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## GENERAL BEHAVIOR AND VEGETATION ASSOCIATED WITH THE HABITATS OF ASSAMESE MONKEY (*Macaca assamensis* McClelland, 1840) ALONG KALIGANDAKI RIVER BANK, WESTERN NEPAL

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### ABSTRACT

This study was focused on *Macaca assamensis* general behavior and vegetation associated with their habitats in Kaligandaki River Basin at Baglung and Parbat Districts of Nepal. The field survey was conducted from December, 2015 to May, 2016 to explore the Assamese Macaque general behavior and vegetation associated with their habitats. Total area of 104.70 km<sup>2</sup> was surveyed, vegetation analysis was done by random quadrates sampling method and behavioral data were collected by scan sampling method. A total of 47 individuals of Assamese Macaques (*Macaca assamensis*) were counted in four different troops. Total of 2240 scan samples were recorded from the four different troops during this study period the scan samples revealed that foraging was 47%, moving 28%, resting 14% and grooming 11%. In the context of daily activity pattern for aging time of Assamese monkey was found to be highest 54% in 15:00 to 18:00 observational phase and lowest 40% in the observational phase of 12.00 to 15.00 hours. Moving time of the Assamese monkey was found to be highest 33% in 12.00 to 15.00 observational phase and lowest 22% at 15:00 to 18:00 observational phase, resting time of Assamese monkey was found to be highest 15% in 09:00 to 12:00 hours and lowest 13% in 15:00 to 18:00 observational phase and Assamese monkey were seen mostly grooming 13% in 12.00 to 15.00 hours and lowest 10% in 15:00 to 18:00 observational phase. By quadrat sampling, 58 plant species with 716 number were recorded. Sal (*Sorea robusta*) was the dominant plant species with relative density 31.42% and relative frequency 8.376% which was followed by Tiju (*Diospyros malabarica*) with relative density 10.93% and relative frequency 8.376%.

**Keywords:** *Macaca assamensis*, Quadrat, Scan sampling, Vegetation, Western Nepal.

### INTRODUCTION

Assamese monkeys inhabit in the mountains and hills along the Himalayas. This species has been reported from Nepal, India (Medhi *et al.*, 2007), Bhutan (Kawamoto *et al.*, 2006) Myanmar, Bangladesh (Menon, 2003; Chalise, 2011) Thailand, Southernmost China and Laos (Zhou *et al.*, 2011; Timmins & Duckworth, 2013). It was recorded from North Thailand ranging 610m to 1830m asl (Sanjaya *et al.*, 2003). Chalise (2013) recorded it from 380m in Mulghat, Tamor to 2350m asl in Langtang, Nepal. It was reported to cover wider geographical ranges, with fragmented population, distributed along rivers in the tropical and subtropical areas. The reported areas covered Kankai valley of Ilam, Sabhaya Valley and its range further extended west to Makalu Barun National Park, Melamchi, Langtang National Park (Chalise, 2003), Nagarjun Area of Shivapuri Nagarjun National Park, Makwanpur, Dhading,

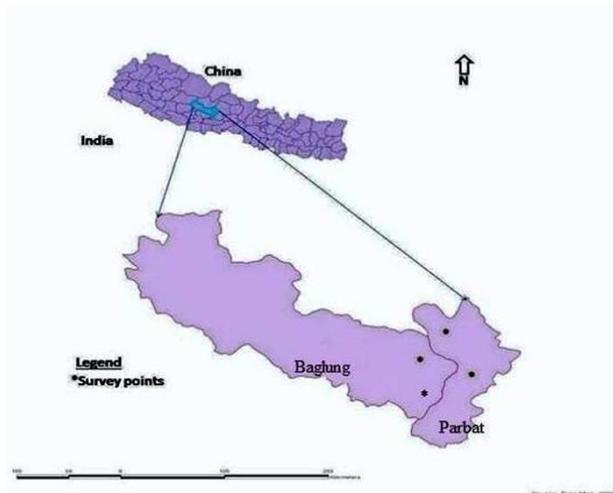
Myagdi, Ramdi, Palpa, Achham district (Chalise, 2003 & 2008; Wada, 2005), Baglung and Parbat (Paudel, 2016b & 2016c; Paudel & Chalise, 2016) to Chamelia river basin (N 29°48'34.6'', E 80°51'02.8'', 1607m) of Api Nampa Conservation Area (Chalise, 2013). Assamese monkeys have been categorized as endangered species by International Union for Conservation of Nature (IUCN) Red list category and one of the protected species by National Parks and Wildlife Conservation Act 1973 due to the low population and conservation threats (Janawali *et al.*, 2011). They are kept as Appendix II of Convention on International Trade in Endangered Species (CITES) (Chalise, 2013).

