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VAN-GUJJARS AS A BARRIER FOR WILD ANIMALS AND HUMAN OUT-MIGRATION

(A STATISTICAL STUDY BASED ON RNP PROBLEMS WITH A LOGISTIC REGRESSION MODEL)

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Abstract: *This study is an attempt to understand the problems of Van Gujjars in Rajaji National Park (RNP), Uttarakhand, India. On one hand, the Government wants to remove all disturbances from the RNP for security purpose of wild animals, but on the other hand there are some drawbacks for removal of Van-Gujjars according to local communities residing around the park boundaries. The main objective of this study is to analyze that Van-Gujjars residing in RNP, is it good for park values? The secondary objectives of the study are as follows; Are the local communities benefitted by Van-Gujjars? How the problem is related to the out-migration? To develop a logical framework for the presence of Van-Gujjars in the RNP; for this study the primary data is collected by survey in the some villages of Kimsar area. And the secondary data is based on web, RNP officials, HIMCON NGO as well as newspapers. For the analysis of data logistic regression model is used to show the behavior of some variables regarding the problem.*

The study shows that Van-Gujjars are one of the factors by which local communities had been benefitted by saving them. The study also focused on the point in which Van-Gujjars are also benefitted for wild animals. They are the tribes which help to manage the relationship with park animals and human being.

Key words*: Logistic regression, Tourism in RNP, Forced removal, Friends of animals.*

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INTRODUCTION

The major portion of land in Uttarakhand is covered under forest, further some portion is snow cover and some other portion suffers from steepness of slopes. Distinct for its pristine scenic beauty and rich biodiversity, a paradise of nature lovers and wildlife enthusiasts, nestled in the lap of the mighty Himalayas in the abode of God's Rajaji National Park (RNP) is one of the largest park in India and spread over 202,630 acres (820 km²). It has the largest population of Elephants and a good number of Tigers and Leopards. RNP is situated at the conflux of three districts i.e. Haridwar, Dehradun and Pauri Garhwal of Uttarakhand State. Most of the protected areas (PAs) in India are surrounded by forest dependent population. The Van-Gujjars are the people who reside in the park. The historical background of Gujjars is as follows- Gujjars numbered around 2,038,692 according to their last census in 1931. Eight provinces were then identified as pockets inhabited by them namely, Delhi, Jammu-Kashmir, Punjab (undivided) the North-West Provinces (Pakistan) and other area in and along the Himalayas (now Uttarakhand and Himanchal Pradesh). The Van Gujjars are relatively unknown in relation to the Hindu Gujjars of North West India. According to the current reports, the majority of Van Gujjars are semi-nomadic, forest-dwelling and cattle-herding Muslim. Much has been said and written on Government and NGO involvements among the Van Gujjars and their socio-political, economic and educational advancement, and how they themselves are struggling to fight for their rights in some pockets. Their origins, relations with traditional Islam and religious worldview remain largely shrouded in mystery. Gujjars are normally associated with North-Western India, especially the state of Gujrat. The state of Gujrat was formed on 1stMay 1960, as a result of Bombay re-organisation act of 1960. The term ‘Gujrat’ is the shortened form of ‘Gujjar Rashtra’, the land of the Gujjars.

The Himalayas are the youngest mountain chain of the world. They form about 18% of the geographical area of India, feed the major river systems and regulate the climate of a good part of north India. The Himalayas span approximately 3000km from the North West to the North East of Indian Subcontinent. The highest Mountains in the Indian part are the Kanchanjanga and Nanda Devi, standing at around 7-8000 meters. The medium ranges (approximately 3-5000 meters) lie to the south and flanking the indo-gangetic plains are the foothills of the Shivaliks (approximately 900-1500 meters). The Gujjar Muslims inhabit the

