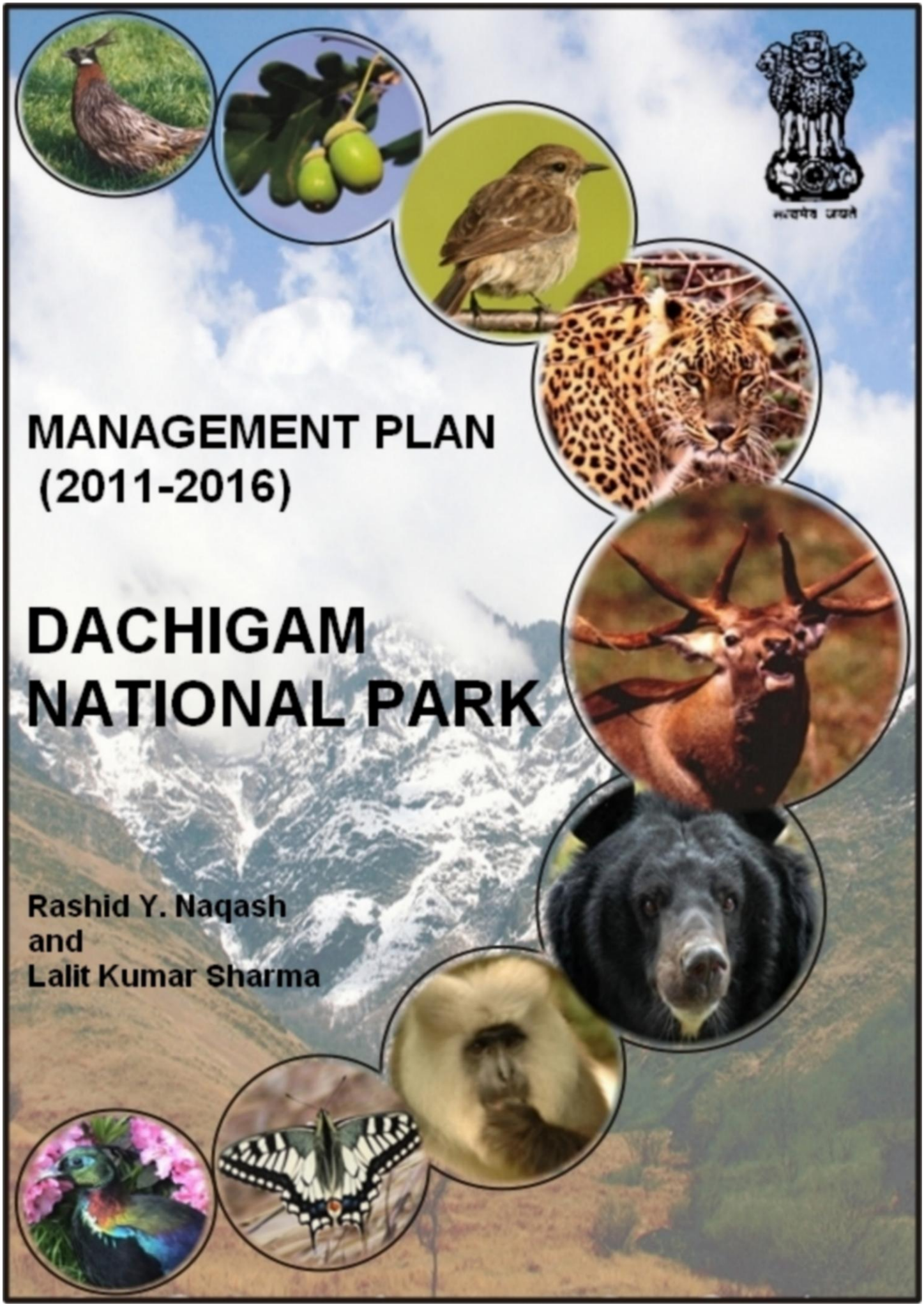
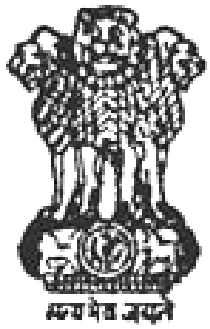


MANAGEMENT PLAN (2011-2016)

DACHIGAM NATIONAL PARK

Rashid Y. Naqash
and
Lalit Kumar Sharma



MANAGEMENT PLAN

(2011 - 2016)

DACHIGAM NATIONAL PARK

RASHID Y. NAQASH

WILDLIFE WARDEN CENTRAL

AND

LALIT KUMAR SHARMA

RESEARCH SCHOLAR

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Introduction

The Jammu and Kashmir state is the northern most state of the country and known for its biodiversity, natural beauty and for the uniqueness found in the species composition. The rapidly increasing population, infrastructure development is causing deforestation, depletion of natural resources and conditions of paucity. The Himalayas, which play vital role not only in Indian but also in sub-continental economy, is in the grip of environmental degradation. The carrying capacity of the Himalaya is decreasing day by day due to the heavy pressure of both increasing human and livestock population. Historically, local communities were dependent on natural resources for there livelihood.

The Western Himalayas state Jammu and Kashmir supports a diverse array of cultures, resource uses, and management traditions in spiritual beliefs. The Western Himalayan ecosystem, of which Jammu and Kashmir is a part, has been recognised as a repository of local conservation traditions that promote the careful use of natural resources in order to maintain a long-term sustainability and to support local socio-economic condition. However, these mountainous areas undergo rapid socio-economic and environmental changes due to hasty increase in population, forest degradation and developmental activity.

The outstanding conservation values made Dachigam National Park as one of the most important protected areas and it holds the last viable population of Kashmir stag ‘Hangul’. The recent study states that Dachigam holds one of the largest population of Asiatic black bear in Asia.

For the maintenance of the physical and demographic integrity of the site and rich wildlife resources in Dachigam national Park need more scientific management with a long term planning process. In the changing world management of wildlife as a separate planning strategy is quite newer than the mainstream forest management. The current management plan is the first management plan which is prepared by following the guidelines developed by Wildlife Institute of India and the manual for planning wildlife management in protected area and managed forest.

Though the management plan is written for the period of five years, it is necessary to revise after the completion of the period on regular basis to incorporate and upgrade the changes which are caused due to dynamic nature of habitat and accrued knowledge after research publications. It is felt that the management plan in the present condition is the big leap towards achieving set goals and objectives.

Srinagar, 05 August, 2011

Rashid Y. Naqash
Wildlife Warden Central

Lalit Kumar Sharma
Research Scholar

Executive summary of the management plan

Dachigam National Park is one of the most important protected area in Jammu and Kashmir state because it holds the last viable population of Hangul in world. The park spread over an area of 141 sq. km in the Zabarwan mountain ranges of great Himalayas. Dachigam National park harbors the last viable population of Hangul and one of the largest population of Asiatic black bear.

Dachigam National park was a hunting reserve or 'rakh' of the Maharaja of Jammu and Kashmir for a long time from 1910 until 1947, after that its management was handed over to Department of Hospitality and Protocol (Fisheries Department, Directorate of game preservation) and subsequently to the Forest Department. It was managed under the Wildlife wing of Forest Department and later Dachigam was declared as a sanctuary by state order no. 276/C in 1951 (Holloway, 1970; Holloway and Wani, 1970). Dachigam Wildlife sanctuary was upgraded to National Park on 4 February 1981 (state order no. FST/20) by the Government of Jammu and Kashmir. The management of Dachigam NP is handed over to the newly formed Department of Wildlife Protection, Jammu and Kashmir 1982 after separation from Forest Department. The park is divided into two administrative unit Lower and Upper Dachigam which are administered by Central and South Wildlife Division respectively. Today it is managed in IUCN category- II (National Park).

So for the focus of the park management had mainly been on the protection aspect. Today the wildlife enjoying near wildness conditions, because of the proper management of the park and protection given to the habitats of wild animals but today it was needed to explore the other facets which the management of the park is facing in the changing world. The draft management plan written for the year (2011-16) focuses on important aspects with the following objectives:-

1. To maintain and to restore the demographic features of the park when ever needed relating to the population of wild animals and the plants with special focus on

hangul, Asiatic black bear and rare medicinal plants found to be distributed in Dachigam National Park.

2. To maintain and restore the physical integrity of the habitats when ever needed for the long term survival of the animal species living in them.
3. To identify research priority and implement research based programs to establish mechanism and create opportunities for enhancing management capabilities and knowledge of wildlife science.
4. To enhance the quality of awareness, conservation education, recreation and wilderness experience given to the general peoples.
5. Consistent with the above four objectives, in the zone of influence with sensitivity to cultural and economical well being of the local communities and to reduce the forest dependency for there livelihood.

The management plan has been written strictly according to the guidelines given by Wildlife Institute of India for writing management plan in a protected area.

It comprises of three parts;

Part one covers four chapters namely (Introduction, Background information, History of the management and present practices in the protected areas and the interface land use situation) respectively.

Part two of the plan covers rest of the eight chapters namely (Plan objectives and problems, strategies, Tourism interpretation and conservation Education, Eco-development, Research and monitoring, Organization and administration, the budget and the schedule of operations) respectively.

Part three comprises of various Annexures and control forms pertaining to the park.

The objectives are well defined however there are a number of constrains/ problems in achieving these objectives.

Some of the major constrains that have been identified are: Grazing in alpine pasture, fire in grasslands, siltation of water bodies and problems related to infrastructure and communication needs of the park. The VIP guest house in the heart of the park and the recent increase in man-animal conflict reports are the

problems of greater and some lesser magnitude, with greater implications for the future.

The strategies proposed in chapter-6 to tackle these problems are to divide the park in zones. Each zone has its own set of objectives and strategies for dealing with the problems which the management is having today.

Nine theme plans which are applicable to the entire parks irrespective of the zonation are as under. The management strategies for the Dachigam National Park that are applicable to the entire park irrespective of their zones and have not been discussed in the chapter no.6 of the plan are listed here:

1) **Control of Poaching**
2) **Control of Grazing and other biotic disturbances**
3) **Weed Control**
4) **Controlling ranging patterns of wild animals outside the managed habitat**
5) **Soil erosion monitoring and control**
6) **Animal health surveillance**
7) **Man-animal coexistence**
8) **Development of infrastructure and communication**
9) **Management of quarantine areas or captivity center of rescued animals**

Similarly the chapter no. 7, 8, and 9 that deal with ecotourism, Eco-development and Research and monitoring deal with the various measure for conducting the said activities.

Chapter no.10 talks about the present and proposed staff that would be required at Dachigam national Park for the proper management and protection. Chapter no.11 deals with the budget that would be required both at central and state level for fulfilling these activities. The total budget at present rate of the entire period of

five year would be Rs. 1583.00 lakhs while the projected expenditure at 5% annual increase would be Rs. 1642.59 lakhs.

Chapter no. 12 deals with the schedule of operations showing the month wise activities of each operation carried out at Dachigam National Park.

All of the Annexures and the Control forms pertaining to Dachigam National Park and are relevant towards formulation and execution of the management plan.

ACKNOWLEDGEMENTS

We thank Shri. Shantamanu, IAS, Commission Secretary to government forest department, Shri. Irshad Ahmad Khan, IFS, Principal Chief Conservator of forest former chief wildlife warden, Shri. P.C. Kapoor, IFS, Principal Chief Conservator of forest former chief wildlife, Shri. A. K Singh Additional principal Chief Conservator of forest / Chief Wildlife Warden, Shri. Deepak Khanna, IFS, Chief Conservator of forest (Eco-tourism), Shri Javed Ahmad Panzoo, IFS former Conservator of forest (wildlife) Kashmir, Shri. Hafizullah Sidiqui, IFS, Chief conservator of forest (Wildlife) / Regional Wildlife Warden (Kashmir), Smt. Ifshan Deevan, Wildlife Warden Technical, Shri. Mushtaq Ahmad Parsa, Wildlife Warden Head quarters, Shri. Tayub shah Qadri, former Ranger officer Dachigam, Shri. Shamsudein Nishati, Range officer Dachigam, and the other frontline staff of Dachigam for providing us the necessary support and encouragement during preparation of the document. We express our gratitude to the other persons which were of great help during the preparation of this document and their name was not included above.

CHAPTER ONE

INTRODUCTION TO THE AREA

1.1 NAME, LOCATION, CONSTITUTION AND EXTENT

1.1.1 NAME AND HISTORY:

The name of the park comes from the Kashmiri word *Dah* which means 10, *chi* means are and *gam* means village so "ten village". Before the existence of the park there were 10 villages which later on translocated from the area due to the formation of a game preserve of rakh by the Maharaja of Jammu and Kashmir. The name of the National Park was given in the memory of these 10 villages. Inside the park there are many nallahs which are named after the translocation of those villages. This area was having diverse flora and fauna by keeping this in mind maharaja made it rakh for him and for this guests (hunting).

1.1.2 LOCATION:

Dachigam National Park lies between 34^0 05'N - 34^0 11'N and 74^0 54'E -75^0 09'E and the area comes under the civil jurisdictions of Srinagar, Anantnag, Pulwama districts. Its area comes in 2.38.12 (Himalayan Highlands) biogeographical province, and 2A Bio-geographic zone. It is 21Km north-east to Srinagar the summer capital of Jammu and Kashmir state situated in Zabarwan mountain range of Great Himalayas. Nearest Airport and railhead stand 32 and 315 kms away respectively.

1.1.3 CONSTITUTION:

Dachigam National park was a hunting reserve or 'rakh' of the Maharaja of Jammu and Kashmir for a long time from 1910 until 1947, after that its management was handed over to Department of Hospitality and Protocol (Fisheries Department, Directorate of game preservation) and subsequently to the Forest Department. It was managed under the Wildlife wing of Forest Department and later Dachigam was declared as a sanctuary by state order no. 276/C in 1951 (Holloway, 1970; Holloway and Wani, 1970). Dachigam Wildlife sanctuary was upgraded to National Park on 4 February 1981 (state order no. FST/20) by the Government of

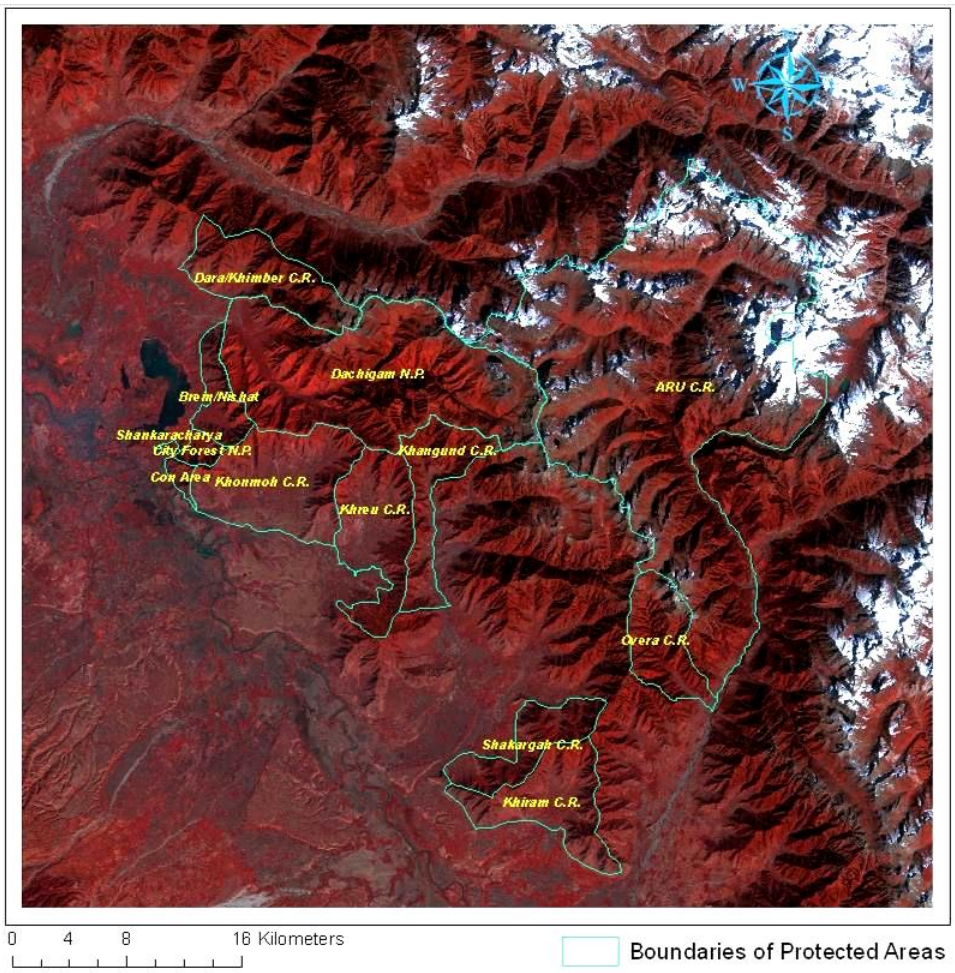


Fig.1 Map showing Dachigam National Park and surrounding Protected areas in Dachigam Landscape.

Jammu and Kashmir. The management of Dachigam NP is handed over to the newly formed Department of Wildlife Protection, Jammu and Kashmir 1982 after separation from Forest Department. The park is divided into two administrative unit Lower and Upper Dachigam which are administered by Central and South Wildlife Division respectively. Today it is managed in IUCN category- II (National Park).

Today Dachigam National Park is surrounded by many conservation reserves which are contiguous to the boundaries. There are many villages which are located on the periphery of Dachigam where managing wildlife have become challenging task. For the better management of the National Park there is a need for the additions of new areas of Sindh forest division which are providing contiguous habitat for wild animals such as black bear, leopard and most importantly Hangul.

1.1.4 EXTENT:

The total area of Dachigam national Park is 141 Sq. Km. Dachigam National Park is divided in two Lower and Upper Dachigam

Name of the area	Area Sq. Km	Date of notification	Section Under Which Notified
Dachigam National Park	141	4/ February/ 1982	Section-35 of Jammu and Kashmir WPA, 1978

1.2 APPROACH AND ACCESS:

The administrative head office and the range office of Dachigam National park is located at Harwan, Srinagar. Harwan is 21km from summer capital of Jammu And Kashmir State. The nearest airport is Srinagar international airport which is 35km from Harwan.

1.3 THE STATEMENT OF SIGNIFICANCE:

Dachigam National Park is known world-wide because it holds one of the best populations of Asiatic black bear in Asia and the red deer sub- species Hangul. It also provides a natural habitat for a number of threatened and endangered species. Dachigam National Park is one single compact catchment area in the central Kashmir which has a highly unique and diverse type of fauna and flora. Dachigam occupies almost half of the catchment zone of the famous Dal Lake and is the main source of water for the Srinagar city. The National Park is significant in the sense that it is the only area in the world where last viable population of Kashmir Stag (Hangul) is in existence. The Park is foster mother nurturing rich assets of threatened as well as rare flora and fauna. The faunal, floral, ecological and geomorphologic significance together with proximity to Srinagar has added splendor shine to the glory of Dachigam, as a gene pool for rebosement, protection and propagation of Wildlife. Dachigam is a stupendous example which represent and preserves significant ecological and biological processes in the way of evolution and development of various ecosystems consisting of several communities of plants and animal species. Most significantly Dachigam national park provides suitable habitat for the in-situ

conservation of Hangul which is critically endangered and needs attention for the conservation of species which have global importance such as Himalayan Grey Langur, Himalayan Yellow throated Marten, Asiatic black bear, Common Leopard.

Some of the key significance conservation values of Dachigam National Park are enumerated below:-

- It hold the last surviving population of Hangul
- It is the main Catchment for the famous Dal Lake
- It holds best population of Asiatic black bear and with high ecological density
- Dachigam national park with adjacent conservation reserves and wildlife Sanctuaries makes Greater Dachigam Landscape which harbors high level of biodiversity.
- It has a substantial Research, Education and Recreation values.

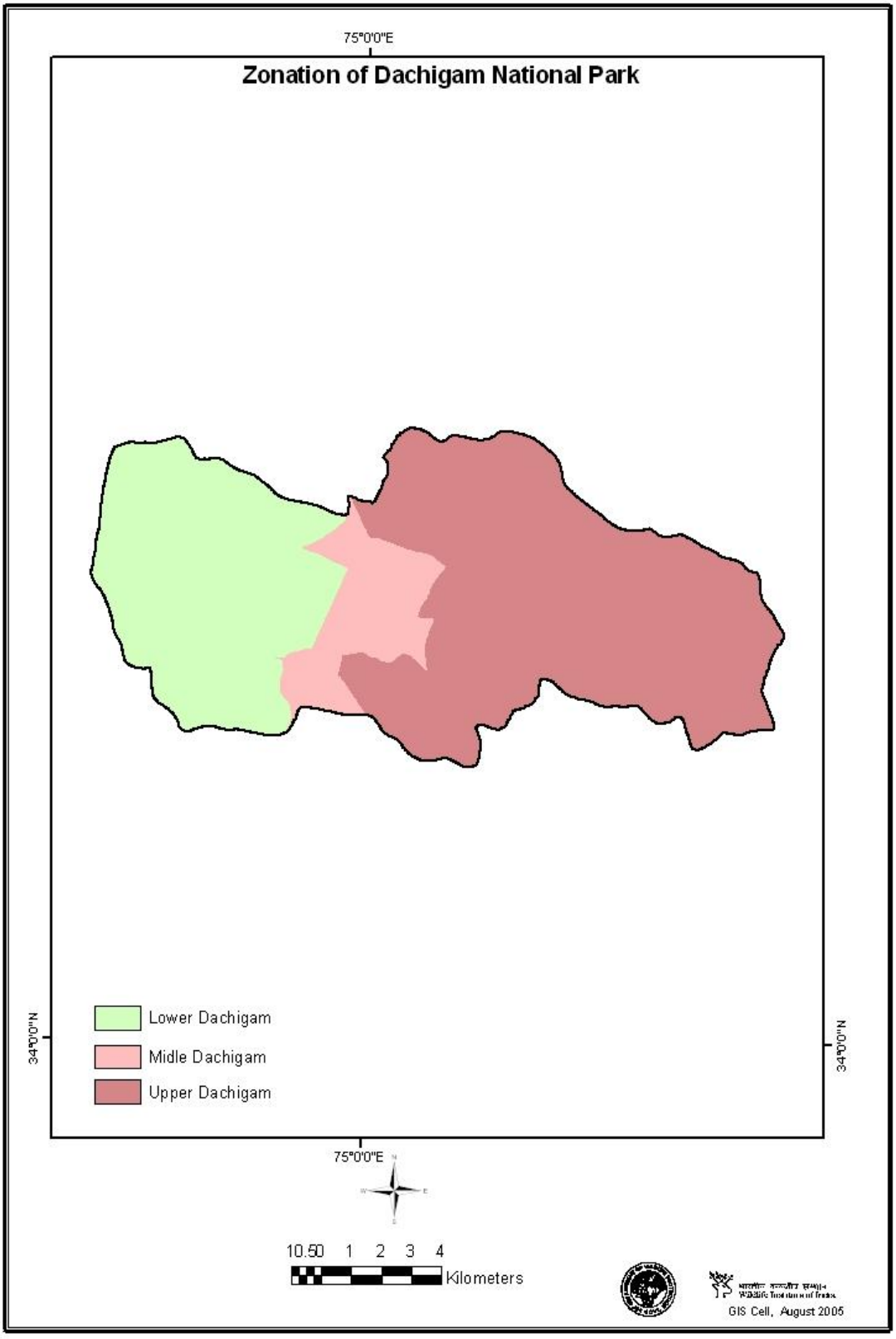


Fig. 2. Map showing administrative zones of Dachigam National Park.

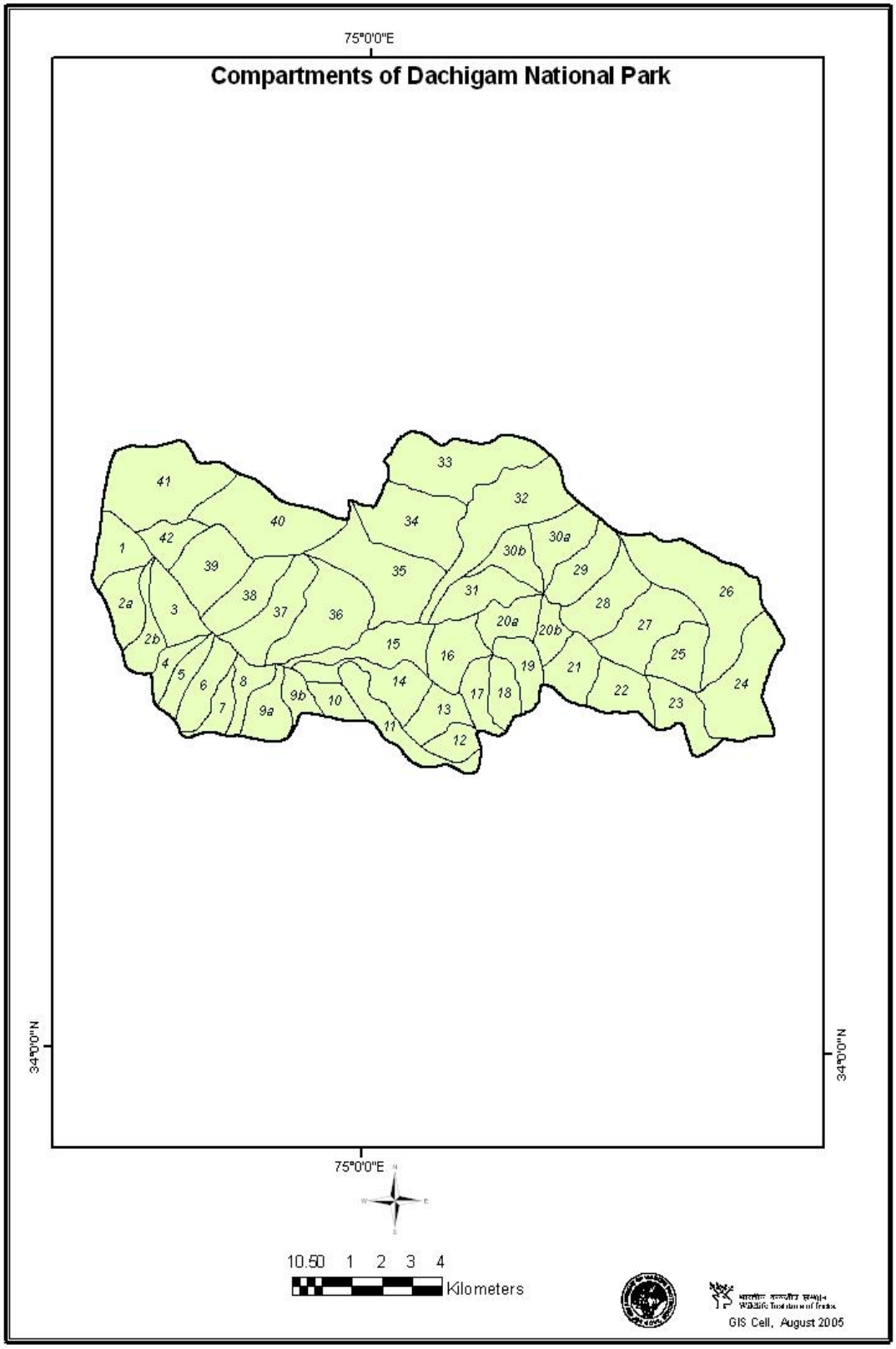


Fig.3 Map showing compartments in Dachigam National Park.

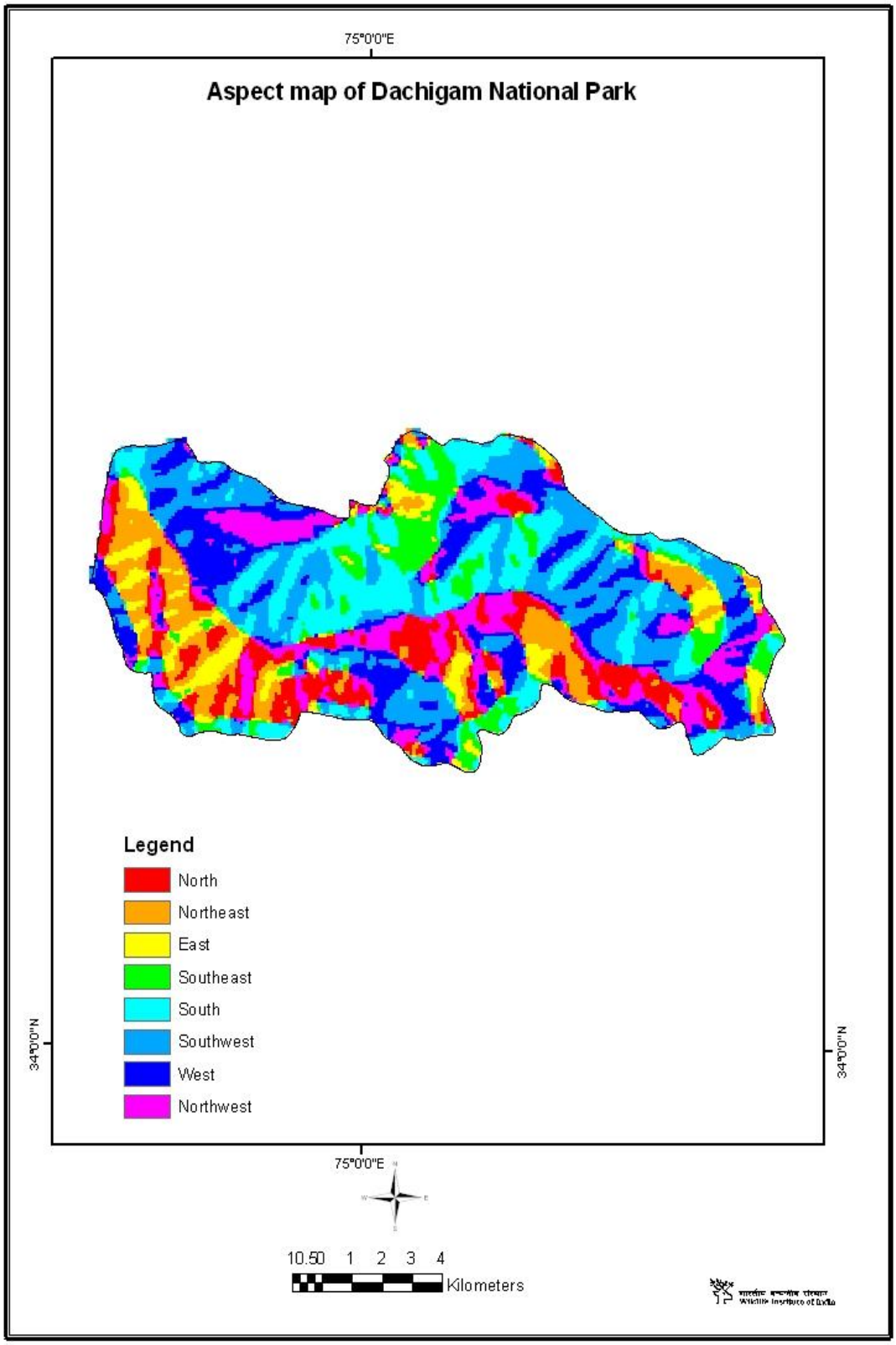


Fig. 4. Aspect map of Dachigam National Park.

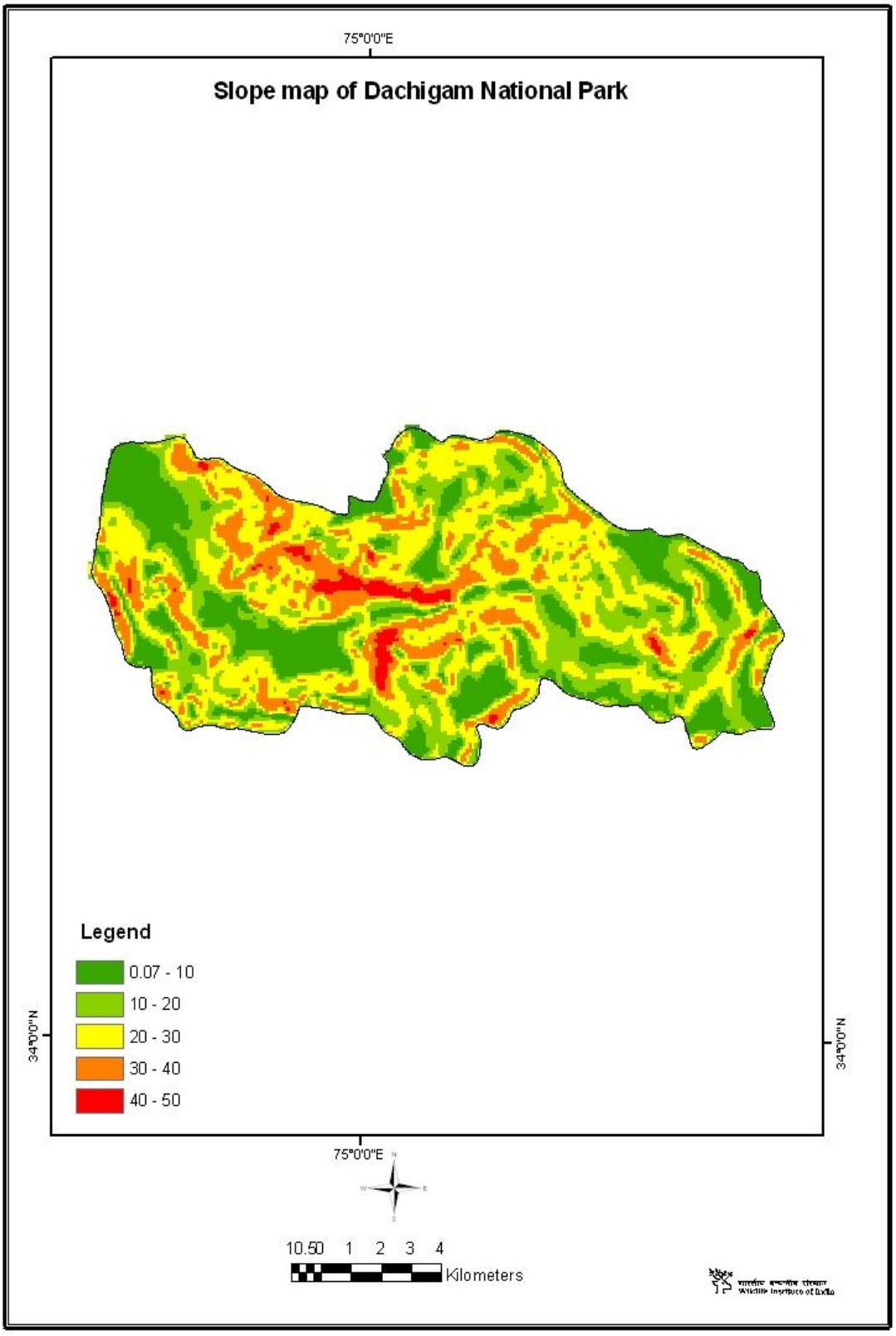


Fig. 5. Slope map of Dachigam National Park.