Behavior is the response of both the physical as well as habitat condition of animals (Sarkar, 2000). It varies from habitat to habitat depending upon the resource distribution. In primate, food, mates, drink and roosting trees are the most important resources,

which control activities. Among these resources, food seems to be the most crucial primary factor which regulates day-to-day activity profiles (Sarkar *et al.*, 2012). So, the study of animal behavior is of great practical importance for the conservation of wild animals in their natural habitats (Manning & Dawkins, 1998).

## MATERIALS AND METHODS

### Study area



**Fig. 1.** Study area and sites in the map of Nepal.

The study was carried out in Baglung and Parbat districts of Dhawalagiri Zone; it lies in the Western development region of Nepal. The district Baglung is a part of Province No. 6, with its district headquarters Baglung, and the district Parbat is a part of Province No. 4 and one of the seventy five districts of Nepal with its district headquarter Kushma. The study mainly conducted at the Kaligandaki river basin, covering 11 VDC's study area extended between  $83^{\circ}35'29.2''$  to  $83^{\circ}35'72''$  East longitude and  $28^{\circ}05'24.2''$  to  $28^{\circ}19'45''$  North latitude and elevation ranges between 560 m to 1650 m asl. The total population of the study area within 11 VDC's was 37,153 and the total households was 8,949 (Census report, 2011).

Total research site area of Baglung site VDCs is  $71.3452 \text{ km}^2$  and Parbat site VDCs is  $33.357 \text{ km}^2$ . The study area lies in between tropical to temperate belt of Nepal. This study area has a unique geographical feature having both North and South facing topography. The rain-bearing wind from the Bay of Bengal blows from the east towards west of Nepal during the rainy season. The climate of study area and its vicinity is mainly dry and wet. The

average maximum temperature was recorded ( $27.70^{\circ}\text{C}$ ) and minimum temperature was recorded ( $15.30^{\circ}\text{C}$ ) (Source: NG/ RDHM Pokhara). According to the climatic data, average monthly relative humidity at morning was 77.17% and at evening was 78.15%. Highest precipitation was recorded (553.6 mm) in the month of July during the study period, while no precipitation was recorded in the months of November and December (Source: NG/ RDHM Pokhara). Study area is rich in biodiversity which may be due to presence of alluvial soil along the basin of this large Kaligandaki River, and high productivity of tropical deciduous riverine forest (Chalise, 2013). In broad classification, the study area falls in *Sorea-Diospyros* zone (Paudel, 2016a). Mixed type of forest was found in the study area. Tropical deciduous riverine forest sub-tropical grassland and sub-tropical evergreen forest are the forest types in the study area (Chalise, 2013).

### Block design

To study the Assamese monkey, study area were divide into four blocks namely Block A (Chisti, Jaidi, Arjewa and Binamare VDCs), Block B (Kusmisera, Amalachaur and Narayansthan VDCs), Block C (Siwalaya and Pang VDC) and Block D (Nangliwang and Dhairing VDCs). Blocks are designed on the basis of habitat character (Rijal, 2014). Which were separated by large Kaligandaki river i.e. Block A and B from Baglung district site where as Block C and D from Parbat District site.

### General behavior

Behavioral data were obtained by the scan sampling method. The behaviors of monkey were recorded for two minute at interval of 10 minutes (Altman, 1974; Martin & Boteson, 1993; Chalise, 1997) with the help of timer aided by binoculars. Scan samples were recorded covering all four distinct time period viz. early morning, late morning, afternoon and evening. Other events and interesting behaviors of any members of the groups were also recorded whenever noticed. The animals were observed daily from 06:00 A.M. to 18.00 P.M. The daily observation schedule was divided into four shifts; early morning shift: 06.00-09.00 hr. late morning shift: 09.00-12.00 hr. afternoon shift: 12.00-15.00 hr. and evening shift 15.00-18.00 hr. Once in a week continuous 12 hourly observations was undertaken with the help of field assistance. Direct ocular observation method was employed for cataloguing the behavior. The ocular observation was aided with  $10 \times 40 \text{ mm}$  binoculars. Following behaviors were observed including other social

activities of Assamese Macaques in the study area. Below mentioned description from Chalise (2003) was used to distinguish the behaviors among troops.

