

COVER PAGE

Project title:

Evaluation of Population Status, Demography and Threats of Golden langur, *Trachypithecus geei* (Khajuria, 1956) in different Fragmented Forests of Assam, India and issues related to its Conservation.

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PROJECT INFORMATION

Species to be studied: Golden langur (*Trachypithecus geei*)
Order: Primate,
Sub-Family: Colobinae
Family: Cercopithecidae
IUCN/SSC/PSG/CAMP (2002) Status: **Endangered, B1a + b (i, ii, iii, iv, v)**

Other species at site: Rhesus macaque (*Macaca mulatta*),
Assamese macaque (*M. assamensis*)

Location: India

Project period: 05.04.2003 to 04.03.2004

Estimated project cost: \$14146.00 (Requested from CIS- 7315.00\$)

Does this project meet animal welfare regulations for the country in which it is located? Yes

ABSTRACT

The Golden langur (*Trachypithecus geei*), an "endangered" primate species, is "endemic" to India and Bhutan. Its global distribution is restricted to the region bounded by three rivers: Sankosh in the east, Manas in the west, and Brahmaputra in the south. This region includes 1500 sq. km in western Assam, India and 1400 sq. km in the foothills of Bhutan in the north up to an altitude of 3000 meters. In Bhutan the populations seem to be doing well in protected areas like Royal Manas NP (National Park), Black Mountain NP, Trumsingla WLS (Wildlife Sanctuary) and Phipsoo WLS. But in India, only a small portion of the Golden langur's range is protected (40 sq. km in Manas NP and 45 sq. km in Chakrashilla WLS) while a substantial population is distributed in different Reserve Forests, Proposed Reserve Forests and in non-forested areas of Dhubri, Bongaigaon and Kokrajhar districts of Assam. Recent estimates compiled with satellite images reveal that 30% of these forest habitats of the Golden langur were lost during the last 10-12 years in India (Forest Survey of India, 1997) resulting in severe fragmentation and degradation of the habitats (see appendix-I). The populations that live in these fragmented Reserve Forests and Proposed Reserve Forests are virtually trapped, isolated from the main breeding population and vulnerable to demographic and genetic factors.

Further, due to increased land use and felling of their feeding and roosting trees by the local communities in these fragmented forests, a number of Golden langur troops now occupy unfamiliar areas. Such areas include private lands in fringe areas, which have planted fruit in gardens near the degraded forest areas resulting in strong human-Golden langur conflict. There are no systematic studies of Golden langurs in the fragmented forests of its whole range. The overwhelming emphasis is on maintaining the remaining populations wherever it is feasible. Given the greatly reduced distribution of Golden langurs both in Bhutan and India and the current trend of habitat destruction in India, it must be realized that even small local populations are valuable and should be protected wherever practicable, and not abandoned on the unproven hypothesis that genetic degeneration would set in and automatically eliminate them. Unless a comprehensive study of the population status, demography and pattern of threats is conducted, no specific recommendation and action plan can be standardized. The proposed study will concentrate on demographic as well as socio-ecological factors, identify site-specific conservation measures and initiate community interaction programs. The project will also assist the Assam Forest Department to draft a management plan for conservation.

Objectives:

1. To collect data on the present status and demography of Golden langur populations in the fragmented forests.
2. To identify the survival threats to these populations.
3. To assess the extent of human-Golden langur conflict, and people's attitudes.
4. To identify and recommend site-specific remedial measures and
5. Evaluate the possibilities of ex situ conservation measures like translocation and reintroduction of scattered populations in natural forest habitats.

BODY OF THE PROPOSAL

Preface:

The political events have led to the present deforestation crisis in Assam and other northeastern states of India. Radical groups including Bodo tribes have resorted to violent measures to achieve their goals of political autonomy in Western Assam while other (as many as 35) groups are active in other parts of the state. Santhal people from Bihar, Orissa and further west were brought by the British into the Northeastern States of India for tea plantation and forestry labor. Moreover, people migrate from Bangladesh and other parts of India to Assam and the Northeast. Over time, these people have increased in numbers, causing conflict with the indigenous tribes of the region. In the late 1980s agitation led to forest destruction by radical groups to finance their political activities. After forest destruction to justify their claims, tribal groups entered and cleared areas of the forests for farming and settlement and dominated demographically. In the past 10 years, approximately the lower third of the Reserve Forests of western Assam have been cleared, both for agriculture and for illegal timber extraction and human settlements. In all the cases the forest and the animals are the ultimate victims.

