

Recommendation for a Greater Hesaraghatta Conservation Reserve (GHCR) in Bangalore

Including an Assessment of the Biodiversity and Conservation Value of the Hesaraghatta Grasslands & nearby Lakes



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SUMMARY	1
INTRODUCTION TO THE PROPOSAL	2
Why This Proposal?	2
Rejuvenation of the Water Catchment Area – A Case for Bangalore’s Water Security	5
Public Interest Litigation (PIL) in Karnataka High Court	5
Other Considerations – Animal Husbandry & Bio-security	6
PROPOSED CONSERVATION RESERVE AREA	7
Richness of Flora and Fauna	11
Conservation Issues: Commercial & Other Activities	12
Solutions: Conservation Strategy	12
ATTACHMENTS	14
REFERENCES	15
APPENDIX A: SPECIES	16
Plants (including grasses)	16
Mammals	19
Reptiles	19
Birds	19
Amphibians	24
Spiders	25
Butterflies	25
Source of Information	25

TABLE OF FIGURES

FIGURE 1: JCB DUG PITS USED FOR HIGH-DENSITY TREE PLANTING BY BDA IN 20113

FIGURE 2: HIGH INTENSITY TREE PLANTING IN THE TREE-SAVANNA TYPE OF GRASSLAND ECOSYSTEM AT HESARAGHATTA3

FIGURE 3: HIGH INTENSITY OF TREE PLANTING IN THE OPEN GRASSLAND ECOSYSTEM.....4

FIGURE 4: GOOGLE EARTH IMAGERY (WHITE AREAS) SHOWING THE EXTENT OF TREE PLANTING IN HESARAGHATTA.....4

FIGURE 5: THEMATIC PLAN DEPICTING THE PROPOSED HESARAGHATTA CONSERVATION RESERVE.....8

FIGURE 6: CLOCKWISE FROM BOTTOM RIGHT – LILAC SILVERLINE BUTTERFLY, SLENDER LORIS, COMMON LEOPARD AND LESSER FLORICAN
.....10

FIGURE 7: CLOCKWISE FROM BOTTOM RIGHT – PALLID HARRIER, MARSH HARRIER, SHORT-TOED SNAKE-EAGLE, RED-NECKED FALCON ..11

Summary

The Hesaraghatta Lakebed area and Grasslands in the surrounding catchment area in the north-west of Bangalore are an important reservoir of biodiversity that includes scheduled 1 species like the Lesser Florican and the Indian Leopard. Yet, such areas remain outside of the protected area network of Karnataka and face severe threats to its biodiversity.

Hesaraghatta Lake was an important source of drinking water to the city of Bangalore till about 1994 and could be revived as a catchment area. The landscape surrounding the lakebed is the last remaining grassland habitat in the Bangalore region and supports unique biodiversity.

Unfortunately, in recent times, the grasslands have been degraded due to numerous commercial and other human-induced pressures. Lack of protection adds to these pressures. The grasslands have also been severely dissected by planting trees in unprecedentedly high densities by the Bangalore Development Authority (BDA).

This adversely impacted biodiversity, by disrupting large populations of migratory birds that inhabit the area during winter. India has ratified the Ramsar Convention and Convention on Migratory species (CMS) and it is imperative for upholding the commitments by providing necessary protection to the migratory birds and their habitat.

The grasslands have other vital benefits to citizens of Bangalore like outdoor recreation and nature education.

As per the Animal Husbandry department any development of the grasslands could pose a bio-security hazard to the various animal farms in the area and have strongly recommended protection of the grasslands. The High Court of Karnataka has declared a **Status Quo** in a response to a public interest litigation (PIL).

This proposal provides important information and strategies for successfully conserving the region as a critical and sensitive ecological zone.

We hereby request it be declared a **Conservation Reserve**, under section 36A of the Wildlife Protection Act 1972.