- I. Foraging:** The behavior activity in which monkey searches for food or wanders in search for food including eating any substance, licking stone, drinking water and slight movement in search of food.
- II. Moving:** The behavioral phenomenon in which monkey produces motion displacing from one place to another.
- III. Resting:** The state when Assamese rest with the body supporting upon the buttocks with hind quarters lowered on to a supporting surface.
- IV. Grooming:** The behavioral phenomenon in which monkeys search their own fur or the fur of others for lice, bugs or diet which include rubbing, licking and scratching.

### Habitat analysis

Due to the mountainous topography that precludes most of the systemic survey methods (Ross & Reeve, 2003), quadrat sampling by using the quadrates of 20×20 m sized were done to analyze vegetation of Assamese monkey habitat. Total 21 quadrates were laid down randomly in the possible habitat of macaques. 11 quadrat were laid down in Baglung site where as 10 quadrat were laid down at Parbat site (Figure 2). Species diversity of trees was calculated. The collected vegetation data were quantitatively analyzed. To understand characteristics and productivity of the habitat, different parameters like density, relative density, frequency, relative frequency and dominance were determined (Zobel *et al.*, 1987). Local name of the plant was identified by the experienced local person. Unidentified plants in the field were prepared herbarium and were identified at National Herbarium Center, Godawori, Lalitpur.

$$\text{Density of a species} = \frac{\text{Total no. of individuals of a species}}{\text{Total no. of quadrates} \times \text{Area of a quadrat}}$$

$$\text{Relative density of a species} = \frac{\text{Density of a species}}{\text{Total Density of all species}} \times 100$$

Frequency of a species is the percentage of quadrates in which the particular species occurs. It gives an index on the spatial distribution of a species and is a measure of relative abundance (Krebs, 1978).

$$\text{Frequency of a species} = \frac{\text{No. of quadrat in which of a species occurs}}{\text{Total no. of quadrates}} \times 100$$

$$\text{Relative Frequency of a species} = \frac{\text{Frequency value of species}}{\text{Total frequency value of all species}} \times 100$$



Fig. 2. Vegetation analysis.



Fig. 3. Adult male Assamese Monkey.

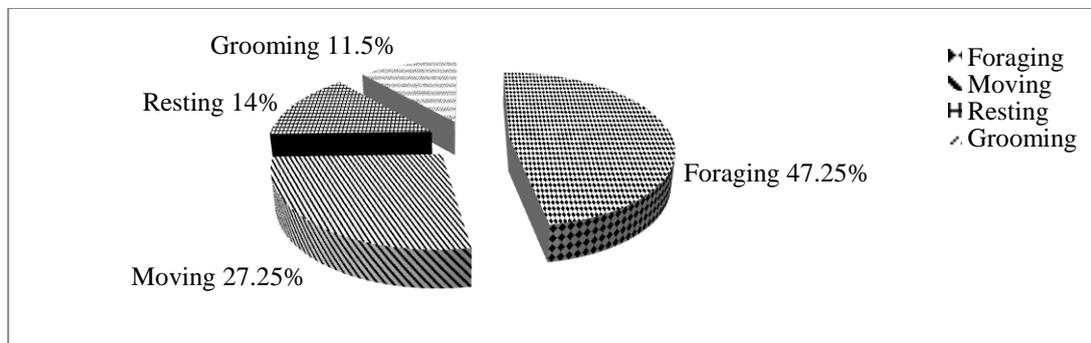
**RESULTS**

**General behavior**

In the study site a total of 47 individuals of Assamese Macaques (*Macaca assamensis*) were counted in four different troops during the field study dated from December, 2015 to May, 2016. The minimum numbers of Assamese Macaques were reported from the Balewa troop of Amalachaur VDC whereas maximum numbers of Assamese Macaques were reported in Aduwabari troop of Chisti VDC.