Background:

Being the core component part of the Eastern Himalayan Hotspot, Northeast India harbors a diverse range of primate taxa. Despite sporadic survey reports and a few short-term ecological studies, the subject of primatology and issues related to primate conservation were virtually untouched until recently. In 1994, the Indo-US Primate Project (a cooperative program of Ministry of Environment and Forest, Govt. of India and US Fish and Wild Life Services, grant agreement no-INT/FWS-22) initiated a program with the goals of developing a center for primate field studies, improving the quality of primate ecological and behavioral research, initiating studies of endangered Indian primates, training a new generation of primate field biologists and developing conservation strategies to benefit primates and other wildlife (Mohnot et al ., 1995-2001).

To accomplish its goals to work with the 9 Northeast Indian primates species, IUSPP initiated status surveys and species' pilot studies in the Northeast States. During the past 6 years, an enormous amount of data was collected on Northeast Indian primates. Eco-behavioral studies were carried out by post graduate students of Gauhati University on 5 of the more endangered species viz. Golden langur, Phayre's leaf monkey, Assamese macaque, Stump tailed macaque and the Hoolock gibbon. I worked on Golden langur on the topic "Ecology and social behaviour of Golden langur, *Trachypithecus geei* Khajuria (1956) in Assam". Having accomplished the major project goals, the remaining issues related to conservation must remain a focus now after the official closure of IUSPP.

During the IUSPP's status survey, except for few regions, the fragmented forests of the Golden langurs' range including Chakrashilla WLS were left out due to some unavoidable reasons. Owing to the fact that a considerable number of populations (roughly 15 - 20% of the global population) live in these fragmented forests, it is obvious that these forests should also get priority for scientific study on the above subject leading to conservation. It is for this purpose that I am seeking a supporting grant of \$ 7315.00 (USD) for this study.

Introduction:

The species:-

The Golden langur, *Trachypithecus geei* (Khajuria, 1956) is a leaf-eating, arboreal, canopy-dependent Colobine monkey classified under the family - Cercopithecidae. It is one of the most important primate species of South Asia with unique taxonomic and conservation status. The species is monotypic and endemic to India and Bhutan. It is found only in a small pocket of forests of North Western Assam, India and South Central Bhutan at the Indo-Bhutan border.

Distribution and habitat:-

Due to their localized distribution, Golden langurs are restricted between river Sankosh in the west, Manas in the east, river Brahmaputra in the south and foothills of Bhutan in the north up to an altitude of 3000m.

The general habitat of Golden langurs comprises sub-tropical monsoon fed moist deciduous and semi-evergreen forest up to 3000m. The specific forest type consists of Sub-Himalayan high alluvial semi-evergreen; East Himalayan moist-mixed-deciduous, Eastern Bhabar Sal and Low alluvial-savannah-woodland forests and occasionally degraded forests with secondary growth (Champion & Seth, 1968) that harbour three other species of non-human primates, viz. *Macaca assamensis*, *Macaca mulatta* and *Nycticebus coucang*.

Global status:-

The population estimation by Indo-US Primate Project research team revealed that it might be about 4500 individuals, covering both India and Bhutan (Mohnot et al., 1998). According to Srivastava et al., (2001), the population is not more than 1,500 individuals in India with small sized groups with a higher proportion of adults compared to immatures. Good populations may exist in Bhutan, estimated to be over 4,340 individuals, but these figures are based on an extrapolation from only 58.5 sq. km. of study area in Black Mountain National Park (Wangchuk, 1995).