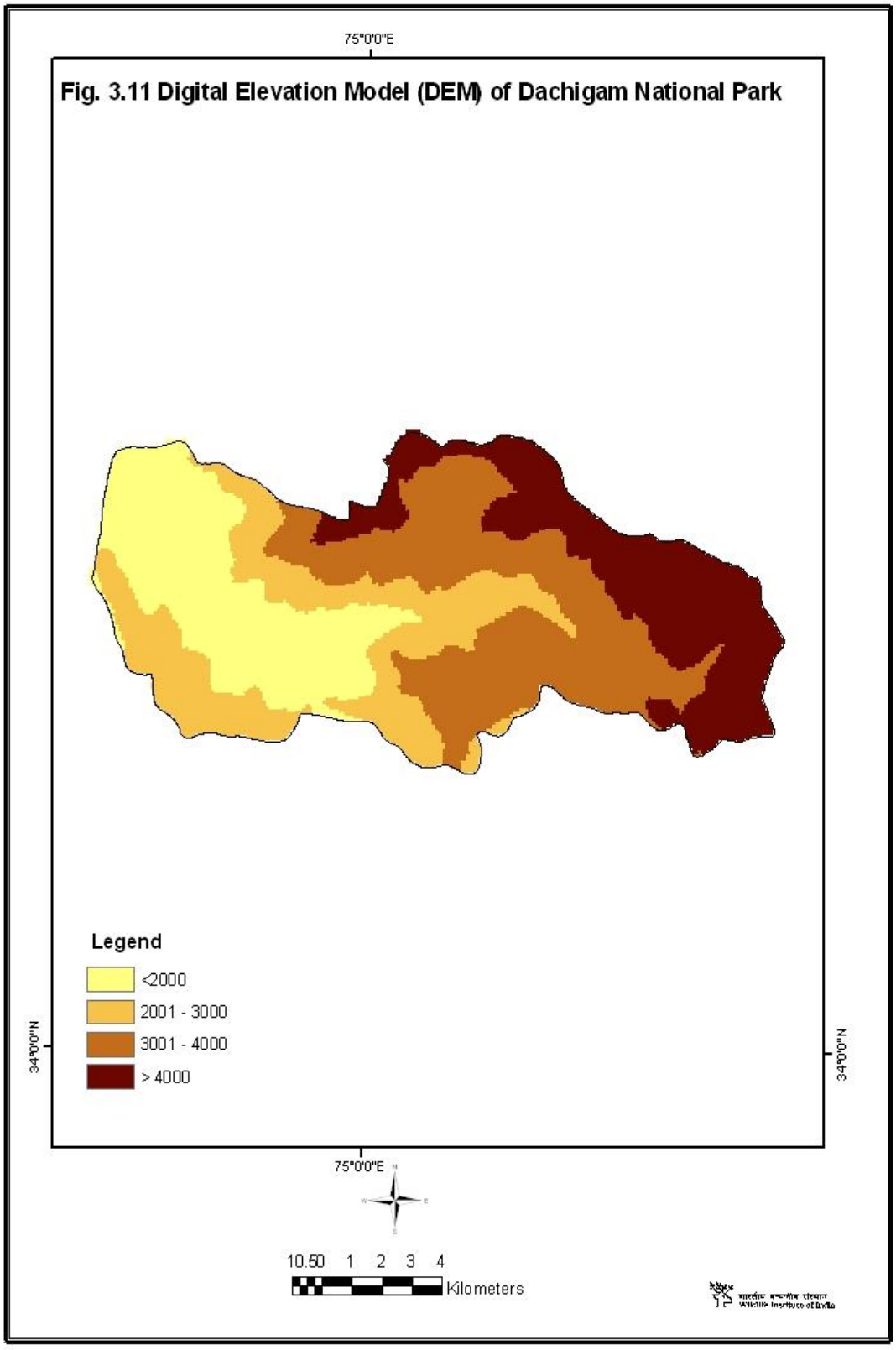


Fig. 6. Map showing different elevation zones in side Dachigam National Park.

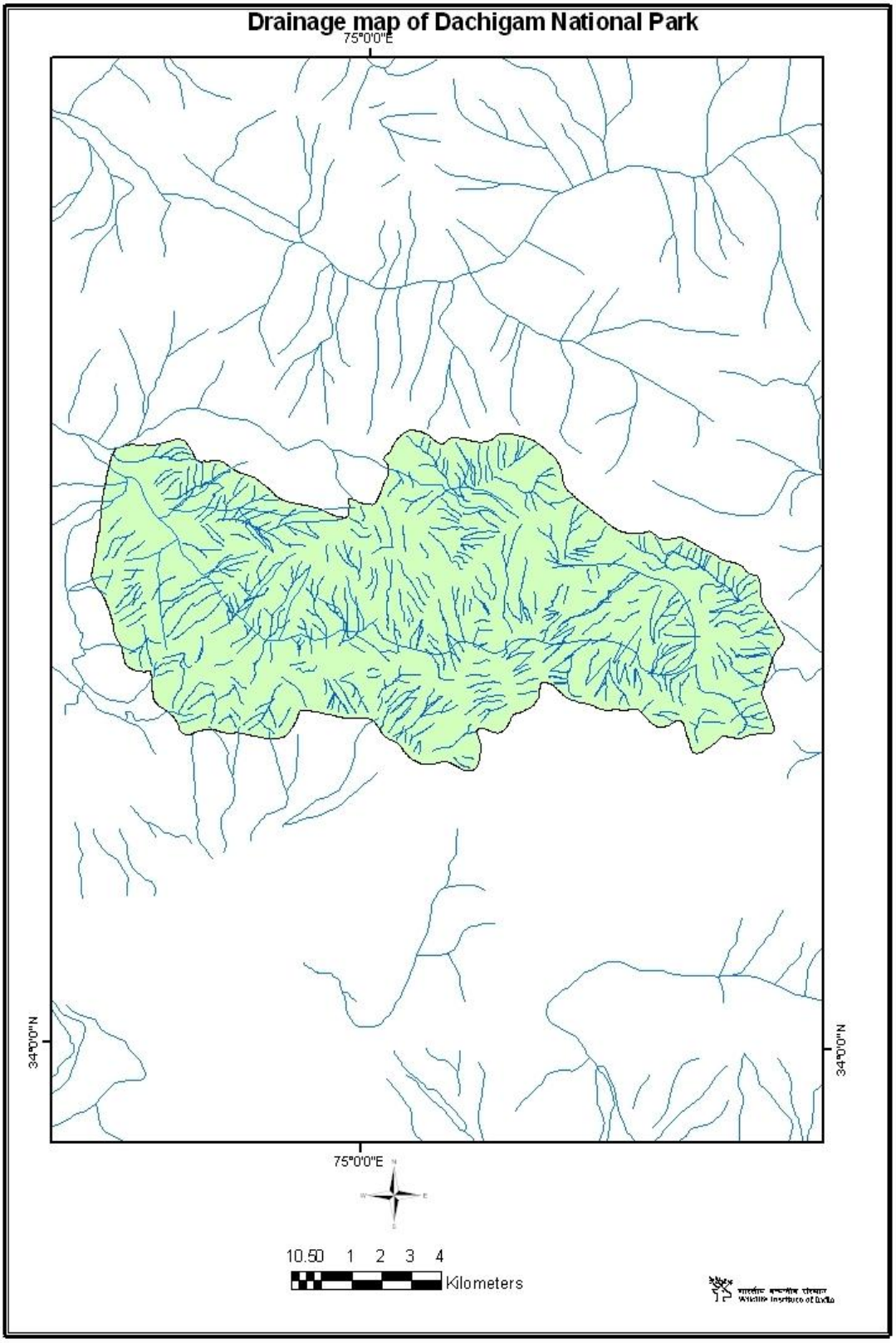


Fig.7. Map showing drainages in Dachigam National Park.

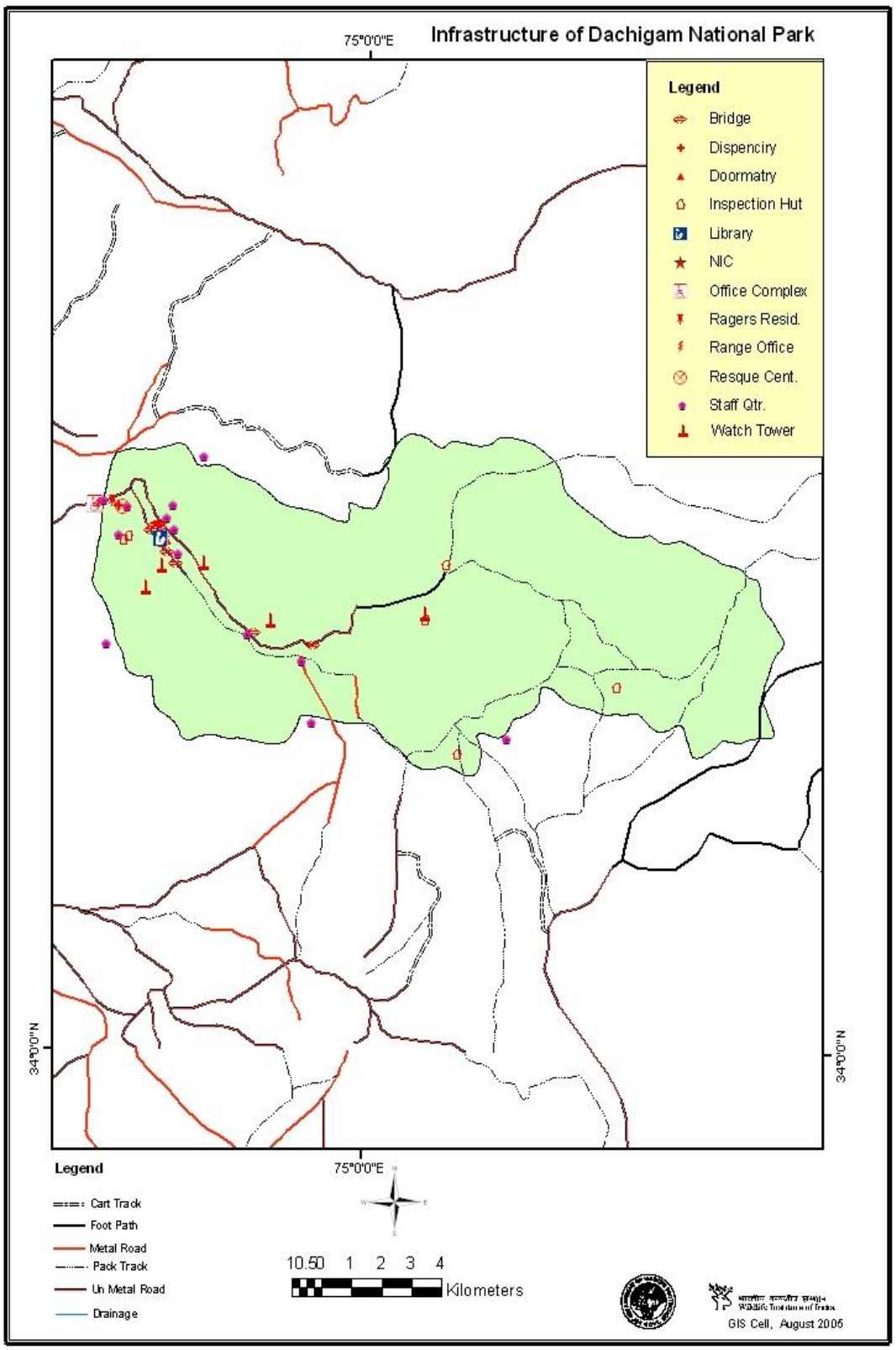


Fig. 8. Map showing infrastructure inside Dachigam National Park.

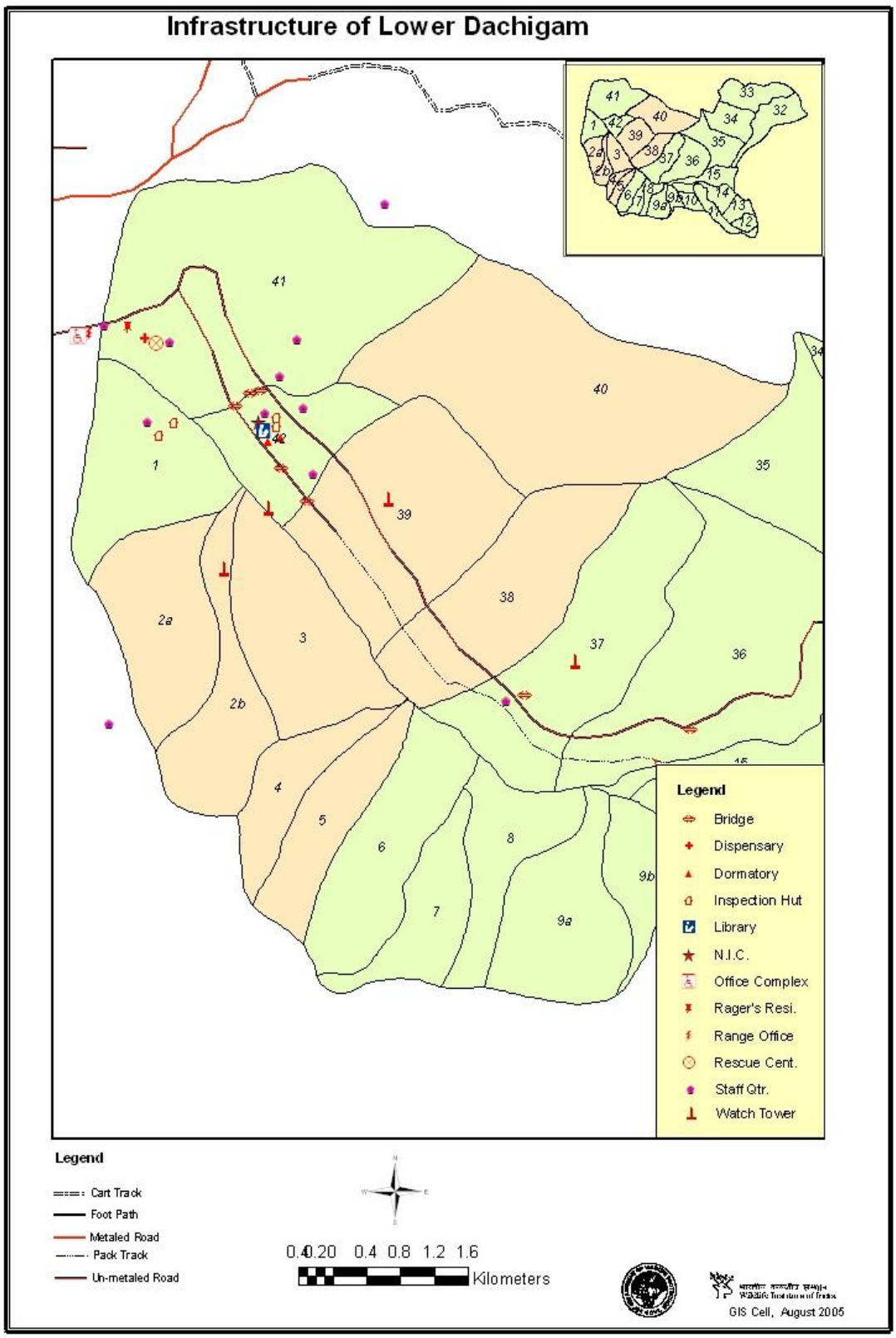


Fig. 9. Map showing infrastructure setup in lower Dachigam

CHAPTER TWO

BACKGROUND INFORMATION AND ATTRIBUTES

2.1 BOUNDARIES:

2.1.1 LEGAL

Dachigam National Park (NP) came in existence by the government notification no. FST/ 2A ??? dated 4 Feb 1982 which describes the boundaries of Dachigam. The natural boundaries to the park are two steep mountain ridges, one originating from Harwan water reservoir on the south west side of the park and the other originating from Dara/ Khimber side with an elevation gradient of 2,600m to 3,000m. Dachigam is bounded by Sindh valley to the north- east, Tarsar, Lidderwath, Kolhai of Lidder Valley and Overa-Aru Wildlife Sanctuary in the Far East. Tral range in the south- east and Harwan, Brain and Nishat in the west and south- west (Kurt 1978). The artificial boundaries are demarcated in field. Pillars are required for maintaining the integrity of area and law enforcement.

2.2 GEOLOGY, ROCK AND SOIL:

The entire area of Dachigam NP is mountainous and has crystalline rocks such as granite, phyllites and schists with embedded lime stone. Which form the core of the Zanskar range, a fold of which encloses the Dachigam national park. The region from Khanmoh to mahadeo consists of calacarious slates, shale and blue limestone (Singh and Kachroo, 1976). Most of the sediments composing these ranges have been laid from Cambrian to tertiary (Wadia, 1939, 1961).The crystalline axis of the Himalayan system contains the oldest rocks and the northern flank of these crystalline axis are found

fossiliferous sediments of marine origin. Godwin Austin (1896); Lydekker (1876) and Middlemiss (1911).

The soil depth in Dachigam on the slope from lower to middle reaches is less than 25 cm and hence falls under the category of very shallow soils (Bhat 1988).

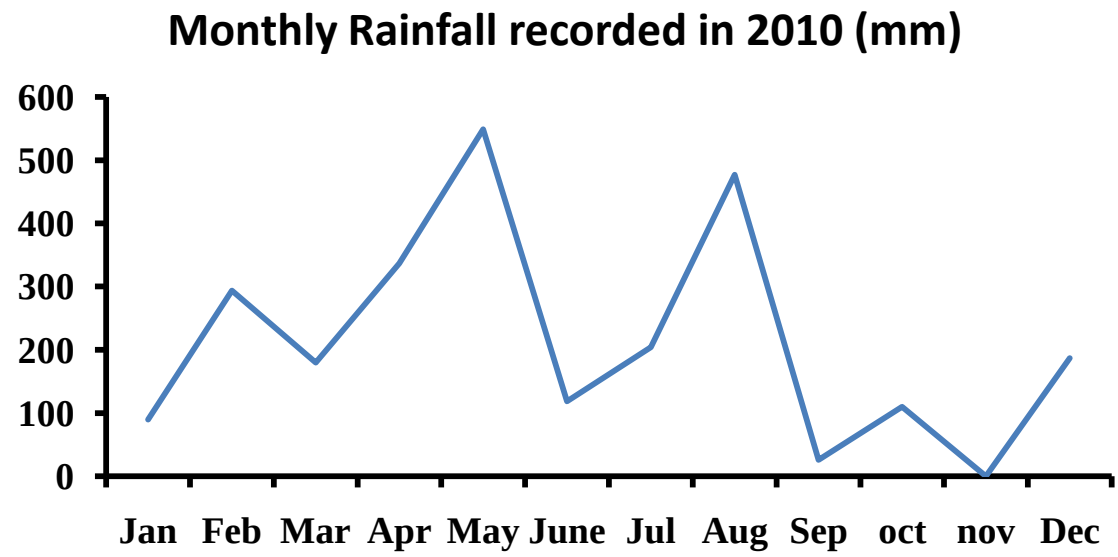
2.3. TERRAIN

Dachigam NP possesses Great Himalayan feature with steep mountains separated with deep gouges, valleys. The series of undulations present a variety of slope aspects supporting an array of vegetation types. The overall terrain in Dachigam is steep mountainous.

2.4. CLIMATE

2.4.1 RAINFALL PATTERN AND DISTRIBUTION

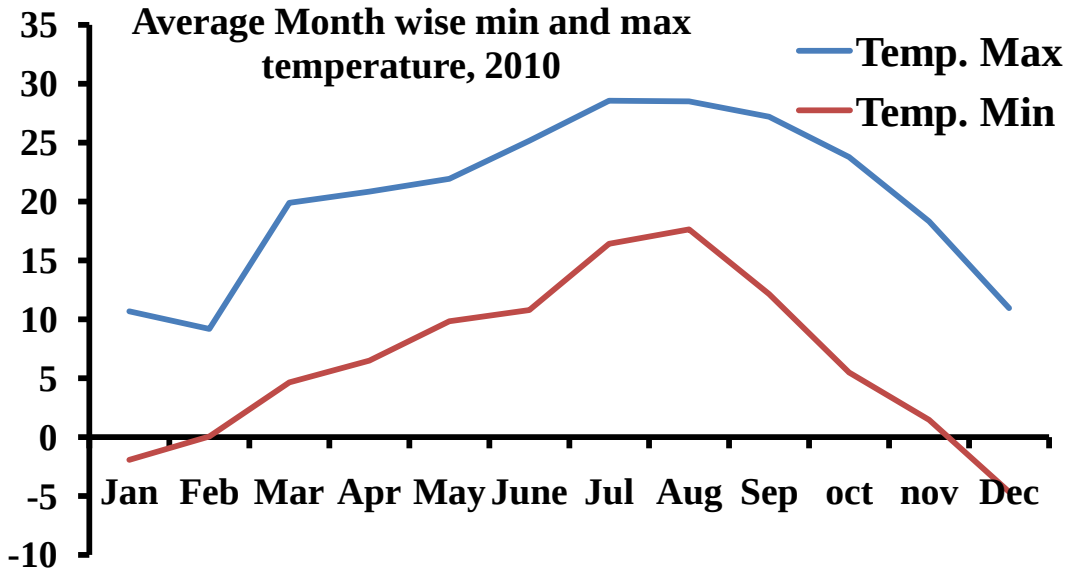
The climate in Dachigam is sub-Mediterranean type with bixeric regime having two spells of dryness of April- June and September- November (Singh and Kachroo, 1977, 1978). The area observes an irregular weather conditions with a considerable variation in the amount of precipitation. Snow is the main source of precipitation and in some parts melts till June. The annual minimum and maximum rainfall of Dachigam have been calculated ranging between 32 mm to 546 mm (Bhat, 1988).



2.4.2 TEMPARATURE; A SUMMARY OF YEAR ROUND PATTERNS:

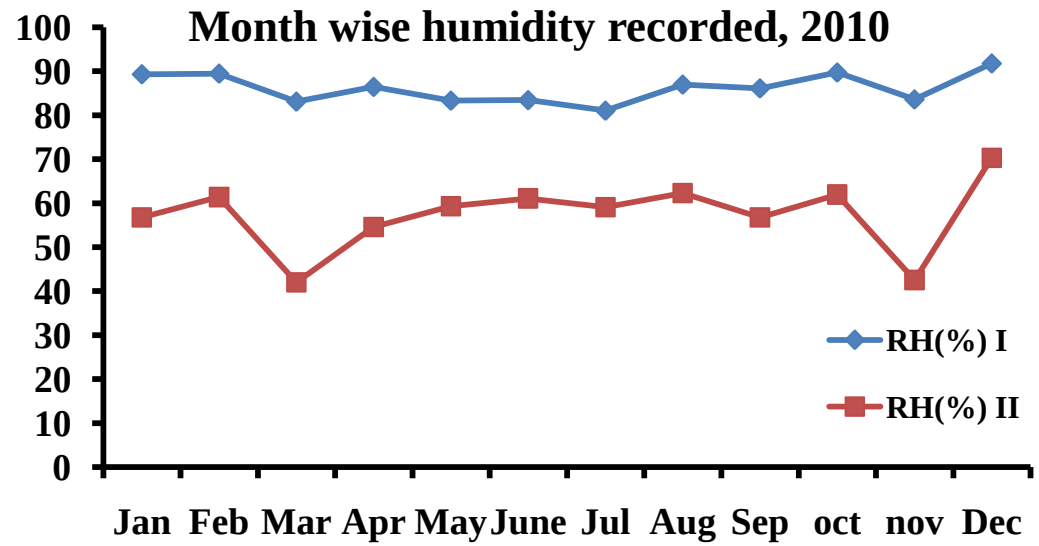
The Kashmir valley experiences four distinct seasons: winter (Dec.-Feb.), spring (Mar.-May), summer (Jun.-Aug.), and autumn (Sep.-Nov.). Dachigam NP has

a temperate climate with cool summer and chilling winter. The temperature recorded in summer shows a maximum and minimum mean temperature of 27.3^{0}C and 2.0^{0}C. The mean month wise temperature recorded in the area is shown in Annexure ? .



2.4.3 HUMIDITY:

The relative humidity is generally low in most part of the year. The maximum humidity is recorded in ?. The mean month wise humidity recorded in the area is shown in Annexure ?



2.4.4 DROUGHT:

The drought is very rare and has not been observed in past 20 years and therefore does not require any management consideration.

2.4.5 WATER SOURCES:

Dachigam NP is gifted with numerous perennial streams, nallah, springs, glaciers, and the main Dachigam nallah coming from Marshar Lake as a result of which water supply in the area is adequate throughout the year. Marshar Lake is the main source of water which is feeding Dachigam nallah the main catchment of Dal. The perennial water streams and main nallah provide drinking water for the wild animals living in the natural habitats of Dachigam NP.

2.6 RANGE OF WILDLIFE, STATUS DISTRIBUTION AND ATTRIBUTES:

2.6.1 VEGETATION:

2.6.1.1 The bio-geographic classification:

According to the bio-geographic classification suggested by Rodgers *et al.*, 2002, Dachigam National Park comes under 2A.

2.6.1.2 The forest Types, cover and food for wild animals.

As per revised Champion and Seth (1968) the vegetation of Dachigam National Park is typically Himalayan moist temperate forest: sub-albine forest and alpine forest type and can be classified into following forest types:

- **Moist temperate deciduous forest.**
- **Parrotia (pohu) scrub forest**
- **West Himalayan low level blue pine forest**
- **Western mixed coniferous forest**
- **Deciduous alpine scrub**

- **West Himalayan sub-alpine birch-rhododendron forest**
- **Dwarf juniper scrub**
- **Dry temperate scrub**

A detailed study on vegetation structure in lower Dachigam was carried out by Singh and Kachroo (1978) and Sharma *et al*., 2009. The vegetation of the valley is very patchy. The tree species such as *Ulmus wallichiana, Salix alba* and *Populus cilia* are found along the streams. *Prunus armeniaca* is found in open scrub areas, and *Quercus robur* and *Robina pseudoacacia* in distinct pure patches which show evidence of having been planted on abandoned agricultural fields. Shrubs species are quite evenly distributed throughout the valley. Common shrub species in the lower parts of Dachigam are four species of *Prunus*, two species each of *Rubus, Berberis, Vibernum and Rosa, Indigofera* and *Parrotiopsis* (Sharma *et al.*, 2007, 2009; Charoo *et al*., 2010). The vegetation on the southern aspects is characterized by grassy slopes with *Prunus armenica, Rosa webbiana* and *Rubus niveus*. The nullahs (streams) have reasonable tree cover, including species such as *Aesculus indica* and *Juglans regia*. The northern aspects have more tree and shrubs cover with species such as *Pinus griffithi, Aesculus indica, Prunus armenica and Parrotiopsis jacquemontiana* (Sharma *et al.*, 2007).

A list of flora of Dachigam national park is shown in Annexure ?

2.6.1.3 VEGETATION AND HABITAT MAPPING OF DACHIGAM NATIONAL PARK

The vegetation map of Dachigam was prepared using the landsat data IRS-1D LISS-III sensor using ArcGis9.1, ERDAS 8.4 software program. The toposheets of Dachigam national park in the scale of 1:50000 were digitized. For the vegetation characterization in Dachigam vegetation sampling was carried out throughout the Dachigam. The vegetation data was analyzed for the plant community classification in Dachigam.

For the vegetation type delineation in Dachigam hybrid method (supervised, un-supervised and rule based classification) was used. A unique color was given to all

different vegetation types. Maximum likelihood classification method of classification was adopted for the false color classification.

Based on the results of TWINSPAN analysis and field survey we classified the vegetation of Dachigam into following type:-

MOIST TEMPERATE DECIDUOUS FOREST

Riverine forest is the forest type mainly confined along the main Dachigam nallah. It is basically a succession vegetation type which is mainly dictated by the local eudopho-climatic conditions. The plant community of this forest type have following broad leaved tree species *Morus alba, Morus nigra, Salix babyloniea, Populus alba, Acer caesium, Juglans regia, Ulmas lavigata, Rhus sp., Corylus sp,*. The dominant shrub species in this forest type are *Rosa brunonii, Roubinia sp, Indigofera heterantha, Vibernum sp, Berberis sp.* The under growth comprises of *Alliaria so. Viola odorate, Geranium sp., Solenanthus cereinatus, Climatis grate, Vitis vinifera*. This forest type lies in the elevation gradients of 1600m to 1900m and it comprises almost 30% of the total area of Dachigam.