medium and the lower ranges. Van Gujjars of the park have been identified as in two groups: Bakarwals & Dodhis. In describing the Flora of the Rajaji National Park (RNP), B Singh and MP Singh describe the Gujjars as 'a tribal community of the park'. The Gujjars, as observed earlier, are the descendents of the warrior people, some of who converted to Islam and gradually moved northward to Jammu and Kashmir and, then, to the other parts of the foothills of the Himalayas. A story is told of a King of Sirmaur in Himanchal Pradesh visiting the kingdom of Punch in Kashmir. He is said to have liked the quality of milk in Punch so much that he invited the Gujjars to settle down in Sirmaur. It is believed that it was from here that family units migrated to the, possibly at the turn of the 20th century. According to the director of the RNP, the Park presents myriad management problems. To begin with, the existing rail way lines, the highways and the surrounding villages impinge on the wildlife. In addition to these, the Park houses three different ethnic human settlements: Van Gujjars are one of them. The 1400 Van Gujjar families and over 10,000 domestic cattle inside the RNP are said to exert enormous pressure on the wildlife habitat. In contrast to the Bakarwals who herd the goat, the Van Gujjars of RNP herd a small, tough and hybrid variety of the buffalo. The Van Gujjars are vegetarian and depend entirely on the forest produce and the milk or milk products of the hybrid buffalo. The buffalo is an extremely prized animal. It is treated with respect and each buffalo is considered an individual in its own right with appropriate name by which it is called and known. This is what the Gujjars say about their buffaloes. Our buffaloes start migrating on their own when the weather gets hot in the month of March or April or when it becomes cold in the month of September (close to the snow line). At times if we are not ready to move, we have to physically stop them. If they are not disturbed they can reach their destinations even on their own. They are like any other wild animal of the forests and know how to protect themselves against attacks from carnivorous animals. They have their own warning sounds and all of them gather together in a circle and can fend off any attack. This behaviour you will not see in dairy buffaloes. Our buffaloes forage mainly on leaf fodder during the winter months and on the rich grass of the Himalayan pasture land during the summers. In winter we lop off branches from selected fodder trees making sure that enough nodal branches and leaves are left so that the tree may regenerate. The efforts of the government and NGOs at relocating the Gujjars have not been very successful. The Van Gujjars spend autumn (approximately October to April) in the

Shiwaliks and the summer and the rainy season (May to September) in the higher pastures of the Himalayas. Migrations between these grazing zones take up to three months. They are completely dependent on the forests for their needs of fodder, fuel wood, thatching material and timber for their huts. According to the Park reports, the wildlife and cattle of the RNP competes for fodder and water with the Gujjars and their buffaloes. Traditionally, they migrated to the higher Himalayan pastures during the monsoons. This allowed the vegetation in the park to regenerate and when they returned in October, there was more than adequate fodder reserve to last until their migration in May again. According to the park reports, the Gujjars and their buffalo populations have grown many-fold in the last few decades causing additional pressure on the forest resources that have remained the same. Their annual migration cycle has come in for disruption from the villages on route to the higher mountain pastures, since the Gujjar cattle compete with the domestic sheep for food. Also, the Gujjars are today, more aware of the profits they can make from selling milk in towns around the forest. The youth are least enthusiastic about annual migration also because of the prospects of additional year-round job opportunities in towns adjoining the forest. The result is that only a small proportion of the Gujjars and their cattle migrate. The majority remain in the forest round the year. Some Gujjar families have been rehabilitated outside the Park. By the middle of March 2000, a total of over 400 families were relocated to Pathri and Gaindikhatta, the two rehabilitation sites near the famous Hindu pilgrim-town of Haridwar. Each family has been allocated two acres of land for cultivation. Reports on how these changes impact the forest and its biodiversity exist. No studies have so far been done to understand their impact on the Gujjars and their traditional faith/practice. The Gujjars of the RNP live in homesteads called the deras. Each house is built from the forest material on a clearing in the forest. The Gujjars live and move in joint family groups and set up temporary settlements where the grazing is good. Men graze the animals and sell the milk and the women milk the cattle, make butter and do the other household chores. The men wear a turban, a lose tahmet (sarong) and generally have a flowing beard. Some wear embroidered waistcoats. The women wear a long kurta (shirt), churidar (tight pyjamas), and jackets. The women do not generally veil themselves. Gujjars speak Gujjari or Gojri, a dialect of Hindi. Many speak Urdu, Kashmiri, Pahari or Dogri as well. They are a monogamous and

patriarchal society. Milk and cornmeal are their staple food, and are strict vegetarians. Thus the Van Gujjars are totally dependent on forest for their livelihood.