Introduction to the Proposal

The city of Bangalore is one of the fastest growing cities in Asia. With increasing urbanization, biodiversity in natural areas have been facing an onslaught. Wildlife and their habitat are facing the onslaught due to rapidly shrinking habitats, disturbance and destruction of habitat, fragmentation and persecution from various quarters. The Hesaraghatta Lake and its immediate surrounding areas are no exception. This proposal is a plea making a case for conservation of the fragile grasslands around Hesaraghatta Lake and to prevent any further destruction.

In this direction, it presents the sources of threats and disturbances the area is currently facing, the uniqueness of the area with respect to biodiversity conservation and presents the options for conservation.



Why This Proposal?

According to a report released by the Planning Commission (attached #1), Government of India, grasslands and deserts are among the most neglected and yet important ecosystems supporting rich biodiversity in India (Planning Commission 2013). This neglect is evident is obvious in grasslands across India and the Hesaraghatta area is no exception. Like much of the country's grasslands (and forests), this area faces severe pressures from human activities, such as unregulated vehicular movement, sand mining, hunting and tree plantations.

Hesaraghatta Lake, located about 18 km. from Bangalore once supplied drinking water to the city of Bangalore and reached its full capacity for the last time in 1994 (Wikipedia 2013). Since then, the lake and its surrounding areas have undergone tremendous change. The drying of the lake bed has set in motion an ecological succession on a massive scale. As a consequence, most of the area surrounding the lake bed, that forms the immediate catchment area around the lake, looks like a tree savanna. More recently, the Hesaraghatta area has been subjected to intense tree planting to an unprecedented scale, which has totally desecrated its unique grassland habitat (Lakshman 2012, Sreenivasan 2011, Subramanya 2013; figures 1, 2, 3, 4). Besides, the unrestricted and heightened human activity (Seshadri *et al.* 2013) in the area has been impacting the habitat and the biodiversity it supports.



Figure 1: JCB dug pits used for high-density tree planting by BDA in 2011



Figure 2: High intensity tree planting in the tree-savanna type of grassland ecosystem at Hesaraghatta



Figure 3: High intensity of tree planting in the open grassland ecosystem



Figure 4: Google Earth imagery (white areas) showing the extent of tree planting in Hesaraghatta

This is apart from the direct anthropogenic disturbances caused by the numerous establishments of hospitality and entertainment industry that have been set up in the region (Bhat, 2013). Considering

these threats and disturbance that the Hesaraghatta grasslands are subjected to, it is proposed that the grassland that thus exists and supports a rich biodiversity (Subramanya 2012b, attached #2) is worth preserving. Otherwise, due to the present apathy, lacking any conservation intervention, hundreds of species of flora and fauna will be at risk at Hesaraghatta and its catchment. Here, we propose to declare the Hesaraghatta lake bed, surrounding grassland/woodland and conserve the water catchment area from further degradation by proposing to declare it as a Conservation Reserve.

Rejuvenation of the Water Catchment Area – A Case for Bangalore’s Water Security

If one draws an arc with a radius of 3 km from east to west via north, keeping the south end of Hesaraghatta lake as the centre, that would be one of the largest single and prime catchment of Hesaraghatta reservoir and the (now extinct) Arkavathy river as well. On the northern side, it extends to over 10-11 Km all the way to Kakolu tank. As the government owns over 4000 acres of this catchment, and even though intensive agriculture has taken place, it is not built up. There is almost no toxic effluents or large amounts of sewage.

The ground water levels in and around Hesaraghatta have plummeted and continues to do so. What was 70ft in the 1980s is now between 600 to over 1000 ft. The land use pattern around is rapidly changing; unused agricultural lands are legally and illegally being sold as ‘residential plots’. To feed into this development water is being farmed from deep bore wells. Cropping patterns have changed and farmers are growing water intensive crops such as corn in large scale, which is further depleting the water table.

There is no sewage and garbage management plan here and the increasing population is increasing this problem every day. Garbage will soon find its way to the dry lake bed. The drinking water supply is in an alarming situation right now in Hesaraghatta and surrounding villages. Severe granite quarrying around Hesaraghatta is also degrading the catchment area.