Due to their small number and severe habitat fragmentation, IUCN Red Data Book enlisted the species under Endangered (A1acd, C2a) category and placed in Appendix-I of CITES. It has been placed under Schedule-I of Indian Wildlife Protection Act, 1972 (amended in 1991). Recently in IUCN / SSC / PSG / CAMP (2002) assessment, the status was re-evaluated as Endangered, B1a + b (i, ii, iii, iv, v).

The issue:-

The reduction of habitat is increasingly the most important issue threatening the existence of primates. Some primate populations, which once had large and extended habitats, are now reduced to small, isolated populations in a few remaining pockets of primary and secondary natural forests. Once a population becomes very small and isolated from potential sources of immigrants, random demographic and genetic process can lead the population towards extinction. By identifying those areas that satisfy the minimum

requirements for a particular species, management decisions can be made to preserve the key areas.

During the last few decades, the entire range of Golden langurs in India has been in great danger due to political unrest and inter-tribal ethnic violence resulting in large-scale destruction and encroachment on the primary forest habitat of the species. Since these forests have become the "tragedy of the commons" the actual area of Golden langur habitat has been reduced by 1/3rd of its original in the last ten years (Forest Survey of India, 1997) resulting in severe fragmentation and subsequent degradation of their habitats.

Recent estimates revealed that the range of Golden langur covers only 1500 sq km in Western Assam, India (Mohnot et al., 1998) while according to Choudhury (2002) the actual forest habitat of Golden langur in India is only 950 sq. km. In Bhutan, the range was previously estimated to be 2000 sq km (Wangchuk, 1995) bounded by river Sankosh/Manas and an altitudinal barrier up to 3000m in the Black Mountain range. However, a more recent study in Bhutan revealed that the range is 1400 sq km, a 30% reduction; now the boundary in Bhutan is confirmed as the Chamker / Mangde / Manas river complex, further west than previously thought (Wangchuk, et al., 2001).

As per the information available, in Bhutan region the populations of Golden langur seem to be doing well in the protected areas like Royal Manas NP, Black Mountain NP, Trumsingla WLS and Phipsoo WLS. But in the Indian part, only a small portion of Golden langur's range comes under protected areas of Manas National Park (40 sq km) and Chakrashilla WLS (45.6 sq. km) (which has been declared as a Wild Life Sanctuary in the recent year, solely to conserve Golden langur). The rest of its range comes includes a few Reserve Forests, Unclassified Forests and Proposed Reserve Forests, which are now under intense pressure due to various anthropogenic factors.

A substantial number of Golden langur populations are distributed in these fragmented forests. If the current trend of habitat destruction continues, except for three large Reserve Forests viz. Ripu (605.3 sq. km), Chirrang (592.5 sq. km), Manas RF (100 sq. km), the remaining Reserve Forests have low possibility of long-term survival of these populations of Golden langur, unless an immediate action plan for conservation is undertaken in such areas. The populations that live in these fragmented Reserve Forests and Proposed Reserve Forests, are virtually trapped, isolated from the main breeding populations and vulnerable to demographic and genetic factors.

Further, due to increased land use and felling of their feeding and roosting trees by the local communities in these fragmented forests, numbers of Golden langur populations now occupy unfamiliar areas including private lands in fringe areas. As a consequence, villages with planted gardens near the degraded forest fragments have now become the foraging sites of the monkeys. In some cases, langur populations are trying to adapt to village areas located at the fringe, isolated from other breeding populations. The fate of such populations is completely dependent on the mercy of the villagers.

A few efforts have so far been made to explore and study the status (Gee, 1955; 1961; Khajuria, 1956; Biswas, 1967, Mukherjee & Saha, 1974; Mukherjee, 1978; 81; Mukherjee, Southwick, 1997; Wangchuk, 1995; Subba, 1989; Wangchuk, et al., 2001; Srivastava, et. al., 2001), ecology and conservation perspectives (Ghosh, and Biswas, 1976; Gupta, Chivers,

2000; Biswas, J. personal comm.) of Golden langur in Manas Biosphere reserve and Chakrashilla WLS.