OBJECTIVES OF THE STUDY

- To analyze that Van-Gujjars residing in RNP is it good for park values?
- Are the local communities benefitted by Van-Gujjars?
- How the problem is related to the out-migration?
- To develop a logical framework for the problems.

STUDY AREA & METHODOLOGY

The study area falls in Yamkeshwar Developmental Block of the Pauri Garhwal District of the Uttarakhand State. The Kimsar Area comprises 28 small villages that are located in close proximity of the Chilla Range of Rajaji National Park. The area consists of highly undulating mountainous landscape are now isolated from other revenue lands by a 16 Km stretch of protected forest of RNP. The remote and in accessible villages where regular visit cannot be feasible mainly **due to location on highly steeped, rough terrain, wild animals and wild life mafia** only 20 villages are selected for extensive survey and monitoring, to know the status of currently available human and natural resources in the area as well as to assess the major problem of the area caused due to creation of RNP. After selection of villages, 100 households were investigated at random with the help of questionnaire. The secondary data is collected from web, RNP officials, HIMCON NGO as well as newspapers.

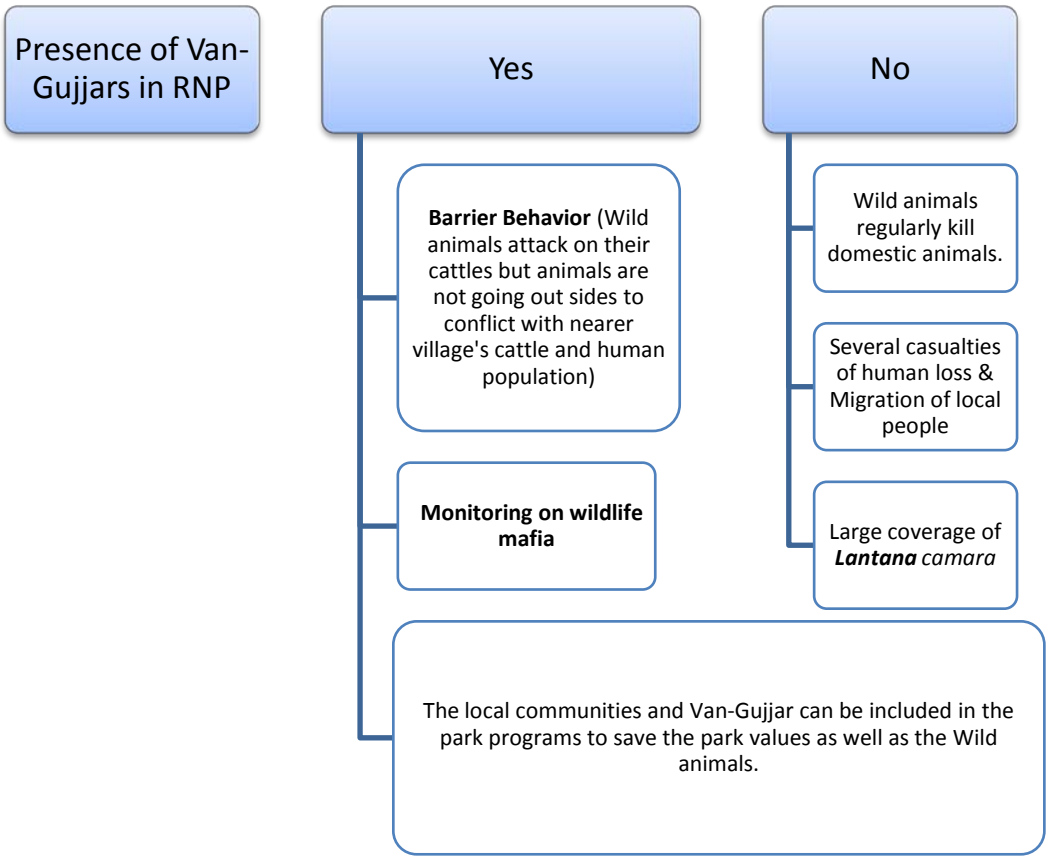
DATA ANALYSIS AND INTERPRETATION

The study is based on primary data basically on the basis of respondent's views from the Kimsar area. The experimental units for this study are the local communities residing the villages near to the RNP boundaries and Van-Gujjars residing in the RNP. The data analysis is done by using the software SPSS, Logistic regression model is used to analyze the problem that Van-Gujjars are good for park values or not. Our null hypothesis H_0*: There is no significant difference between the presence and absence of the Van-Gujjars in the RNP with respect to the local communities, park officials and other RNP problems.* The study involves some variables defined by some questions regarding the problem; the dependent variable can be defined as the "Y" with reference to the Van-Gujjars presence. Government and park authorities want to remove the Van-Gujjars from the park area. But they are the person who lives in Jungle by a long lime so they established a relationship with the wild animals