To add to all this, the city of Bangalore is inching north like a giant amoeba and it's just a matter of a couple of years before this place gets totally built up. Hence it is important to preserve the 5000 acre lake bed, catchment and surrounding grasslands keeping the water security of Bangalore and surrounding areas in mind. By preserving the thousands of acres of land around Hesaraghatta reservoir, Byatha, Kakolu tanks and the Hesaraghatta Lake bed itself as part of the Greater Hesaraghatta Reserve, we will be making a large contribution to the future generations. Any large scale commercial activity in this area will spell doom to the already precarious water situation.

Public Interest Litigation (PIL) in Karnataka High Court

In September 2012, a group of concerned citizens led by photographer Mahesh Bhat, who lives near the Hesaraghatta grasslands in Bangalore, had initiated an online petition campaign to save the Hesaraghatta grasslands from getting converted into a film city as proposed in the annual 2012 Karnataka budget. Earlier, in August 2011, the Bangalore Development Authority (BDA) had planted several thousand saplings in almost half of the grassland. The misguided seemingly good-intentioned

approach was stopped thanks to an outcry from conservationists in the city but not before considerable damage was done.

Subsequently Mahesh and his colleagues from Arkavathy and Kumudvathy River Rejuvenation Trust had met the then chief minister, the chief secretary, and other senior officials on this subject too. The department of Information who is responsible to build the film city on this land had even sent our petition to the government. But there was no response. Hence the trust filed a PIL in the high court of Karnataka (WP45759/2012) in December 2012.

The PIL came up for hearing before the division bench of the acting Chief Justice and JusticeNagarathna on 4th January 2013. The Hon'ble court has admitted the petition and issued notices to the govt. The bench has also asked status quo(order attached #3) to be maintained till further orders.

We hope that the final verdict will favour the environment, and not mindless and insensitive development in a fragile ecosystem.

Other Considerations – Animal Husbandry & Bio-security

In addition to the rationale provided about protecting the grasslands, there are other important reasons that necessitate the area is left undisturbed.

The Principal Secretary to the Government, Animal Husbandry & Fisheries Department, in a letter to Chief Secretary (attached #4) has clearly recommended NOT subjecting the Hesaraghatta Grasslands to any development for several reasons.

Here is the summary / opinion in the last part of her letter:

On the above grounds, this department is of the opinion that it is not advisable to develop this land on the lines suggested by the Tourism Department. This department is also of the considered view that this particular piece of land be left as grassland and returned to the Animal Husbandry Department for protecting and preserving it as such.

Additionally, as per the instructions of the Principal Secretary, Dept. of Animal Husbandry and Fisheries, a meeting of Heads of various farms at Hesaraghatta under the Chairmanship of Dr.SYathiraj, Dean, Veterinary College, KVAFSU, Hebbal, Bangalore was held on 5th May 2012. Subsequently, the Dean visited Hesaraghatta Farm and had discussions with the Heads of various centres / farms to discuss about the bio-security threats to the animal husbandry activities in and around Hesaraghatta in view of establishment of Theme Park related to Film Industry.

Here is the opinion of the Dean (full report attached #5):

Any form of increased human activity in this area will be a great threat to the breeding activities which are the primary source of breeding material to the state and country which has a direct impact on the milk production of state in turn gravely effects the economy and livelihood security of farmers.

In order to maintain highest order of bio-security in terms of maintaining disease free animals in the zone, sustainable livestock, poultry and fish production, rural economy, any enterprising activity, which enhances human movement around the existing farms, should not be encouraged.

These considerations suggest, in no uncertain terms, that the Hesaraghatta grasslands should be left undisturbed.

Proposed Conservation Reserve Area

The proposed Hesaraghatta Conservation Reserve is about 5000 acres in and around Hesaraghatta Lake (Figure 1). It includes the larger water catchment of Byatha and Kakolu Lakes. Though these lakes do not cater to the water needs of Bangalore today, they possess immense potential in doing so in the near future. The existence of these lakes also has significant effects on the ground water table as well. A detailed description and justifications for this proposition is provided below.