But unfortunately no scientific evaluation has been made so far to assess the population status and demographic picture of the species with respect to the habitat qualities of these fragmented forests; this should have first priority for any conservation effort. The dependence on extrapolation and then estimation has already created problems for other primate species in the region. Apart from that, the comparative social format and inter-individual relations of the Golden langurs in different fragmented habitats - if not properly understood in the field situation - may lead to a dead-end in otherwise well-supported conservation efforts. A complete understanding of the demographic picture of such populations pinpointing the threats in the field is the only option for rebuilding a healthy population with the least effort in a cost effective manner. Any delay in formulating an action plan for these species, which have already attained the status "endangered" may cause great harm to the total population.

Concept:-

All primate species respond to habitat alteration and this impacts the species demographic pattern and survival (Hill & Bernstein, 1969). Golden langur is not an exception and has been observed to respond to these changes. The problem of the conservation of this unique species is complicated and not solely associated with the traditional conservation methods of protection limited to specific protected areas . The overwhelming emphasis is to maintain the remaining populations wherever it is feasible. Given the greatly reduced distribution of Golden langur both in Bhutan and India and the current trend of habitat destruction in India, it must be realized that even small local populations are valuable and should be protected wherever practicable, and not abandoned

Aim:

1. To collect data on the present status and demography of Golden langur populations in the fragmented forests.
2. To identify the survival threats to these populations.
3. To identify some issues related to their conservation.
4. To assess the extent of human-Golden langur conflict, and people's attitudes.
5. To identify and recommend site-specific remedial measures and
6. Evaluate the possibilities of ex-situ conservation measures like translocation and reintroduction of scattered populations in their natural forest habitat.

PROJECT DESCRIPTION:

Study Areas:

The proposed study is planned to be conducted in the fragmented Wildlife Sanctuaries, Reserve Forests and Proposed Reserve Forests of three districts of Western Assam: Bongaigaon, Dhubri and Kokrajhar district. The proposed study areas are enlisted below.

1. **Bongaigaon District:** Nak kati RF (2880 ha); Kakoijana RF (1724 ha); Bamungaon RF (1059 ha); Rakhalthakur RF (93 ha); Bhairabi Hill PRF (509 ha).

2. **Dhubri District:** Singram RF (830 ha), Bangalduba RF (690 ha), Chakrashilla WLS (4557 ha), Nayakgaon PRF (145 ha).

3. **Kokrajhar District:** Nayakgaon PRF (1660 ha), Nandangiri RF (1020 ha); Katrigocha RF (710 ha)

Project Design and Methodology:

Goals:

Goal-1: Study the present status & demographic features in the fragmented habitat

Specific aims: Habitat alterations have serious implication in the life history of primates, which in turn affect the species status and demography (Hill & Bernstein, 1969). So, in this context the study will cover:

Population and demographic status evaluation in the study area.

Method: Line transects method (Burnham et al, 1980, NRC, 1981) and direct count method in different types of forests like degraded and rubber plantations.

Design and implementation: The transects will be laid in stratified random manner to cover all representative areas of the Reserve (Burnham et al, 1980). Transects will be marked and will be followed on foot on each working day. When a primate group is encountered, individuals will be counted and classified as adult males, adult females, juveniles and infants as described in the literature and depending on the size and maturity of the individuals. All primate encounters will be recorded and complemented by data on habitat parameters. Indirect information will also be collected from villagers or from feces, bones, and footprints etc.

Habitat Evaluation: Data on landscape and habitat parameters will also be collected from a circular plot of 10 meter radius after every 500 meter during transect walk and at each location where primates will be encountered. Canopy height, canopy cover, ground cover, dominant tree, shrub and herb species and their phenological state will also be recorded at every sampling point. Data will also be collected on the degree of encroachment by people, grazing pressure and logging.

Analysis: These data will be later used for statistical analysis to estimate abundance, group density, average group size, socioeconomic ratio and other demographic parameters .

Goal-2: Human-langur conflict assessment and community education:

Specific aims: To assess the extent of human-langur conflict and nature of damage done by the stranded troops in the fringe villages. The attitude of the peoples and threats from various human angles will be covered. This community interaction will also help to sort out some of the problems related to conservation of the species from the local communities point of view.