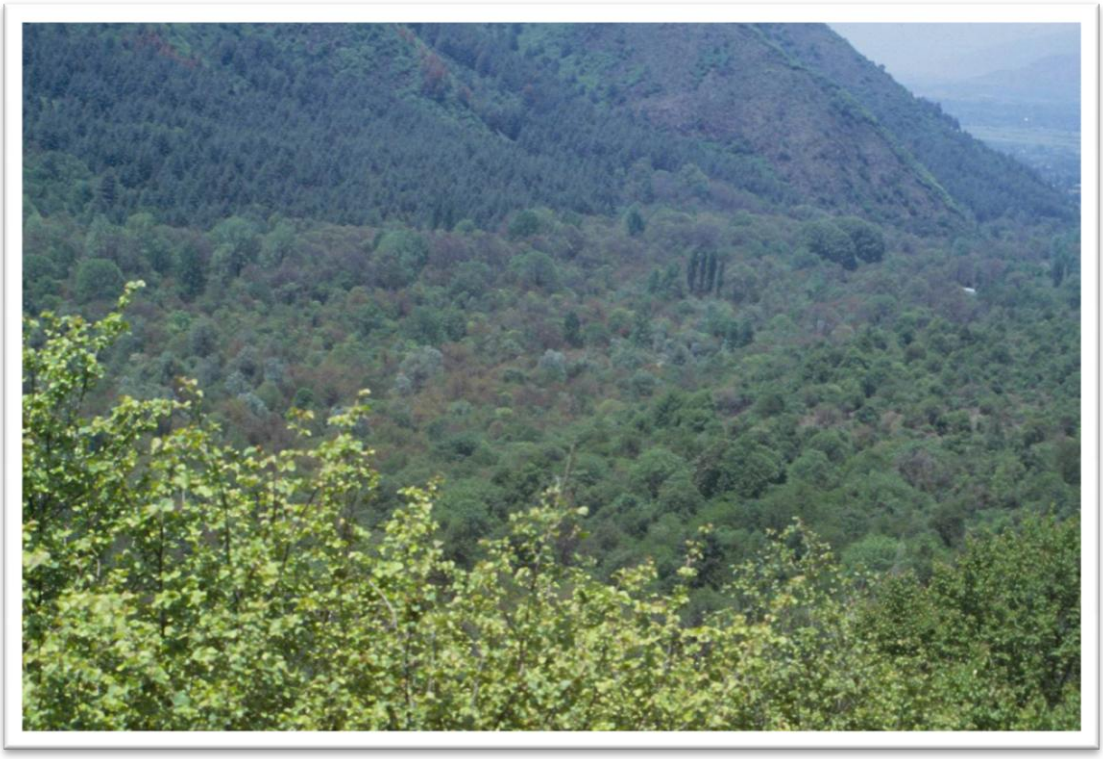


Fig. 10. **MOIST TEMPERATE DECIDUOUS FOREST**

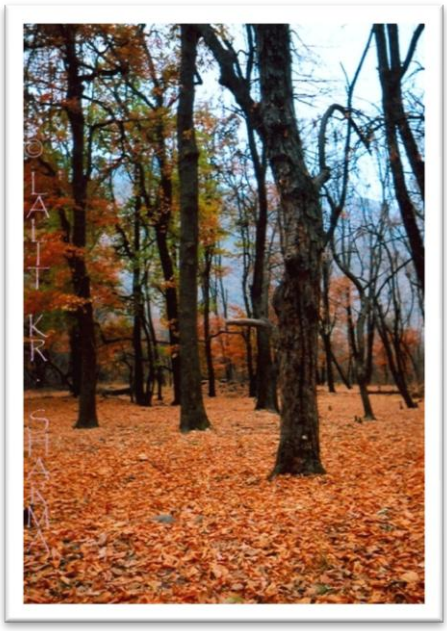


Fig. 11. OAK PLANTATION HABITAT IN LOWER DACHIGAM NP

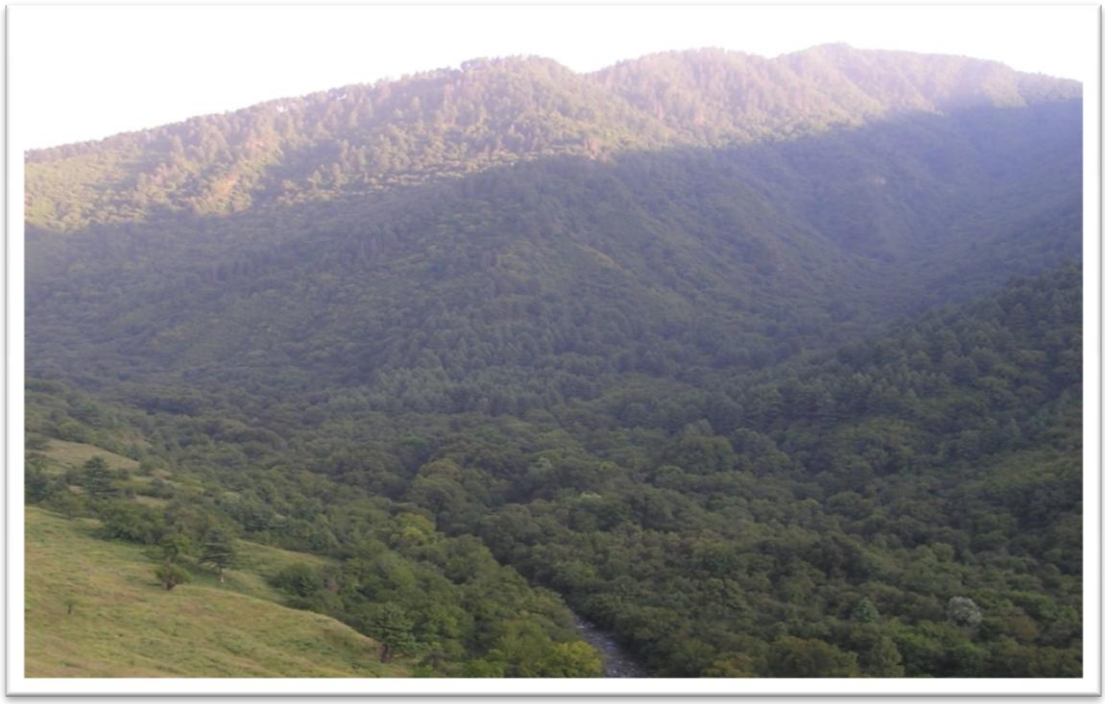


Fig. 12. RIVERINE HABITAT ALONG MAIN DACHIGAM NALLAH

Fig. 13. TEMPERATE GRASSLAND AND SCRUBLAND HABITAT

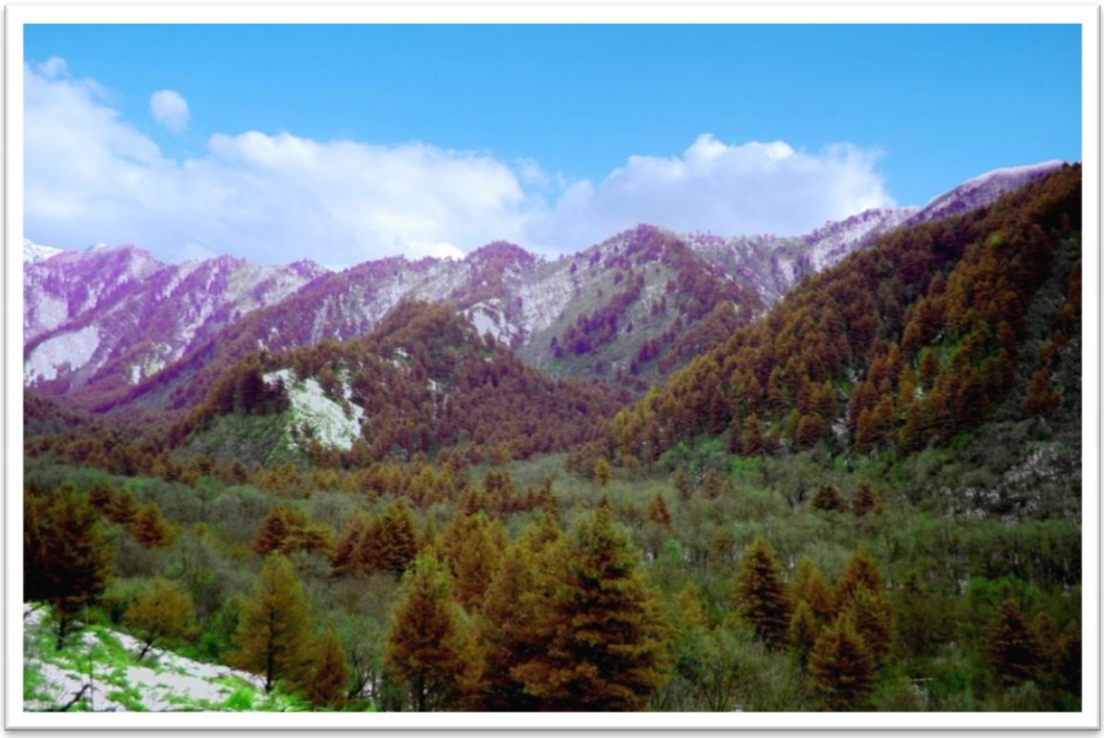


Fig. 14. **HIMALAYAN LOW LEVEL BLUE PINE FOREST HABITAT**

Fig. 15. **MID TEMPERATE MIXED FOREST HABITAT**

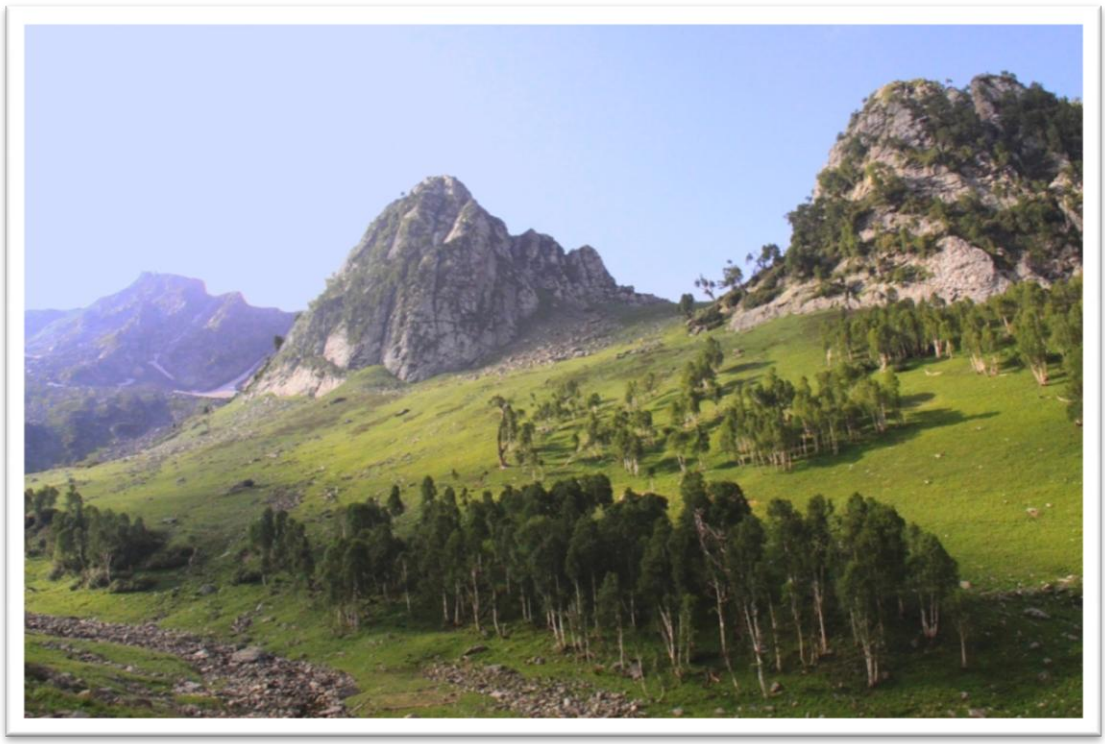


Fig. 16. HIMALAYAN SUB-ALPINE BIRCH-RHODODENDRON FOREST

Fig. 17. ALPINE PASTURES AND MARSAR ALPINE LAKE IN UPPER DACHIGAM

OAK PLANTATION

Oak plantation is a plantation of white oak (English oak) planted by Maharaja of Kashmir in early 60's. White oak is an exotic species now it has become one of the most important habitat for species such as Asiatic black bear, Hangul. Oak plantation is a small patch in riverine forest with around 500 sq m area. Oak acorn is the most important food of black bear in autumn season (Sharma, *et al.*, 2010). Asiatic black bear use to feed extensively in this patch before going into hibernation or winter sleep. The other tree species in this patch are *Aesculus indica*, and *Morus alba*.

TEMPERATE GRASSLANDS AND SCRUBLANDS

These are vast starches of open lands particularly on slopes facing South – west between 1,800m to 2,700m. These open stretches are sparsely covered by thickets of broad leaved deciduous scrub comprising, *Parrotiopsis jacquemontiana, Prununs armenica, Celtis australis,* and *Ulmus sp.* This vegetation type has large number of zerophytic species as its undergrowth. These include *Indiofera heterantha,*

Rosa brunonii, Rosa webbiana, Lonicera quinqelocularis, Geranium nepalensis, Dipsacus mitis, Dactylis gloerate, Colochicum luteum, Stipa sibirica, Zizypus anathera, Fragaria verca, Kocleuria cristata. This vegetation type is very much important for Hangul.

HIMALAYAN LOW LEVEL BLUE PINE FOREST

Pine forest found and grows on the slopes along the north and north east aspects between Harwan water reservoir and Draphama. *Pinus walichiana* is the dominant conifer that some times reaches up to the open scrubs and forms patches. In the lower zones the *Pinus walichiana* has very little undergrowth and has the herbaceous element in *Lonicera quinquelocularis, Vibernum continifolium, Berberis lyceum, Rosa webbiana, Stipa sibirica, Artemesia vestita, Polygonum auplexicaule, Geranium wallichiana, Origanum normal* etc. In many places pine found to be in association with shrubs such as *Rosa brunonii, Rhus succedanea, Parrotiopsis jacquementiana, Rosa webbiana, Prununs cerasifera, Creteagus monogyua, Berberis lyceum*. Pine forest is distributed mainly in the elevation range of 1,800m to 3,400m through out the Dachigam in small patches.

MID TEMPERATE MIXED FOREST

Mid temperate mixed forest is distributed in the elevation gradient of 1,800m to 2,400m. In this forest type the dominant tree species are *Juglans regia, Asculuas indica, Rus sp. Populus ciliata, Corylus colurna, Padus cornuta, Fraxinus floribunda, Taxus wallichiana*. This forest type is very much important for Black bear and Hangul throughout the year. It comprises almost 20% of the total area of Dachigam. The dominant shrub species in this forest type are *Prunus sp., Berberis sp., Vibernum sp., Rosa webbiana,* etc.

MIXED CONIFEROUS FOREST

This forest community is distributed in the upper elevations ranges from 2,700m to 3,400m. The pine trees are found distributed on the open and exposed slopes whereas *Abies pindrow* is confined to smaller areas that are less exposed to sun light and along the water streams. The dominant tree species are *Cedrus deodara,*

Taxus wallichiana, Abies pindrow. The pine forest occurs in association with shrub species such as *Isodom plectranthoides, Indifera heterantha, Rosa webbiana*. The small silver fir patches are mixed up with *Rosa macrophylla, Viburnum grandiflorum*. This type of forest is mainly distributed in upper Dachigam and such type of association starts from Waskhar area on both of the sides of main Dachigam nallah.

HIMALAYAN SUB-ALPINE BIRCH-RHODODENDRON FOREST

Birch forest is found at an elevation where fir ceases to grow i.e. above 3,500m in some places it merges with silver fir and higher up it forms a pure patches. The dominant species in this forest type are *Betula utilis Rhododendron campanulatum Syringa emodi, Lonicera discolor, Rhododendron anthopogon, Juniperus recura* and the dominant herbs which form ground cover are *Anemone obtusiloba, Sieversia elata, Aster thomsonii, Iris hookeriana, Fragaria vesca* and *Stachys sericea*. This forest type is distributed near Nagberan area in upper Dachigam.

ALPINE PASTURE

Upper Dachigam is full of vast grasslands with no tree growth but have luxuriant herbaceous grass cover. These grasslands are distributed in the elevation gradients of 3,400m to 4,100m. The area is devoid of any tree growth whereas alpine grasses and medicinal herbs are common. This forest type is very much important for Hangul as it serves as summer distribution range. The meadows are composed of perennial mesophytic herbs with very little grasses. Conspicuous amongst the herbs are *Primula spp., Anemone spp., Fritillaira imperialis, Iris spp., Gentiana spp.* with many Rananculaceae, Cruciferae, Compositae and Caryophylaceae species.

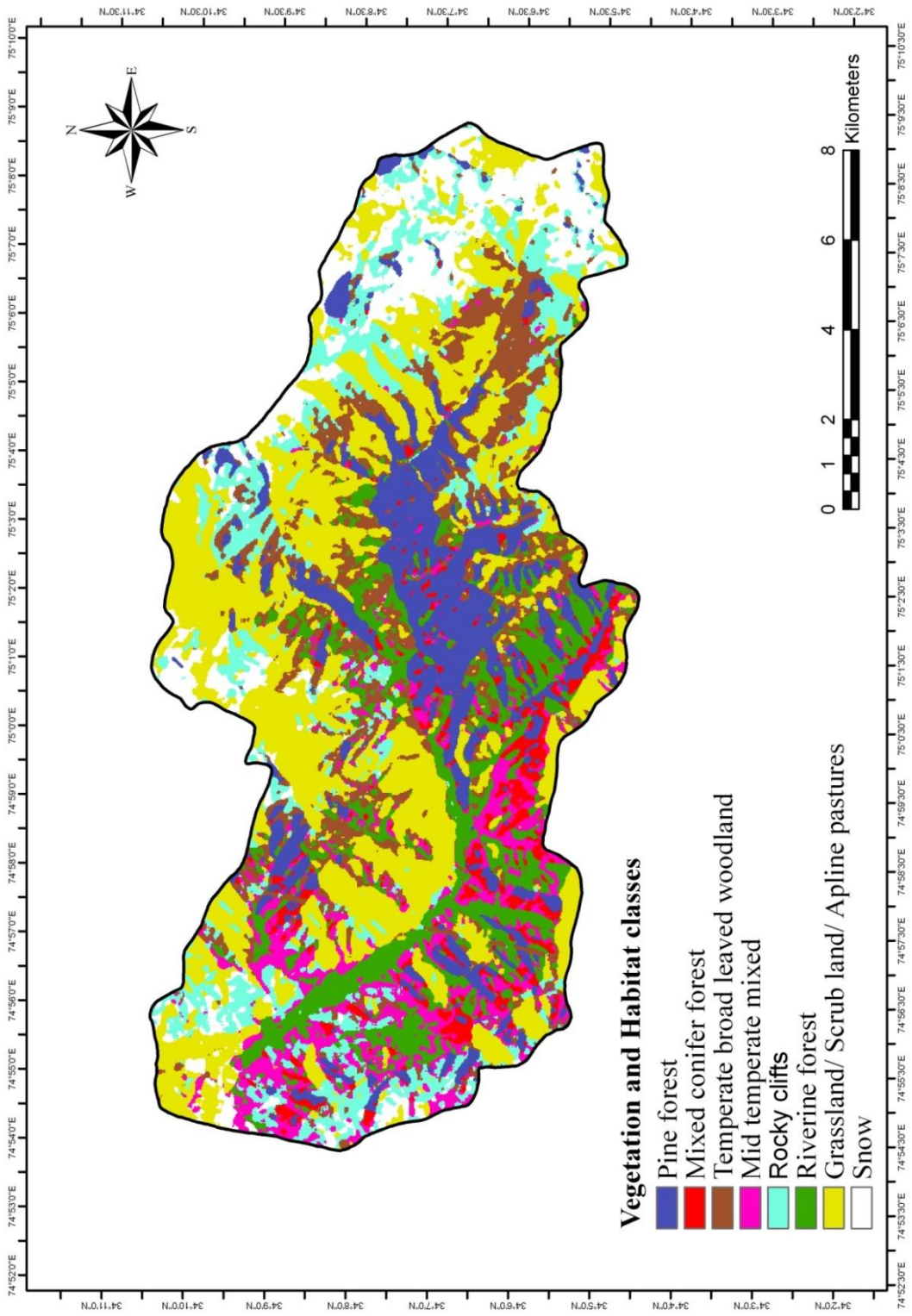


Fig. Map showing different land use classes in Dachigam National park

2.6.2 FAUNA

2.6.2.1 Vertebrates their status, distribution and habitats

Dachigam NP is a home for large number of species which belongs to phylum vertebrata. The vertebrata phylum is represented by large number of birds, mammals, reptiles.

Mammals, status, distribution and habitats

HANGUL

The Kashmir Red deer or Hangul (*Cervus elaphus hanglu*) is one of the four eastern most distributed subspecies of red deer. Today, the only viable population of Hangul is restricted to Dachigam NP and adjoining protected areas (Kurt, 1978, Iqbal *et al.,* 2005, Ahmad *et al.,* 2005, Ahmad, 2006). Hangul is placed under schedule-I in the Jammu and Kashmir State Wildlife Protection Act, 1978 and in Indian Wildlife (Protection) Act, 1972, and least concerned in IUCN 2010.

The Dachigam Hangul population has shown a decreasing trend from 1940's till 2004. The numbers have declined drastically since 1947 (Gee 1966, Schaller 1969, Holloway 1970, Department of Wildlife Protection 2004). The Dachigam Hangul population was about 1000-2000 just before independence but by late 1950's, it was reduced to some 400 individuals (Gee 1966). The number of Hangul estimated in November 1969 in Dachigam was approximately 150-200 (Holloway and Schaller 1970). According to Holloway (1970), the total number of Hangul of the Dachigam population was 140-170 individuals in February 1970. Population estimations carried out in winter 1976/77 and in April 1977 estimated the Dachigam population at about 250 individuals, an increase of 25% from 1975 (Kurt 1978). This conclusion was attributed to the fact that poaching had been largely contained with the assistance of Indian Armed Forces (Kurt 1978).

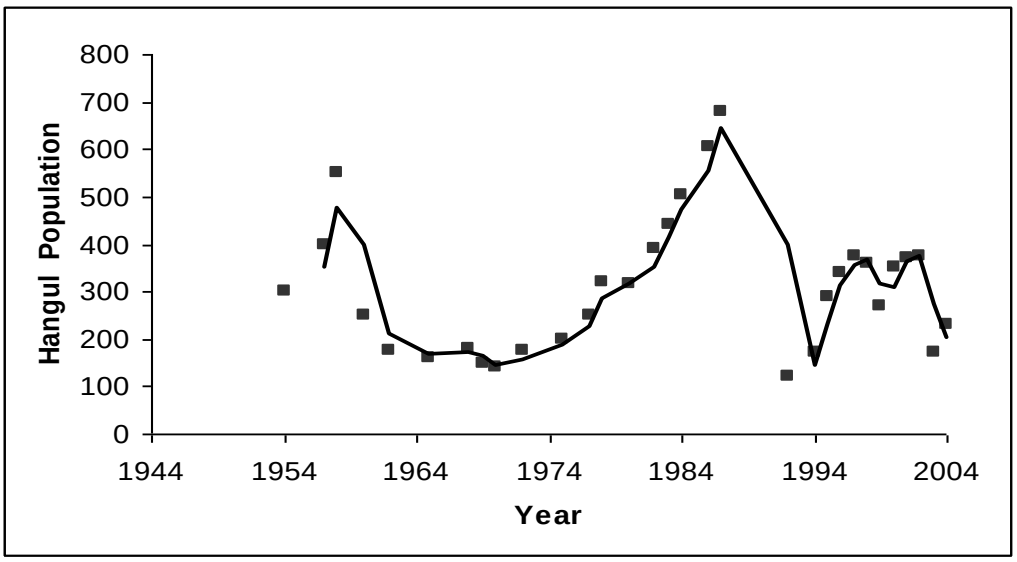


Fig. 17. Hangul population estimates trends in Dachigam and adjoining areas from 1954 to 2004.

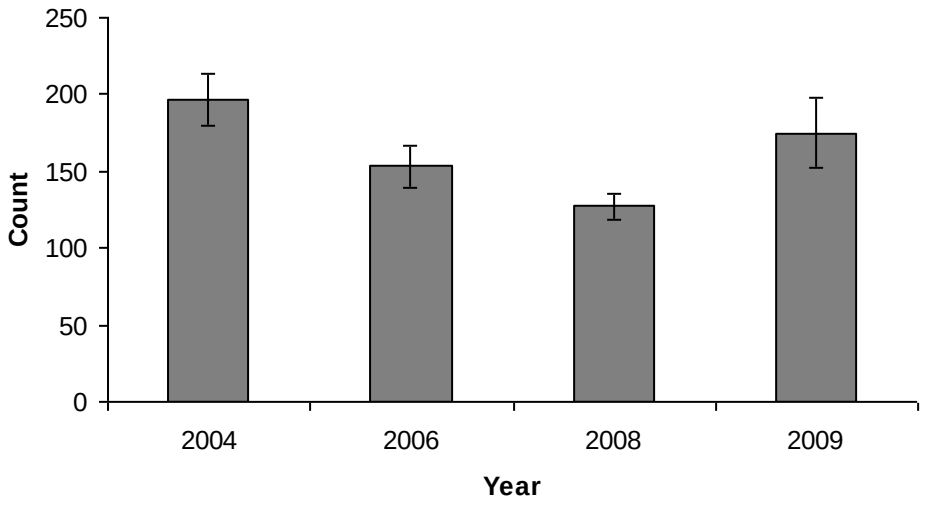


Fig. 18. Hangul population counts with Standard Errors (2004 to 2011).

After the 1980's the population of Hangul showed marked fluctuations, a reflection of either true population fluctuations or inadequacies in population estimations carried

out. The table below provides the figures from the Wildlife (Protection) Department of J&K on the estimates of Hangul populations in Dachigam National Park.

The recent census done in March 2011 has provided an estimate of 218±13.68 Hangul for Dachigam and adjoining areas (Department of Wildlife Protection, 2011).

Habitat and Distribution

Recent study by Sharma *et al.*, (2010) on Hangul habitat use suggests that Hangul habitat use shows a seasonal shift in utilization patterns which can be associated with the changes in habitat structure and abiotic factors such as temperature and snowfall. Some of the major factors that affect habitat use by ungulates in the Himalaya include altitude, aspect, slope, habitat type, food availability-abundance and quality, escape terrain, escape cover and cover against extreme of weather and biotic pressures. There was a significant difference in the habitat use patterns by Hangul in Dachigam NP. In winter and spring, the maximum sightings and signs were recorded in the Valley with flat areas which provide shelter to Hangul from extreme cold and heavy snowfall in its distribution range and fulfill the requirement of food (Table 4) since valley or stream has been considered to provide a better shelter (Staines 1976). The preferential use of riverine habitat by Hangul in winter and spring was due to the fact that riverine habitat were close to water and being provided with artificial food (salt lick) by the park management. The movement of Hangul population from upper elevations to valley areas in winter and spring can be attributed with extreme cold weather conditions in upper elevation. The preference of eastern and steeper slopes was due to the fact that eastern slopes get more exposed to sunlight that provides relief from harsh cold winds. But in summer, maximum Hangul sightings and signs were recorded in the altitudinal range of 2,500-2,700 m because of the fact that they do segregate, i.e., females forming smaller groups and males separated from each other establishing social hierarchy and moving in different areas which was similar to other Red deer. In summer, the southern slopes provide good forage, but the valley areas were warmer and were not suitable for Hangul so they migrate to higher reaches of the Dachigam NP. The availability and quality of forage in Dachigam varies seasonally which leads to changes in diet of Hangul among seasons. Hangul is a generalist feeder as other Red deer and its diet

was composed of grasses, herbs, tree bark and browse. The diet of Hangul in winter and autumn season was largely composed of tree bark (38.7%) and shrubs (25.8%) possibly as a strategy for complementing their diet when other forage is scarce. In winter, diet of Hangul tends to be more dependent on availability than on their foraging selection. The diet of Hangul was largely composed of forbs (46.7%) in spring season. In summer, Hangul diet was dominated by grasses and herbs (60%).

The distribution of Hangul in Dachigam NP shows a seasonal trend in spring season Hangul is distributed in lower riverine forest of Dachigam, but in summer season Hangul moves towards the upper reaches of Dachigam in Upper Dachigam. In autumn and winter season Hangul used lower and medium elevation of riverine, pine forests and grasslands and the distribution is clumped in lower altitudes of Dachigam.

Fig. 19. Picture of Hangul inside Dachigam crossing road near oak patch

Threats

The young to female ratio in Hangul was reported to range between 21 to 51 young/100 females during February and March (Department of Wildlife Protection, 1996, 1997, 2000, 2001, 2002, 2003). Schaller (1969) reported 45 juveniles to 100

females. The counts from 2000 to 2004 indicate a decreasing trend (Department of Wildlife Protection, 1996, 1997, 2000, 2001, 2002 and 2003). This is alarming and need to be monitored carefully by the management. The fawning grounds therefore need to be monitored and safeguarded.

Poaching was identified as the principal cause of decline of the Hangul (Gee 1966, Schaller 1969, Holloway and Schaller 1970, Kurt 1978). However, the department undertook an important step by stationing infantry from the Indian Army Forces in Dachigam to cope up with poachers. Poaching seems to have decreased significantly, although these anti-poaching patrols that were operating during the rut and winter months were restricted only to Lower Dachigam (Kurt 1978).

The poaching by Gujjars, Bakarwals and other sheperds, who take their livestock to Upper Dachigam during summer, is the main cause for Hangul decline (Stockley 1936, Gee 1965). This is compounded in Dachigam by the large scale biotic interference due to grazing by the State Animal Husbandry Department owned cattle which use Dagwan in Upper Dachigam as a grazing ground. In the vast areas of Nageberan and Marser, thousands of sheep, goat, horses and cattle are grazed by local graziers, gujjars from Kashmir as well as Bakarwals and Banyaris from Jammu. This has created potential competitors and persistent sources of disturbance for Hangul during summers. The Dachigam Hangul population decreased from 3000 animals in 1940's to some 200 by 1969 while the sheep introduced in Dachigam NP in 1961 by the State Animal Husbandry Department increased from 20 to some 3000 during the same period. The sheep spend the summer in Upper Dachigam and winter in Lower Dachigam (Kurt 1978). High livestock densities may out-compete native Trans-Himalayan wild ungulates (Mishra, 2001). Empirical studies in the adjoining areas of Spiti, Himachal Pradesh has established that the Bharal gets out competed by livestock . The Deer and sheep have similar preferences in grazing and are hence competitive (Darling 1937, Smith 1953).

Long term conservation action plan

Hangul conservation action plan was developed in collaboration with Wildlife Institute of India. The main aim of the plan is the recovery of the declining *Hangul*

population so as to bring this to the endangered category from existing endangered status. Under this broad aim the plan has following specific objectives.

a) To improve the recruitment in the adult population.

b) To restore the shrinking habitat range of species.

Major proposed outcomes

The action plan proposes four major outcomes for the conservation of the species.

a) Improved survival rate of the young fawns so as to ensure their recruitment into adult population.
b) Reduction of disturbance in the summer habitat range of the species so that the animals could use wider range of habitat, particularly during breeding season.
c) The identification and prioritization of relic habitats based on their ecological status/ suitability and connectivity with the existing habitat of Dachigam NP.
d) Operational awareness programmes for different stakeholders concerning conservation of this species.

Problems causing decline in numbers:

a) **Poaching:** Though poaching is not the main factor that caused the decline of Hangul in Dachigam for the last two decades however, initially hunting was regulated under law, later with the change in legal setup and enforcement poaching got controlled to a large extent. But with the changing political scenario and with the intent of normalcy in the valley, Poaching could be envisaged a potential threat to Hangul in coming years.
b) **Increase in predator numbers:** There seems to be an increase in the population of predators (mainly leopard and black bear) on account of an actual increase in the population or an artificial increase by release of conflict animals. There seems to have been a dramatic increase in the number of leopards sighted in Dachigam and also evidence (hair) of hangul in leopard scats. This may also have caused the low dam to fawn ratio prevalent in Dachigam at present. This could also be true of locations outside Dachigam
c) **Grazing of domestic livestock in summer grounds.** Hangul is locally migrant, moving attitudinally between high altitude grazing grounds in summer and then descending to lower altitudes where they over winter. The females drop fawns in May at these low altitudes while males who segregate from females move to higher altitudes. Thus movement is necessary and by

causing continual disturbance in the uplands, the natural movements of hangul are disrupted. Also, the rutting may happen close to these areas so the rutting may also be disrupted. The Bakerwals, the local graziers and even the state run sheep breeding farm take their livestock up to upper Dachigam during summer months.

d) **Zoonotic diseases:** Diseases having caused large-scale hangul mortality but in a single population that is small, chances of spread are great and therefore caution needs to be exercised. The existing Sheep Breeding Farm run by the animal husbandry department could be a potential source of transmission of zoonotic diseases and needs to be addressed. Thus far, post mortems or even disease screening has been rudimentary and stricter disease screening regimes may need to be in place.

Problems restraining growth of hangul population in Dachigam and outside areas and those that can play a positive role

a) **Fragmentation of habitats and disruptions in key movement areas.** In the past, hangul used to occur in an arc from Bandipora district through Srinagar eastwards to Anantnag and Kishtwar. There was probably a constant genetic flow across these populations and contiguous habitats permitted movement of males across the valleys. This movement is now hampered and has resulted in populations becoming locally scarce or even extinct. Movement paths need to be identified and protected. Habitats outside Dachigam may also, on account of not receiving adequate protection, have deteriorated.

b) **Grazing:** As in Dachigam, grazing is prevalent across most high altitude pastures that also are summer grounds for stags. Control or regulation of grazing in these summer grounds may provide some relief to the hangul during summer.

c) **Development:** Linear developments (mainly roads) in hangul habitats may caused temporary and sometimes permanent disruptions in animal movements and this needs to be dealt with cautiously.

d) **Security:** Due to security concerns, some upland pastures, especially those close to the LoC have been made out of bounds for graziers. They therefore have had to shift their grazing grounds to ones already occupied adding

immense pressure. Suitable alternatives need to be provided so that rangelands for key animal species are not violated.

e) **Poaching:** Poaching still continues in areas outside the PA network and it is imperative that this is stalled. Local forest officials and the police officials need to be taken on board so that in absence of wildlife staff, proper enforcement is done.

f) **Tourism:** While wildlife is conserved for aesthetics and to promote tourism (eco-tourism), unregulated activities may be detrimental to its population growth. Also important tourism areas like Pahalgam and Sonamarg are also important areas for hangul and any plans development for the respective development authorities must be sensitive towards the requirements of the wildlife in the area, especially threatened species.

g) **Education:** Education has a very important role to play in creating awareness for the hangul and other species and wildlife conservation should be a part of the regular curriculum.

h) **Administration:** See tourism vis-a vis growth of development authorities of the important tourist locations.

LEOPARDS

Leopard is the top most carnivores in Dachigam National Park. Leopard (*Panthera pardus*) is the most widely distributed of all the wild cats in the world (Nowell and Jackson 1996). The geographical distribution of leopard extends throughout Africa, central Asia, south-east Asia and north Amur valley in Russia. Leopard is found through the Indian sub-continent with the exception of deserts, the sundarbans mangroves, and densely settled areas (Khan 1986, Jhonsingh *et al.*, 1991). It is the most common of the big cats, Myres (1976) recommended that it remain in Appendix I of CITES because of its extensive hunting had depressed populations in several parts of Africa. In India it figures in the Schedule I of the Indian Wildlife Protection Act, 1972 (Anonymous). Leopard is placed under Least Concern category of 2002 IUCN Red List of threatened animals.

Leopard is found to be distributed in all forest areas of Kashmir up to tree line. It is the most common wild animal in Kashmir after Asiatic Black bear in the state of

Jammu and Kashmir. In Dachigam National Park leopards are fairly common. No scientific study was carried out on leopard population, abundance, habitat use in Dachigam. A short study on Leopard-Hangul interaction was carried out by Iqbal *et al.,* 2008 which states about the interactions and food habits of leopards only no population estimates is available for leopards in Dachigam. It is distributed in all forest types of Lower Dachigam area of the National Park. There are some areas in upper Dachigam which supports leopards but most of the Distribution is restricted to Lower Dachigam only.

Threats

The increasing in reporting of Leopard-human conflict cases in the nearby areas of Dachigam has become most common threat to the survival of Leopards. There are instances of retaliatory killing of leopards by local villagers to reduce conflict in the state. There is need for the long term study on leopard ecology in Dachigam National Park under which ecological aspects such as population, habitat uses, ranging and movement patterns should be covered.

ASIATIC BLACK BEAR

Four species of bears are found in India, the sloth bear (*Melursus ursinus*), the Asiatic black bear (Ursus thibetanus), Himalayan brown bear (Ursus aractus), and the sun bear (*Helarctos malayanus*), out of the total eight species of bears in the world. Asiatic black bear overlaps its distributional range with sloth bear and brown bears.

As per the 2005 survey (Sathyakumar & Choudhury, 2008), the status of black bear in the state of Jammu and Kashmir has been reported as 'fairly common'. Black bear is reported from 16 PAs and 20 FDs, RFs, and FVs of the State. The Dachigam (NP), Kishtwar NP, City Forest NP, Overa-Aru WS, Limber WS, Lachipora WS, Gulmarg WS, Thajwas (Baltal) WS, Rajparian (Daksum) WS and five (CRs) viz., Ajas, Bran-Harwan, Khiram- Shikarkgarh-Panyar-Khangund, Khrew-Khonmoh, Naganari and Wangat have black bear populations. Black bear is also reported from over 20 other areas and some of these include FDs in Lidder (Pahalgam), Naranaga, Sindh, Wangat, Anantnag, and RFs of Gugnar, Bianoi, Pir Panjal, Zaberwan,

Bandipora, and Kahai. It is also reported from Banihal CR, Sumchan Saphare WS, proposed PAs such as Pir Panjal NP, Ghambiar Mongtu WS, Dhera-ki-Gali WS, Ans River WS, and Nowshera WS. In Jammu region, black bear is reported from the FDs of Marwa, Rambandh, Batote, Doda, Badhruwa, Kistwar, Poonch, Rajouri, Nowshera, Reasa, Mahor, Udhampur, Jammu, Ramnagar and Bilwar (Sathyakumar & Choudhury, 2008). Saberwal (1989) reported Asiatic black bear density estimates of 1.3–1.8 bears/km^2 in Lower Dachigam during high fruit abundance. Encounter rates ranged from 0 to 3.5 bears/km walked. Twenty-five to 40 bears were estimated to use Lower Dachigam in early September and probably late June through October (times of high fruit abundance). The relative abundance of Asiatic black bear in Dachigam at present is not known, but the NP has been unprotected for several years.

As like many other parts of India, the human population in the State of Jammu & Kashmir has also increased over the last 100 years. The decadal variation in human population growth in this state was less than +11% between 1911 and 1961, but it rapidly grew and ranged between + 23.69% and + 29.65% during the period 1961 and 1991. The census by the Government of India for Jammu and Kashmir during 2001 reported a human population of 10069917. In Srinagar and Anantnag districts, the human population growth rate is 31.45% and 32.7% respectively. In rural areas of Srinagar and Anantnag Districts the human population density is 127/km2 and 258/km2 respectively (http://www.indiastat.com). As a result of growing human population, changing land use practices and resultant anthropogenic pressures, forest cover had either decreased or declined in quality due to habitat degradation. The official estimate of forest encroachment in Jammu and Kashmir (as of 4.12.2007) is 14,375 hectare. (http://www.indiastat.com). Movement and ranging patterns of large mammals are controlled essentially by availability of food and water, escape cover, and the availability of mates (Mace *et al*., 1983). When food is the limiting factor, its nature (ephemeral or long lasting, super abundant or scarce) and its distribution (clumped or random) will be crucial importance in determining animal movement and distribution (Cluttom-Brock, 1975). Kashmir being a valley has an interspersion of orchards, croplands with human habitations and forest. The movement of bears for food outside these forest areas in search of cultivated crops leads to close encounters of man and bear, and sometimes to conflict. The black bear–human conflicts are in the

form of crop damage, livestock predation, human attacks and sometimes even death of humans. All these have led to strong backlash from people resulting in confrontation with the Department of Wildlife Protection or the Government authorities, and sometimes retaliatory killing of strayed bears. The Dachigam NP and its surrounding forested and agricultural/horticultural landscape has black bear in relatively high densities resulting in increasing bear-human conflicts and also providing ample opportunities for ecological research on different aspects of ecology and bear-human conflicts. Comparison of scientific information generated on these ecological aspects in other forested areas near Dachigam NP would help in better understanding of the species behavior, habitat ecology and bear–human conflicts in north west Himalayan landscape.