and local people as well as the park values. The independent variables are "X_1": referred to local communities with the questions like they are benefitted by Van-Gujjars or there is a systematic relationship between local people and Van-Gujjars, "X_2": referred to park officials supports the local people or not, "X_3": are the Van-Gujjars behave like a barrier in RNP? (Table 1 above here), on the bases of these variables a logistic regression model is fitted to show the dependency of these variables.

The logistic regression model can be written in terms of the log of the odds, called the logit, as $log_e\left(\frac{\pi}{1-\pi}\right) = logit(\pi) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$ Where the odds are defined as the probability of a "success" outcome divided by the probability of a "failure" outcome, $odds = \frac{P(Y=1)}{P(Y=0)} = \frac{P(Success)}{1-P(Success)} = \frac{\pi}{1-\pi}$. Since π lies between 0 and 1 the odds can take values between 0 to ∞. The logit is just the (natural) logarithm of the odds. Now we have something that looks very familiar. We have a linear model on the logit scale. This is the most common form of the logistic regression model. An alternative and equivalent way of writing the logistic regression model is in terms of odds $\frac{\pi}{1-\pi} = e^{(\beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3)}$. With this form of the model, the range of values that the right-hand side can take is now between 0 and∞ (since the exponential function is non-negative), the same as for the odds. According to the fitted model the presence of Van-Gujjars residing in RNP represents a success if Y= "1" and odds $\frac{P(Y=1)}{P(Y=0)} = e^{(\beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3)}$ thus the required equation is $\frac{P(Y=1)}{P(Y=0)} = 0.45 + 34.39\, X_1 + 0.025\, X_2 + 32.632\, X_3$ (Table 2 above here). It shows the highest responsible variable is X1 as the magnitude 34.39 is greater than others; secondly responsible variable is X3 as having magnitude 32.632. The explanatory variable X2 with coefficient 0.025 shows less favorable for the dependent variable Y. The β_2 = -3.704 shows the negative response of X2 (Park officials) with reference to the Y. In the model, Nagelkerke R Square statistics shows 66.6 % variations on Y due to the independent variables X1, X2 & X3 (Table 3 above here). Thus the significant values are 0.007, 0.040 & 0.007 for X1, X2 & X3 respectively at 5% level of significant so the Null hypothesis is rejected. So the presence of Van-Gujjars in RNP is strongly related with the local communities, park values. The logic behind the problems, this logical framework on presence or absence of Van-Gujjars in the RNP can be understandable by the figure shown in Fig.1 which reflects the main problem points and suggestions.