Method: Questionnaire in the fringe areas and visit to estimate the damage done.

Design and implementation: Personal interviews by benchmark methods will be conducted. A few selective questionnaires will be prepared to interview the fringe villagers and to determine the context of man-monkey conflict. This will be done during the status survey of the study area and will cover representative communities of the surrounding reserve forest. This community interaction will also help to sort out some of the problems related to conservation of the species from the local communities' point of view. Possibilities of establishment of community groups to begin protection of primate habitat and implementing the joint forest management (JFM) scheme that will provide the communities with their local requirements, through community participation and group meetings will also be evaluated.

Analysis: All the data collected through by the questioner will later be tabulated in the computer for statistical analysis of percent of damage done, percentage of the land use, encounter rate and magnitude, number of animals killed or injured etc.

Timetable:

Work Frame-I: (April 2003) = 1 month

Groundwork:

Organization and arrangement of the base camp and logistic support, hiring the assistants, purchasing field equipment, lay out of transect, focal troop selection and habituation.

Work Frame-II: (May 2003 - February 2004) = 10 months

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|--|---------------------|
| 1. For status survey and demographic Study | 150 Days (5 months) |
| 2. Habitat study / Vegetation sampling | 30 Days (1 month) |
| 3. Questionnaires
(For socio economic studies in the fringe villages) | 30 Days (1 month) |
| 6. Community education and awareness campaign | 10 Days (1/2 month) |
| 7. Transportation (5 Days × 10 months) | 50 Days (2 months) |

Total = 270 Working Days (Ten months)

Work Frame-III: One month (March 2004)

Data analysis and report preparation = 1 month.

Grand Total: (April 2003 - March 2004) = 12 Months

Project outputs (contribution to primate conservation):

It is expected from this project that critical information regarding this endangered primate species in Northeast India will come out. This information will help to prioritize the conservation action plan by making the following contributions:

1. Current status of Golden langur and its habitat in these fragmented forests.
2. Identify the threats (immediate and long term like inbreeding depression etc) in the social structure and demographic trends of Golden langur because of changed conditions due to habitat fragmentation and degradation?
3. Distinguish factors that are directly related to man-monkey conflict and develop some viable solutions.
4. Increase general education and public awareness to ensure community participation in conservation of primate habitats.
5. Possible implementation of joint forest management schemes with the help of NGOs and the forest department that will provide communities with their local requirements, such as fuel wood and cash crops with high economic returns.
6. Direct involvement of local community in the study of population trends will be encouraged to monitor and conserve their natural heritage.
7. Publication of educational materials, brief notes, media reports and scientific papers.
8. Identify some forests to upgrade their legal status from Reserve Forest to Wildlife Sanctuary from the information generated by the project and the prioritizing of conservation measures.

Significance to Species Conservation:

The proposed study will help in quantifying the current status and demography of scattered population of Golden langur in fragmented forest habitats. The eco-behavioral study will help to understand whether these populations can withstand the substantial change of their habitat. Identifying the threats like man-monkey conflict, the damage caused by these monkey populations, predation by dogs, and killing in the fringe areas will help to sort out possible remedial measures involving community participation. This community participation will eventually help in future prospects of ex-situ conservation and will also help to increase general education and public awareness to ensure conservation of primate habitat with the help of NGOs and forest department.

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Budget for one year:

Heading	Details	Requested	Total (US \$)
Travel Expenses			
Local (Field Visit)	By hiring a vehicle to visit all the study area for survey		
	@250\$ × 12 months	1500\$	3000\$
Fuel	@100\$ × 12 months	500\$	1200\$
Other	Visit to Guwahati @300\$ Forest head quarter, other Department	200\$	300\$
Logistics			
Insurance	Medical insurance for PI, RA & FA @ 50\$× 3	Nil	150\$
Accommodation & Subsistence			
Field	Local accommodation in the field and at base camp@50\$ × 12	300\$	600\$
Materials			
Equipments (field equipments)	Maintenance cost	100\$	250\$
Consumables	Field kits, Hunting shoes, Rucksack Sleeping bag, Rain coat, Film and Developing charge, Torch & battery, 400\$ Data sheet, Herbarium sheet, Stationary items, Final report printing, cartridge for Computer, Floppy etc.		850\$
Others	Kitchen utensil, table, chair for Base camp, bed etc.	100\$	300\$
Allowances/per Diems			
Daily allowance (PI & RA)	Food & other expenses for @15\$×270 Work Days	2500\$	3510\$
other daily expenses for PI & RA			
Local Salaries	Salaries for 1 Field Assistance @ 80\$ × 12 months	400\$	960\$
Publication/ Awareness Communication			
Telephone, Email, Correspondence.	Community Education materials, Leaflet, awareness campaign	500\$	900\$
Contingency 10% and other unseen cost in the field.	All types of correspondence including local and international Xerox, electricity bill, Local wages	150\$ 665\$	300\$ 1286\$
Total:		7315\$	14146 \$ (US)

Total Requested from CIS: 7315.00 \$ (Seven Thousand Three Hundred and Thirteen USD only)

Budget justification:

Travel: May include transportation from the base camp to the various Reserve forests. Most of these forests are not connected with any bus route or other mode of transportation. So hiring of private vehicle is the only option in that case and most of the money will be spent on fuel, lubricant for vehicle. Travel by road, by railways within India will be paid from this budget category. The staff and supporting staff will be paid for actual expenditure.

Logistics:

Visa/Permits: No visa or permit is required.

Medical Insurance: As PI and Field Assistant will have to move extensively in the forest area that is prone to various diseases like malaria etc. Medical insurance will be paid from this category.

Accommodation & Subsistence:

Field: During the study PI and FA will have to stay in different reserve forest areas, which do not possess any kind of Inspection Bungalow. So money will be spent in this category on local accommodation in nearby fringe villages during the study period. A temporary base camp will be set up at Bongaigaon town to communicate to all the study areas. For this, a double bedded room will be taken on rental basis for 12 months at Bongaigaon from where all the study sites will be accessed by PI and FA and other field staff.

Materials:

Equipment: In this category only the maintenance cost of the equipment that will be used for field studies like camera, binocular, video camera, GPS etc (which the PI personally possesses) will be covered.

Consumable: May include all kinds of consumable goods like field kits, Hunting shoes, Rucksack, Sleeping bag, Rain coat, Datasheet printing, Herbarium sheet, Plant identification charge and Film roll and developing charge, Stationary items, Report preparation, Final report printing, Ink cartridge for Computer, Floppy etc.

Others: For temporary base camp a house will be established on rental basis. All furniture like table, chair, bed as well as kitchen utensils will be purchased with funds from this category.

Allowances/per Diems:

Daily Allowances: Money will be spent in this category mainly for food and other daily expenses for PI.

Salary for FA: One field assistant will be hired on daily wages basis for field guide and other assistance in the field. Other field staff will also be hired on daily wages basis for work like grid preparation, troop monitoring etc.

Publication:

Awareness: Publication of Community Education materials, leaflets, posters and other publication materials related to the study will be prepared with funds in this category. The awareness campaign will also be organized from this money. Refreshment for local community meetings will also be provided from this category.

Communication: This may include telephone charges and local or inter state or international, expenses for surface mailing and e-mail. Certain study materials and relevant study references will also be brought from other countries.

Contingency: This may include electricity charge at base camp, other administrative expenses, money for daily wages and other activism. Administrative charges will be either given to a nodal agency like PRC, who is going to handle the fund or directly to PI.

Curriculum Vitae of PI

1. Name: JIHOSUO BISWAS

2. Present address: Animal Ecology & Wildlife Biology Lab
Department of Zoology, Gauhati University
Guwahati-781014, Assam (India)
Ph. No- 091 (361) 570647
E-mail: jihosuo@yahoo.com

3. Nationality: Indian (By birth)

4. Educational qualification: **Ph.D** {*Thesis submitted on December 2002* on the topic: "Ecology and Social Behaviour of Golden langur: *Trachypithecus geei* (Khajuria, 1956) in Assam"}, **M. Sc.** (Zoology).