Asiatic black bear abundance in Dachigam National park

Dachigam NP is known to posses one of the best populations of black bears (Sathyakumar 2001). The population density of black bears has been estimated to be high as reported by the two studies at Dachigam NP (Saberwal 1989, Charoo *et al.*, 2007). As per the results of the ongoing study at Dachigam NP, during 2007 and 2008, the encounter rates (#/km) of black bears showed a seasonal variation (ρ=0.04, One Way ANOVA) (Table 1). It was highest in summer followed by autumn, spring and winter. The distribution and availability of food has a considerable influence on the black bear movement and activity.

Table ?: Encounter rates (# / km) of Black bear in Dachigam National Park, 2007-09.

Season	Encounter Rate (# / km)	SE
Spring (Mar. - May)	0.52	0.05
Summer (Jun. - Sep.)	1.13	0.17
Autumn (Oct. – Nov.)	1.01	0.02
Winter (Dec. – Feb.)	0.17	0.12

In spring, black bear encounter rates (ER) (Fig. ?) was low as bears have just come out of hibernation. In summer, the fruit abundance was highest and bears were more

active during this period. Autumn season also had bear food in the form of oak acorns and walnuts, but comparatively less when compared to the summer. ER was low in winter as bear activity ceases from December onwards. The occupancy and detection probability have almost a similar trend for all the three seasons of spring, summer and autumn (Fig. 7). But in case of spring season detection probability was comparatively less probably because of the less activity of animals after the state of hibernation.

Habitat use by Black bear in Dachigam National Park

The selection of a habitat is based on food, cover and other requirements of a species. We categorized six major bear habitats viz., Riverine, Oak, Lower temperate, Lower temperate pine mixed, Mid temperate, Temperate grasslands and scrub land in Lower area of Dachigam NP. Based on Black bear sightings and signs (Fig. 8), we found that black bears showed considerable variation ($\rho<0.05$, Chi-square test) in the use of different habitats in different seasons. Oak habitat recorded maximum number of signs followed by Lower temperate pine mixed, riverine, lower temperate and mid temperate (Table 2). Grassland and scrub land habitats were comparatively less used by black bear. Maximum number of black bear signs and sightings were recorded in habitats with more than 80% canopy cover indicating black bear preference for forested habitats. North-eastern aspect ($\rho<0.01$, Chi-square test) and the altitudinal ranges of 1,800 - 2,000m were used most by the black bears.

Fig. 20. Occupancy and detection probability of Black bear in Dachigam National Park, 2007- 2008

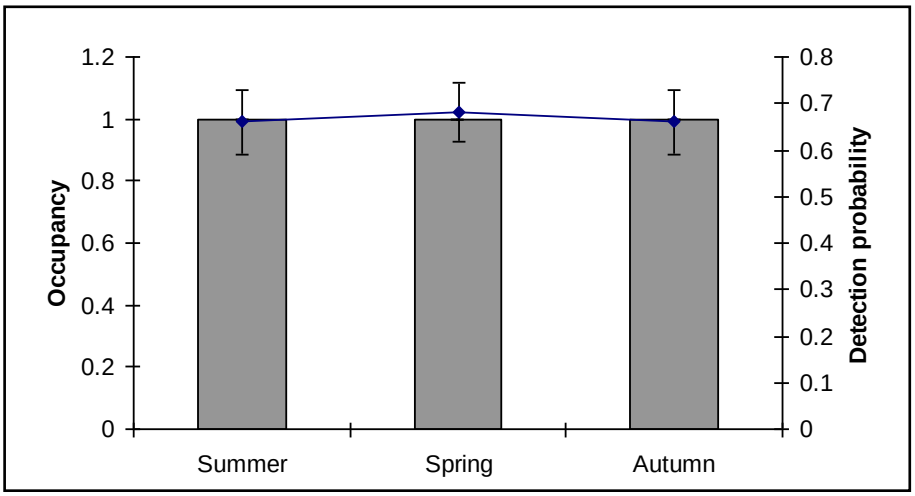


Table 2: Black bear signs (%) recorded at Dachigam National Park in different habitats, June 2007-August 2008.

Habitat	Black bear sign type (n=295)		
	Feeding sign (n=70)	Scat (n=171)	Other signs (n=54)
Riverine (58)	10	26.90	5.71
Oak plantation (98)	14.28	30.40	39.04
Lower Temperate (67)	41.42	12.28	8.57
Lower temperate pine mixed (51)	27.14	18.77	33.33
Mid temperate (15)	7.14	8.77	13.33
Temperate grassland/ scrub land (6)	0	3.50	0

Distribution

There is seasonal variation in the distribution of Asiatic black bear in Dachigam National Park. In summer and autumn seasons the distribution is clumped in reverine forest or valley areas of Lower Dachigam because of high food abundance but in spring and winter black bear distribution is even in all parts of Dachigam. Out of total area of Dachigam 90 sq.km represent the black bear habitat which starts from the nambal beat the nearest beat to Dachigam gate up to the waskhar beat of Pahlipora beat of Dachigam.

Studies on population ecology, movement and ranging patterns of black bear in Dachigam NP are under way from Wildlife Institute of India, Dehradun.

Threats

Black Bear are threatened due to poaching for gall bladder (medicine), skin (ornamental), retaliatory killings to reduce bear-human conflicts, and due to large scale habitat degradation or loss. As a result of these threats, the black bear population in India is decreasing in many areas. Existing information on black bear in India is either anecdotal or insufficient for effective conservation and management. A few short investigations (Schaller 1969, Manjrekar 1989, Saberwal 1989, Sathyakumar

1999, 2001, 2006, Sathyakumar & Viswanath 2003, Sathyakumar & Choudhury 2008) on black bear have been carried out so far in India. Black bear-human conflicts is an important management issue that needs to be addressed on priority basis as depredation of agricultural/ horticultural produce by black bears have resulted in the resentment of the local people who suffer such losses leading to retaliatory killings and animosity with the government departments.

HIMALAYAN GREY LANGUR

The Langurs (*Semnopithecus*) is the most abundant of six species of Colobine monkeys found in South Asia (Newton, 1988). In India out of twenty five species of non-human primates the Grey Langur or Hanuman Langur (*Semnopithecus entellus ajex*) is the most widely distributed primate species (Rajpurohit, 2005) (Roonwal and Mohnot, 1977). Himalayan grey Langur is folivorous in feeding habits, have complex sacculated stomachs and lack cheek pouches (Thorington and Anderson, 1984), diurnal, arboreal and social in habits. It is distributed in the subtropical, moist temperate, alpine, broad leaf and coniferous forests of Himalayas. Himalayan grey Langur is placed in schedule II, Part I, in Indian Wildlife Protection Act, 1972 amended up to 2002. It is listed in IUCN red data list of threatened Species (Groves, & Molur, 2008) and critically endangered (Sanjay *et al.*, 2003). The Himalayan grey Langur is distributed in some parts of Pakistan occupied Kashmir, Nepal and in India it is distributed in Great Himalayas of Kashmir (Roberts 1997), (Walker and Molur, 2004). Historically it was distributed in Chamba valley, Great Himalayan National Park of Himachal Pradesh and in Jammu and Kashmir it was distributed in mountains of Chenab valley, Kistwar National Park and Dachigam National Park (DNP). Today in Kashmir its distribution is restricted to Dachigam National Park and surrounding Protected area (PA's), and Kistwar National Park. There are no estimates of population in Kistwar. In Dachigam NP Himalayan Grey Langur is fairly common. The greatest threats to its survival are the large scale livestock grazing in its habitat range, lopping, deforestation, anthropogenic pressures, agricultural expansion and disturbances in the form of movement of people and operations by the security forces. The major predators in Dachigam NP are Common leopard and Asiatic black bear (Iqbal *et al.*, 2005, Sharma *et al.*, 2009). Langur forms a major proportion (ca. 25%) of the leopard diet (Iqbal *et al*., 2005) and it forms almost 3% of black bear diet

(Sharma *et al.,* 2009). The overall density of common langur in Dachigam National Park was estimated to be 22.38 ± 3.9, against it's A.I.C. values 551.17 of the model uniform. Therefore, the total population of langur in lower Dachigam was estimated to be 572. The other estimated parameters i.e. effective strip width (ESW), encounter rate (n/L), density of cluster (DS), and expected cluster (ES) with 95% confidence interval, & lowest of chi-square ($\chi 2$) is given in the table 3.2.

Table: Transect analysis for common langur in DNP, J&K. The model tested was uniform with associated adjustments, Akaike Information Criterion (AIC), chi-square, point estimator, standard error, p value and 95% confidence interval. Model uniform, $\chi 2$ = 30.30, P = 0.00, AIC = 551.17.

Parameters	**Point estimator**	**Standard error (SE)**	**95% confidence interval**	
			Low	**High**
Density[D]	22.388	3.9003	15.871	31.582
Effective strip width [ESW]	150.00	0.00	150.00	150.00
Encounter Rate [n/L]	0.000829	0.00013	0.00059	0.001128
Cluster Density[DS]	2.7363	0.43834	7.1334	9.3848
Expected Cluster size [ES]	8.1818	0.56024	7.1334	9.3843

Distribution

Himalayan Langur habitat use was significantly different across the seasons. Riverine and Lower temperate habitats were used more in all seasons. In winter and spring, Langur uses the Valley with flat areas which provide shelter to Himalayan Langur from extreme cold and heavy snowfall in its distribution range and fulfill the requirement of food since valley or stream has been considered to provide a better shelter. The eastern slopes were used widely in all season. Himalayan Langur used flat and less steep slopes in all season except winter which can be related with, the availability of food and shelter. The valley areas are having high density of food tree and canopy cover. It is distributed in all areas of Dachigam starting from gate up to sub-alpine areas of Dagwan valley.

OTHER ANIMALS

Apart from the above large mammals Dachigam hold good population of many small mammals which includes, Himalayan brown bear (*Ursus arctos isabellinus*), Himalayan yellow Marten (Martes *flavigula*), Himalayan Musk deer (*Moschus chrysogaster)*, Serow (*Nemorhaedus sumatraensis*), Himalayan weasel, Himalayan wolf (*Canis lupus*), Red fox (*Vulpes vulpes*), Jackal (*Canis aureus)*, Small Indian civet (*Viverricula indica*), Leopard cat (*Felis bengalensis*), Common otter (*Lutra lutra*), Common Mongoose (*Herpestes edwardsi*) and long tailed marmot (*Marmota caudata*).

Himalayan yellow-throated marten (Martes *flavigula*) is the commonly found in reverine forests and pine forest in areas of Dachigam mainly in lower Dachigam.

Red fox is distributed in the middle elevation of Dachigam mainly in mixed forest, temperate grasslands, and nallahs. They are not sighted frequently in lower elevations. No estimate of red fox population is available for the area.

Serow is reported after a long period of twenty years by the research team of Wildlife institute of India in mid temperate pine mixed forest.

The first record of Small Indian civet is reported from Dachigam in Kashmir valley of Jammu and Kashmir state by WII research team Charoo *et al*., 2010.

Himalayan Mush Deer

Yellow throated marten

Jackal

Himalayan Grey Langur

Long tailed Marmot

Himalayan weasel

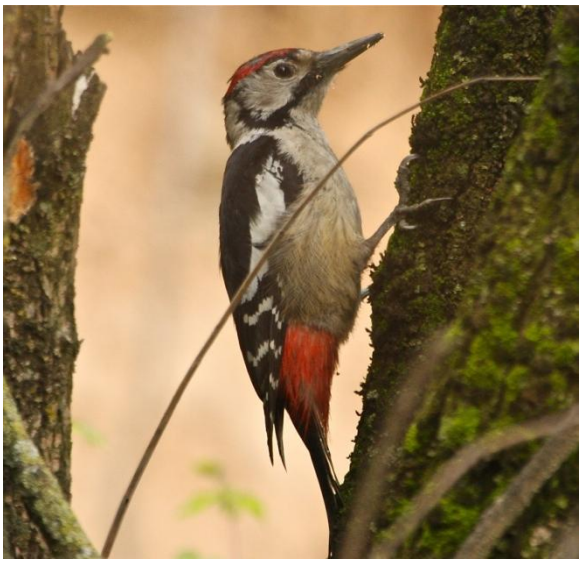
Checklist of Mammals of Dachigam National Park

Common Name	Scientific Name
Common Leopard	*Panthera pardus*
Himalayan Brown Bear	*Ursus arctos isabellinus*
Asiatic Black Bear	*Ursus thibetanus*
Leopard Cat	*Prionailurus bengalensis*
Jungle Cat	*Felis chaus*
Red Fox	*Vulpes vulpes*
Jackal	*Canis aureus*
Himalayan wolf	*Canis lupus*
Serow	*Nemorhaedus sumatraensis*
Hangul or Kashmir Stag	*Cervus elaphus hanglu*
Himalayan Musk Deer	*Moschus chrysogaster*
Himalayan yellow-throated Marten	*Martes flavigula*
Himalayan weasel	*Mustela sibirca*
Long-tailed marmot	*Marmota caudata*
Indian porcupine	*Hystrix indica*
Himalayan Mouse Hare	*Ochotona roylei*
Common Langur	*Semnopithecus ajex*
Rhesus macaque	*Macaca mullata*

Blue whistling thrush

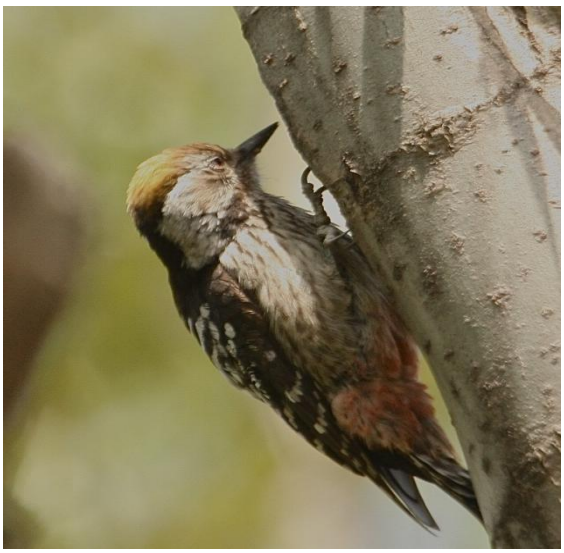
Mistle thrush

Winter wren



Himalayan wood pecker

Yellow crowned wood pecker



Chestnut eared bunting

Green backed Tit

Spot winged tit

Dark sided fly catcher

Long tailed Minivit Male

Rose ringed parakete

Shikra

AQUATIC FAUNA

The main Dachigam stream is the ideal habitat for the cold water fishes, and other aquatic forms of life. There not many aquatic species have been reported from the Dachigam so far and a survey to access aquatic fauna is required in Dachigam NP.

AVIFAUNA

The Dachigam National Park supports a rich and varies bird life. In addition to numerous species of resident birds it serves as the winter visiting ground to many migratory birds. Altogether ? species of birds were reported in Dachigam. The list includes ? rare species and ? near threatened birds species.

2.6.2.2 LIMITING FACTORS

Factors limiting the range, movement, food, shelter otherwise affecting the general well being of the wildlife population may be stated as absent. Habitat lose is the man limiting factor for the survival of wild animal species such as black bear, Hangul, leopards. Increased pressure on forests of Dachigam by local villagers for grass cutting, livestock grassing in upper reaches on upper Dachigam is becoming one of the main limiting factor for the survival of Hangul in Dachigam.

The Upper Dachigam is under a heavy grazing pressure and is one of the main limiting factors for the wildlife because of following effects of grazing on Wildlife.

Interference

Reduction in food availability for herbivores

Disease propagation

Reduction in area of wilderness needed for the wildlife

There are about 100 families of nomadic Bakerwals with the huge livestock of 5,000 cattle heads graze in Upper Dachigam which is a summer home of Hangul. The concentration of these grazers is maximum in Dagwan valley and other areas of upper

Dachigam. Though there is the carrying capacity of the area to accommodate considerable wildlife, but owing to the limiting factor of grazing the actual population of Wildlife in the area is quite low. There is a need to have specific proposals and rapid intervention to overcome this limiting factor to obviate the menace of grazing in Upper Dachigam.

Fire

Fire does occur accidentally in the lower part of the National Park. The fire common in the area is ground fire and the crown fire does not take place in the area. The fire is usually confined to lower grassy areas mainly on southern or western aspects. The most sensitive are for fire are Drog nallah, Reshwoder nallah and the menu.

Snow

The snow is also limiting factor for both the flora and fauna. The trees get damaged by snow by way of uprooting of the trees, debarking of the branches and snow slides. In winter season most of the areas of Dachigam National Park are remain covered under snow and the animals have to migrate to lower areas for food, etc. The most affected areas come in upper Dachigam. The winter season is the touch period for the wildlife in the area. Artificial feed for species such as Hangul is very much important for there survival.

External Interference

The entire Dachigam NP is free from any sort of external interference except the summer grazing in upper Dachigam but Lower Dachigam do not have any external interference no forest products exploited from the area excepting some human disturbance, collection of mushroom in spring season that to in some areas. The external interference in lower Dachigam at present consists of the activities of large number of government department such as Department of hospitality, Fisheries department, and sheep breading form, power supply department, irrigation department, flood control department, and military operation. Wildlife department staff activities are also a source of external interference in park by way of cutting

patrolling paths, clearance of visiting spots, etc. along with the activities of the visitors coming to view wildlife in Dachigam.

The most important external interference in Dachigam is the VIP guest house (Draphama) which is visited by large number of VIP's and state guest with there cavalcade vehicles mostly in summer season.

A menace which may be considered as an external interference is the frequent blasting sound which comes from the near by cement factories in north side of park near to Kawnar nallah.

Epidemic

The animals of the park have not been affected by any serious epidemic disease in the recent years. The danger of spreading epidemic diseases is always there because of the presence of large capacity sheep breading form on one corner the park and the large number of grazing livestock presence in upper Dachigam.

Unsuitable period

In winter season period after show is the most unsuitable period for the wildlife in the areas because of foraging grounds get covered by snow and getting food becomes difficult for many species.

2.6.2.3 IMPORTANT INVERTEBRATES, THEIR STATUS, DISTRIBUTION AND HABITAT:

The status, distribution and habitat for the invertebrates require studies/observation in the park. No systematic research work for invertebrates has been done in Dachigam NP. However among snakes in Dachigam three species of viper have been reported which includes: - Himalayan pit viper, Leventine viper and Rat snake. There are more then 50 species of butterflies reported to be present in Dachigam. (Annexure ?).

CHAPTER THREE

HISTORY OF MANAGEMENT AND PRESENT PRACTICES

3.1. GENERAL

Dachigam National Park comes under the Central Wildlife Division of Kashmir region and was constituted in year 1982. Before National Park status it was a wildlife sanctuary. Dachigam have a history of management practices before the establishment of the forest department of Jammu and Kashmir it was managed by the Maharaja of Kashmir as a game reserve. The area of National Park has the history of unimaginable faunal diversity. The ecosystem harbors one of the largest population of black bear and it is a home for the last surviving population of Kashmir stag (*Hangul*). The ten villages which were present in today's Dachigam were translocated when the area was declared as Rakh (game reserve). During the Maharaja Rule time the park area was his game reserve where he uses to hunt animals for pleasure which results into over exploitation and excessive removal of wild animals from the park. He have done lot of intervention with the natural ecosystem of Dachigam maharaja brought wild bore (*Sus scrofa*) from outside Kashmir for hunting which was not the part of the ecosystem and may had become pressure on the park ecology. Later the wild bore population was completely disappeared from the park as early as 1985. After the formation of department of wildlife protection habitat management and improvement intervention were under taken by taking up plantation work in some areas of the park.

3.2. TIMBER OPERATION INCLUDING FIREWOOD HARVEST:

The prime objective of creating Dachigam as a national park was for the protection of Kashmir stag (Hangul) and other wild animals in the park. The entire park was closed to hunting and trapping of any wild animal as soon as it was declared as sanctuary in 1951 after maharaja rule. Initially wildlife protection was the only management practice which was carried out. There is no record of timber harvest from Dachigam area.

3.3. NON-WOOD FOREST PRODUCE COLLECTION:

The reserve was covered by some management interventions at the time of Maharaja. There were strict guide lines under which some activities were allowed up to some extent such as grass cutting, and fire wood collection in winter season. There were reports of collection of Hangul shielded antlers from Dachigam in past.

3.4. LEASES:

No lease has been given under the jurisdiction of the manager of the park in the area under the control of Wildlife Warden Central and South.

3.5. OTHER PROGRAMMES AND ACTIVITIES:

There are many government department settlement exists in Dachigam where large number of employs are working which includes sheep husbandry form, trout fish form, hospitality and protocol department, irrigation works, flood control working department and power supply department which are becoming as limiting factor for the survival and management of wild animals. The department of wildlife protection activities includes protection and conservation of wild flora and fauna. Otherwise all the other activities such as involving people for conservation etc. are confined to the adjoining areas of the park by the department.

3.6. FOREST PROTECTION:

3.6.1. Legal status:

Dachigam National Park has been legally notifies as a National Park in the year 1982. The detailed legal status for Dachigam National Park has been discussed in para 1.1.3 and 1.1.4 of chapter one.

3.6.2. Hunting:

Before the declaration of Dachigam as a National Park and during colonial rule it was found that giving protection to Hangul population did not given desired results. It was because there were many areas adjacent to Dachigam which were having good population and access to Dachigam where hunting use to take place. After the declaration of many adjacent areas as conservation reserves the problem of hunting comes down to zero and today there are no cases of Hangul hunting in the area.

Government Sheep Breeding Farm Administrative block

A herd of Sheep behind breeding farm

Floriculture nursery near VIP guest house

Trout fish hatchery
Laribal

Trout fish
hatchery ponds

Power department
transformers

inside Dachigam

CRPF barrier near NIC

CRPF bunker and settlements at VIP guest house

VIP guest house Draphama in the middle of the NP

Water supply department control gate and canal

Irrigation department

3.6.3. Illegal activities:

Poaching and other illegal activities

All action, efforts and management practices executed in the Dachigam National Park from the beginning till date are however aimed mainly towards the protection of Hangul from the poachers. During the formative years this was to be achieved by extending the areas and by keeping it close to hunting and poaching. Hangul poachers mainly kill animals using gun shot. Using gun become difficult in Kashmir because of political term oil and out brake of militancy in Kashmir. Today there is no report of poaching incidences in Dachigam National Park.

3.6.4. Livestock grazing:

In Dachigam National Park the most effected area by grazing is upper Dachigam where nomadic grazers are coming from other areas in summer seasons. The summer habitat of Hangul is getting degraded because of excessive grazing by thousands of livestock's. The destruction of habitat coupled with the danger of spreading epidemics is the dangerous threats for the wildlife in Dachigam NP. Livestock grazing is completely stopped in lower Dachigam and in upper Dachigam it is still going on illegally.

3.6.5 Forest Fires:

Natural forest fires are not common in the region; however accidental fires may result in the woodland areas of the park because fire spreads from grasslands due to non maintenance of proper fire lines. However, the control burning of grasslands is an important management tool for maintaining the vegetation structure and checking the succession stages of the grasslands. Drog, menu and Reshwoder are the three fire sensitive areas in Dachigam NP. As a result of increasing awareness and vigilant protection, the incidents of forest fires have been declined over the years.

3.6.6 Wildlife health

Since the inception of the National Park no out break of insect attacks or any pathological problem has been noticed in the area. Similarly, there are no incidents of disease epidemics in wildlife have been reported in Dachigam. But there is a need to do immunization of livestock which are living in the surrounding areas of Dachigam and the livestock's which are coming for grazing in upper Dachigam.

Fig. 21. Nomadic grazer with livestock near Dachigam National Park.

Fig. 22. NTFP collection inside Dachigam National Park

3.7. Eco-tourism

Dachigam being very close to Srinagar summer capital of Jammu and Kashmir is visited by large number of tourists in summer because of the natural beauty. Large number of visitors use to come to Dachigam from mid sixties but today it have become one of the most important tourist destination because of Hangul. Every year 1,000-2,000 tourist visits Dachigam which includes students, naturalists, scientists, conservation activists, etc. Department also organize limited number of nature education camps every year for the awareness creation at Nature interpretation center.

3.8 Research and Monitoring

The rich biodiversity and unique ecosystem of Dachigam National Park require well established, scientifically proved data/ information/ studies to at as an effective management tool for the conservation of habitat and wildlife. Many studies/ research projects have been carried out by individuals/institutions mainly for academic interests. There has been much of systematic recording and retrieval of information at the PA level for use in the management. The details of the studies are given separately in the chapter nine on research and monitoring in the management plan.

3.9 Wildlife conservation strategies:

Wildlife conservation strategies consist of mainly two components viz. Anti-poaching activities to counter the threat of organized gangs of poachers and Habitat manipulation for improving the habitat condition when ever needed.

Some of the major efforts to stop illegal hunting were made during the late 1980-90s under the leadership of Mr. A.R Wani in Dachigam landscape. Intensive measures for the protection of Dachigam National Park were again taken up with due earnestness from the early part of 1980 when the chief wildlife warden himself took up the matter with all seriousness. The entire administrative setup was reorganized and has been vastly improved.

The overall response of all the animals of the park to the present management practice which is primarily protection oriented is quite encouraging. For the habitat improvement in side Dachigam plantations were carried out in many areas which have become dense forest today.

3.10 ADMINISTRATIVE SETUP

The National Park is under the control of wildlife warden central, Dachigam and Wildlife Warden South, Bejbhira. Dachigam spread over two wildlife divisions. The lower Dachigam comes under one range called Dachigam range and the upper comes under upper Dachigam range.

Details of Staff in Dachigam National Park is given in Annexure no. ?

3.11 COMMUNICATION

Wireless control room is located at the gate of Dachigam but not in use from last ten years because of security problem in Kashmir. There is a need for the complete renovation of wireless network system in Dachigam National Park.

3.12 SUMMERT OF THREATS TO WILDLIFE

The dwindling biodiversity, degradation of habitats, heavy grazing in some areas of park and epidemic diseases from livestock, man-animal conflicts are the main threats for the wildlife in Dachigam NP.

CHAPTER FOUR

THE PROTECTED AREA AND THE INTERFACE LANDUSE SITUATION

4.1. THE EXISTING SITUATION IN THE ZONE OF INFLUENCE:

There are 40 villages located surrounding the boundary of the park excluding the North boundary. The livelihood of villages is agriculture, orchids, animal husbandry, poultry and dairy activities. Prior to declaration of national park, people used to be dependent on the natural resources of the area such as livestock grazing, fire wood collection. The villages located near to the park have some negative impacts like crop raiding, orchid raiding and loss of livestock due to straying of wild animals from the park. Traditionally the fringe residents are conservation oriented and therefore extent of alienation is not very significant but today because of increase in crop damage and livestock depredation by black bear and leopard the attitude is changing. The zone of influence of Dachigam National Park is identified within 10 km of the legal boundaries.

4.1.1. LOCATION, EXTENT, BOUNDARIES, NATURAL ATTRIBUTES OF THE ZONE OF INFLUENCE.

Dachigam National Park, along with eight conservation reserves and one wildlife sanctuary named Overa-Aru Wildlife Sanctuary makes Greater Dachigam Landscape. The zones of influence have 40 revenue villages. The zone of influence extends from Mufti Bagh to Sonwar Srinagar. The revenue villages located on the boundary will be trusted area for the eco-development activities owing to the fact that livelihood of these villages are affected by the existence of the park.

The area within zone of influence comprises area which has very high level of tourism activities such as Mugal Gardens and other are tourist areas owing to the fact that Srinagar is one of the famous summer tourist resort in country.

4.1.2. VILLAGES INSIDE AND OUTSIDE THE PROTECTED AREAS:

There is no village inside the originally notified Dachigam National Park. However, there are many government departments which are operating inside the boundary of the park. The area which is under the biotic interference starts from the gate up to Draphama VIP guest house, most of the infrastructure of these government lies in between Dachigam gate and Draphama guest house.

The main communities in the village which comes in the zone of influence are Kashmiris, and gujars. These communities are mainly dependent on horticulture for subsistence.

The gujars community is the only tribal community in the area. Agriculture, horticulture is their principal activity and they rear livestock like as cows, goats, and sheep to supplement their economy. Socio-economic condition of the gujar community is poor. This community is also involved in fire wood collection and herbs collection from the reserved forests.

4.1.3. STATE OF THE PEOPLE'S ECONOMY

A large number of villagers are marginal framers and therefore the average land holding of the people of the zone of influence is small. The main occupation is the orchid cultivation and a large number of local laborers are involved in food harvesting in orchid field. The animal husbandry practices is one of the main source of livelihood of the locals the animals which are reared includes cows, goats and sheep's. For the large number of goats, sheep rearing many peoples do livestock grazing in forest areas.

The socio-economic conditions of other kashmiri communities is somewhat better. A significant population of this community in engaged in government jobs, business and in tourism industry etc. Land use patterns in the zone of influence: The terrain and the topology in the zone of influence is mountainous which are anatomized by numerous water streams and nallahs. Though at presents no proper survey has been conducted for entire zone of influence, a thorough survey on socio-economic status of villagers living in the vicinity of Dachigam is required. Land use pattern within 10 km of the boundary of Dachigam National Park is given as under:-

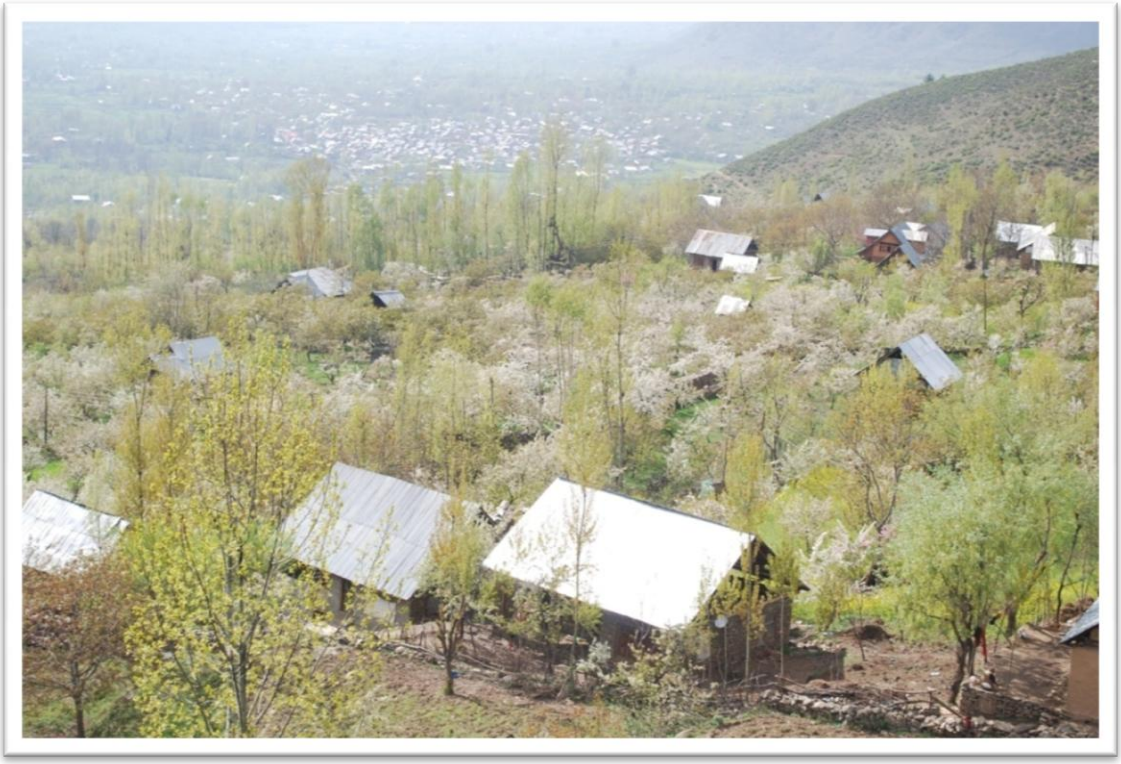


Fig. 23. Horticulture crop land near to the boundary of Dachigam National Park.