Fig.1 Logical Framework



CONCLUSIONS & DISCUSSION

The Van-Gujjars used to live in the RNP with the wild animals and other natural resources. They have stabilized a relation with the park biodiversity. Some of them have the small agriculture land and not follow the seasonal migration from lower to upper Himalayan region. The local communities and Van-Gujjars can be included in the park programs to save the park values as well as the Wild animals. The absence of Van-Gujjars increases the probability of out-migration of local communities from the area. When the Van-Gujjars regularly live in the park with their domestic animals the wild animals avoid crossing their territory. Thus the wild animal attacks on Van-Gujjar's animals. They have to bare this loss but on the other side they are saving the life of nearer local communities and their domestic animals. They are behaving like a middle unit between the wild animals and local communities. They know how to live with the wild animals, according to the survey 98% Van- Gujjars loves to live with wild animals. Local communities are also benefitted by them to get milk products with a reasonable price.

The analysis also shows park area facing the problem of becoming barren. ***Lantana*** *camara* is sometimes known as **"Red (Yellow, Wild) Sage"**, despite its classification in a separate

family from sage (Lamiaceae), and a different order from sagebrush (Asterales).*L. camara* is an invasive species and has covered large areas in India, Australia and much of Africa. It colonizes new areas when its seeds are dispersed by birds. Once it reaches an area, *L. camara* spreads quickly. It coppices so well, that efforts to eradicate it have completely failed. It is resistant to fire, and quickly grows in and colonizes burnt areas. It has become a serious obstacle to the natural regeneration of important native species including the Saal Tree (*Shorea robusta*) in Southeast Asia, as well as plants in 22 other countries. In greenhouses, *L. camara* is notorious for attracting whitefly. In India they bear fruit all year round and this appears to have an impact on bird communities. While considered a pest in Australia, it shelters several native marsupial species from predators, and offers a habitat for the vulnerable *Exoneura* native bee, which nests in the hollow stems of the plant. *L. camara* has been listed as a Category One "Invasive Toxic Species" in Florida by the Florida Exotic Pest Plant Council, and has become a problem in Texas and Hawaii. The Van-Gujjars helped to remove this *L. camara* plant for grazing purpose of their animals.

If the park officials include Van-Gujjars and local communities in the park programs or activities there are the possibilities to monitor the wild life mafia. Wild life mafia is the special problem with reference to the RNP areas in Uttarakhand which are responsible for the loss of park properties and wild animals.

According to the Uttarakhand Forest Statistics 2011-12, in this year 21,061 tourists arrived in the RNP and 52.42 lakh rupees revenue generated by them, so if tourists are not interrupting the wild animals then how can the Van-Gujjars and local people. Thus according to the overall findings the Van-Gujjars are the good for park values as well as the local people. They are the true friends of animals.

Table 1: Variable Definitions

S.N.	Basic Variables	Description	New derived variable	Values
1.	**Van-Gujjars**	Presence in the park area is good	**Y**	"1" =Yes "0" = otherwise
2.	**Local communities**	Local people are benefitted by Van-Gujjars	$\mathbf{X_1}$	"1" =Yes "0" = otherwise
3.	**Park Officials**	Park officials supports the local people	$\mathbf{X_2}$	"1" =Yes "0" = otherwise
4.	**Barrier behaviour**	Are the Van-Gujjars behaved like a barrier in RNP?	$\mathbf{X_3}$	"1" =Yes "0" = otherwise

Table 2: Variable's frequency distribution

Basic Variables	Y	X_1	X_2	X_3	Total
Yes	92	84	93	83	352
Otherwise	8	16	7	17	48
Total	100	100	100	100	400

Source: Primary data

Table 3: Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	2.442	.369	43.903	1	.000	11.500
Step 1		B	S.E.	Wald	df	Sig.	Exp(B)
	X1	3.538	1.301	7.398	1	.007	34.390
	X2	-3.704	1.799	4.238	1	.040	.025
	X3	3.485	1.295	7.239	1	.007	32.632
	Constant	-.798	.889	.806	1	.369	.450

Table 4: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	22.267	.285	.666

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