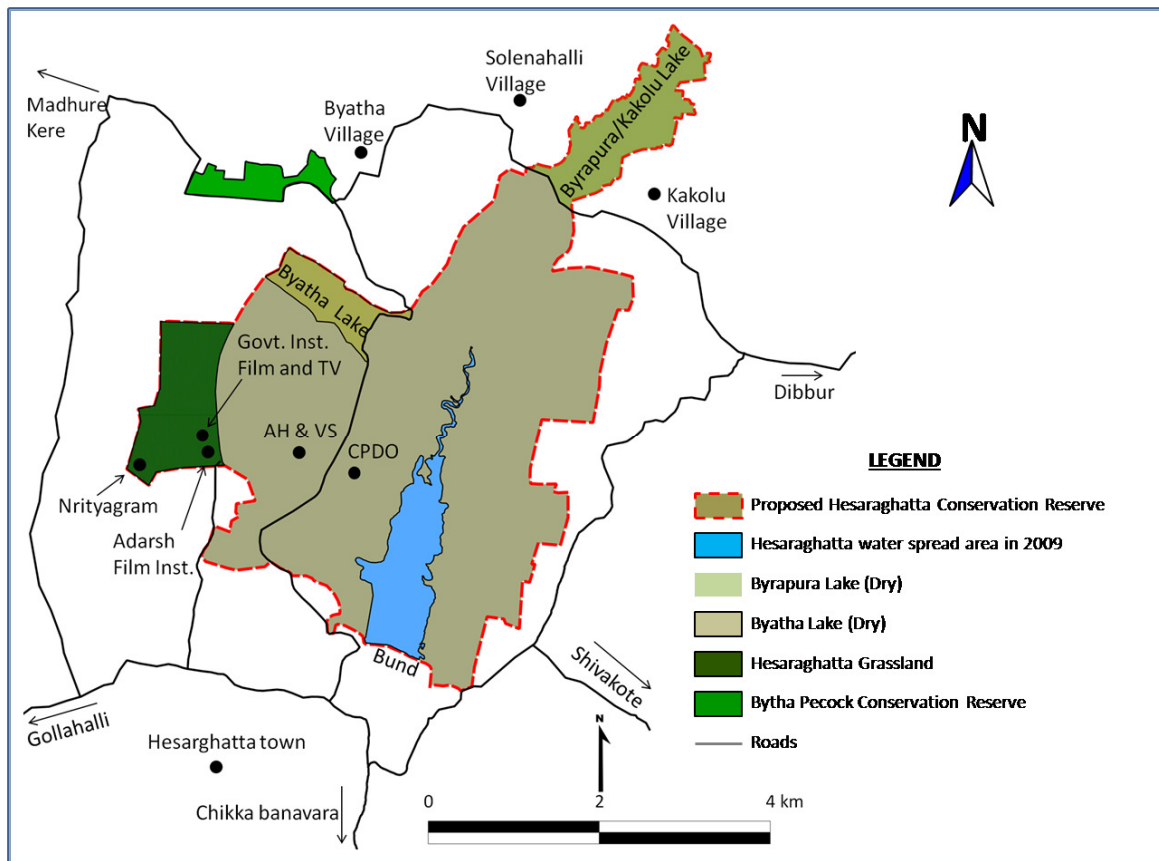


Figure 5: Thematic plan depicting the proposed Hesaraghatta Conservation Reserve

The proposed area includes:

- Hesaraghatta Grassland (356 acres)
- Byrapura Lake (Dry – 383 acres)
- Byatha Lake (Dry – 165 acres)
- Waterspread area in Hesaraghatta lake (1356 acres (2009))

Justification for selecting the aforementioned areas:

- The proposed Reserve is home to hundreds of species of flora and fauna, including plants, mammals, reptiles, amphibians, birds, spiders, butterflies and more (Subramanya 2012b).
- The place has about forty native and naturalized plant species belonging to the grassland ecosystem, apart from a few invasive species that have made their home here.
- There are also about a dozen species of trees have been planted in large numbers here recently.
- The area supports a unique diversity of avifauna in this area (Subramanya 2012b). About 133 species of birds across more than 40 families are seen here, accounting for a third of the species recorded for Bangalore. Quails, peafowl, egrets, harriers, kites, eagles, vultures, falcons, doves, cuckoos, lapwings, owls and more reside in the area of the proposed Conservation Reserve.
- Some of the rare and significant species found in the proposed Reserve area include:

- The Indian Leopard (*Panthera pardus*) has been intermittently spotted on the grasslands. Recently a forest department project camera-trapped a leopard in the grasslands. The leopard is listed under Schedule I of the Wildlife Conservation Act (1972), according them the highest level of legal protection in the country.
 - The Lesser Florican (*Sypheotides indicus*), an endangered endemic bustard that is listed under Schedule I of the Wildlife Conservation Act (1972) which has been sighted in Hesaraghatta after 100 years (Raghavendra 2012, Subramanya 2012a attachment #6).
 - The Slender Loris (*Loris tardigradus*) is a small, nocturnal primate that prefers thorny bushes that dot the grasslands. They are also listed under the Schedule I of the Wildlife (Protection) Act of India, 1972.
 - European Roller (*Coracias garrulous*), a bird listed as 'Vulnerable' in the Red List of the International Union for Conservation of Nature (IUCN), and
 - The Lilac Silverline (*Apharitis lilacinus*) butterfly, sighted after 103 years in Bangalore, and only at Hesaraghatta.
- The area is also home to thousands of migratory birds that arrive here every winter from the Palearctic and from as close as Arctic Circle.

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Figure 6: Clockwise from bottom right – Lilac Silverline Butterfly, Slender Loris, Common Leopard and Lesser Florican



Figure 7: Clockwise from bottom right – Pallid Harrier, Marsh Harrier, Short-toed Snake-eagle, Red-necked Falcon

Richness of Flora and Fauna

The following table summarizes the flora and fauna recorded at the Hesaraghatta lake and grassland area. More details can be found in Appendix and Subramanya (2012b, attachment #2).

Group		Number of species
A.	Plants (including grasses)	
a.	Native and Naturalized Plant Species in Hesaraghatta Grasslands and Grassland Scrub	39
b.	Invasive Plant species in Grassland	4
c.	Trees species planted recently in the Grassland and Grassland Scrub	12
B	Mammals	10
C.	Reptiles	5

D.	Birds	133
E.	Amphibians	1
G.	Spiders	3
F.	Butterflies	14

Conservation Issues: Commercial & Other Activities

- **Unregulated vehicular movement:** In recent years, nature, more specifically, wildlife photographers have been a source of great disturbance to the birds and other fauna that inhabit the Hesaraghatta area. These photographers, pursue birds in their vehicles continuously, which besides a source of disturbance, would cause damage to the habitat (see, Seshadri *et al.* 2013). This activity has been facilitated by the drying of lakebed and causes damage by destroying vegetation.
- **Sand mining:** Owing to the drying-up of the lake, sand mining in the lakebed area by villagers from the surrounding area has resulted in the formation of large pits damaging the lakebed area. Unchecked sand-mining would alter the lake structure and thus the biota that inhabit the lake.
- **Tree plantations:** In the recent years, tree planting activity has been wide spread with pits dug using JCB and most of the grassland area was intensely planted with saplings with the inter-plant distance being anywhere between 6-8feet. Majority of the sapling species planted belonged to Pongamia, Bamboo, Neem, Simarouba, Jamun, Rose-apple and a few others. The high intensity tree planting at Hessarghatta has completely desecrated the grassland ecosystem due to the planting sapling of trees that are not native to the open and tree-savanna grassland habitats. This desecration and the scale at which tree-planting has been carried out has destroyed the last remaining unique grassland ecosystem in the outskirts of Bangalore. Close examination of the tree planting activity on Google Earth clearly shows that an enormous area has been covered under the tree-planting activity and destruction of the habitat has been of unprecedented scale and has caused an irreparable damage to the unique grassland ecosystem (Subramanya 2013).
- **Hunting:** It has been observed that hunting of birds and other animals that inhabit the grassland area by the people from the surrounding area has been of regular occurrence. As area is not being patrolled by the staff of the State Wildlife Department of KFD, this activity has shaped up without any control.
- **Commercial establishments:** The setting up of various commercial units related to the hospitality and entertainment industries has worsened the situation: As can be seen in Figure 1, many establishments both private and State owned have built their establishments and facilities within the immediate surroundings of the lake.