Field work was carried out from January to April, 2016. Total jungle time was of 345 hours and animal contact time was 185 hours. Four major behaviors (foraging, moving, resting and grooming) were recorded during the study period. Behavioral

data were obtained by the scan sampling method. Total of 1640 scan samples were recorded from all four troops. The animals were observed daily from 06:00 AM to 18.00 PM. Daily observation schedule was divided into four shifts; early morning shift: 06.00-09.00 hr. late morning shift: 09.00-12.00 hr. afternoon shift: 12.00-15.00 hr. and evening shift 15.00-18.00 hr. Once in a week continuous 12 hourly observations was undertaken with the help of field assistance. Direct ocular observation method was employed for cataloguing the behavior. The ocular observation was aided with 10×40 mm binoculars. The scan sample revealed that foraging was 47.25%, moving 27.25%, resting 14%, grooming 11.5% (Figure 4).

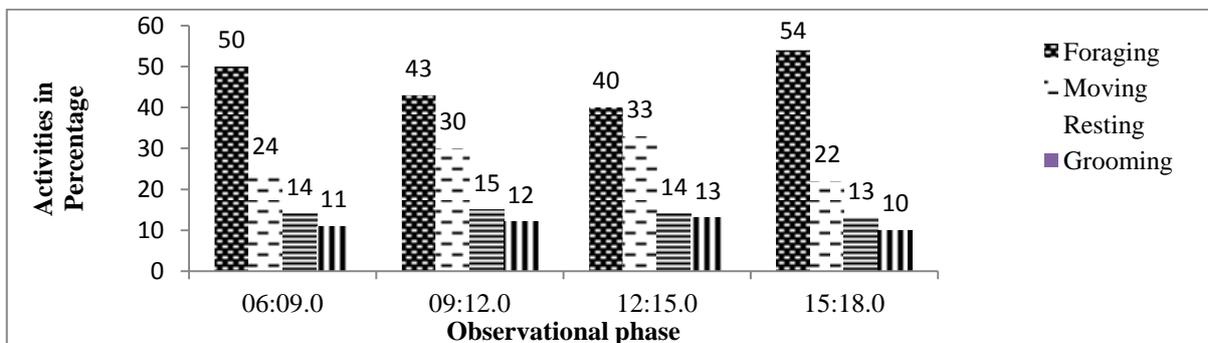


**Fig. 4. General behavior of Assamese Macaques in Kaligandaki river bank of Western Nepal 2016.**

**Diurnal activity pattern**

Foraging time of the Assamese monkey was found to be highest 54% in 15:00 to 18:00 observational phase followed by 50% in the morning from 06:00 to 09:00 observational phase, 43% in 09:00 to 12:00 observational phase and 40% in the observational phase of 12:00 to 15:00 hours. Moving time of the Assamese monkey was found to be highest 33% in 12:00 to 15:00 observational phase followed by 30% in 09:00 to 12:00 observational phase, 24% in 06:00 to 09:00 observational phase, 22% in 15:00 to 18:00 observational phase. Resting time of Assamese monkey was found to be highest 15% in 09:00 to 12:00 hours followed by 14% in 06:00 to 09:00 and 12:00 to 15:00 hours, 13% in 15:00 to 18:00 observational phase. Assamese monkey were seen mostly grooming 13% in 12:00 to 15:00 hours, 12% in 09:00 to 12:00 observational phase, 11% in 09:00 to 12:00 observational phase, and 10% in 15:00 to 18:00 observational phase (Figure 5).

to 09:00 observational phase and 22% in 15:00 to 18:00 observational phase. Resting time of Assamese monkey was found to be highest 15% in 09:00 to 12:00 hours followed by 14% in 06:00 to 09:00 and 12:00 to 15:00 hours, 13% in 15:00 to 18:00 observational phase. Assamese monkey were seen mostly grooming 13% in 12:00 to 15:00 hours, 12% in 09:00 to 12:00 observational phase, 11% in 09:00 to 12:00 observational phase, and 10% in 15:00 to 18:00 observational phase (Figure 5).



**Fig. 5. Diurnal activity pattern of Assamese Macaque in Kaligandaki river bank Western Nepal 2016.**

**Vegetation analysis**

Quadrates of 20m × 20m size were laid down in the main habitat of Assamese Macaques to analysis the habitat. By quadrate sampling, 58 plant species with 716 number were recorded. This study revealed that Sal (*Sorea robusta*) is

the dominant plant species with relative density 31.42% and relative frequency 8.38% which is followed by Tiju (*Diospyros malabarica*) relative density 10.93% and relative frequency 8.38%. The details of vegetation is given in (Table 1).