Fig. 24. Landscape picture showing mosaic of forested habitats and crop land

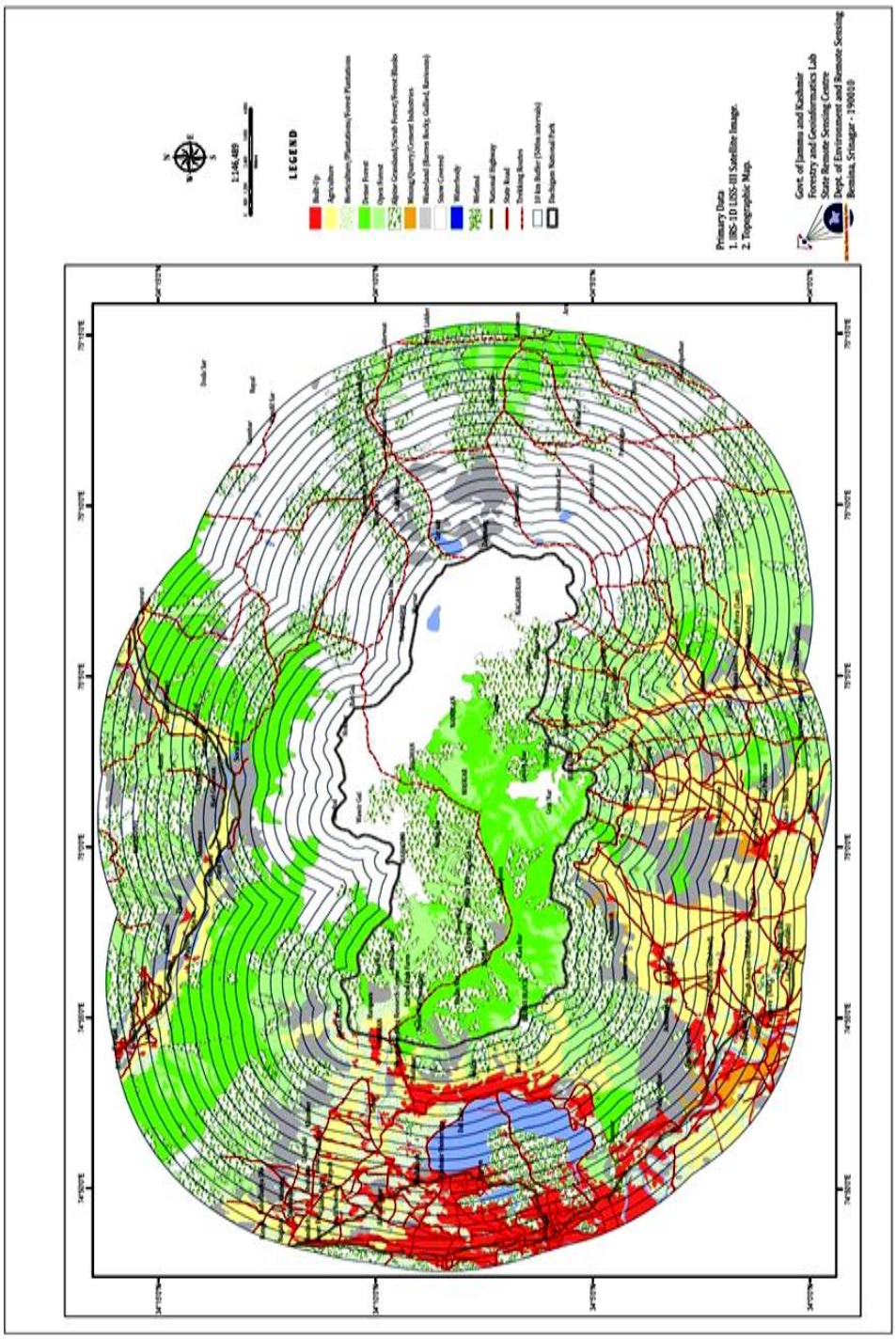


Fig. 25. Map showing land use categories in Dachigam Landscape

Table. ?. LANDUSE CATEGORIES WITH AREA IN DACHIGAM LANDSCAPE

Category	Area(ha)
BUILT-UP LAND	3804.13
FOREST AREA	24556.72
CULTIVATED	15004.22
PLANTATION/ ORCHARD	3679.71
MARSHY AREA	745.22
BARREN/GRASSLAND	22993.92
QUERY SITE	207.41
WATER BODY	1926.72
SNOW COVERED	18149.76
TOTAL	91067.84

4.1.4. IMPLICATIONS OF THE LAND USE AND RESOURCE DEPENDENCY FOR THE CONSERVATION OF THE PROTECTED AREA:

The land holding of the villagers is small and the quality of the livestock they are rearing is poor. The economy of the villagers is poor because of small land holdings and poor quality of livestock. The economy of the area is totally dependent on the resources of the agricultural crop land and it is poor because of various reasons such as small land holding, traditional cultivation practice, poor milk cattle etc. But in some areas scenario is changed peoples have started growing orchids in place of traditional crop. In summer seasons there are many locals which are going for

livestock grazing in upper Dachigam and in spring season many locals are involved in Guchi (mushroom) collection because of its high market price which is the main dependency on Dachigam National Park.

4.1.5. FOREST / PROTECTED AREA MANAGEMENT PRACTICES AND THEIR IMPLICATIONS FOR PEOPLES:

The major implications of the management practices for the peoples of the area are listed as: Livestock Grazing: The villagers who used the areas of originally notified Dachigam National Park, were prevented from cattle grazing, hunting, fishing and collection of timber etc. Now they have to graze their cattle elsewhere or illegally in the protected areas. The upper Dachigam area is under huge livestock grazing practice in spite of the area comes under National Park norms.

Delayed and inadequate compensation for crop damage: Today man-animal conflict has become one of the major concerns for the department of wildlife protection. The increase in number of conflict cases in zone of influence has become a major problem for the locals. The livestock killing and human injuries by wild animals such as black bear and leopard, crop raiding by black bear etc have become common in the zone on influence. The increase in killing and damage by animals in the area leading to retaliatory killing of species such as black bear and leopard by local villagers.

The studies on black bear-human conflict by Wildlife institute of India states large number of crop damage in zone of influence. Many of the conflict affected peoples do not report to department for compensation / ex-gratia because of fewer amounts and because of time taking process. The main problem in compensation scheme is the inadequate funds. The factor of suitable compensation and fast relief from damage by wild animals to crop, livestock and human is very important to the well being of the protected area and some efficient mechanism should immediately be worked out which includes rise in compensation amount, faster release of funds and there is need of inclusion of some orchid crops in the compensation scheme to reduce the negative impact of such incidences on wild animals.

4.2. THE DEVELOPMENT PROGRAMMES AND CONSERVATION ISSUES:

4.2.1. Government agencies such as rural development, erosion and drainage, education, agriculture, animal husbandry etc. are implementing various development activities such as construction of roads and other infrastructures, improvement of livestock quality etc. These development practices many likely influence the socio-economic condition of the locals which are living in the zone of influence. The improvement in the socio-economic condition of the local peoples will definitely help in conservation of the resources of the park.

4.2.2. Summary of problem faced by people that affect the management of the protected area and the zone of influence:

a) Shrinkage of area for cattle grazing.
b) Abolition of traditional access to forest resources in the park.
c) Poor conditions of the local villagers' results in considerable illegal activities such as timber felling and grazing in reserved forest areas in zone of influence.
d) Poor education and awareness, which results in lack of sensitivity among the people towards wildlife protection as observed during forest fire time. In conflict situations peoples use to harass the animals which some time comes out of the forest in human habitations.
e) Damage because of different types of conflicts by man-animal interaction which includes crop damage, livestock killing and some time human killing.

CHAPTER FIVE

PLAN OBJECTIVES AND PROBLEMS

5.1. Objectives of management:

The following objectives have been formulated around the set of values recognized and prioritized:

5.1.1. To maintain and wherever necessary restore the demographic features relating to population of all endangered, endemic, vulnerable, rare species of animals and plants with special focus on Hangul, Asiatic black bear, Common leopard.

5.1.2. To identify research priorities and implement programs to establish mechanism and create opportunities for enhancing management capabilities and knowledge of wildlife science.

5.1.3. To enhance the quality of educational, recreational, and wilderness experience given to the general public.

5.1.4. Consistent with the above objectives in the zone of influence with sensitivity to cultural and economical well being of the communities, reduce the dependency on forest based resources.

5.2. PROBLEM IN ACHIEVING OBJECTIVES:

5.2.1. CONSTRAINTS/ PROBLEM IN ACHIEVING OBJECTIVE NO. 1.

1. **Poaching of wild animals**- Although poaching of Hangul and other wild animals gone down drastically with improved infrastructure and enhanced vigilance, however the need to regularly maintain the infrastructure and monitor the wildlife population is very crucial.
2. **Lack of proper demarcation of boundaries**- The legal boundaries of Dachigam National Park and the additions are clearly notified however those demarcations is not fully laid out and needs regular monitoring and upkeep.
3. **Biotic pressure in the addition areas**- Several kinds of biotic pressure

exist around the park. That range from encroachment, cattle grazing, fishing, and pouching activities inside the park. Livestock grazing is one such major problem that continues in some of the notified/preliminary notified areas. These livestock not only compete with the wild animal for the natural resources but are also a potential source of pest and disease that are transmittable to the wild animal. Similarly illegal encroachments by grazers pose a problem, which are a potential source of man-animal conflict.

4. **Inadequate logistic and financial support-** The Park needs intensive management considering the rich Biodiversity it protects. However, the inadequacy of funds and the lack of adequate infrastructure, communication and institutional support are the major constraints which hamper the effective management of the park.
5. **Ranging pattern of wild animals outside the park boundary-** Large mammals such as Asiatic black bear, Leopard often comes out of the National Park boundary and got involved in conflicts in surrounding human habitations around Dachigam. This results in man-animal conflicts and also poses a problem in driving back the animals inside the park.
6. **Inadequate staff and inter-departmental support-** The intensive management of the park makes it mandatory that adequate staffing is needed at various anti-pouching camps and dealing man-animal conflict situations. However with the downsizing policy and no new recruitments in the recent years, the park will face an acute shortage of staff in the coming years. Similarly the inter-departmental coordination has not been explored much.

5.2.2. CONSTRAINTS/ PROBLEM IN ACHIEVING OBJECTIVE NO. 2.

1. **Inadequate inventorisation of the existing resources-** Although the park has along management history, the basic inventory for the various nature resources is lacking. The focus so far has been only on the large mammals and there fore besides carrying out daily monitoring and census operations for a few selected species, the rest have been largely ignored.

2. **Inadequate ecological and behavioral studies-** No long-term study has been carried out in the park to study the ecological and behavioral traits of the animals. The ranging patterns of the various animals have not been studied.
3. **Lack of knowledge on carrying capacity and infrastructure-** With adequate protection the number of wild animals especially Asiatic black bear, Leopards has significantly risen in the park. However there is no study have been conducted so far that can suggests the carrying capacity of the park and the subsequent management intervention therein.
4. **Lake of proper documentation-** The studies that have been conducted in the past are not been documented adequately to serve as a database for future management initiatives. Moreover the existing database management system is also not adequate to properly utilize the current information available at the park such as census data.
5. **Inadequate monitoring mechanism-** The census operations have been carried out for Hangul only. So there is a need to monitor lesser-known species also which is lacking.
6. **Lack of coordination with research institutions-** There is no mechanism currently existing that facilitates for research to be conducted by the well known research institutes and universities. This communication gap results in lesser exploration of the research potential in the park**.**
7. **Lake of research facilities and infrastructure-** A well equipped research and monitoring cell that would look exclusively in the aspect of conducting, documenting and implementing the research information is lacking. There are not much research facilities are available which can be provided to the researchers for carrying out their research in the park.
8. **Lake of appropriate training to the staff for research activities-** The staff especially at the ground level is not properly trained to carry out simple research and monitoring operation while doing their daily duty of patrolling etc. Training at higher levels is also lacking especially for gaining the knowledge in latest wildlife management techniques.

5.2.3. CONSTRAINTS/ PROBLEM IN ACHIEVING OBJECTIVE NO. 3.

1. **Lack of effective tourism plan-** The tourism at the park is an important source of revenue generation for the park however there is no effective plan that deals with the growing number of visitors. There is no mechanism yet existing, which is able to plough back the revenue earned and to manage the tourist influx to ensure the sustainability of the system.
2. **Lack of scientific study on tourism and the carrying capacity of the park-** There is a need of scientific study on tourism management in the park. The growing number of tourist in park raise a pertinent question about the numbers of tourist that the park can support and also whether that shall be in coherence with the overall objective of biodiversity conservation in the park.
3. **Inadequate staff and infrastructural support to deal with the growing tourism-** There is a need to increase the number of staff personal in Dachigam since the park is now facing the additional burden of managing the growing number of tourists. Even the infrastructure available to cater to the tourist is not adequate and needs regular maintenance.
4. **Improvement of Interpretation, conservation education awareness and publicity facilities-** There is a great scope in improving the interpretation facilities at Dachigam NP for the education awareness. Basic publicity facilities such as pamphlets and web-sites are inadequate and lacking. As a result the actual potential of the park is not properly harnessed.

5.3.4. CONSTRAINS/PROBLEMS INACHIEVING OBJECTIVES NO.4

1. **Lack of socio-economic database. –** No study has been carried out to assess the socio-economics condition of the villagers which are living on the fringes of Dachigam NP. There is a need to have a well designed scientific study to assess the socio-economic status of the local peoples living in villages adjacent to Dachigam NP for the formulation of effective eco-development plan.
2. **Low priority to eco-development by the policy makers-** The concept of eco-development is in itself a newly emerging field in this part of the

world. Not much work has been done earlier to serve as a precedent for the eco-development plan around the park.

3. **Lack of infrastructure and trained staff-** The staff especially at the lower level has so far solely played the role of the protector of forest and wildlife. The new approach towards Biodiversity conservation that involves people's participation is a concept for which the staff may not currently have the mindset. Lack of proper training and infrastructural facilities adds more to the confusion regarding the execution of the policy at the ground level. Stipulation of proper training and infrastructure facilities will help to eradicate the confusion regarding the execution of the policy at the ground level.
4. **Political interference and unorganized approach to Man-animal conflict-** "The island repository of natural resources" Dachigam NP is encircled by the oceanic people, so the man-animal conflict is apparent to happen. Unmethodical approach towards dealing with the problem motivate to already existing stress on the park. Lack of political will and an unsystematic approach towards dealing with the problem adds fuel to the already existing pressures on the park.

CHAPTER SIX

THE STRATEGIES

6.1. BOUNDARIES:

The details of the boundaries of the park have been discussed in Chapter 2. Detailed boundary description of the originally notified Dachigam National Park have been provided as Annexure ?.

6.1.1. ECOLOGICAL BOUNDARIES:

The Dachigam National Park is bounded by Sindh valley to the north east, Tarsar, Lidderwath, Kolhai of Lidder Valley and Overa-Aru Wildlife Sanctuary in the Far East. Tral range in the south-east and Harwan, Brain and Nishat in the west and south west.

1. **Boundary delineation** – The boundaries of the national park and reserve forests to be carefully checked and marked clearly on the map. All the existing boundary pillars in the artificial boundaries to be regularly checked and new pillars in the artificial boundaries to be regularly checked and new pillars should be erected on compartments and blocks wherever required to avoid confusion. Beat maps showing clear boundaries and other important features should be maintained.
2. **Maintenance and regular monitoring** – Name of Block, Compartment number and number of pillar should be inscribed on the pillar and record maintained in the office. Wildlife wardens, Range officers should regularly check these boundaries during their routine inspection of the area.
3. **Inter-departmental coordination.** – Liaison should be established with the Revenue authorities, forest department for proper correction of records relevant to lands allotted to the park management for different uses. Liaison with Revenue department will be helpful in clarify the confusions on the protected area boundaries.

6.2 ZONATION AND ZONE PLANS IN DACHIGAM NATIONAL PARK:

Following zones are being proposed for achieving the already defined objectives:-

1. Core Zone.
2. Buffer Zone.
3. Tourism.

Zone	Area in sq. Km
Core Zone	130 Km^2
Buffer Zone	2 km buffer surrounding Dachigam NP
Tourism Zone	11 km^2

ZONE PLANS

6.2.1. CORE ZONE:

Core zone is a distinct management entity that is also the "sanctum sanctorum" of a protected area. An important objective for setting up a core area is for such a areas as center of ecological reference and ecological processes and to maintain at least a good percentage of the key habitats, elements of conservation importance such as species, communities and population under reduced threats. (Sawarkar, 1995).

Out of the total notified area of 141 Sq. Km of Dachigam National Park we selected about 130 Sq. Km as an Core zone which should be free from human disturbances and external influences. In the core zone, natural ecological process shall be allowed to continue and in this zone minimal management interventions will be introduced.

The following objectives and strategies have been formulated for the core zone.

1. **To give apex priority for protection, conservation and preservation of species in their natural habitats.**
2. **To allow minimal external influences this also includes habitat management interventions.**

Strategy recommended

1. **Intensive management plan** – To develop a proper pattern for division of area into blocks and compartments.
2. **Inventorisation** – Of all resources of core zone shall be done and maintained properly with provision for periodic monitoring.
3. **Protection** – Effective protection to the wild animals and their habitats against poaching, grazing, fire and other natural hazards shall be provided. This shall be achieved through intensive patrolling, enhanced communication facilities and monitoring.
4. **Habitat management** – Various habitat management practices such as controlled burning, cutting and maintenance of fire lines, weed control, grassland habitat enhancement techniques to be undertaken, but with extreme caution so as to keep the area as pristine as possible.

6.2.2. BUFFER ZONE:

Buffer zone can be defined as the zone that acts as a cushion to absorb all the distresses of biotic impacts and does not let them affect the core zone. The buffer zones compresses of area outside Dachigam NP falling in 1km buffer and inside Dachigam starts from gate up to Draphama VIP guest house because this is the area which is under high biotic interference inside the notified area of Dachigam. The presence of VIP guest house inside the park is attracting VIP's with there huge cavalcade of security vehicles, sheep form also comes in this zone and there are as many as eight different government departments are working inside the administrative boundary of Dachigam NP. In spite of that the area is notified a large number of activities carried out by the employees of these departments are creating problem which can affect the natural behavior of the animals. Inside this buffer area the most important Oak patch also lies which is very much important for the survival of species like black bear and hangul, so there is a need to stop or minimize the activities of said departments from Dachigam, for the better management and conservation of the endangered species such as hangul, leopard etc.

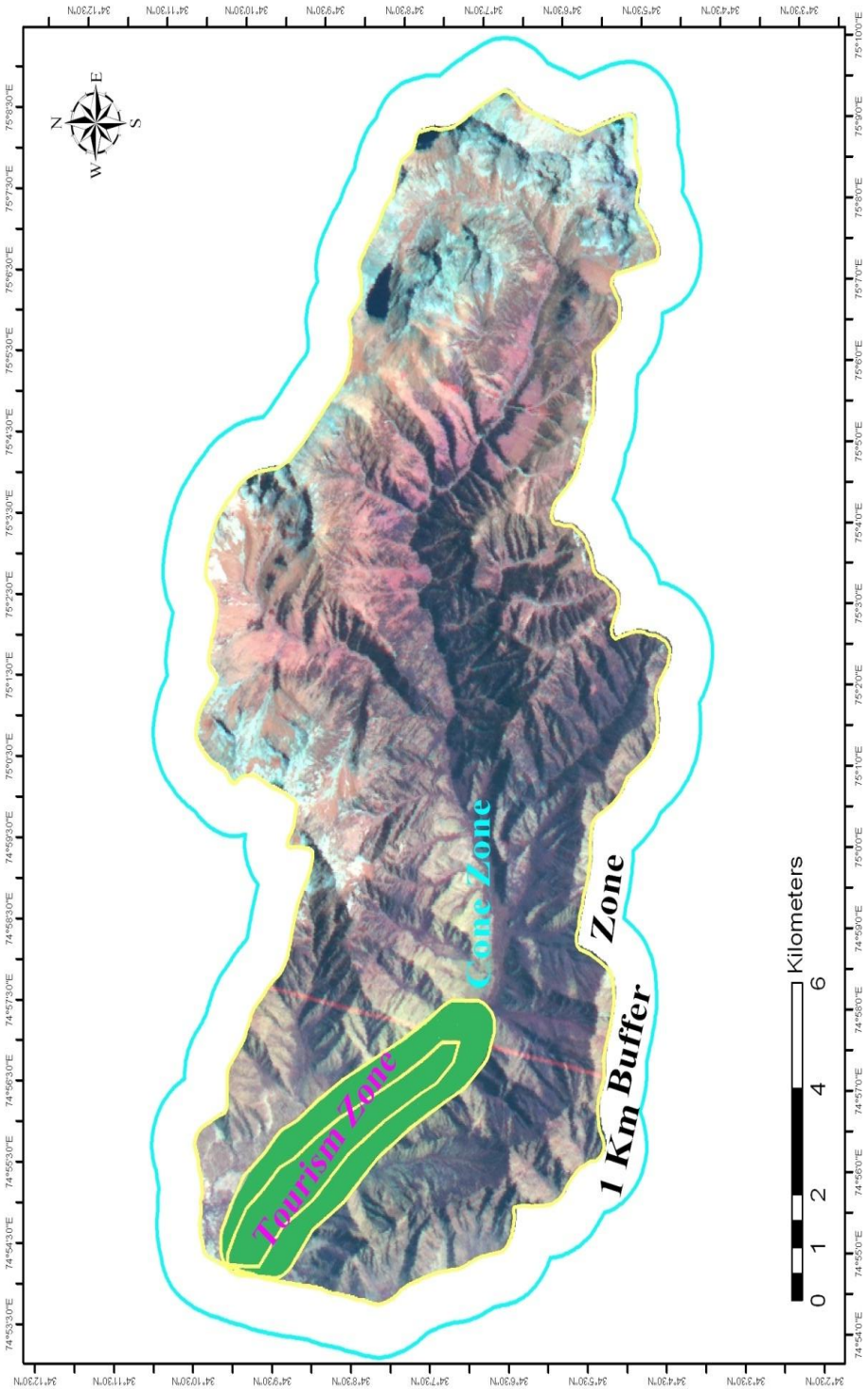


Fig. Maps showing different zones in Dachigam National park

There are many areas out side such as khimber, Sarashbal, Nishat, Brein, Chasmasahi, Khunmoh, Khrew, Hanjin, Aru, and Dara conservation reserve which are included in buffer areas of Dachigam and they shall also serve as corridors for wild animals like hangul and black bear.

The following objectives and strategies have been framed for the buffer zone:-

1. **To maintain and restore the fragile ecosystems within the buffer zone.**
2. **To provide a safe refuge for animals who would reside in such areas due to their movement, food availability and during extreme cold conditions in upper reaches of Dachigam.**
3. **To encourage eco-tourism related activities in order to generate local employment and a sense of belongingness towards the national park.**

Strategies

1. **Boundary demarcation, maintenance and monitoring** – The boundaries should be surveyed and demarcated properly. Damaged and missing pillars shall be repaired. At strategic boundary fencing should be erected.
2. **Reducing biotic pressure** – There is a need to cut down all the biotic pressures inside the areas by stopping and minimizing the activities of the other government department. Uncontrolled grazing should be properly regulated in the CR's and effective measures should be taken for allowing fodder regeneration. Immunization of livestock entering such CR's should be carried out on an annual basis.
3. **Planning and execution of eco-tourism related activities** – Eco-tourism activities will also be taken up in buffer zone. The details of the eco-tourism activities have been described in a separate chapter elsewhere in the management plan.

6.2.3. TOURISM ZONE

This zone can be defined as that part of the park where tourism is allowed to a certain extent without disturbing the natural integrity of the ecosystem. The tourism zone is identified in the form of a dendritic pattern of trails, road network in Dachigam National Park. Further expansion of the tourism activities may be proposed

in the CR's surrounding Dachigam. The following objectives and strategies have been proposed exclusively for the tourism zone.

The following objectives and strategies have been framed for the tourism zone:-

1. **To regulate tourism in such a manner that there is no adverse impact on the protected area.**
2. **To provide maximum satisfaction to the visitors besides creating nature awareness and conservation.**

Strategies

1. **Regulate and monitor the inflow of tourists** – The tourist influx should be controlled especially in summer season. Strict regulation on type and conditions of vehicles, maximum number of tourists to be allowed at a particular point of time and time permitted should be strictly followed. All the rules pertaining to wildlife photography and use of video camera should be enforced. Details of the various strategies adopted have been dealt separately under a separate chapter on tourism.

6.3. THEME PLANS:

Management strategies for the Dachigam National Park that are applicable to the entire park irrespective of their zones and have not been discussed before in the plan are discussed in the following theme plans:

1) **Control of Poaching**
2) **Control of Grazing and other biotic disturbances**
3) **Weed Control**
4) **Controlling ranging patterns of wild animals outside the managed habitat**
5) **Soil erosion monitoring and control**
6) **Animal health surveillance**
7) **Man-animal coexistence**
8) **Development of infrastructure and communication**
9) **Management of quarantine areas or captivity center of rescued animals**

6.3.1. THEME PLAN FOR CONTROL OF POACHING:

Since Dachigam National Park is the last home of the endangered Hangul "Kashmir Stag" so it is constantly under threat from poachers. Owing to patrolling by field staff as well as pro-active role played by the park authority, the poaching instances have come down to zero. However, threat perception still persists because of demand of hangul antlers and meat. So the park authority has to equip itself adequately for all the meet challenges. It will require regular reinforcement and improvement of existing infrastructure and other measures.

6.3.1.1. General strategies for controlling poaching:

Following strategies are proposed to strengthen the anti-poaching measures:-

1. **ANTI-POACHING CAMPS:** The terrain in Dachigam is very rugged. As the existing roads and communication could not meet the demand of regular urgent situations such as attempt, rescue of distressed animals, etc. by usual measures, it is necessary for the park authority to maintain a large number of anti-poaching camps inside and on the strategic locations considering the inaccessibility of such areas throughout the year.
2. **STAFFING:** The anti-poaching camps are manned with foresters, forest guards, watchers etc. At present in Dachigam number of staff is not adequate and therefore several camps are deficient in personal.
3. **PATROLLING:** Regular patrolling is a must for effective protection of valuable flora and fauna of the park. At present the protection staff patrols the nooks and corners of the park with special focus on habitat protection for hangul and other wild animals. The staff usually moves on foot and is visiting all the vulnerable locations in early mornings and evening. Night patrolling is almost stopped in Dachigam because of militancy in Kashmir all of the guard garters have been destroyed in Dachigam. Measures necessary for effective patrolling:-
    - **I.** Effective monitoring of regular patrolling inside the park.
    - **II.** All existing patrolling paths will be cleared thrice annually to provide safe movement to field staff for patrolling. Proper mapping of these paths will be done and if required new alignment of patrolling paths for effective patrolling will be done.

III. Providing all basic logistic to field staff such as wireless equipment, flash light and cells, arms, ammunition, kerosene, summer and winter gears etc.

4. **REGISTARION OF FIRE ARMS AROUND THE PARK:** A villagers which are living in surrounding of Dachigam and having fire arms. Effort is on enlist the names of such persons for registering such arms with the park authority as per the existing Wildlife protection rules. There is a need for strict compliance of provisions suggested in different sections of the J&K Wildlife Protection Act, 1978.

6.3.2. CONTROL OF GRAZING AND OTHER BIOTIC DISTURBANCES:

Grazing by migratory livestock's in upper Dachigam area is a challenge for the park management. During summer seasons large number of nomadic livestock grazers snick in upper Dachigam area of the park for grazing which have become a serious concern for park management. Grazing of domestic livestock should be prevented by effective enforcement by the staff.

I. The grazing in alpine pastors of upper Dachigam have done considerable damage to summer habitat of hangul in park, so there is an urgent need to stop grazing in Dachigam for the survival of endangered satellite population of hangul. It is imperative that the legal issues in these areas should be disposed off speedily restoration of these pastors in Dachigam.

II. A proper survey of livestock population in the zone of influence should be initiated to formulate a scheme for immunization of livestock.

Figure. 27. Picture showing anti-poaching and anti-grazing camps inside Dachigam National Park.

III. The migratory population of livestock should be immunized.

IV. In most vulnerable locations such as Dara, Nishat, khunmoh, Khrew cattle proof fencing should be raised. Fencing of approx. 10 Km is proposed during the plan period. Temporary cattle watchers will be engaged at highly vulnerable locations.

6.3.3. WEED CONTROL:

In Dachigam no proper survey has been done for weed identification and there is an urgent need of weed identification in Dachigam for the management of grasslands.

6.3.4. CONTROLLING RANGING PATTERNS OF WILD ANIMALS OUTSIDE MANAGED HABITAT:

An ever growing management problem for the park is straying of wild animals. Every year, wild animals such as black bear and leopard etc. stray out of the park. These result following problems:

I. Crop damage, livestock killings and human attacks some time killing.

II. Extensive effort to bring back the animals to the park including continuous vigil on the stray animals such as black bear and leopards.

III. There is a need of extensive survey to collect data on stray animals in collaboration with research institutes.

IV. Erecting physical barrier in some locations such as in Mulnar and Dara village.

V. Tranquilization of problem animals and other steps such as physical capture and release inside the park.

VI. Compensation for crop damage, livestock killing and human injury/ death.

VII. Provision of mobile camp/ machans to keep vigil on stray animals and to provide protection.

VIII. Organizing mobile patrolling.

6.3.5. SOIL EROSION MONITORING AND CONTROL:

Soil erosion in Dachigam National Park is basically attributed to cloud busts, heavy rainfall in upper elevations of Dachigam. Erosion is not a regular process but

constant monitoring with the use of multi-date satellite data to ascertain the fluvial dynamics and trend of erosion is required.

6.3.6. ANIMAL HEALTH SURVEILLANCE:

In Dachigam health monitoring of wild animals is very much required. Health monitoring of wild animals will be carried out by adopting scientific methods and protocols.

For health monitoring following strategies will be adopted:

- **I.** Record maintenance of all the livestock within zone of influence of the park through collection of data from Block Development and Veterinary office.
- **II.** Liason will be maintained with the District Veterinary Officer to carry out regular immunization of these cattle's.
- **III.** The immunization programme should be linked up with the integrated cattle and dairy development programme.
- **IV.** Awareness campaign in villages can be organized to impart knowledge on communicable diseases in cattle.
- **V.** At present in Dachigam 4 black bears and 2 leopards are kept in the captivity center located near to the gate number two of Dachigam NP. These animals are among the main attractions for visitors. Proper housing facilities for all the captivity animals should be crested and upgraded.

Norms for upkeep for black bear:

Fruits- depend on the season and availability of the fruit

Honey- depend on the animal size and age (approximate 500g in a day)

Meat- Seasonal

Norms for upkeep for Leopard:

Meat	2kg mutton / day/ animal

6.3.7. MAN-ANIMAL COEXISTANCE:

The depredation on crop and property by wild herbivores and occasional cattle lifting by large predators cause considerable hardship to the poor people who reside in the fringe of the National Park. The livelihood of majority of fringe dwellers mainly depends upon agriculture. When their crops are destroyed or livestock are killed by wild animals, their economy is shattered. Today man-animal conflict management has become a challenging task for the park management. The number of conflict cases have increased to such an extent that even patrolling in these areas have become difficult because on less number of employs in department. Increase in man-animals conflict cases have resulted in antagonism towards wildlife and have become another management problem for the park authority.

Proposed strategies:

I. The damage to the crop, livestock should be adequately compensated.

II. Injury or death of people due to attack by wild animals should be immediately attended and compensation/ ex-gratia is to be provided soon after the incident.

III. Formation of crop protection committees in problem villages and provision to provide some logistics such as fire crackers, solar lights, torch lights etc. to such committees.

IV. A flying squad in each range will be formed entirely to manage crop damage by wild animals during orchid food harvesting. The squad will patrol the vulnerable locations from evening till morning and will be equipped with fire arms, fire crackers and other tools necessary to drive the wild animals from human habitations and crop fields to park. The vehicle for flying squad will be kept ready in good condition with enough POL for the above-mentioned specific period.

V. The villagers will be encouraged to go for animal proff fencing all along the crop fields and village.

VI. A survey will be conducted for assess the feasibility of taking up fencing in vulnerable locations as means to reduce man-animal conflict.

VII. Electric-fencing is proposed on the boundaries of park in areas which are close to human habitations.

VIII. It is also proposed to take up eco-development works in the surrounding areas of the park.

Fig. 27(a, b). Pictures showing handling of conflict situations and rescue operation

6.3.8. DEVELOPMENT OF INFRASTRUCTURE AND COMMUNICTION:

To provide adequate protection to the wildlife and manage the park, extensive infrastructure and communication network are to be maintained in a best possible way. The existing infrastructure is as follows: Buildings: The head quarter of the

National park is located at the gate-1 of Dachigam National Park. There are two ranges in Dachigam. Dachigam is managed by two wildlife wardens: Wildlife warden Central and South.

There are large number of buildings at the disposal of the park management which are used as (i) Officers, (ii) Residential Quarters for range officer and guards (iii) Rest house. However the present condition of the majority of these buildings is in bad condition due to non-repairing over a long period of time.

Abstract of present number of Buildings:

1. Offices:
a) Wildlife Warden/ DFO = 2
b) Ranges = 2
c) Beat/ Sub Beats = 3
2. Rest house/ Dormitory = 2 + 1
3. Staff Quarters:
a) Range officers = 1
b) Quarters for other staff including Barrack = 5
4. Anti-poaching camps:
a) Permanent: = 2
b) Temporary: = N/A
5. Anti-Grazing Posts/ naka
a) Permanent
b) Temporary = 3
6. Nature interpretation Center = 1

Prescriptions:

I. All the office buildings will be repaired periodically and as per requirement.

II. Almost all the staff quarters are in badly need of major repairing and few need minor repairing.

III. Permanent and semi-permanent camps will be annually repaired after the end of winter season.

IV. All the existing buildings are in bad shape and will be renovated and reconstructed in the plan period. Beside few new more buildings as mentioned below are suggested for this plan period.

V. Residential quarters for Wildlife Warden = 2 Nos.

VI. Quarters for range officers = 2 Nos.

VII. Quarters for field staff = 40 Nos.

VIII. Requirement of anti-grazing camps and watch towers has been discussed in the theme plan for grazing control.

ROADS/ BRIDGES/ CULVERTS:

Dachigam National Park has a small network of roads inside the park which require renovation and there is a need to construct some new roads during the plan period. These roads are to be repaired annually after the winter season to make them jeepable. Besides there are several wooden, iron bridges and culverts on these roads. These are also to be periodically repaired and some of these are to be reconstructed. Details of roads including proposed roads are given in Annexure-?.

COMMUNICATION:

VEHICLE:

List of vehicles under Dachigam National Park is given in **Annexure-?.** Vehicles of Dachigam are to be repaired constantly in order to make them fit for engaging in various works such as anti-poaching duty, supervision, man-animal conflict, and anti-grazing duty. Beside the existing vehicles new vehicles are required for each range and for the conflict monitoring team. A time limit for using the vehicle in the park i.e. service period is to be fixed.

WIRELESS:

There is no wireless network system is in use in Dachigam National Park for communication and largely dependent on mobile networks which are some time do not have coverage in all areas of the park. There is a immediate need of wireless network in Dachigam for better communication.

Though the prescriptions for development of infrastructure and communication are given above, a detailed plan involving proper survey and

alignment of roads, present status of buildings, new requirement and their locations, estimates etc. will be prepared during the first year of the plan.

6.3.9. MANAGEMENT OF QUARANTINE AREAS OR CAPTIVITY CENTER OF RESCUED ANIMALS

The quarantine areas or captivity center for rescued animals have to be maintained properly for the better caring as per the IUCN standards. At the quarantine area there is a need to have an aversive conditioning facility for the rescued animals from man-animal conflict situations.

Fig. 28. Picture showing quarantine and captivity center for rescued animals.

CHATER SEVEN

TOURISM, INTERPRETATION AND CONSERVATION EDUCATION

7.1. General:

Wildlife or the national park now days have become part of tourism. Now wildlife works as a magnet for the tourists, on the other hand it creates positive impacts such as raise the awareness among the people on stern role and overt function in the biosphere. Dachigam national park is important wildlife tourism for people form al over the world. Flow of tourist indicates a continuous rise in their number.

