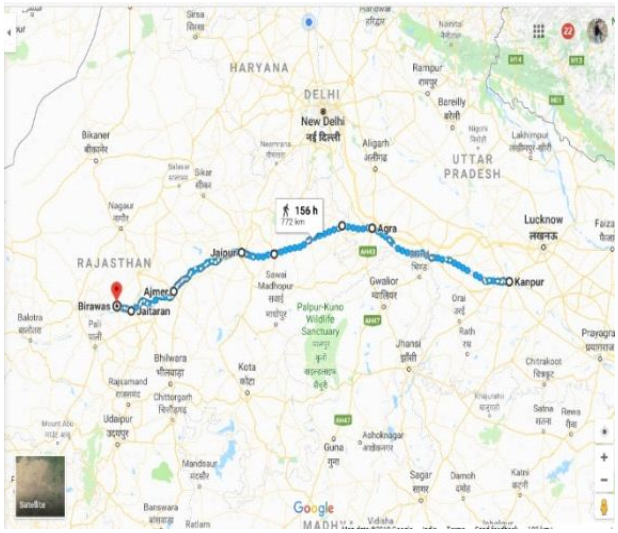

Fig 12. Backward Migration of Birawas village

Conclusion

The *Raika* pastoralists of Rajasthan migrated in search of fodder resources for their animal except rainy season. *Raikas* of Pali district migrated towards Harda and Indore district of Madhya Pradesh for eight months from October to May and covered almost 900 km journey through forward and backward migration. *Raika* of Jodhpur districts migrated towards Haryana and Uttar Pradesh state of India for 8-11 months in a year and during migration they covered almost 1000 km through forward and backward migration. Camel herders and shepherds migrated separately. Study also revealed that there were mainly four factors, which affected their migration *viz*., availability of grazing field, climate and weather, water scarcity in Marwar region and market for selling animals and milk.

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