**Table 1. Value of different parameters for tree species in the study area.**

S.N.	Common Name	Scientific Name	Total	Density	Relative Density	Frequency	Relative Frequency
1	Sal	<i>Sorearobusta</i>	208	0.0204	31.42	85.71	8.376
2	Chilaune	<i>Schimawallichii</i>	56	0.0055	8.47	66.66	6.514
3	Aap	<i>Mangiferaindica</i>	14	0.0013	2.002	28.27	2.762
4	Ghokre		10	0.0009	1.386	23.80	2.325
5	Kutmiro	<i>Litseamonopelata</i>	3	0.0002	0.308	9.52	0.930
6	Khanyo	<i>Ficussemicordata</i>	41	0.0040	6.162	33.33	3.257
7	Jamun	<i>Syzigiumcumini</i>	14	0.0013	2.002	38.09	3.722
8	Aamala	<i>Phyllanthusemblica</i>	5	0.0004	0.616	9.52	0.930
9	Tiju	<i>Diospyrosmalabarica</i>	73	0.0071	10.93	85.71	8.376
10	Kaligede		13	0.0009	1.386	23.80	2.325
11	Tuni	<i>Toonaciliate</i>	11	0.0010	1.540	47.61	4.652
12	Pakhuri	<i>Ficus spp.</i>	3	0.0002	0.308	9.52	0.930
13	Mahuwa	<i>Engelhardiaspicata</i>	29	0.0028	4.467	42.85	4.187
14	Belauti	<i>Psidiumguajava</i>	29	0.0028	4.467	14.28	1.395
15	Saj	<i>Terminaliaalata</i>	6	0.0005	0.770	19.04	1.860
16	Bhorla	<i>Bauhiniaavahlilii</i>	8	0.0007	1.078	19.04	1.860
17	Thulogabajo		4	0.0003	0.462	19.04	1.860
18	Mel	<i>Pyruspashia</i>	1	0.00009	0.138	4.76	0.465
19	Sindure	<i>Bixa orelana</i>	1	0.00009	0.138	4.76	0.465
20	Pipal	<i>Fecus religiosa</i>	1	0.00009	0.138	4.76	0.465
21	Dhairo	<i>Woodfordiafruticosa</i>	22	0.002	3.081	38.09	3.722
22	Aakhitare		6	0.0005	0.770	14.28	1.395
23	Pakhuri	<i>Ficusglaberrima</i>	3	0.0002	0.308	4.76	0.465
24	Bas	<i>Bambusa spp.</i>	6	0.0005	0.770	23.80	2.325
25	Dabdabe	<i>Garugapinnata</i>	10	0.0009	0.386	9.52	0.930
26	Sajiwan	<i>Jatrophacurcas</i>	8	0.0007	0.078	9.52	0.930
27	Kavro	<i>Ficusinfectoria</i>	2	0.0001	0.154	14.28	1.395
28	Gijari	<i>Premna spp.</i>	2	0.0001	0.145	9.52	0.930
29	Aasuro	<i>Adhatodavasica</i>	4	0.0003	0.462	9.52	0.930
30	Simal	<i>Bombaxceiba</i>	10	0.0009	0.386	23.80	2.325
31	Katus	<i>Catanopsisindica</i>	1.	0.00009	0.138	4.76	0.465

32	Jai Chilauni		2	0.0001	0.154	9.52	0.930
33	Chiuri	<i>Aesandrabutyracea</i>	4	0.0003	0.462	9.52	0.930
34	Bad dhairo	<i>Lagerstroemia parviflorus</i>	1	0.00009	0.138	4.76	0.465
35	Dhursu	<i>Colobrokiaspp.</i>	11	0.0010	0.540	14.28	1.395
36	Khirro	<i>Sapium insigne</i>	13	0.0012	0.848	19.04	1.860
37	Bar	<i>Ficusbengalensis</i>	4	0.0003	0.462	19.04	1.860
38	Dumri	<i>Ficusracemosa</i>	1	0.0009	0.138	4.76	0.465
39	Kemano	<i>Careyaarborea</i>	7	0.0006	0.924	19.04	1.860
40	Goldarim		2	0.0001	0.154	9.52	0.930
41	Besare		1	0.00009	0.138	14.28	1.395
42	Musure Katus	<i>Catanopsisindica</i>	4	0.0003	0.462	4.76	0.465
43	Bhote		1	0.00009	0.138	14.28	1.395
44	Bhogate	<i>Citrus spp.</i>	6	0.0005	0.770	4.76	0.465
45	Sano gabajo		1	0.00009	0.138	9.52	0.930
46	Mallato	<i>Macaranga spp.</i>	2	0.0001	0.154	9.52	0.930
47	Guyelo		4	0.0003	0.462	14.28	1.395
48	Ratpate		4	0.0003	0.462	14.28	1.395
49	Gayo	<i>Bridelia retusa</i>	5	0.0004	0.616	9.52	0.930
50	Bel	<i>Aeglemarmellos</i>	1	0.00009	0.138	9.52	0.930
51	Karjo	<i>Sapium insigne</i>	4	0.0003	0.462	9.52	0.930
52	Githo	<i>Discorea spp.</i>	2	0.0001	0.154	4.76	0.465
53	Niuwa	<i>Citrus spp.</i>	5	0.0004	0.616	4.76	0.465
54	Teltapre		3	0.0002	0.308	9.52	0.930
55	Raju		3	0.0002	0.308	4.76	0.465
56	Ketuki	<i>Pandanus Odoratissimus</i>	5	0.0004	0.616	9.52	0.930
57	Aarari Kanda	<i>Acacia pinnata</i>	3	0.0002	0.308	4.76	0.465
58	Kaiyeu	<i>Gravelliarobusta</i>	13	0.0012	0.848	9.52	0.930
<b>Total</b>			<b>716</b>	<b>0.06491</b>		<b>1023.2</b>	