7.2. The Objectives:

There are so many issues regarding to tourism for the national park management which are to be concentrate on and these are obliging utmost number of tourists, causes maximum number of disturbance to the wildlife , equitable distribution of tourists pressure in the tourism zone, etc., . For smooth running of the tourism plan in national park some objectives may follow these are:

1. **To sensitize the visitors for nature conservation.**
2. **To maximize people's amusement during their stay through education, construal and recreation.**
3. **To provide some memento like calendars, wild books etc.**
4. **To minimize negative impact on the park and its wildlife.**
5. **To create the data base on tourist flow and its impact.**

Observations in existing tourism activities in Dachigam national park are:

I. There is no confinement except chilling winter for tourism in a year.

II. A more comprehensive tourism plan is called for in respect of the following points:-

a) Allowing utmost number of tourist in a day with respect to a picky range/route.
b) Type and conditions of provided vehicle.
c) Registration of vehicles with the park management.
d) Minimum and maximum number of tourist in the vehicle.
e) Provision of tourist guides and role to be played by them.
f) Publicity & wildlife/nature interpretation.
g) Strict obedience of Do's and Don'ts by all parties concerned.
h) Dealing with protocol tourism pressure.
i) Involvement of local people in tourism.
j) Strict obedience of fixed time for trip in park.
k) Maintaining schedule system for tourist vehicle.
l) Displaying rates of hiring of vehicle, entry and other related charges at suitable places.
m) Addressing the problem of engaging staff for accompanying tourist.
n) Measure to be taken against violation of rule of the National park.
o) Mechanism for sort out all complaints of tourists on corrupt practices and negligence of different stake holders.
p) Any other relevant issue of wildlife tourism at Dachigam National Park.

While formulating the comprehensive tourism plan for the Dachigam National Park, all stakeholders including tour operators, hoteliers, NGOs, Government Agencies etc. will be invited to discuss the plan for better tourism opportunities in Dachigam National Park. Guidelines issued by the government from time to time will be also kept in mind.

7.3. PROBLEMS:

A few identified problems pertaining to the tourists are:

i. Lake of comprehensive tourism plan.
ii. Lake of proper maintenance of tourism infrastructures.
iii. Lake of facilities of Interpretation centre to educative visitors.

iv. Lake of well trained guides and drivers.

v. Inadequate staff deployed for controlling and regulating tourism in the park.

7.4. STRATEGIES:

7.4.1. IDENTIFICATION OF THE TOURISM ZONE:

The Tourism zone is identified in the form of two roads on both sides of the main Dachigam nallah in Dachigam NP. Details about the roads and tracks which are used for tourism purpose inside Dachigam NP:-

1) Road starts from gate no.1 to Daraphama VIP guest house.
2) Road starts from gate no.2 to Kawnar bridge on the other side of the main Dachigam nallah.
3) Tracking track from Drog watch tower to Menu watch tower.

For the future department is planning to add some more tracks for tourism purpose inside Dachigam and areas on the fringe of the National Park.

7.4.2. INFRASTRUCTURE DEVELOPMENT:

Road and tracks: The road inside Dachigam which starts from gate no.2 is in bad conditions which need improvement that can be done by laying gravel and boulders. This comes under the recurring maintenance owing to the fact that every year heavy snow fall and rain causes damage to the existing rood network inside Dachigam NP.

Eco friendly battery operated carts: Eco-friendly carts are available with the park authority. These carts are used on road no.1 and are allowed up to Draphama. The tourists or visitors are taken up to Lilcham and Draphana which is about 3-5 km from gate no.1 inside the park (Tourism Zone). The timings for visitors to visit Dachigam is 5.00 am to 5.00 pm. The fee charged for the cart is determined by the Department of Wildlife protection Jammu and Kashmir which changes time to time based on cost benefit analysis.

Fig. 29. Picture showing participants during conservation education sessions.

Fig. 30. Picture of watch tower near Drog visited by tourists inside Dachigam NP.

Lodging, boarding and other facilities: The department has one rest house at Panchgama which is meant for the official meetings only. Apart from Panchgama rest

house one dormitory and green huts are existing near to NIC for researchers which are occupied by central security forces.

Watch Towers: The existing watch towers are at the following places:

1). Drog watch tower
2). Menu watch tower
3). Reishwoder watch tower
4). Lilchum watch tower
5). GandKadal watch tower
6). Murkha watch tower

These existing watch towers require necessary maintenance. The areas for the construction of new watch towers and hide outs for wildlife observations and watching inside Dachigam will also be explored.

Separate Tourism staff:

Separate tourism staff under the control of Range officer is proposed which will help park authorities for the smooth running of tourism inside Dachigam. This tourism staff comprised of 2 Foresters, 5 Forest guards and 1 Range Asstt. This team will be fully devoted to look after tourism and eco-tourism activities inside and outside Dachigam NP.

Interpretation and Conservation Educations:

The aim of interpretation is to recreate in the minds of visitors, through the use of illustrative media. Curiosity develops among to know more interpret, appreciate, feel and develop an interest about the things in the wilderness. This perception further leads to their sensitization to the needs of wildlife. The role of the park authorities will be to assist the visitors in the sensitization process. Detailed information has been given in the theme plan of the Interpretation Education and Awareness.

Regulation, monitoring and evaluation:

There should be strict code of conduct for the visitors, which should be printed on the tickets and displayed at the ticket window and on the entrance gate of the park. Drivers and the nature guides should be made aware of their duties and responsibilities. Severe punishments should be awarded for the rule violators. Inside the park only registered vehicles are allowed for the ride. The color of the vehicle should not be bright, green should be preferred, the ground clearance of the vehicle should not be less then 190mm. The motor bikes should be allowed in any case for any purpose inside the park. There is an urgent need to restructure the existing entry presently applicable and is recommended to be enhanced by at least by 100 percent.

Awareness creation:

For popularizing wildlife safari and nature tracking inside wildlife areas zones should be identified starting up at gate no.2 to panchgam, Rajnari watch tower, oak patch and gate no.1. Proper documentation will be prepared, developed and disseminated in the form of hordings, pamphlets, posters, etc. This will also include:-

1) Setting up of library and related documentation facility. Organizing film show, exhibitions etc. both for rural and urban populace including students.
2) Organizing experience sharing workshop and use of mass media.
3) Organization of Environment/ Awareness camps.
4) Sensitization of politicians, public servants, media personnel's etc.

However, at present following measures are sought to be implemented.

1. Existing tourism tracks and roads will remain open as usual.
2. The eco-carts at Dachigam NP will be continued as usual and strict supervision will be required in order to prevent ant shot of corrupt practice.
3. At the entrance gate, enough publicity materials on Dachigam National Park and its wilderness will be kept for the use of tourists.
4. Vigorous effort will be made to improve and bring new facilities at Nature Interpretation Center located at Laribal.

5. A detailed study will be conducted on Tourism carrying capacity of Dachigam National Park by institute such as Wildlife Institute of India, etc.
6. Construction and renovation of watch tower for observation of wild animals in the tourism zone is also suggested.
7. The areas near to Dachigam will be explored for the eco-tourism potentials and some infrastructure should be constructed at these sites.
8. Tourism Department Jammu and Kashmir will be consulted regularly so as to assign some work such as repairing roads, creating tourists amenities and with its resources.

Table MEDIA, FORUMS AND FINANCIAL BUDGET INVOLVMENT/ YEAR

Medium	**Activities**	**Estimated Cost in Rs. Lakhs/Year**
Print Medium	Posters, booklets, pamphlets, news letter, wall slogans, website	2.5
Audio-Visual	Video program, Wildlife films	2.0
Exhibitions	Mobile as well as fixed	0.50
Mass media	News paper, magazines, T.V, radio	0.25
Other media	Street plays, exposure tours, eco-camps	1.0
Forums	Interactive forums such as meetings, Seminars, Workshops, Eco-Clubs, Demonstration Centers	2.0
Training program	Trainings of local people for skill transfer, training of eco-workers, Teacher training for program with children	2.0
	Total	

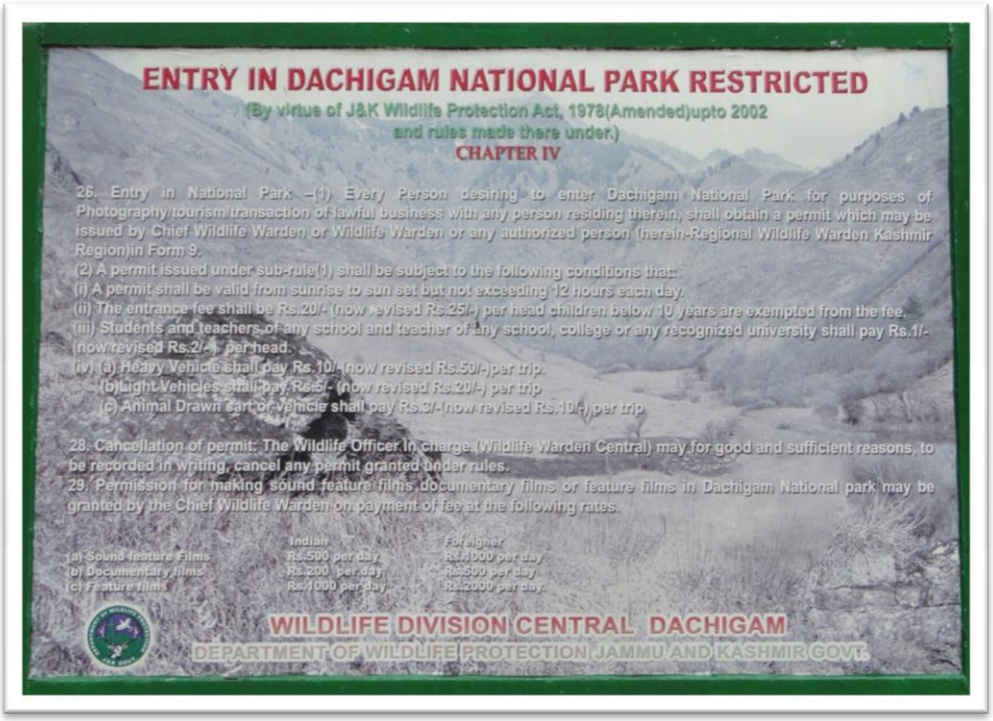


Fig. 31. Pictures showing pamlets and hoardings for visitors displayed at Dachigam national Park gate.

7.4.3. VISITORS ANALYSIS:

The frequency of visiting the park of the visitors should be analysis at the divisional office and feedbacks gathered from should scan will be used to enrich their experience and better management of tourism influx inside Dachigam. An effort shall be made to incorporate the aspirations/ expectations of visitors by coordinating with the other concerned government department and private organizations.

CHAPTER EIGHT

ECO-DEVELOPMENT

The Dachigam National Park is surrounded by 41villages. The livelihood of the people of these villagers is mainly of agriculture based and rearing cattle. The socio-economic condition of the majority of villagers mainly inhabited by Schedule Tribe (ST) and backward communities. As the existing wildlife low do not allow traditional access to forest based resources in the park, people have to explore other areas for some activities like cattle grazing, collection of wood, fishing etc. besides, sometimes the wild animals comes out of the park and cause the damage to life and property of the people resulting in man-animal conflict. Therefore to uplift the socio-economic condition of the people of the fringe villages and to maintain a good relation between wildlife warden and the villagers, a broad based eco-development program in the buffer zone should be adopted.

8.1. OBJECTIVES:

- **To create a congenial relation between the wild life warden and the people, this will act as an effective barrier against attempt of poachers and miscreants.**
- **To improve capacity of protected area management to conserve resources of the park and to achieve local co-operation for achieve park management objectives.**
- **To develop effective and extensive support for eco-development**.

8.2. SPECIFIC ISSUES:

- Alternative livelihood strategies.
- Improvement of living condition.
- Mitigating negative impact arising out of man-animal conflict.
- Community development work.
- Non consumptive use of protected area through eco-tourism.
- Dependence of villagers on forest resources.

- Sustainable use of forest resources.

8.3. BROAD STRATEGIES:

- Conduct participatory micro-planning and provide implementation support for eco-development.
- Provide assistance for village eco-development program which specify measurable feat by villagers to strengthen conservation effort of park management.
- Implementation of eco-development activities which will encourage alternative livelihood and resource use, conservation and protection of the protected area.

8.4. VILLAGE LEVEL SITE SPECIFIC STRATEGIES:

8.4.1. PARTICIPATORY MICRO-PLANNING AND IMPLEMENTATION PROCESS:

Micro-planning support teams composed of protected area personnel, NGOs and villagers will assist village communities to develop and implement micro-plan on a continuing basis. Micro-plan should be accommodating all issues such as guidelines, investment criteria, training program, schedule, commitment etc so as to ensure achieving the set objectives.

8.4.2. METHODOLOGY TO BE ADOPTED FOR ECO-DEVELOPMENT

- Eco-development guidelines issued by the government to be adhered to and strictly followed
- Formation of eco-development committees through active participation of all segments of society in planning and decision making.
- Participatory Rural Appraisal (PRA) technique is to be adopted for mutual interactions and reciprocal arrangements between the protected area management and people.

- Adoption of simplified micro-plan format. This will help in incorporating the PRA results in an easier way. Micro-plan should have clear information on objectives, activities proposed, mutual obligations, approved investments, schedule, monitoring and evaluation mechanism, indicators of success.

8.4.3. VILLAGE INSTITUTION AND MARGINAL SUB-GROUPS:

Each single village should have an Eco-development committee (EDC). Relatively small and homogenous villages in which all house holds are represented in the decision making body. Women, tribal, schedule caste, back ward castes, people from Panchayat and NGOs should be encouraged to contribute in the formulation of plan and decision making. This will enhance the success probability in a giant way.

8.5. MONITORING AND EVALUATION:

All the eco-development programs should have inbuilt monitoring and evaluation mechanism so as ascertain the progress in right direction and also keep the ongoing activities on right track through timely corrective measures. Monitoring team should be comprised of PA personnel, representative of EDC and NGOs. Monitoring formats should be prepared regularly and submitted for regular checking. The progress of the activities will be evaluated on the basis of set indicators of success.

Eco-development activities will comprise of the following:

1. To conduct detailed socio-economic survey in the fringe villages
2. Identification and development of local organizations/institutions.

3. Implementation of support program activities.

    a) Vaccination program.

b) Improvement of community facilities.
c) Community welfare activities.
d) Self employment activities.
e) Plantation program.
f) Compensation scheme for crop/hut damage and death cases caused by wild animal.
g) Miscellaneous income generation schemes.
h) Creation of durable community assets.

4. PRA and micro-planning will be main tool for executing eco-development activities.

CHAPTER NINE

RESEARCH, MONITORING AND TRAINING

9.1. RESEARCH AND MONITORING:

India is a country which has rich biodiversity. This biodiversity needs proper conservation and the National Wildlife Action Plan has recommended the establishment of representative network of protected areas to achieve this objective as well. The park management has to be equipped with all scientific data on exact status on park resources, ongoing ecological process, nature of threats and opportunities, etc. which will help in proper decision making and adopting effective strategies to deal with various management challenges. Research and monitoring is very much required for the batter management and conservation of biodiversity. Taking decision on park management goals and objectives, an information base is to be developed. It is desirable to have a well organized research base which would help the Protected Area Management in the following areas:-

- Improvement of bench mark knowledge
- Effective decision making
- Enhance integrity of park eco-system
- Enhance benefit
- Reducing overall management cost
- Finding solutions to threats
- Enhance public awareness and community participation in conservation

9.1.1. OVERVIEW OF RESEARCH AND MONITORING ACTIVITES:

9.1.1.1. RESEARCH:

Though Dachigam National Park is an ideal place for researchers, but it is almost neglected by research institution for long time because of political term oil in the state of Jammu and Kashmir. Inadequate scientific data on various management aspects is becoming problem in decision making. In many areas, even initial action has not been taken till now. Whatever research works has been done, these were confined to following:

- Some aspects on life history traits of Hangul.
- Information on Prey-predator relationship.
- Information on genetic structure of Hangul and other species for population viability.
- Preparation of check lists, floristic and faunal species.
- Satellite based studies on habitat use and suitability analysis.

Only few studies have been carried out on hangul dealing with habitat use, food habits and population estimates. A base line data on socio-economic status of the fringe area is yet to be acquired. There are many threat perceptions for which studies are not yet initiated.

9.1.1.2. MONITORING:

At present only estimation of wild animals with special emphasis on hangul is being conducted at fairly regular interval. A long term study on ecology of Asiatic Black Bear is under going from Wildlife Institute of India. Apart from hangul censes there is need to have population estimation of black bear, leopards and other species which will help the park management in better decision making. Now, park management has identified some extremely urgent areas in which monitoring is considered to be initiated immediately and these are population dynamics of hangul,

leopard and black bear, dynamics of food availability and threats to wildlife etc. But effort is yet to be initiated.

Monitoring population trends:

The general response of various species in the park to the present management practices, which is primarily protection oriented is very encouraging. The population of all species exhibits an increasing and stable trend. However, the inter-specific relationship, their impact on habitat, ecological problems, and status of habitat is yet to be properly ascertained.

Dachigam National Park holds the last viable population of hangul in world. The hangul population in Dachigam has shown a decreasing trend since 1940's and continues till date. The numbers have declined drastically since 1947 (Gee 1966, Schaller 1969, Holloway 1970, Department of Wildlife Protection 2004). There were between 1000-2000 hangul individuals just before independence but by late 1950's, the numbers had already fallen to about 400 individuals (Gee 1966). The number of hangul estimated in November 1969 in Dachigam was approximately 150-200 (Holloway and Schaller 1970). According to Holloway (1970), the total number of hangul in Dachigam population was 140-170 individuals in February 1970. Population estimations carried out in winter 1976/77 and in April 1977 estimated the Dachigam population at about 250 individuals, an increase of 25% from 1975 (Kurt 1978). This conclusion was attributed to the fact that poaching had been largely been contained with the assistance of Indian Armed Forces (Kurt 1978). After the 1980's the population of hangul showed marked fluctuations, a reflection of either true population fluctuations or inadequacies in population estimations carried out.

Estimation of hangul is carried out on regular basis for understanding the population trends on spatial and temporal scale. This exercise is carried out in technical collaboration with Wildlife Institute of India. Local NGO's, students, naturalists, scientists are also involved in the estimation process. In 2009, the hangul population (raw counts) was estimated to be 175 (SE$\pm$23). The estimated population based on sight-resight method ranges between 201 and 234 animals. The population appears to be stable. The 2009 hangul population estimate and recruitment indicate a

positive trend. The latest population estimation was carried out in March 2011 were the present hangul number was n=? ± ? which was ?

Studies in collaboration with national institution like Wildlife Institute of India are to be undertaken to assess the carrying capacity of the major species such as:- Common Leopards, Asiatic black bear, Himalayan grey Langur etc.

9.1.1.3 RESEARCH INFRASTRUCTURE AND PRESENT STATUS:

A present basic facilities such as accommodation, field equipment, laboratory, museum, vehicle, library and computer facility etc. for conducting research are virtually non existent. There is one research officer in department which is looking entire state and there is no research officer which is fully devoted to park management. There is need for providing some facilities for augmenting research works in Dachigam National Park such as building, laboratory, library and few assistants for collection of regular data on the park environment. Research is not been given worth while attention to strengthen the park management for a long period.

Prescription:

Research officer for the park should be appointed and the research wing should be made fully functional. It will be supervised directly by the chief wildlife warden. The main thrust will be collection of routine data, compilation, population dynamics and census, vegetation monitoring, threats to wildlife and identifying research areas which needs immediate and future attention and a well designed study. The research wing should be entrusted with proper documentation of scientific data.

9.1.1.4 RESEARCH ADVISORY COMMITTEE:

There is need for having a Research Advisory Committee (RAC) at the protected area level which will advise on various policies related matters. The research permissions should be issued to the researchers based on the evaluation of the project where the need, effectiveness should be evaluated by the advisory committee. Composition of research Advisory Committee will be as follows:

RESEARCH ADVISORY COMMITTEE

1.	Chief Wildlife Warden (PCCF).	**Chairman**
2.	Regional Wildlife Warden (Conservator of forest).	Member
3.	Two eminent scientists working on: Wildlife related studies/ Ecological research/ Bio-sciences drawn from WII, ICFREE/ Kashmir University.	Member
4.	An eminent scientist from Jammu university/ Kashmir central university.	Member
5.	Wildlife Warden Central and South (Managers of DPN) divisions	Member
6.	One scientist who have done or doing research in DNP	Member
7.	Manager of Dachigam National Park	**Member Secretary**

9.1.1.5 RESEARCH FUNDING:

Adequate funds should be provided for execution various research works for consolidation of research wing on the following issues:

- Field research and monitoring
- Strengthening Research infrastructure
- Meeting research coordination cost

9.1.1.6 IDENTIFICATION OF RESEARCH THRUST AREAS AND RESEARCH TOPICS:

(A) ECOLOGY (INCLUDING HABITAT):

I. Biodiversity of Dachigam National Park
II. Vegetation community structure in Dachigam National Park
III. Habitat ecology of Himalayan grey langur, Common leopard
IV. Seasonal habitat suitability for Hangul
V. Population ecology (Asiatic black bear, Common leopard)

(B) ETHOLOGY:

I. Social and reproductive behavior of different species e.g. hangul, leopard, black bear
II. Home range and Movement patterns of hangul
III. Study on reptiles in Dachigam NP
IV. Inter-specific relationship between hangul, leopard, black bear and langur

(C) WILDLIFE POPULATION SURVEYS:

There is a huge scope in refinement of current wildlife population methods which will help in giving more robust estimate of animals in Dachigam National Park. A precise estimate of animal population with spatial and temporal scale will help the task of management in selecting the proper strategy at the proper time.

(D) WILDLIFE POPULATION DISESAES:

Research studies dealing with wildlife disease in Dachigam National Park are required. Database on various wildlife diseases of different species should be maintained. Study on livestock diseases of importance to wildlife and wildlife diseases of importance to livestock & Zoonontic diseases.

(E) SOCIO-ECONOMIC

The socio-economic studies of the local forest dwellers are extremely important to understand the there livelihood on the forest resources extracted from Dachigam and surrounding protected areas of Dachigam. This type of study will help the management in changing antagonistic behavior towards wild animals such as Asiatic black bear, common leopard etc. by local villages which they develop during the man-animal conflict situations.

(F) MISCELLANEOUS:

1) Monitoring the landscape use by hangul, black bear using satellite-telemetry

2) Monitoring the population growth of hangul
3) Genetic studies on hangul population viability
4) Impact of tourism on the park ecosystem and its management
5) Impact of security forces operation and camps inside Dachigam on behavior of wild animals
6) Effect of pesticide used in the adjoining apple and cherry orchid on the ecosystem and bird community structure of Dachigam
7) Long term study on man-animal conflict around Dachigam to identify the factors responsible
8) Detailed study on the socio-economic status of the peoples living in surrounding villages of Dachigam and the nomadic grazers
9) Study on small mammals of Dachigam
10) Study on insects and butterflies of Dachigam to understand the community structure

9.1.1.7 RESEARCH PROJECTS UNDER TAKEN IN DACHIGAM NATIONAL PARK:

Few research projects were under taken in Dachigam but mostly on hangul ecology except a long term study which is under going on ecology of Asiatic black bear at Dachigam by Wildlife Institute of India. Most of the research work has been done during 1970-1990 basically on hangul population and habitat ecology. University of Kashmir have carried out many research work mainly on flora of Dachigam and a very few studies on wild animals including langur, black bear, leopard and hangul.

The projects which were more scientifically oriented and involved systematic data collection and analysis have been undertaken only in the recent years. Three Doctoral work (Bhat 1985, Ahmad 2005, Bilal 2009), and more than five Msc dissertation (Manjeraker1989, Shaberwal 1989, Sebasteen 2010, etc) have been carried out in Dachigam by various research organization. The ongoing project on Ecology of Asiatic black bear is the only research project in which data was collected systematically of long time and which includes all the ecological aspects of black bear

mainly population, ranging pattern, movement patterns, food habits, habitat use, population genetics and black bear – human conflict.

The need to undertake long term studies especially on the population dynamics on large mammals is of great importance of the management and conservation.

Fig. 32. Pictures showing researcher performing field work at Dachigam NP.

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9.1.1.8. MANAGEMENT INFORMATION SYSTEM:

The park authority is not having well documented information system and this is causing numerous inconveniences and problems in overall functioning of the organization. Following problems the management is facing due to non-existent of management information system have been identified:-

- Delays in transmission of information.
- Slow retrieval of information.
- Repetitive processing of information manually.
- Erratic flow of information
- Lack of standard formats.
- Non Compliance of the schedules.

Efficient management information is suggested for Dachigam National Park which will address the following:

- Areas requiring special attention
- General periodical return
- Forest and wildlife offences and court cases relating to crimes
- Pending court cases related to addition areas.
- Boundary survey and demarcation.
- Detailed information on flora, fauna, habitat, terrains etc.
- Tourisms details.
- Welfare and eco-development activities.
- Socio-economic data of the house hold in fringe villages surrounding Dachigam
- Management plan and prospective planning.

- Personal information systems including deployment of staff.
- GIS based resource inventory including wildlife estimation and inventory of development works.
- Annual action calendar, budgeting, monitoring and evaluation.
- Assistance provided by external aid agencies and inventory of such aids.
- Environmental education and awareness creation programs.
- Information on registered arms in accordance with the wildlife protection act. 1978.
- Information on the entire existing infrastructure inside the national park.
- Information on habitat manipulation and improvement such as weeding, plantation etc.
- Information on immunization of domestic animals in accordance with wildlife protection act. 1978
- Information of the villages located in the zone of influence.
- Information on the number of livestock and there immunization in sheep breeding center located in Dachigam NP.
- Information on the number of livestock going for grazing in upper Dachigam from sheep breeding center.

Prescription

- ✓ Information need at different level will be identified.
- ✓ Identification of sources of data.
- ✓ Finalization of standardized formats for collecting and recording data will be done.
- ✓ A communication network for information transfer and feed back will be identified.
- ✓ Formats for all report, publications will be finalized as per needs of different levels.
- ✓ Range officers will maintain all relevant data up to date and in a systematic manner.
- ✓ These data will be pertaining to all relevant information on villages, resources, offences etc.

- ✓ Computer based GIS frame work will be used for inventory and management purposes including monitoring and evaluation.
- ✓ The divisional offices will be equipped with computer facilities and internet connections. Important computer software's will be procured for the record keeping and interpretation.
- ✓ Networking and creation of exclusive web site for Dachigam National Park will be executed.
- ✓ The basic character of the data to be collected in the field by the staff remains the same as far as possible.
- ✓ The format of out put data should be kept as existing today to avoid confusion at decision level.
- ✓ The formats for transfer of information should be designed in a simple and compressive manner for making quick decision.
- ✓ Provision for collection of input data in a easy way.
- ✓ The program be introduced in a phased manner and improved according to the need.
- ✓ A renowned consultancy firm may be entrusted to for design Management Information System for Dachigam National Park.

9.2 TRAINING:

Wildlife management has emerged as a science and this science is making progress. The different cadres of wildlife staff are to be imparted with certain level of basic training and education on wildlife management and other related disciplines to entrust them different tasks for effective management on the park. Staffs are also to be made physically fit through regular training and include handling modern's arms, combat, etc. to deal effectively against training.

It is realized that there is inadequacy of training at all levels. Basic skill development will be targeted for the field staff. The front line staff will be exposed to other wildlife areas outside the state on regular based for development of the skills and to bring competitive attitude among them. It is proposed to carry out regular training programs on matters of wildlife protection, conservation and relevant subjects

of wildlife management in the field as well as reputed specialized institutes of the country.

TRAINING AREAS:

- ✓ Wildlife and forest protection laws.
- ✓ Handling arms and modern combat.
- ✓ Management and handling of man-animal conflict situation.
- ✓ Management of ranging patterns of animals especially large carnivores.
- ✓ Nature interpretation.
- ✓ Population dynamics and wildlife estimation.
- ✓ Animal health and nutrition.
- ✓ Participatory rural appraisal and micro-planning.
- ✓ Ecology and population biology.
- ✓ First Aid.
- ✓ Intelligence gathering.
- ✓ Management of captivity animals.
- ✓ Basic wildlife forensics.

Fig. 33. Pictures showing various training sections for the front line staff of Dachigam National Park.

Short term training courses can be held at field level in which skill will be imparted to the staff. The institutes where other training can be organized are:

1. Wildlife Institute of India, Dehradun.
2. Forest Research Institute, Dehradun.
3. SUKAST-K, Srinagar.
4. Indian Institute of Forest Management, Bhopal.
5. Indian Institute of Remote Sensing, Dehradun.

It is also possible to send higher level officers of the park management to other countries for getting training on advanced wildlife management techniques and other relevant issues like GIS so as to equip them with the latest technological developments in this rapidly growing science.

Detailed year wise training plan will be prepared in consultation with the training institutes when ever required.

9.2.1. ESTABLISHING OF TRAINING CENTER:

After fulfilling the regular monitoring and database generating needs, it would be essential that a learning/training center should be established where the staff is imparted training for furthering the cause. This would also ensure the sustainability of the system. A well equipped hostel preferably at least 10 rooms should come up and the renovation and maintenance of the existing audio-visual center is essential in this regard.

CHAPTER TEN

ORGANIZATION AND ADMINISTRATION

10.1 STRUCTURE AND RESPONSIBILITIES

10.1.1. PRESENT SETUP:

The present Dachigam National Park was upgraded as National Park from its Wildlife sanctuary status in 1982. The management during 80's was so intense and technically oriented that the Dachigam national park received a national award for the best management national park in the country. The Dachigam National Park is administratively managed by two Wildlife wardens. Lower Dachigam comes under the jurisdiction of Wildlife Warden Central, Kashmir and its head quarter is located at Harwan (Srinagar) and, the upper Dachigam is managed by Wildlife warden South, head quartered at Beajbihara, (Anantnag). Regional Wildlife Warden (Conservator of forest (Wildlife), Kashmir) plays supervisory and managerial roles on the activities executed by wildlife Warden.

10.1.2. PROPOSED STAFF PATTERNS:

A director of the National Park will be assisted by the following officers is proposed:

1. Field Director: -- 1
2. Research officer: -- 1
3. Wildlife veterinary officer: -- 1
4. Range officers: -- 2
3. Black officers: -- 5
4. Forest guard: -- 45

For proper staffing of anti-poaching camps, it is estimated the number of anti-poaching camps will rise to 5. With this back ground following staff arrangement will be required:-

Item	Forester/ Block officer	Forest guard	Helper/ Watcher
Fro anti-poaching camps	5	10	15
For mobile squad at range H.Q.	2	5	5

For the maintenance and caretaking of captivity animals at captivity center 5 no. of helpers are required.

10.2 STAFF AMINITIES:

The work of field staff is very stiff they supposed to work under constrictions and in every odd situation like: squally weather, confronting wild animals, etc., usual patrolling of park in day-night. The climatic condition in the landscape becomes very harsh in winter season for which devotion and hard work have been recognized through out the world and in fact it is matter to pride for the park management.

The basic amenities required to provide for smooth functioning in field are:

- Regular supply of uniform and jungle and gum boots.
- Provision of raincoats and pullover at convinced time.
- Provision for regular supply of flash lights and batteries.
- Regular supply of kerosene and whirlwind lamps
- Provision of winter gars in extreme cold conditions

These are the needs to scrutiny of the park. Except this a few more requirements are to be provided to the field staff for the improvement working capacity and to make them enthusiastic towards their daily strenuous work as:

- Free ration should be provided as they are scantily paid find in difficulty to feed bread-butter to their family.
- Regular health check up with some life saving drugs and a registered medical practitioner should be provided.
- All the medical treatments should provided by the government for the workers who injured or seriously ill at the time of their duty.
- Possible, ex-gratia grant should be provided to the immediate relatives of the staff who succumb to death while on duty to illness, any accident.
- Construction of housing complex in every range head quarter for the staff families will be helpful; in turn it will affect the work out put of the staff. Incidence of unauthorized absence will also be checked.

CHAPTER ELEVEN

THE BUDGET

Dachigam National Park gets funds from state government under various Plan and Non Plan budgets. The budgeting for plan has been done for the initial five years. After five years based on the impact of management prescriptions and local conditions ,necessary changes in the management may be incorporated and the budgeting then will be accordingly designed for the future implementation of the plan. The major expenditure for maintenance of the park and other Anti-pouching activities are incurred from the fund under following Plan and Non-Plan Budgets:

11.1. PLAN

11.1.1 CENTRALSECTOR:

11.1.2. STATE SECTOR:

1. Development and management of protected area.
2. Control of pouching.

Although the budget seems to be a big budget, some portion of amount is spent for the salaries of staff and wages for anti-pouching works. There is a scope for the developmental works and absolutely necessary logistic needs. This often results in

accrual of huge amount as arrear for procurement of supplies and maintenance cost of assets on credit in effective protection of the park.

11.2. TIMELY ALLOCATION AND RELEASE OF FUNDS AND PLOUGHING BACK OF REVENUE GENERATED BY TOURISM

Every year the park envisages an Annual Plan of Operation (APO) based on various strategies proposed in the management plan. The grant is also sanctioned by state government however the timely allocation of the funds usually does not take place. Sometime it reaches late and As a result there are difficulties in carry out the work allotted for that year. Several strategies therefore are suggested to streamline the funding processes which are as following:

ITEMS OF BUDGETING COMPONENTS:

NON-RECURRING:

1. **Protected area management:**
    i. Anti-pouching camps
    ii. Equipment(camera, binoculars etc)
    iii. Roads\ tails
    iv. Buildings
    v. Habitat improvement
    vi. Fences
    vii. Survey and demarcation
2. **Infrastructure and communication**:
    i. Vehicle.

ii. Wireless system.

iii. Specialized equipments

iv. Field equipments

3. **Eco-development** :

i. Entry point investment.

ii. Village eco-development program

iii. Specialized program

4. **Tourism management** :

i. Tourism facilities

ii. Nature trails

iii. Camp facilities

iv. Interpretation centre

v. Development of educational audio-visual programs

5. **Information system:**

i. Computers and software

ii. Survey equipments

iii. Printing and electro state equipments

6. **Environmental education**:

i. Development and procurement of education material

ii. Educational programs

7. **Research and monitoring:**

i. Research studies

ii. Research facilities

iii. Monitoring studies

iv. Development of research lab

8. Staff amenities:

i. Solar lighting.

ii. Camping equipments

iii. Housing for families of staff.

RECURRING COST:

1. Establishment cost:

i. Salaries and allowance

ii. TA/Medical

iii. Office expenses

2. Maintenance cost:

i. Maintenance of camps and buildings

ii. Maintenance of vehicle

iii. Maintenance of patrolling path, trails

iv. Uniform and other staff amenities (torch, batteries, kerosene, winter gear.

v. Maintenance of wireless network

vi. Compensation arising out of man animal conflict

vii. Training

viii. Research

ix. Legal fees

x. Awareness program

xi. Staff welfare

xii. Co-ordination

xiii. Immunization program

xiv. Wages

Financial requirements for the management plan period have been prepared and shown in the next page.