5. Field experience:

- a) Four years research experience on **Status survey and Habitat assessment** of non-human primates in Northeast India under Indo-US Primate Project.
- b) Two year research experience on **Socio-ecology and Behaviour of Golden langur: *Trachypithecus geei*** (Khajuria, 1956) in Assam under Indo-US Primate Project.
- c) **Community Conservation** to protect the habitat of Golden langur in collaboration with Community Conservation Inc. and other local NGOs and Forest Department.
- d) **Tiger Population Census**, Manas Tiger Reserve (Assam).
- e) **Elephant Census and Habitat Evaluation**, Pakui Wild Life Sanctuary (Arunachal Pradesh).

- a) "Monitoring and Assessment of biodiversity, Adaptive management Course (**SI/ MAB, 2003**)" organized by the Smithsonian Institutions, USA.

6. Training received:

- b) "Census Technique Workshop on Galiform and Primates" organized by World Pheasant Association and Indo-US Primate Project.
- c) "Ecology and Conservation of Non-Human Primate" organized by Gauhati University and Indo-US Primate Project.

7. Present Position: **Researcher / Principal Investigator.**

Primate Research Centre, Department of Zoology, Gauhati University.

8. Project/Grant Received:

- a) **Conservation International**, Primate action Fund as *Principal Investigator*, February 2003 to March 2004.
- b) **Primate Conservation Inc.** as *Principal Investigator*, January, 2003 to December 2003.
- c) **Grate Ape Conservation Fund** given by USFWS as *Researcher*.
- d) **Primate Conservation Inc.** as *Principal Investigator*, September, 2001- March, 2002 on Effects of habitat condition (disturbed and undisturbed habitat) on activity pattern, feeding ecology and ranging pattern of Golden langur (*Trachypithecus geei*): a comparative account.
- e) **Indo-US Primate Project** as *Senior Research Fellow* (December 1999 - July 2001).
- f) **Indo-US Primate Project** as *Junior Research Fellow* (November 1997 - November 1999).
- g) National Merit Scholarship 1994 -1996.

10. Publications:

Published:

- a) Chetry, D; Medhi, R; **Biswas, J**, Das, D and Bhattacharjee, P.C.2003. Nonhuman Primates in the Namdapha National Park, Arunachal Pradesh, India. **International Journal of Primatology** **24 (2). Pp: 383 – 388.**
- b) Srivastava, A; Das, J; **Biswas, J**; Bujarbarua, P; Sarkar, P; Bernstein, I.S. and Mohnot, S.M, 2001. “Primate population decline in response to habitat loss: Borajan Reserve Forest of Assam, India” **PRIMATES** **42 (4). Pp: 401-406.**
- c) Srivastava, A; **Biswas, J**; Das, J; Bujarbarua, P; 2001. “Status and Distribution of golden langur in Assam”. **American Journal of Primatology** **55. Pp:15-23.**
- d) **Biswas, J.** and Mohnot, S.M, 2001, “Inter troop interaction of free ranging populations of golden langur (*Trachypithecus geei*) at Ultapani, Assam” Abstract Vol. XVIIIth IPS Congress, 2001. **Abstract.**
- e) Bhattacharjee, P.C and **Biswas, J**, 2000, “Site selection of refugee camp affect the biodiversity: A case study in Kokrajhar district, Assam” National Seminar in Environmental issues and Priorities: Challenges of the millennium, Assam University, Silchar, Assam. **Abstract.**
- f) Srivastava, A; Das, J; Bujarbarua, P; **Biswas, J**; Medhi, R; Sarkar, P and Ahmed, S.S.G, 1999, “Primate conservation in Northeast India” Kyoto: Poster at Asian Science Seminar on Synthetic Studies on Biodiversity: Message from Primatology, pp.19, 1999. **Abstract.**
- g) **Biswas, J**; Medhi, R and Mohnot, S.M, 1996, “ Ecology and Behaviour of introduced pair of golden langur (*Trachypithecus geei*) to Umananda river island, Brahmaputra, Assam”, IPS/APS joint congress, 1996.’ **Abstract.**