## DISCUSSION

Four major behaviors were recorded in different field visiting time during the study period in which general behavior were recorded as foraging 47.25%, moving 27.25%, resting 14%, and grooming 11.5% whereas Bhattarai (2002) recorded eating 29.20%, sitting 33%, walking 28.20%, grooming 6.40%, mating 1.1%, aggregation 0.71% and play 0.40% in LNP, Chalise *et al.* (2005) recorded foraging 43.4%, moving 31.7%, sitting

18.5%, grooming 3.4% and stone licking 1.7% in the same Langtang National Park. Regmi (2008) recorded foraging 49%, moving 26%, resting 16% and grooming 9% in LNP. This similarity between LNP and this study site may be due to similar season and similar vegetation type. Chalise (2013) recorded foraging/eating 56%, resting 19%, locomotion 16%, sleeping 12%, grooming 6% and playing 1% in Shivapuri Nagarjun National Park, Adhikari & Chalise (2014) recorded foraging 45%,

locomotion 25%, resting 20%, and Grooming 10% and Pandey & Chalise (2015) recorded 40% time in foraging/feeding, 21% time in locomotion, 16% time in grooming while 40% time inactive, 6% playing, and 1% sleeping in SNNP. The different in general behavior may be due to different season, food resources availability and day length as well.

The amount of time spent on locomotion is determined primarily by the distribution of food and food plant species in the habitat and by the nature of food items (Sarkar, 2000). Therefore, the Assamese Macaque had to allot 28% time to locomotion similar result were recorded by Sarkar *et al.* (2012) in forest group of Assamese Macaque in Jokai reserved forest (RF) of Assam as 25% time (range 23-26) for locomotion. Similarly, Chalise (2000a) recorded four major behaviors during the study in the both expeditions (1997/98) in Makalu-Barun National Park taking geophagy into separate account and found 3 to 4% difference in case of feeding in his study (1997/98) invested 29/25%. The present study showed that the Assamese Macaques spent 47% of their total time on feeding while Sarkar *et al.* (2012) showed that the forest group spend 40% of their total annual time (range 38-45) on feeding. Chalise (2000b) found 47/44% which is 3 to 4% difference in case of feeding in his study (1997 to 1998) in Makalu Barun National Park. Adhikari & Chalise (2014) recorded that the seasonal activity budget of Assamese Macaques in different four season as, 47% feeding in winter, 45% in pre monsoon, 44% in monsoon and 43% in post monsoon. They found 43/47% which is 4% difference in feeding on different four seasons. Higher time spent in locomotion, costs higher expenditure of energy. The Assamese Macaque which spent more time on locomotion had to spend more time in resting in order to make a balance of energy demand and supply. Hence the *Macaca assamensis* spent 14% of their total time in resting where different time spent was recorded by Sarkar *et al.* (2012) in resting for 13% (range 7-20). Similarly Adhikari & Chalise (2014) recorded that 21% time for resting in Lamjung whereas Pandey & Chalise (2015) reported that 14.95% resting in SNNP. Food resources are randomly distributed in the study area, individual of primate do not able to monopolize the resources. So, social tension due to aggregation is comparatively less in the forest group as compared to provision or temple group (Sarkar, 2000). Grooming behavior in long term serves the function of reducing "Social Tension" (Schino *et al.*, 1988) and establishes a social