DISTRIBUTION OF NON RECURRING EXPENDITURE DURING THE PLAN PERIOD (AT CURRENT RATES)

Item/ Activities	Distribution during plan period (Rs. In Lakh)										Total
	1st Year		2nd Year		3rd Year		4th Year		5th Year		
NON-RECURRING / CAPITAL	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
1	2	3	4	5	6	7	8	9	10	11	12
Boundary Survey and demarcation:	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
Erection of boundary pillars	100	2.00	100	2.00	100	2.00	100	2.00	100	2.00	10.00
Control of poaching:											
A. Anti-poaching camp/watch tower	10	2.00	10	2.00	10	2.00	10	2.00	10	2.00	10.00
i. new construction	2	5.00	2	5.00	2	5.00	2	5.00	2	5.00	25.00
B. Equipment procurement											
i. wireless and accessories	LS	1.00	LS	1.00	LS	1.00	-	-	-	-	3.00
ii. flash lights	20	1.00	20	1.00	20	1.00	-	-	-	-	3.00
iii. binocular	20	1.00	-	-	-	-	20	1.00	-	-	2.00
iv. night vision binocular	5	2.00	-	-	5	2.00	-	-	-	-	4.00
v. solar light	100	12.00	-	-	100	12.00	-	-	-	-	24.00
C. Mobility											
Purchase of :-											
i. Vehicles	1	8.00	-	-	-	-	1	10	-	-	18.00
ii. Motor bikes	-	-	6	3.00	-	-	-	-	6	3.50	6.50
iii. Excavator & dumper	1	20.00	-	-	-	-	-	-	1	20	40.00
Control of grazing and other biotic disturbances	LS	3.00	LS	3.00	LS	3.00	LS	3.00	LS	3.00	15.00
Cattle proof fencing	1 km	5.00	-	-	1 km	5.00	-	-	1km	5.00	15.00
Grassland management	LS	2.00	-	-	LS	2.00	-	-	LS	2.00	6.00
Demarcation of fire lines	10 km	2.00	10 km	2.00	10 km	2.00	10 km	2.00	10 km	2.00	10.00
Control of ranging pattern of wild animals outside managed habitat	LS	4.00	LS	4.00	LS	4.00	LS	4.00	LS	4.00	20.00

Fencing including power fencing at strategic points	2 km	20.00	-	-	2 km	20.00	-	-	2 km	20.00	60.00
Total	-	92.0	-	25.0	-	63.0	-	31.0	-	70.5	281.5

1	2	3	4	5	6	7	8	9	10	11	12
Infrastructure & communication :											
A. building construction:											
i. Wildlife warden's office	-	-	-	-	-	-	-	-	1	20.00	20.00
ii. Range office-2 no.	1	10.00	-	-	1	10.00	-	-	-	-	20.00
iii. field staff quarter	2	10.00	-	-	1	5.00	-	-	1	5.00	20.00
iv. office asstt's quarter	-	-	-	-	-	-	1	5.00	-	-	5.00
B. Culverts construction	2	2.00	-	-	2	2.00	2	2.00	-	-	6.00
C. causeway construction	1	1.00	-	-	1	1.00	1	1.00	-	-	3.00
Animal health surveillance											
D. livestock immunization	LS	2.00	-	-	LS	2.00	-	-	LS	2.00	6.00
i. mobile van	-	-	1	8.00	-	-	-	-	1	9.00	17.00
ii. laboratory equipment	LS	3.00	LS	3.00	-	-	LS	3.00	-	-	9.00
Man animal coexistence:	LS	5.00	LS	5.00	LS	5.00	LS	5.00	LS	5.00	25.00
Erection of power fencing-	1 km	10.00	1 km	10.00	-	-	-	-	1 km	10.00	30.00
Research :											
i. Building(database centre)	1	20.00	-	-	-	-	-	-	1	20.00	40.00

ii. equipments	LS	5.00	-	-	-	-	LS	5.00	LS	5.00	15.00
iii. furniture	LS	1.00	LS	1.00	-	-	-	-	LS	1.00	3.00
iv. research lb facility	-	-	-	-	LS	20.0	-	-	-	-	20.00
Management information system:											
i. consultancy	LS	2.00	-	-	-	-	LS	2.00	-	-	4.00
ii. equipments	-	-	LS	5.00	LS	5.00	-	-	LS	5.00	15.00
*computer with accessories	2	1.00	-	-	2	1.00	-	-	-	-	2.00
*camera (still/video)	1	5.00	-	-	-	-	1	5.00	-	-	10.00
* Photostat machine	-	-	-	-	1	0.50	-	-	1	0.50	1.00
Total	-	77.0	-	32.0	-	51.5	-	28.0	-	82.5	271.0

1	2	3	4	5	6	7	8	9	10	11	12
*net-working	LS	3.00	LS	2.00	-	-	-	-	-	-	5.00
*gis &software including satellite imageries	LS	2.00	LS	2.00	-	-	-	-	LS	1.00	5.00
iii. web site	LS	2.00	LS	1.00	-	-	-	-	LS	1.00	4.00
Tourism ,interpretation and conservation education											
Tourism :	LS	3.00	LS	3.00	LS	3.00	LS	3.00	LS	3.00	15.00
Purchase of battery operated vehicle	3	15.00	3	15.00	-	-	3	15.00	-	-	45.00
Interpretation :											
i. new building	-	-	-	-	1	30.00	-	-	-	-	30.00

ii development and execution of interpretation model & materials	LS	1.00	LS	1.00	LS	1.00	-	-	-	-	3.00
Staff amenities :											
i. transit camp for staff – 2 Nos.	1	2.00	-	-	1	2.00	-	-	-	-	4.00
Accommodation for staff – 10 Nos.	2	12.00	2	12.00	2	12.00	2	12.00	2	12.00	60.00
Total	-	40.0	-	36.0	-	48.00	-	30.00	-	17.00	171.00
Total of Non-Recurring Items	**-**	**209.00**	**-**	**93.00**	**-**	**162.5**	**-**	**89.00**	**-**	**170.00**	**723.5**

DISTRIBUTION OF RECURRING EXPENDITURE DURING THE PLAN PERIOD (AT CURRENT RATES)

Item/ Activities	Distribution during plan period (Rs. In Lakh)										Total
	1st Year		2nd Year		3rd Year		4th Year		5th Year		
RECURRING / CAPITAL	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
1	2	3	4	5	6	7	8	9	10	11	12
Boundary Survey and demarcation:											
A. External & internal boundary survey and monitoring	1 km	2.00	1 km	2.00	1	km	2.00	1	km	2.00	10.00
B. Coordination meeting with other departments	LS	1.00	-	-	-	-	LS	1.00	-	-	2.00
Zone plans											
Habitat restoration	1 lac plants 1 lac	20.00	1 lac plants 1 lac	20.00	1 lac plants 1 lac	20.00	1 lac plants 1 lac	20.00	1 lac plants 1 lac	20.00	100.00

	patches 1 lac dibbling Soil arresting measures		patches 1 lac dibbling Soil arresting measures		patches 1 lac dibbling Soil arresting measures		patches 1 lac dibbling Soil arresting measures		patches 1 lac dibbling Soil arresting measures		
Legal matters in courts	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
Control of pouching:											
A. Anti-pouching camps:											
i. repairing of anti pouching camps & buildings	10 camps	5.00	10 camps	5.00	10 camps	5.00	10 camps	5.00	10 camps	5.00	25.00
B. Equipments											
i. Repairing	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
*arms	-	-	-	-	2	2.00	2	2.00	-	-	4.00
*wireless	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
*flash light	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
* solar Lanterns	50	2.50	50	2.50	50	2.50	50	2.50	50	2.50	12.50
iii. purchase :											
* battery	5	0.50	-	-	-	-	5	0.50	-	-	1.00
C. Staffing											
* increment staff wages	-	-	-	-	-	-	-	-	-	-	-
D. Mobility											
i. Maintenance of vehicle	4	2.00	4	2.00	4	2.00	4	2.00	4	2.00	10.00
ii. Purchase of POL	4	3.00	4	3.00	4	3.00	4	3.00	4	3.00	15.00
Total	-	41.00	-	39.5	-	41.5	-	43.00	-	39.5	204.5

1	2	3	4	5	6	7	8	9	10	11	12
C. Patrolling :											

i. Patrolling path	10 km	1.00	10 km	1.00	10 km	1.00	10 km	1.00	10 km	1.00	5.00
ii. maintenance/new alignment of @ Rs.0.10/km	10	1.00	10	1.00	10	1.00	10	1.00	10	1.00	5.00
iii. Surveillance plateform	2	1.00	2	1.00	2	1.00	2	1.00	2	1.00	5.00
iv. Logistics	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
*contingencies for camps	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
F. Intelligence gathering											
*Purchase of information/hiring of vehicles/operational Expenses etc.	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
Control grazing and other biotic disturbances	LS	5.00	LS	5.00	LS	5.00	LS	5.00	LS	5.00	25.00
*wages for temporary cattle watchers	LS	3.00	LS	3.00	LS	3.00	LS	3.00	LS	3.00	15.00
Grass land management	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
A. Annual survey of fire lines	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
B. Uprooting of unwanted tree seeding	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
C. Vegetation mapping	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
D. wages for creating and maintenance of fire lines app. @	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
Awareness programme about conflict											
A. Meeting for public	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00

awareness											
B. Rewards for villagers for rescue	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
C. Logistic support to additional staff on deputation	-	-	-	-	-	-	-	-	-	-	-
D. Signboard etc.	10	2.00	10	2.00	10	2.00	10	2.00	10	2.00	10.00
E. External veterinary & other services(hiring of vehicle etc.)	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
F. Health check-up	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
G. Publicity material	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
Total	-	32.00	-	32.00	-	32.00	-	32.00	-	32.00	160.00

1	2	3	4	5	6	7	8	9	10	11	12
Control of ranging pattern of wild animal outside of managed habitat											
A. Immobilization &capture	LS	5.00	LS	5.00	LS	5.00	LS	5.00	LS	5.00	25.00
B. Wages for driving back animal	LS	3.00	LS	3.00	LS	3.00	LS	3.00	LS	3.00	15.00
C. Hiring of vehicle	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
Infrastructure & communication :											
A. Building											
i. office repairing	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
ii. Staff quarter repairing	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00

B. roads											
i. repair/annual maintenance of central roads	5 km	10.00	5 km	10.00	5 km	10.00	5 km	10.00	5 km	10.00	50.00
ii. repair/annual maintenance of fair weather roads	10 km	1.00	10 km	1.00	10 km	1.00	10 km	1.00	10 km	1.00	5.00
C. Annual repairing of existing -? Wooden bridges and culverts	10	2.00	10	2.00	10	2.00	10	2.00	10	2.00	10.00
D. Annual repairing of causeway	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00	5.00
Weed control											
A. Annual survey	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
B. Wages for eradication	LS	3.00	LS	3.00	LS	3.00	LS	3.00	LS	3.00	15.00
C. Purchase of P.O.L.	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
Erosion control:											
A. Monitoring of bank line using satellite imageries	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
B. Co-ordination meeting with flood control and other departments	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
Animal health surveillance											
Maintenance of departmental b.bear & C.leopard including feed, veterinary care,	LS	4.00	LS	4.00	LS	4.00	LS	4.00	LS	4.00	20.00
Livestock immunization including logistic support:	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00

Total	-	40.00	-	40.00	-	40.00	-	40.00	-	40.00	200.00

1	2	3	4	5	6	7	8	9	10	11	12
Man animal coexistence											
A. Wages for crop protection	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
B. Logistic support	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
C. Compensation and treatment of injured persons	LS	5.00	LS	5.00	LS	5.00	LS	5.00	LS	5.00	25.00
D. Power fencing maintenance	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
Research and monitoring :											
A. laboratories equipments	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
B. Books etc.	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
C. Project cost- 3 Nos.	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
D. Stationary ,logistics and writing of reports	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
Eco –development :											
A. Socio-economic survey	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
B. Micro-planning & project formulation	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
C. Execution of eco-development activities	LS	10.00	LS	10.00	LS	10.00	LS	10.00	LS	10.00	50.00
Tourism:											

A. Tourist amenities	LS	10.00	-	-	LS	10.00	-	-	-	-	20.00
B. Training	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
C. Publicity	LS	2.00	LS	2.00	LS	2.00	LS	2.00	LS	2.00	10.00
D. Monitoring	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
E. development of eco-tourism sites	LS	10.00	-	-	LS	10.00	-	-	LS	10.00	30.00
Interpretation :											
A. Improvement of existing facilities	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
B. Consultancy	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
	2	3	4	5	6	7	8	9	10	11	12
C. Equipment	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
Management information system:											
A. Consultancy for contractual staff	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
B. Website and updating	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
C. Population dynamic census	LS	3.00	LS	3.00	LS	3.00	LS	3.00	LS	3.00	15.00
Training	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
A. Local	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
B. Institutional	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
C. Educational tour & visit to other protected areas	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
Organization and administration											

Staff amenities:											
A. Medical facilities	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
B. Uniform	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
C. Camp equipment	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
D. Free ration for field staff	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
E. Office maintenance	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	5.00
Total	-	69.00	-	49.00	-	69.00	-	49.00	-	59.00	295.0
Total of Recurring items	**-**	**182.00**	**-**	**160.5**	**-**	**182.5**	**-**	**164.00**	**-**	**170.5**	**859.5**

ABSTRACT

											Total
	1st Year		2nd Year		3rd Year		4th Year		5th Year		
RECURRING	-	209.00	-	93.00	-	162.5	-	89.00	-	170.00	723.5
Non -RECURRING	-	182.00	-	160.5	-	182.5	-	164.00	-	170.5	859.5

Total (AT PRESENT RATES)	**-**	**391.00**	**-**	**253.5**	**-**	**345.0**	**-**	**253.0**	**-**	**340.5**	**1583.00**
Projected total expenditure @5% annual increase on present rates	**-**	**391.00**	**-**	**266.17**	**-**	**362.25**	**-**	**265.65**	**-**	**357.52**	**1642.59**

CHAPTER TEWELVE

THE SCHDULE OF OPERATION

An action calendar for timely execution of various management activities in the park has been prepared and shown in the next page, which has to be followed strictly.

THE SCHDULE OF OPERATION

Non Recurring/ capital	Jan	Feb	Mar	Apr	Mar	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	3	4	5	6	7	8	9	10	11	12	13
Boundary Survey and demarcation:												
Erection of boundary pillars												
CONTROL OF POACHING												
A. Anti-pouching camp/watch tower												
i. New construction												
B. Equipment procurement												
i. Wireless and accessories												
ii. Flash lights												
iii. Binocular												
iv. Night vision binocular												

v. Solar light												
C. Mobility												
PURCHASE OF												
i. Vehicles												
ii. Motor bikes												
iii. Excavator & dumper												
Control of grazing and other biotic disturbances												
Cattle proof fencing												
Grassland management												
Demarcation of fire lines												
Control of ranging pattern of wild animals outside Managed habitat												
Fencing including power fencing at strategic												
INFRASTRUCTURE & COMMUNICATION												
A. Building construction:												

i. Wildlife warden's office												
ii. Range office-2 no.												
iii. Field staff quarter												
iv. Office assistants quarter												
B. Culverts construction												
C. Causeway construction												
ANIMAL HEALTH SURVEILLANCE												
D. Livestock immunization												
i. Mobile van												
ii. Laboratory equipment												
MAN ANIMAL COEXISTENCE:												
Erection of power fencing-												
1	2	3	4	5	6	7	8	9	10	11	12	13
RESEARCH												

i. Building(database centre)												
ii. Equipments												
iii. Furniture												
iv. Research lab facility												
MANAGEMENT INFORMATION SYSTEM:												
i. Consultancy												
ii. Equipments												
*Computer with accessories												
*Camera (still/video)												
* Photostat machine												
*Net-working												
*GIS &software including satellite imageries												
iii. Web site												
Tourism ,interpretation and conservation education												

TOURISM												
Purchase of battery operated vehicle												
INTERPRETATION												
i. New building												
ii Development and execution of interpretation model & materials												
STAFF AMENITIES												
i. Transit camp for staff – 2 Nos.												
Accommodation for staff – 10 Nos.												
RECURRING / CAPITAL												
Boundary Survey and demarcation:												
A. External & internal boundary survey and monitoring												
B. Coordination meeting with other departments												

Zone plans												
Habitat Restoration												
Legal matters in courts												
CONTROL OF POUCHING:												
A. Anti-pouching camps:												
i. Repairing of anti pouching camps & buildings												
B. Equipments												
i. Repairing												
*Arms												
*Wireless												
*Flash light												
* Solar light												
iii. Purchase :												
* Battery												

C. Staffing												
* Increment staff wages												
D. Mobility												
i. Maintenance of vehicle												
ii. Purchase of POL												
C. Patrolling :												
i. Patrolling path												
ii. Maintenance/New alignment of @ Rs.												
iii. Surveillance platform												
iv. Logistics												
*contingencies for camps												
F. Intelligence gathering												
*Purchase of information/hiring of vehicles/operational Expenses etc.												

CONTROL GRAZING AND OTHER BIOTIC DISTURBANCES												
*wages for temporary cattle watchers												
GRASS LAND MANAGEMENT												
A. Annual survey of fire lines												
B. Uprooting of unwanted tree seeding												
C. Vegetation mapping												
D. Wages for creating and maintenance of fire lines app. @												
AWARENESS PROGRAMME ABOUT CONFLICT												
A. Meeting for public awareness												
B. Rewards for villagers for rescue												
C. Logistic support to additional staff on deputation												
D. Signboard etc.												
E. External veterinary & other services (hiring of												

vehicle etc.)												
F. Health check-up												
G. Publicity material												
CONTROL OF RANGING PATTERN OF WILD ANIMAL OUTSIDE OF MANAGED HABITAT												
A. Immobilization &capture												
B. Wages for driving back animal												
C. Hiring of vehicle												
INFRASTRUCTURE & COMMUNICATION :												
A. Building												
i. Office repairing												
ii. Staff quarter repairing												
B. Roads												
i. Repair/annual maintenance of central roads												

ii. Repair/annual maintenance of fair weather roads												
C. Annual repairing of existing -? Wooden bridges and culverts												
D. Annual repairing of causeway												
WEED CONTROL												
A. Annual survey												
B. Wages for eradication												
C. Purchase of P.O.L.												
EROSION CONTROL:												
A. Monitoring of bank line using satellite imageries												
B. Co-ordination meeting with flood control and other departments												
Animal health surveillance												
Maintenance of departmental Black bear including feed, veterinary care,												
Livestock immunization including logistic support:												

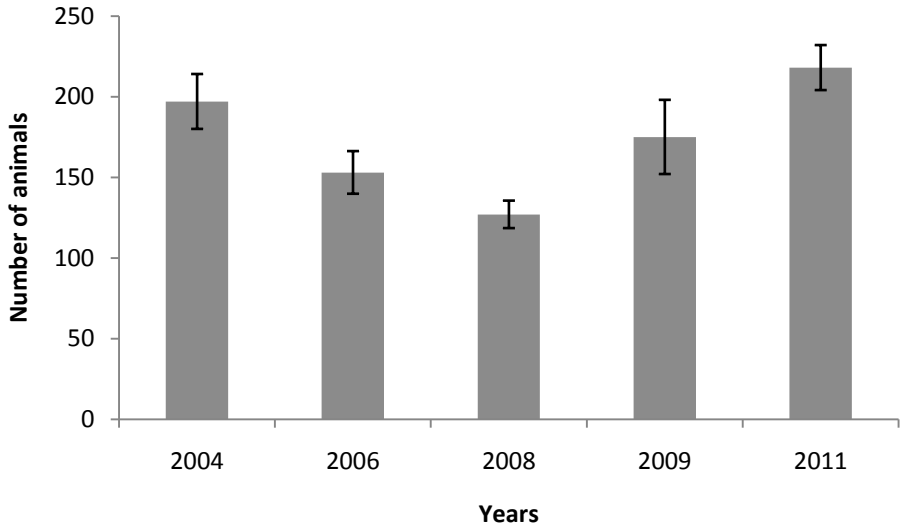
MAN ANIMAL COEXISTENCE												
A. Wages for crop protection												
B. Logistic support												
C. Compensation and treatment of injured persons												
D. Power fencing maintenance												
RESEARCH AND MONITORING :												
A. Laboratories Equipments												
B. Books etc.												
C. Project cost- ? Nos.												
D. Stationary, logistics and writing of reports												
ECO –DEVELOPMENT :												
A. Socio-economic survey												
B. Micro-planning & project formulation												
C. Execution of eco-development activities												

TOURISM:												
A. Tourist amenities												
B. Training												
C. Publicity												
D. Monitoring												
E. Development of eco-tourism sites												
Interpretation :												
A. Improvement of existing facilities												
B. Consultancy												
C. Equipment												
MANAGEMENT INFORMATION SYSTEM:												
A. Consultancy for contractual staff												
B. Website and updating												
C. Population dynamic census												

TRAINING												
A. Local												
B. Institutional												
C. Educational tour & visit to other protected areas												
Organization and administration												
STAFF AMENITIES:												
A. Medical facilities												
B. Uniform												
C. Camp equipment												
D. Free ration for field staff												
E. Office maintenance												

Annexure-2

Hangul Population trends in Dachigam Landscape, 2004 to 2011.



ANNEXURE - 3

Man-power in Dachigam National Park

S no.	Category of post	Physical strength	Vacant
1	Wildlife Warden	2	No information
2	Range officer	2	No information
3	Forester-I	2	No information
4	Fr.-II/Hd. G.W	3	No information
5	Forest guard	3	No information
6	Driver	1	No information
7			

Man-power in the office of the wildlife warden central

Post	Physical strength	Vacant
Steno	1	No information
Superintendent	0	1
UDA	1	No information
LDA	2	No information
Peon	0	1
Chowkidar	0	No information
Sweeper	0	1
Driver	0	No information

ANNEXURE - 4

Month wise average maximum and minimum temperature for the last six years (in Degree Celsius)

Months/Year	2010		2009		2008		2007		2006		2005	
	Mean Max	Mean Min	Mean Max	Mean Min	Mean Max	Mean Min	Mean Max	Mean Min	Mean Max	Mean Min	Mean Max	Mean Min
January	10.68	-1.93	8.27	-0.04	4.83	-2.61	9.36	-2.96	4.08	-1.82	6.31	-0.65
February	9.17	0.05	10.43	1.03	8.15	-1.87	11.11	1.80	12.59	2.38	5.29	0.41
March	19.88	4.65	15.65	3.73	19.02	3.77	13.74	2.05	15.21	3.57	13.54	4.19
April	20.84	6.48	19.91	6.93	19.41	6.32	25.00	6.87	20.94	5.69	19.95	5.63
May	21.92	9.83	24.94	8.96	24.97	9.73	25.13	10.52	28.27	11.45	20.78	8.47
June	25.17	10.78	26.23	11.38	29.48	16.46	28.54	14.55	27.96	13.35	29.00	12.49
July	28.57	16.42	29.72	14.95	29.51	17.23	29.90	16.86	31.13	17.91	28.62	16.60
August	28.52	17.63	31.56	16.45	29.74	17.11	29.79	16.53	28.22	17.26	30.35	15.55
September	27.20	12.15	28.95	10.19	26.22	9.65	26.88	12.35	25.05	11.23	29.17	12.78
October	23.77	5.50	22.71	3.55	22.25	5.17	24.03	2.71	22.13	6.78	22.92	5.08
November	18.30	1.47	14.09	0.17	14.70	0.38	17.20	-1.83	14.17	2.80	15.43	-0.73
December	10.95	-4.65	10.07	-1.08	9.70	0.21	9.60	-2.29	7.47	-0.54	9.80	-3.22

Annexure - 5

List of rivers/ nallah and natural water resources in Dachigam national Park

S No.	NAME OF RIVER/ NALLAH	WATER AVAILABILITY
	DACHIGAM BLOCK	
1	Mahadev nar	Seasonal
	Badin nar	Seasonal
	Narimulla nar	Seasonal
	Dachigam nar	All throughout the year
	PALHIPORA BLOCK	
1	Menu nar	Seasonal
2	Drog nar	Seasonal
3	Zahil nar	Seasonal
4	Kaw nar	Seasonal
5	Chandar nar	Seasonal
6	Yachigachi	Seasonal
7	Bran nar	Seasonal
8	Brimj nar	Seasonal
9	Malik nar	Seasonal
	UPPER DACHIGAM BLOCK	
1	Gunas nar	Seasonal
2		
3		

Natural Water Resources in Lower Dachigam National Park

S no.	Name of Spring/ Lake	Water Availability
1	Abchul Menu Spring	All throughout the year
2	Abchul Mahadev Spring	All throughout the year
3	NIC water Spring	All throughout the year
4	Nambal Spring	All throughout the year
5	Mar Sar Lake	All throughout the year

ANNEXURE - 6

Birds species recorded in Dachigam National Park

BIRDS SPECIES RECORDED IN DACHIGAM NATIONAL PARK			
	COMMON NAME	**Scientific name**	**Status**
Family			
Family-Accipitridae			
1	Black Kite	*Milvus migrans*	R
2	Sparrow Hawk	*Hiereatus nisus nisosimilis*	RM
3	Booted Eagle	*Hiereatus pennatus*	RM
4	Golden Eagle	*Aquila chrysaetos*	R
5	Eurasian Griffon	*Gyps fulvus*	RM
6	White-Rumped Vulture	*Gyps bengalensis*	R
7	Bearded Vulture Or Lammergier	*Gypaetus barbatus*	R
Family-Falconidae			
8	Common Kestrel	*Falco tinnunculus*	RM
Family-Phasianidae			
9	Snow Partridge	*Lerwa lerwa*	R
10	Himalayan Snowcock	*Tetraogallus himalayensis*	R
11	Chukar	*Alectoris chukar*	R
12	Western Tragopan	*Tragopan melanocephalus*	R
13	Himalayan Monal	*Lophophorus impejanus*	R
15	Koklass Pheasant	*Pucrasia macrolopha*	R
Family-Columbidae			
16	Snow Pigeon	*Columba leuconota*	R
17	Rock Pigeon	*Columba livia*	R
18	Oriental Turtle Dove	*Streptopelia orientalis*	RM
19	Eurasian Collared Dove	*Streptopelia decaocto*	R
20	Red Collared Dove	*Streptopelia tranquebarica*	R
21	Spotted Dove	*Streptopelia chinensis*	R
Family-Psittacidae			

22	Rose-Ringed Parakeet	*Psittacula krameri*	R
23	Slaty-Headed Parakeet	*Psittacula himalayana*	R
24	Indian Cuckoo	*Cuculus micropterus*	RM
25	Eurasian Cuckoo	*Cuculus canorus*	RM
Family- Strigidae			
26	Eurasian Eagle Owl	*Bubo bubo*	R
27	Little Owl	*Athene noctua*	R
28	Long-Eared Owl	*Asio otus*	RM
Family- Aodidae			
29	Himalayan Swiftlet	*Collocalia brevirostris*	R
30	Alpine Swift	*Tachymarptis melba*	RM
31	Common Swift	*Apus apus*	M
32	House Swift	*Apus affinis*	RM
Family- Alcedinidae			
33	Pied Kingfisher	*Ceryle rudis*	R
34	Common Kingfisher	*Alceodo atthis*	RM
35	White-Throated Kingfisher	*Halcyon smyrnensis*	R
Family- Coraciidae			
36	European Roller	*Coracias garrulus*	RM
Family- Upupidae			
37	Common Hoopoe	*Upupa epops*	RM
Family- Picidae			
38	Eurasian Wryneck	*Jynx torquilla*	M
39	Scaly-Bellied Woodpecker	*Picus squamatus*	R
40	Grey-Headed Woodpecker	*Picus canus*	R
41	Himalayan Woodpecker	*Dendrocopos himalayensis*	R
Family- Alaudidae			
42	Crested Lark	*Melanocorypha bimaculata*	R
Family- Hirundinidae			
43	Dusky Crag Martin	*Hirundo concolor*	R
44	Barn Swallow	*Hirundo rustica*	RM
45	Striated Or Redrumped Swallow	*Hirundo daurica*	R
Family- Oriolidae			
46	Eurasian Golden Oriole	*Oriolus oriolus*	RM
Family- Surnidae			

47	Common Starling	*Sturnus vulgaris*	RM
48	Common Myna	*Acridotheres tristis*	R
49	Jungle Myna	*Acridotheres fuscus*	
Family- Corvidae			
50	Yellow-Billed Blue Magpie	*Urocissa flavirostris*	R
51	Rufous Treepie	*Dendrocitta vagabunda*	R
52	House Crow	*Corvus splendens*	R
53	Large-Billed Crow	*Corvus macrorhynchos*	R
54	Nutcracker	*Nuctifraga caryocatactes*	
55	Yellow-Billed Or Alpine Chough	*Pyrrhocorax graculus*	
56	Eurasian Jackdaw	*Corvus monedula*	
57	Raven	*Corvus corax*	
58	Jungle Crow	*Corvus macrorphynchos*	
Family- Pycnonotidae			
59	White-Cheeked Bulbul	*Pycnonotus leucogenys*	
60	Black Bulbul	*Hypsipetes madagascariensis*	R
Family- Muscicapidae			
Sub. Family- Timalinae			
61	Jungle Babbler	*Turdoides striatus*	
62	Striated Laughing Thrush	*Garrulax striatus*	
63	Variegated Laughing Thrush	*Garrulax ariegatus*	
64	Streaked Laughing Thrush	*Garrulax lineatus*	
Sub. Family- Muscicapinae			R
65	Kashmir Redbreasted Flycatcher	*Muscicapa subrubra*	
66	Little-Pied Flycatcher	*Muscicapa westermannt*	
67	White-Browed Blue Flycatcher	*Muscicapa supercillaris*	
68	Slaty Blue Flycatcher	*Muscicapa leucomelanura*	
69	Verditer Flycatcher	*Muscicapa thalassina*	
70	Grey-Headed Flycatcher	*Culicicapa*	

		ceylonensis	
71	Paradise Flycatcher	*Terpsiphone paradist*	RM
Sub. Family-Sylvinae			R
72	Plain Leaf Warbler	*Phylloscopus neglectus*	R
73	Tytler's Leaf Warbler	*Phylloscopus tytleri*	R
74	Tickell's Leaf Warbler	*Phylloscopus affinis*	R
75	Sulphur-Bellied Warbler	*Phylloscopus griseolus*	RM
76	Yellow-Browed Warbler	*Phylloscopus inornatus*	R
77	Lemon-Rumped Warbler	*Phylloscopus chloronotus*	R
78	Blyth's Leaf Warbler	*Phylloscopus reguloides*	RM
79	Gold Crest	*Regulus regulus*	
Sub. Family-Turdinae			R
80	Orange-Flanked Bush Robin	*Tarsiger cyanurus*	
81	Blue-Capped Redstart	*Phoenicurus caeruleocephala*	R
82	Black Redstart	*Phoenicurus ochruros*	R
83	White-Winged Redstart	*Phoenicurus erythrogastrus*	
84	Plumbeous Water Redstart	*Rhyacornisfuliginosus*	R
85	Little Forktail	*Enicurus scouleri*	M
86	Spotted Forktail	*Enicurus maculates*	
87	White-Capped Water Redstart	*Chaimarrornis leucocephalus*	R
88	Blue Rock Thrush	*Monticola solitarius*	R
89	Blue Whistling Thrush	*Myophonus caeruleus*	R
90	Grey-Winged Blackbird	*Turdus boulboul*	
91	Chestnus Thrush	*Turdus rubrocanus*	
Family-Troglodytidae			
92	Winter Wren	*Troglodytes troglodytes*	
Family- Cinclidae			
93	White-Throated Dipper	*Cinclus cinclus*	
94	Brown Dipper	*Cinclus pallasii*	
Family-			

Prunillidae			
95	Alpine Accentor	*Prunella collaris*	
96	Altai Accentor	*Prunella hamalayana*	
Family- Paridae			
97	Grey Tit	*Parus major*	
98	Green-Backed Tit	*Parus moniticolus*	
99	Crested Black Tit	*Parus melanolophus*	
100	Black Tit	*Parus rufonuchalis*	
101	Yellow-Cheeked Tit	*Parus xanthogenys*	
102	Fire-Capped Tit	*Cephalopyrus flammiceps*	
103	White-Throated Tit	*Aegithalos niveogularis*	
Family- Sittidae:			
104	European Nuthatch	*Sitta europaea nagansis*	
105	White-Cheeked Nuthatch	*Sitta leucopsis*	
Family- Certhidae:			
106	Tree Creeper	*Certhia familiaris*	
107	Himalayan Tree Creeper	*Certhia himalayana*	
Family- Motacillidae:			
108	Yellow Wagtail	*Motacilla flava*	
109	Grey Wagtail	*Moctacilla cinerea*	
110	Pied Or White Wagtail	*Motacilla alba*	
111	Large Pied Wagtail	*Motacilla maderaspatensis*	
Family- Zosteropidae:			
112	White Eye	*Zosterops palpebrosa*	
Subfamily- Passerinae:			
113	House Sparrow	*Passer domesticus*	
114	Russet Sparrow	*Passer rutilans*	
115	Eurasian Tree Sparrow	*Passer montanus*	
Family- Campephagidae:			
116	Scarlet Minivet	*Pericrocotus flammeus*	
117	Long-Tailed Minivet	*Pericrocotus ethologus*	
118	Small Minivet	*Pericrocotus cinnamomeus*	

Family-Emberizidae:			
119	Pine Bunting	*Emberza leucocephalos*	
120	White-Capped Bunting	*Emberiza stewarti*	
121	Grey-Necked Bunting	*Emberiza bunchanani*	
122	Rock Bunting	*Emberiza cia*	

Annexure - 7

Table:- List of Butterfly species recorded from Dachigam National Park

Family	Common name	Scientific name	Status
Papilionidae	1. Common Yellow Swallowtail	*Papilio machaon* (Linnaeus)	Common
Pieridae	2. Large Cabbage White	*Pieris brassicae* (Linnaeus)	Common
	3. Indian Cabbage White	*Pieris canidia* (Sparrman)	Common
	4. Bath White	*Pontia daplidice* (Linnaeus)	Common
	5. Common Gull	*Cepora nerissa* (Fabricius)	Common
	6. Dark Clouded Yellow	*Colias fieldii* (Menetries)	Common
	7. Common Brimstone	*Gonepteryx rhammi* (Linnaeus)	Common
	8. Pale Clouded Yellow	*Colias erate* (Esper)	Common
Lycaenidae	9. Common Copper	*Lycaena phlaeas* (Linnaeus)	Common
	10. White-Bordered Copper	*Lycaena pavana Kollar*	Common
	11. Dark Grass Blue	*Zizeeria karsandra* (Moore)	Common
	12. Indian Cupid	*Everres lacturnus* (Godarts)	Common
	13. Red Pierrot	*Talicada nyseus* (Guerin-meneville)	Common
	14. Dusky Hedge Blue	*Oreolyce vardhana* (Moore)	Common
	15. White Hedge Blue	*Udara akasa* (Horsfield)	Common
	16. Plain Hedge Blue	*Celastrine Lavendularis* (Moore)	Common
	17. White-Disc Hadge Blue	*Celatoxia albidisca* (Moore)	Common
	18. Orange Bordered Argus	*Aricia astrarche* (Bergsrasser)	Common
	19. Plains Cupid	*Chilades pandava* (Horsfield)	Common
	20. Lime Blue	*Chilades lajus* (Stoll)	Common
Nymphalidae	21. Common Beak	*Libythea lepita* (Moore)	Common
	22. Club Beak	*Libythea myrrha* (Godart)	