Accepted & in Press:

- a) Chetry, D; Bujarbarua, P; Srivastava, A; Das, J; **Biswas, J** and Mohnot, S.M, 2001. “Population survey of primates in Gibbon Wildlife Sanctuary, Assam, India” Accepted in **Biosphere Conservation.**
- b) Das, J; M.M. Feeroz; M.A. Islam; **J. Biswas**; D. Chetry; R. Medhi and J. Bose. 2002 e. Distribution of Hoolock gibbon (*Bunopithecus hoolock*) in South Asia. *Zoos print.* (In press).

- c) Das, J; **Biswas, J**; Medhi, R.; Bose, J; Chetry, D; Bujarbarua, P. 2002. Distributional status of Hoolock gibbon (*Hylobates hoolock*) and their conservation in southern Assam, India. *Tiger paper*. (In press).
- d) Chetry, D; Medhi, R; **Biswas, J**; Das, D and Bhattacharjee, P.C. Non-Human Primates in Namdapha National Park, Arunachal Pradesh, India. *International Journal of Primatology* (In press).
- e) **Biswas, J** and Bhattacharjee, P.C. “Habitat Alteration: Impact analysis on Golden langur (*Trachypithecus geei*) populations and its threats”. *Zoo’s Print* (In press).

Communicated:

- a) **Biswas, J**; Bhattacharjee, P.C; and Mohnot, S.M; 2001. “Birth, breeding seasonality and reproduction in Golden langur: *Trachypithecus geei* (Khajuria, 1956)”.
 b) **Biswas, J**; Bhattacharjee, P.C; and Mohnot, S.M; 2001. “ Population structure and troop dynamics of golden langur: *Trachypithecus geei* (Khajuria, 1956) in Chirrang Reserve Forest, Assam”.
- c) **Biswas, J**; Bhattacharjee, P.C; and Mohnot, S.M; 2001. “Ecology and behaviour of free ranging Golden langur: *Trachypithecus geei* (Khajuria, 1956) in winter season”.
- d) **Biswas, J**; Bhattacharjee, P.C; and Mohnot, S.M; 2001. “An eventful inter-troop interaction of two troops of Golden langur *Trachypithecus geei* (Khajuria, 1956)”.
- e) **Biswas, J** and Bhattacharjee, P.C. “Male dispersal and group formation in Golden langur (*Trachypithecus geei*)”.
- f) **Biswas, J** and Bhattacharjee, P.C. “Observations on uncommon feeding habits of Golden langur, *Trachypithecus geei* (Khajuria, 1956)”.
- g) **Biswas, J** and Bhattacharjee, P.C. “Socio-ecology of Capped Langur, *Trachypithecus pileatus* (Blyth, 1984) in Manas National Park: A preliminary study”.
- h) Chetry, D; Medhi, R; Das, J; **Biswas, J**; Bujarbarua, P; Bose, J; Begum, F; Srivastava, A; Bhattacharjee, P.C; and Mohnot, S.M; 2001. “Population distribution and demography of the Stump Tailed Macaque, *Macacca arctoides* in India”.
- i) Bujarbarua, P; Das, J; **Biswas, J**; Medhi, R; 2001. “Status and threat of Hoolock gibbon (*Hylobates hoolock hoolock*) in two hill districts of Assam”.
- j) Medhi, R; Chetry, D; Das, J; **Biswas, J**; Bujarbarua, P; Bhattacharjee, P.C; and Mohnot, S.M; 2001. “Population status and distribution of Capped langur: *Trachypithecus pileatus* in Assam”.
- k) Bose, J; **Biswas, J**; Das, J; Bujarbarua, P; Medhi, R; Chetry, D; Begum, F; Srivastava, A; Bhattacharjee, P.C; and Mohnot, S.M; 2001. “Population status and distribution of Phayre’s leaf monkey, *Trachypithecus phayrie* in Assam”.

10. Language Skill: English; Assamese; Hindi; Bengali & Nepali (Reading/Writing).