bonding among the individual within the group (Kurland, 1977), so the Assamese Macaque spent only 10% of their total time on grooming in the present study. Whereas, Chopra *et al.* (1992) showed 14% in grooming by Rhesus Macaque, Bhattarai (2002) recorded grooming 29/25%, Chalise *et al.* (2005) recorded grooming 3-4%, Regmi (2008) recorded grooming 9%, Chalise (2013) recorded 6% grooming, Adhikari & Chalise (2014) found 10% grooming and Pandey & Chalise (2015) reported that 16% in grooming. Hence, lacks of extra social tension in the Assamese Macaque due to its smaller size reduce the time spend on grooming.

Diurnal activities were recorded during March to May, 2016. A total of 16 individuals representing different age groups of focal aduvari troop of both the sexes were observed. The most common activity was feeding/foraging which was highest during 15pm to 18pm among the four periods i.e.54% and lowest is during 12am to 15pm. Time spent on moving was found to be highest from 12am to 15pm i.e. 33% and lowest 22% from 15pm to 18pm. Time spent on resting was found highest 15% during 9am to 12am and lowest 13% at 15pm to 18pm. Grooming was observed highest 13% at 12am to 15pm and lowest 10% from 15pm to 18pm where as Koirala & Chalise (2014) reported from SNNP area time spent on feeding and foraging behavior was highest during 12 noon to 15 pm among the four periods i.e. 46% and lowest was during 15pm to 18pm i.e. 33%. Time spent on moving was too highest during 12 pm -15 pm i.e. 29% and lowest percentage of time spent on moving was during 9 am-12 noon i.e. 15%. Between 12 noon – 15 pm macaques spent greater percentage of time on feeding and moving behavior so the time spent in resting and social behavior was lowest than other period i.e. 19% and 6% respectively the higher percentage of feeding during my study period might be due to lack of sufficient food on habitat. Due to newly constructed Kaligandaki corridor habitats of macaques are divided into several fragmented so the macaques spent more time for searching their own food.

Vegetation analysis was done by quadrat sampling recorded 58 plant species with 716 number. This study revealed that Sal (*Sorea robusta*) is the dominant plant species with relative density 31.42% and relative frequency 8.376% which is followed by Tiju (*Diospyros malabarica*) relative density 10.93% and relative frequency 8.376%, with general behavior pattern recorded as foraging

47.25%, moving 27.25%, resting 14%, and grooming 11.5% whereas Aryal (2013) reported, from Arkhele and Nayagaun gulmi area by 8 quadrates of size 25m×25m quadrates sampling, 23 plant species with 191 number. According to his study, Khote Salla (*Pinus ruxberghii*) was the dominant plant species with relative density 30.89% and relative frequency 13.043% which was followed by Chilaune (*Schima wallichii*) with relative density 8.34% and relative frequency 10.87% with general behavior pattern of rhesus macaques recorded as foraging 47.25%, moving 27.25%, resting 14%, and grooming 11.5%. This difference in general behavior pattern may be due to different vegetation associated with their habitat. Due to differences in altitude range between these two study sites, two different types of dominant vegetation were found which directly affected the behavior pattern of monkey. Rijal (2014) recorded 27 plant species with 196 numbers at Nagarjun forest of SNNP by quadrates sampling. From his study Chilaune (*Schima wallichii*) was the dominant plant species with relative density 30.89% followed by Jhankrikath (*Machilus duthiei*) with relative density 8.98% and Masure katus (*Castanopsis tribuloides*) with relative frequency 10.87%. In consistency with results of this findings altitudinal variation causes the change in vegetation pattern which might have ultimately affected the general behavior pattern.

## CONCLUSION

Total 47 individuals of Assamese Macaques were recorded from four troops at Kaligandaki River Basin, Baglung and Parbat Districts during the study period. The minimum of Assamese Macaques were reported from the Balewa Troop of Amalachaur VDC whereas maximum numbers of Assamese Macaques were reported in Aduwabari Troop of Chisti VDC. This study shows that general behavior of Assamese Macaques in different field visiting time in which the feeding activity has been found the major activity profile and minimum was grooming. Vegetation sampling, revealed that study area falls in the *Sorea-Diospyros* zone.

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