	23. Striped Tiger	*Danaus genutia* (Cramer)	Common
	24. Plain Tiger	*Danaus chrysippus* (Linnaeus)	Common
	25. Great Satyr	*Aulocera padma* (Kollar)	Common
	26. Common Satyr	*Aulocera swaha* (Kollar)	Common
	27. Common Fivering	*Ypthima baldus* (Fabricius)	Common
	28. Common Fourring	*Ypthima huebneri* (Kirby)	Common
	29. Himalayan Fivering	*Ypthima sacra* (Moore)	Common
	30. Common Threering	*Ypthima asterope*(Klug)	Common
	31. Large Threering		Common
	32. Western Fivering		
	33. Common Wall		
	34. Indian Fritillary	*Argyreus hyperbius* (Linnaeus)	Common
	35. large silver stripe	*Chidrena children*	Common
	35. Small Leopard	*Phalantha alcippe* (Stoll)	
Nymphalidae	36. Common Leopard	*Phalanta phalantha* (Drury)	Common
	37. Indian White Admiral	*Limenitis trivena* (Moore)	Common
	38. Himalayan Sergeant	*Athyma opalina* (Kollar)	Common
	39. Common Sailer	*Neptis hylas* (Linnaeus)	Common
	40. Short-Banded Sailer	*Phaedyma columella* (Cramer)	Common
	41. Indian Purple Emperor	*Apatura ambica* (Kollar)	Common
	42. Painted Lady	*Vanessa cardui* (Linnaeus)	Common
	43. Indian Tortoiseshell	*Aglais casmiriensis* (kollar)	Common
	44. Mountain Tortoiseshell	*Aglais urticae* (Linnaeus)	Rare
	45. Comma Tortoiseshell	*Nyphalis vau-albm* (denis&schiffermuller)	Rare
	46. Eastern Comma	*Polygonia egea* (Cramer)	Common
	47. Blue Admiral	*Kaniska canace* (Linnaeus)	Common
	48. Red Admiral		
	48. Blue Pansy	*Junonia orithia* (Linnaeus)	Common
	49. Chocolate Pansy	*Junonia iphita* (Cramer)	Common

	50. White Commodore	*Parasarpa dudu* (Doubleday)	
	51. Ringed Argus	*Callerebia ananda* (Moore)	
	52. Small Grass Yellow		
	53. Green-veined white	*Pieris napi* (Linnaeus)	
	54. Himalayan Blackvein	*Aporia leucodice* (Eversmann)	

ANNEXURE - 8

FLORA OF DACHIGAM NATIONAL PARK

Herbs	**Family**	**Local name**	**status**
Anemone obtusiloba	Ranunculaceae	Rattan jot	Uncommon
Aquilegia pubiflora wallich ex royle	"	Sita di panni	Uncommon
Aquilegia fragrance. Benth	"	Maime hait, kalumb	Common
Clath alba camb.	"	Tahool , Ashpmaar	Common
Clematis connata DC	"	Hathkad bel, Dhanvati	Common
Clematis montana	"	Dashraanth , Dudh chivara	Common
Delphinium denudatum wallich ex hook.f. &Thomas	"	Nirbis , Nirvisha	Common
Delphinium roylei munz	"	Nirbis ,Nirvisha	Common
Thalictrum minus L	"	Peeli bani, Haichinsah	Common
Thalictrum pedunculatum Edqew.	"	Mamira ,Pinjaari	Uncommon
Viola sylvatica	Violaceae	Nunposh	Common
Arenaria serpylliofolia Linn.	Cryophyllaceae	Letarluni	Uncommon
Lychnis cornaria (L.)Desr.	"	Laltraukal, Angaarda	Threatened
Hypericum perforatum L.	Hypericaceae	Basantadu, Basanti	Common
Tribulus terresteris L.	Zygophyllaceae	Bhakhada, Tirkundi	Common
Impatiens bicolor Royle.	Balsaminaceae	Trul, Hajlu,	Common
Lathyrus emodi (Wall.ex.Fritsch)Ali	Fabaceae	Khukni, Triputa	Abundant
Lathyrus pratensis Linn.	"	Khukni	Common
Lotus corniculatus	"		Common
Genum elatum Wallich.	Rosaceae	Gogji mool, Bhadrashaak	Common
Potentilla atrosanguina Lodd.	"	Bajardantu, Rolu	Threatened
Astilbe rivularis Buch.Ham.Ex.D.Don.	Saxifragaceae	Pothi	Common
Sexifraga Sibirica	"		Common
Sedum adenotrichum Wall.Ex.Edgew.	Crassulaceae	Dazanposh	Abundant
Epilobium parviflorum Schreb.	Onagraceae	Mellu, Loontar jadi	Common
Bupleurum swatianum Nasir.	Apiaceae	Zardzaari, Shashparni	Common
Chaerophyllum acuminatum Lindley.	"	Chikmi, Neochha	Common
Chaerophyllum reflexum Lindley.	"	Jadgagari, Mukhach	Common

Ferula jaeschkeana Vatke.	"	Haput Kanphur, Hinga, Ghud-kaindal	Common
Heracleum lantum Michx.	"	Shuriyal, Phulao,	Common
Chaerophyllum villosum Wall.ex.DC.	"	Mukhach	Common
Pimpinella diversifolia DC.	"	Jehn,tirua	Common
Scandix pecten-veneris L.	"	Indusaag , Kachhidana	Common
Seseli libanotis (L)W.Koch.	"	Sappad gajari	Common
Vicatia coniifolia DC.	"	Shila dhaniya	Abundant
Asperrula oppositifolia Regal.&Schmalth.	Rubiaceae	Machheet, Chhalmajeeth	Common
Gallium asperuloides edgew	"	Machheetu	Common
Gallium vernum Linn.	"	Peela machete	Common
Anaphalis margaritacea(L)Benth.	Asteraceae	Bhojli,Kinja	Common
Anaphalis nepalensis (Sprengel)Hand.	"	Telgangi, Bhujli	Common
Artemisia dubia Wallich ex.Besser	"	Joon, krinidru	Common
Artemisia parviflora Roxb.	"	Joon, Tethwan	Common
Aster diplostephioids C.B.Clark	"	Tarakpushp, phullala	Abundant
Carpesium abrotanoides Linn.	"	Lihur	Common
Picris hieracioides Linn.	"	Trumbadu	Rare
Saussurea albescens (DC)Sch.Bip.	"	Baklol	Common
Saussurea atkinsonii C.B.Clark	"	Lokat, Baklol	Common
Saussurea heteromalla (D.Don)Hand-mazz	"	Batola, Dashund	Common
Solidago virgaaurea Linn.	"	Thanthaana, Sondandi, Kanakshalakha	Common
Tarracetum dolichophyllum(Kitam)Kitam	"	Lidd guggli, chinnparni	Abundant
Taraxacum officinale Webr.	"	Handri, Hand, Dullal	Common
Tragopogon dubius Scop.	"	Thulkal,Girginok	Common
Tussilago Farfara Linn.	"	Chilchiloti, Ghudkhura	Threatened
Asyneuma thomsonii (HK.f.et.Th.)Bornm	Campanulaceae	Branzbooti,Branzhaak	Threatened
Campanula aristata Wall	"	Padi-branz	Common
Campanula cachmeriana Royle.	"	Kashir branz	Common
Campanula lotifolia L.	"	Branz ghainti	Common
Codonopsis ovata Benth.	"	Tokerkachh, Dodad	Threatened

Androsace rotundifolia Hardw.	Primulaceae	Golpattri tuttan	Common
Androsace sempervivoids Jacquem ex Duby	"	Ashamkund	Abundant
Primula macrophylla D.Don	"	Kaangla-Naakla, Peetsevti	Common
Primula rosea Royle.	"	Mundaal, peetsevti	Common
Cynanchum arnottianum Wight.	Asclepiadaceae	Dudhad	Threatened
Cynanchum auriculatum Roly ex	"	Dudhad	Threatened
Gantiana marginata (. Don) Griseb.	Gentianaceae	Neelkanth, Shirkanth	Common
Nymphoides peltata (S. Gmelin)	Menyanthaceae	Lidd khur	Common
Asperugo procumbens L.	Boraginaceae	-	Common
Cynoglossum lanceolatum Forsk.	"	Khitdi	Common
Onosma hispidum Wallich ex.G.Don.	"	Ratanjot, loljad	Threatened
Veronica biloba Linn.	Scrophulariaceae	Titni	Common
Veronica persica Poiret.	"	Ashvashaak	Common
Pedicularis pectinata Wallich ex.Benth	"	Kankatyukaparn, shaluth	Common
Orobanche solmsii C.B.Clark ex. Hook.f.	Orobanchaceae	Lothus, Jadkhaar	Common
Petracanthus utricifolius (Kuntze) Bremek.	Acanthaceae	Pardaad,Mauhwa, Kunchpushp	Common
Verbena officinalis Linn.	Verbenaceae	Bareen	Abundant
Nepeta erecta (Benth) Benth.	Lamiaceae	Neelpat, Bidaal Parnaas	Common
Nepeta lacvigata (D.Don.) Hand-Mazz.	"	Neelpat, Gandhsoi	Common
Rumex acetosa Linn.	Plygonaceae	Ulloh, Tsoktsin	Common
Rumex nepalensis Sprengel.	"	Ubaj, Chooka	Abundant
Euphorbia helioscopia L.	Euphorbiaceae	Dudhi, Gur sutchsul, Heerusi	Common
Euphorbia plorifera hook f. & Thomus	"	Dudhli, Dudhi	Common
Parieteria lusitanica linn	Urticaceae	-	Common
Epipactis royleana Lindley.	Orchidaceae	Amarkand,phullchamba	Common
Spiranthes sinensis (pers)ames.	"	Muchhmarool, Amarkand	Abundant
Iris germanica L.	Iridaceae	Majaarmund, Sosem	Common
Hemerocallis fulva Linn.	Liliaceae	Riudd, Sunaari	Common
Juncos articulatus Linn.	Juncaceae	Pranad, Tillar	Common

Shrub	**Family**	**Local name**	**Status**
Berberis huegeliana schaeider	Berberidaceae	Sumbal, Daruharidra	Rare
Indigofera hebepetala Benth.ex.baker.	Fabaceae	Krass, Sakena	Scarcely distributed
Indigofera haterantha wallich ex. Brandis	"	Krass, kainthi	Common
Rosa webiana Wallich ex. Royle.	Rosaceae	Arwal, Jungli gulaab	Common
Rosa antennifer	"	Jhaanshi, chhanchh	Common
Rubus pungens Comb.	"	Chhansh, Jhaansh	Common
Rubus ulmifolius Schott	"	Jhaanshi, Chhansh	Common
Sorbaria tomentosa (lindley) Rehder	"	Karukni, Kidsungal	Common
Spiraea canescens D.Don	"	Dhakk, Takky	Common
Hydrangea macrophylla L.	Hydrangea	Himgainda	Abundant
Chaerophyllum acuminatum Lindley	Apiaceae	Chikmi, Neochha	Common
Vibernum cotinifolium D.Don	Caprifoliaceae	Kumansh, Bhutnoi	Abundant
Lonicera quinquelocularis Hardw.	"	Bakkadu, Paakhar	Common
Gaultheria trichophylla Royle.	Ericaceae	Gandhpuri booti, Gandhpura	Abundant
Rhododendron anthopogon D.Don.	"	Nchhni, Inga	Common
Daphne mucronata Royle.	Thymelaeaceae	Kaapshadi, kachlum, kuilal	Common
Juniperus communis L.	Cupressaceae	Bethri, Bethur, Hapusha	Common
Juniperus recurna Buch-Ham ex. D.Don.	"	Palash, Bithur	Common

Tree	Family	Local Name	Status
Euonymus fimbriatus Wallin roxb	Celastraceae	Tran, Lichhoi	Uncommon
Euonymus hamitonianus Wallich.	"	Sheelkul, Chhalchhattar	Uncommon
Ziziphus mauritiona Lamk.	Rhamnaceae	Ber, Badra	Common
Crataegus songarica G.Koch.	Rosaceae	Ringkul, Shonth	Common
Prunus cornuta(Wall x. Royle) steudel	"	Bharath	Common
Prunus cerasifera	"	Chaier	Common
Pyrus malus	"		
Fraxinus hookeri Wenzig	Oleaceae	Sinnu, Soom, Hoom	Threatened
Celtis australis Linn.	Ulmaceae	Kharak brimij	Common
Ulmus wallichiana planchon.	"	Marnu brin, Braari, Bradey	Common
Ulmus lavigata	"		Common
Platanus orientalis L.	Plantanaceae	Booin, Chinaar, Chanaar	Common
Juglans regia Linn.	Juglandaceae	Walnut, dun, khod, Achho	Common
Betula utilis D.Don.	Betulaceae	Burja, Bhojpatra	Common
Quercus robber L.	Fagaceae	Oak, Vilaiti, Banj	Common
Populus caspica Bornm.	Salicaceae	Frass, Safeda	Common
Salix alba Linn.	"	Bot vir, white willow	Common
Salix babylonica	"	Majnoo kashirveer	Common
Salix wallichiana	"	Girveer, Geur, Bhanshri	Common
Abies pindrow Royle.	Pinaceae	Silver fir, Budul, Taleesha	Common
Pinus excelsa	"		Common
Taxus wallichiana	Taxaceae	Postul	Threatened
Parrotiopsis jacquimontiana (Decne) Rehder.	Hamamelidaceae	Hatab, Pasaid	Common
Rubinia psedoacacia	Papilionaceae		Common
Acer caesium	Aceraceae	Chaind, Tilpattar	Common
Morus nigra	Moraceae	Tul	Common
Morus indica	"	Tul	Common
Morus alba	"	Tul	Common

Climbers & Twinner	**family**	**Local name**	**Status**
Potentialla reptans Linn.	Rosaceae	Rengti vajradanti	Common
Rosa burnonii Lindl.	"	Arwl, Kreech	Common
Sibbaldia cuneata Hormem ex.Kuntze.	"	Sinja, chukadu	Common
Aralia cachmerica Decne.	Araliaceae	Khori, Albo	Common
Hedera nepalensis Koch.	"	Kateembri, Karoori, Agraanth	Common
Smilax aspera L.	Smilacaceae	Kaldaaioon, Atkeer	Common
Smilax vaginata Decne.	"	Thir, Cheenmool	Common
Dioscorea deltoidea Wall. Ex. Kunth.	Dioscoreaceae	Kreensh, Krees, Kildari,Shingli-mingli	Threatened
Grasses & Sedges			
Carex stenophylla Vahl.	Cyperaceae	Phikal	Abundant
Kobresia laxa Nees.	"	Kubber	Threatened
Scripus setaceus Linn.	"	Kaseru, Ghussad	Common
Eriocaulon cinereun R.Br.	Eriocaulaceae	Irka	Common
Agrostis pilosula Trinius.	Poaceae	Ghaas	Abundant
Datylis glomerata Linn.	"	Trakkad, Panjaghaas	Common
Digitaria sanguinalis (L.) Scop	"	Chhal, Trakkad	Common
Phleum alpinum Linn.	"	Jaamno gha	Common
Poa alpine Linn.	"	Humulu, Shaadal ghass	Common

ANNEXURE - 9

List of revenue villages surrounding Dachigam National Park with house hold.

S No.	Village	Number of House holds	Human population
1	Takya Sangi Reshi	28	202
2	Mulanar	43	275
3	Chandpora*		
4	Harwan*		
5	Faqir mohalla*		
6	Barji Mohalla*		
7	Darbagh*		
8	Mufti bagh*		
9	Saidpora*	47	274
10	Theed*		
11	Gandtal*		
12	Dara village*		
13	Check*		
14	Astan Mohalla*		
15	Dard Khwur*		
16	Shalkhud*		
17	Shalimar Mohallas*		
18	Aarbal*		
19	Guptganga Village*		
20	Nishat Mohalla*		
21	Brain*		
22	Karpora*		
23	Kral Sangri*		
24	Nehre park*		
25	Zowoora*		
26	Zewan*		
27	Khonmoh*		
28	Sangri*		
29	Wuyan*		
30	Bathen Khrew*		
31	Naginder*		
32	Gagribal*		

*The information of house hold and total population was not available for most of the villages.

ANNEXURE - 10

Poaching and natural death of wild animals during 2007-2011 ending April 2011.

Year	Animal	Poaching	Natural death	Total mortality	Remarks
2007-08	Asiatic black bear		1	1	
	Jackal		4	4	
	Leopard cat		1	1	
2008-09	Asiatic black bear		2	2	
	Leopard		1	1	
2009-10	Leopard		1	1	
	Asiatic black bear		1	1	
2010-11	Asiatic black bear		4	4	
	Leopard		1	1	
	Hangul	1		1	

ANNEXURE - 12

List of vehicles in Dachigam national Park

S no.	Registration No.	Type	Present Status	Remarks
1	JK01D-5948	Gysey	Not in working condition	
2	JK01C-4199	Tempo travel	Not in working condition	
3	JK01G-2047	Scorpio	In use	
4	JK01D-5325	TATA 407	In use	Used in rescue
5	JK01P-1850	Scorpio	In use	
6				

ANNEXURE

List of anti-poaching and anti-grazing camps in and around Dachigam National park

S no.	Name	Type
1	Brain	Anti-grazing
2	Nishat	Anti-grazing
3	Harwan	Anti-grazing
4	Dara	Anti-grazing
5	Khimber	Anti-grazing/ Anti-poaching
6	Dhathapatri	Anti-grazing/ Anti-poaching
7	Safad bal	Anti-grazing/ Anti-poaching
8	Sangri	Anti-grazing/ Anti-poaching
9	Zobra	Anti-grazing/ Anti-poaching
10	Bathin	Anti-grazing/ Anti-poaching
11	Nagender	Anti-grazing/ Anti-poaching

FORM 1

Restoration of habitat: Control of regeneration of woody species in grasslands

S. No.	Location and name of site	Year	Extent of area (ha)	Species controlled	Operation	Total cost	Cost per ha
1	2	3	4	5	6	7	8

Note: Location : By compartment, site name, etc.

Species controlled : List the species.

Operation : Uprooting, cutting, burning etc. manual or mechanized methods.

Remarks : The measure of success, suitability of methods, problems encountered.

FORM 2
Restoration of habitat: Prescribed burning

S. No.	Location and name of site	Year	Extent of area (ha)	Area treated (ha)	Period	Total cost	Cost per (ha)	Remarks
1	2	3	4	5	6	7	8	9

Note: Location : By compartment, site name, etc.

Period : Date of starting and completion

Remarks : Mention resultant structure e.g. a mosaic, & burnt, % intact

Problems encountered in conducting the operation – e.g. fire escape.

FORM 3

Restoration of habitat: Soil conservation measures – initial operations and subsequent maintenance

S. No.	Location and name of site	Year	Extent of area (ha)	Area treated (ha)	Operations	Total cost	Cost per (ha)	Remarks
1	2	3	4	5	6	7	8	9

Note: Location : By compartment, site name, or landmarks

Extent of area : Total area identified for such treatment. In case of streams or gullies, the length involved.

Area Treated : If linear feature then quote length; otherwise area.

Operation : Structures involved such as gully plugs, trench-cum-mound, terracing, spurs and bunds etc. quote quantity nos. and cmt. Of earthwork.

Remarks : Mention if initial work or maintenance.

FORM 4

Restoration of habitat: Planting, sowing – initial operation

S. No.	Location	Year	Extent of area (ha)	Species	Planting stock	Spacing	Operations	Total cost	Cost per (ha)	Remarks
1	2	3	4	5	6	7	8	9	10	11

Note: Location : By compartment, or landmarks and describe the site factors e.g. vegetation cover, soil, perturbations etc.

Planting Stick : Kind and condition e.g. root shoot, naked root seedling, seedlings in polythene bags, age or average size.

Operation : Mention site preparation if any, crowbar holes, pits and pit size, trench, seed sowing (rate), tussock planting (norms), protection measures.

Remarks : Mention operational problems if any.

FORM 5

Restoration of habitat: Response of Planting, sowing and subsequent operations

S. No.	Location	Year	Extent of area (ha)	Species	Survival %	Casualty replacement	Operations	Total cost	Cost per (ha)	Remarks
1	2	3	4	5	6	7	8	9	10	11

Note: Location : By compartment, or landmarks.

Casualty replacement : Mention planting stock by species, number and kind (polythene bag, root shoot, rhizome etc.)

Operation : Planting, sowing technique, protection measures.

Remarks : Operational problems, protection problems, any other useful information.

Assess and mention survival percentage and growth before taking up casualty replacement.

FORM 6

Restoration of habitat: Area under protection / closure

S. No.	Location and name of site	Year	Extent of area (ha)	Description of site	Regulations or protection measures	Response	Remarks
1	2	3	4	5	6	7	8

Note: Location : By compartment, or landmarks.

Description of site : % tree, shrub, ground cover, main species, impact of factors causing perturbations.

Regulations & Protection measure : Social fencing, power or other kind of fencing, enforced protection by patrolling, fire protection etc.

Response : To be recorded annually. Consider trend of regeneration, vegetation cover, change in structure and composition, Wildlife use index.

Remarks : State problems or any other useful information, including alternatives if area being used by people for specific purposes

FORM 7

Animals: Measuring trends in populations

S. No.	Species	Population estimation methodology	Adult		Sub Adults		Yearlings	Fawns	Cubs	Total	Remarks
			Male	Female	Male	Female					
1	2	3	4	5	6	7	8	9	10	11	12

Note: Population Estimation : e.g. pugmark, line transect, scan, roadside counts etc. area covered, sampling intensity, data treatment, extrapolation where involved. In case of indices of density or dung count mention those figures under the remarks column, use details as pertinent. Describe age classes for each species.

Remarks : Operational problems, protection problems, any other useful information.
Indices of density or dung count details to be recorded here.

FORM 8
Animals: New Records

S. No.	Species	Location	Year	How discovered	Details of number, age, sex	Habitat description	Remarks
1	2	3	4	5	6	7	8

Note: Animals will include vertebrates and invertebrates.

How discovered : Sighting, dead specimen, reliability of sighting, captured specimen, incontrovertible other evidence.

Number, age, sex etc. : As applicable to vertebrates

Habitat description : Broad habitat description such as vegetation, and elements such as water, large old trees, den trees, snags down log material. Use microhabitat descriptors only if relevant.

Remarks : Any other useful information.

FORM 9

Animals: Mortality other than that attributable to an offence

S. No.	Species	Location	Year	Sex	Number	How discovered	Cause of mortality	Remarks
1	2	3	4	5	6	7	8	9

Note: Location : By compartment, landmark etc.

Sex and age : As per parameters for age class. Sex, if possible to identify.

How discovered : Carcass, complete or partial. Skull or any other recognizable remains collected where only some remains of an animal are found.

Cause of mortality : If known e.g. territorial fight, accident, possible disease (following postmortem results), old age, cause difficult to determine, predation etc.

Remarks : Any other useful information.

FORM 10

Animals: Mortality attributed to poaching or an act of vandalism

S. No.	Species	Location	Cause of mortality Number, sex, age class	Remarks
1	2	3	4	5

Note: Location : By compartments, or landmarks

Cause of mortality : Whether the animal was intact or remains found, article or trophy to be recorded. Cause if known e.g. animal sanred, shot or poisoned etc.

Remarks : Any other useful information, especially matters of illegal trade.

FORM 11

Animals: Predation on domestic livestock by wild carnivores

S. No.	Range	Month	Category of livestock killed	Location	Numbers	Compensation paid (Rs.)	Carnivore involved	No. of cases undecided	Remarks
1	2	3	4	5	6	7	8	9	10

Note: Category of livestock killed : Buffalo, cow, bullock (adult, sub-adult, calf), camel, horse, donkey, sheep, goat, poultry etc.

Location : Comptt. No. or landmark where killed and the village of the owner.

Carnivore involved : Indicate species responsible for the kill of identity is confirmed.

No. of cases undecided : Either in progress or dropped.

Remarks : Record observations like – attended or unattended animal, killed in forest or waterhole or in the pen/shed. Field and whether kill was in area closed to livestock trespass.

FORM 12

Animals: Killing of a human by wildlife or injury caused

S. No.	Range	Month	No. of incidents	No. of people killed age and sex	Location, circumstances and species	No. of people injured, age and sex	Location circumstances and species	Compensation (Rs.)
1	2	3	4	5	6	7	8	9

Note: Location, circumstances and species : Location by comptt no. the village to which the person belongs and a description of the site and activity such as – open grassy patch, cutting grass, or under a mahua tree collecting flowers etc.

Mention species on proof.

FORM 13

Animals: Wildlife damage to private or public property

S. No.	Range	Month	The category of property	Extent of damage	Species involved and number	Remarks
1	2	3	4	5	6	7

Note: Location : By comptt. No. village survey no. name of village or landmark.

Category of property : e.g. agriculture filed – wheat, huts in a village, any kind of vehicle.

Extent of damage : Crop damage by area, estimated loss of produce and monetary loss. Similar yardsticks for other items like partial or total destruction of huts and belongings with estimated monetary loss.

Remarks : Any relevant information or circumstances e.g. a wild elephant was provoked by people.

FORM 14
Grazing of domestic livestock
Year

S. No.	Grazing unit no.	List of villages in the unit	Village wise listed population of cattle	Capacity of the unit (cattle units) and number of cattle grazed	Total cattle units grazed		Remarks
					Legal	Illegal	
1	2	3	4	5	6	7	8

Note: Remarks : (i) Mention number of cattle immunized against FMD, RP, anthrax as the case might be and the number of cattle without the prophylactic cover.

(ii) If grass is allowed to be cut for cattle being stall-fed, mention the village and number of such cattle.

FORM 15
Inter agency programmes: Agencies and schemes (Government)
Year

S. No.	Name of agency	Central or State	Number and name of scheme operated	Physical and financial targets		Area and location	Remarks
				Given	Achieved		
1	2	3	4	5	6	7	8

Note: Name of the scheme : To include all activites in the Govt. sector. Ie. Construction, use of resources, development processes etc. mention names of schemes, projects or normal operations. This will address all departments in the management area and those activities outside but capable of influencing the management area.

Remarks : Success, adverse impacts, incompatibility with PA management objectives or failures should be mentioned. Detailed notes to go in the PA book.

FORM 16
Programmes of NGOs
Year

S. No.	Name of agency	HQ Location	Nature of the scheme operated	Physical and financial targets		Area and location	Remarks
				Given	Achieved		
1	2	3	4	5	6	7	8

Note: Remarks : Success or adverse impacts, incompatibility with PA management objectives or failures should be mentioned. Detailed notes to go in the PA book. These programmes and activities could be within the management area or those that are outside the management area but are capable of influencing the state of the management area – either complementing the efforts or adversely impacting.

FORM 17

Construction*/maintenance* of infrastructure: roads and bridges (*existing / new)

Year

S. No.	Category	Range	Surface	Name or number	Length covered (km)	Cross drainage works. Bridges with types	Total cost and status
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Note: Category of road : National highway, State Highway, district road etc. public road or open only to managers should be stated

Surface type : Black topped, metal, earth etc. Applies to roads.

Name or number : As the case may be.

Cross drainage type : e.g. for culverts – box, hume pipe culverts etc.

Bridge type : Wooden trestle, suspension, metal multi span, masonry arch etc.

Status : Work completed or ongoing. State also the agency responsibility; state whether operational or non operational.

* : Strike out which is not applicable. Use separate forms as required; for construction and for maintenance details.

FORM 18
Construction*/maintenance* of infrastructure: buildings (*existing / new)
Year

S. No.	Range	Name of the building	Location	Type of construction	Numbers	Total cost	Status
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Note: Nature of the building : e.g. residential (guard), office, store, chauki, watch tower, tourist facility, hide, barrier, patrolling camp (Temporary or permanent) etc.

Location : By compartment or village or landmark as appropriate.

Type of construction : Masnory (brick / stone), log or wooden, metal, local material etc.

Status : Completed or ongoing.

* : Strike out which is not applicable. Use separate forms as required; for construction and for maintenance details.

FORM 19
Development */maintenance* of infrastructure: communication (*existing / new)
Year

S. No.	Range	Type of facility	Location	Number	Cost	Advantage gained	Remarks
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Note: Type of facility : e.g. telephone, wireless.
Location : Staff Hq location, village, landmark etc.
Advantage gained : Area served, staff locations connected etc.
Remarks : Record status – complete, ongoing, functional, non functional.
* : Strike out that is not applicable. Use separate forms as required; for new facility and maintenance

FORM 20
Development */maintenance* of infrastructure: vehicles (*existing / new)
Year

S. No.	Kind of vehicle	Number	HQ if any	Intended use	Cost	Remarks
1	**2**	**3**	**4**	**5**	**6**	**7**

Note: Kind of vehicle : Jeep, trailer, tractor, truck, minibus, tanker, motorcycle, bicycle, boat (Paddle or motor), launch, car, riding elephant, ponies etc.

Intended use : Management support, patrolling / antipoaching etc.

Remarks : Any other useful information. Mention written off vehicles, retired or dead animals.

* : Strike out the inapplicable. Use separate forms as required to indicate acquisition, maintenance.

FORM 21
Development of infrastructure : manpower recruitment /existing manpower
Year

S. No.	Category of post	Number	Status		Scale of pay	Intended deployment / deployed as	Remarks
			Recruited	Vacant			
1	2	3	4	5	6	7	8

Note: Status : Permanent, temporary, contractual.

Intended deployment : State purpose e.g. conservation education, research, antipoaching etc as applicable.

Remarks : Any other useful information. New recruits within the year should be mentioned. This will also include offers and staff obtained on transfer / deputation. Likewise changes due to personnel going out on transfer, deputation, retirement, removal, resignation, death should be reflected in this column.

* : Strike off that which is not applicable. Accordingly, use additional forms. One for recruitment and one for the existing manpower.

FORM 22
Developing infrastructure : fire lines (existing / new)
Year

S. No.	Range	Fireline category or width	Name of points connected	Length (Meters)	Cost	Remarks
1	2	3	4	5	6	7

Note: Category : Main or subsidiary etc. Record width.

* : Strike out that inapplicable. Use one form each for maintenance of existing fireline and creation of new.

FORM 23

Tourism

Total number of visitors all categories: **Year** **Name of the Complex:**

Total revenue earned:

S. No.	The category of visitors by month and number					Indian			Number day visitors	No. staying overnight and revenue
	Adult			Children	Foreigners	Rural	Urban	Revenue		
	Month	Male	Female							
1	2	3	4	5	6	7	8	9	10	11

Note: columns 2 to 5 will be written in three successive lines for the month pertinent, one below the other. First line information pertains to foreign tourists. Put a tick (√) in column 6. second and third line details rural and urban tourists respectively. Put a tick (√) in column 7, column 8 as applicable

FORM 24
Eco tourism – partners
Year

S. No.	Identity of eco tourism entrepreneur	Infrastructure	Programmes	Investment	Kind and extent of benefits to local people	Benefit to PA and resources
1	2	3	4	5	6	7

FORM 25
Outbreak of fires
Year

S. No.	Range	Location	Extent (ha)	Dates		Reasons	Estimated loss	Remarks
				Detected	Controlled			
1	2	3	4	5	6	7	8	9

Note Location : By compartment s
Reasons : Established or suspected
Estimated loss : e.g. number of trees damaged, stacked firewood/timber/bamboo destroyed/damaged by volume and cost, wild animals dead, particulars of sensitive sites affected, other property or life destroyed.
Remarks : State particularly problems encountered in detection and suppression and any other useful information. State also whether the extent of fire has been mapped.

FORM 26
Offence cases detected
Year

S. No.	Range	Category	Numbers	Number of cases decided		Number of cases under process	Number of cases compounded	Remarks
				Successful	Failure			
1	2	3	4	5	6	7	8	9

Note Category : e.g illegal cutting of trees, illegal firewood, illegal NWP, poaching, encroachment, illegal cattle grazing etc. category by codified by letters of alphabet.

Remarks : Any other useful information. This should also include the number of cases pending decision with the department.

The cases under column 8 pertain to area of non PA status under management which do not involve an endangered species (Schedule – I)

FORM 27
Research projects under implementation by other agencies
Year

S. No.	Title	Completed	Ongoing	New	Status	Financial outlay (RS)	Expenditure incurred (RS)	Remarks
1	2	3	4	5	6	7	8	9

Note
Completed : State date of completion and the status of the project report.
Ongoing : State since when the project is under operation and expected period of completion.
New : State the date of commencement and duration.
Status : State the progress towards achievement of objectives, or project which has been dropped or held in abeyance etc.
Remarks : Any other relevant information. State the name of the agency. If animal / plant species are being collected, state authority and where the collections are being housed.

FORM 28
Ecodevelopment programme: Targets and implementation
Year

S. No.	Name of the programme	Sector (Central / State) or NGO sponsored	Target set		Achievements		Village (Buffer / enclaved)	Remarks
			Physical	Financial	Physical	Financial		
1	2	3	4	5	6	7	8	9

Note Nature of the programme : e.g pasture development, fodder plantations, establishing biogas units, livestock improvement, establishment and development of sericulture, revival of local skills such as handicraft, water harvesting systems, adults education etc.

Village : Site where programme is being implemented – whether buffer or inside PA.

Remarks : State problems, state failures and reasons for not attaining targets, for non-implementation or deviation etc. state whether it is on the right tracks in context of achievement of objectives.

FORM 29
A summary of allotment of funds, revenue and expenditure
Year

S. No.	Plan/non-plan/any other grant	Sector (Central / State/other)	Allotment received		Expenditure incurred		Revenue realized	Remarks
			Non-recurrent	Recurrent	Non-recurrent	Recurrent		
1	2	3	4	5	6	7	8	9

Note Explain under expenditure, over expenditure, savings and surrenders. State the extent of demand for the year as per the schedule of operations / APO.wm a.

FORM 30

Existing corridors – conservation inputs accomplished

S. No.	Identity of the corridor	Length / section addressed	Nature of inputs / treatment	Agency	Target set	Achievement	Constraints	Investment	Remarks
1	2	3	4	5	6	7	8	9	10

Note Col. 10 State success and quality of achievement. Anything else that is significant