Solutions: Conservation Strategy

- The proposal in being fully aware of the unique habitat and the accompanying biodiversity that the Hesaraghatta Area supports, strongly campaigns for declaration of the area as a Conservation Reserve.

- Considering the disturbance and damage caused to the grassland habitat and its inhabiting biota and more particularly the unprecedented desecration of grassland habitat due to mindless, large-scale tree-planting activity, would call for an end to these activities and that these habitat destructive and biodiversity un-friendly activities can only be stopped when the area is declared as a Protected/Conservation area.
- As India has ratified the Convention on Migratory Species, it has become necessary to accord protection to a host of migratory species that frequent Hesaraghatta area and the habitat that they inhabit in the area.
- ***Digging of trenches to restrict vehicular movement:*** In an effort to reduce vehicular movements with the Hesaraghatta grassland area, it is recommended to dig trenches along trails, entry points and at key access points.
- ***Policing by forest department against illegal activities:*** As hunting of birds and other animals has been unchecked besides other forms of disturbance to the habitat and fauna, it is strongly recommended to post regular watch and ward at Hesaraghatta area, more particularly during winter (October – April) months, with permanent staff of the State Forest Department deployed in the area.
- Encouraging low-impact recreation activities like bird watching and nature appreciation, cycling, walking and running in demarcated trails. Such citizens would also serve the role of watchdogs for the ecosystem. The Karnataka Forest department has already developed several such “Urban Forests” across the state.
- A year-round multi-year ecology and biodiversity monitoring programme in collaboration with a leading Bangalore-based educational institution like NCBS or IISc.

Thus, both habitat protection and biodiversity conservation needs at Hesaraghatta can be only be addressed by declaration of the area as a ***Conservation Reserve***.

Attachments

1. Planning Commission. Report of the Task Force on Grasslands and Deserts. Government of India (undated).
2. Status Survey of Hesaraghatta Grasslands by S. Subramanya as requested by Karnataka Biodiversity Board (KBB).
3. Karnataka High Court Order in response to Writ Petition WP45759/2012.
4. Letter from Principal Secretary to the Government, Animal Husbandry & Fisheries Department to Chief Secretary.
5. Letter from Dr. S Yathiraj, Dean, Veterinary College, KVAFSU, Bangalore, in view of establishment of Theme Park related to Film Industry.
6. Raghavendra, M., 2011. Occurrence of Lesser Florican *Sypheotides indicus* in Bangalore, Karnataka, India. Indian BIRDS.

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13. <http://www.conservationindia.org/gallery/kannada-film-industry-continues-to-destroy-hesaraghatta-grassland>

Appendix A: Species

Plants (including grasses)

Native and Naturalized Plant Species in Hesaraghatta Grasslands and Grassland Scrub

Family: Acanthaceae

1. *Andrographis serpyllifolia* (Vahl) Wight
2. *Barleria buxifolia* L.
3. *Lepidagathis cristata* Willd.
4. *Agave sisalana* Perrine ex Engelm.

Family: Apocynaceae

5. *Carissa paucinerva* A. DC.
6. *Ichnocarpus frutescens* (L.) R.Br.

Family: Arecaceae

7. *Phoenix sylvestris* (L.) Roxb.

Family: Asclepiadaceae

8. *Calotropis gigantea* (L.) R. Br.

Family: Asteraceae

9. *Chromolaena odorata* (L.) King & Robinson
10. *Launaea acaulis* (Roxb.) Babc. ex Kerr
11. *Vicoa indica* (L.) DC.

Family: Celastraceae

12. *Celastrus paniculatus* Willd.

Family: Convolvulaceae

13. *Evolvulus alsinoides* (L.) L.

Family: Cucurbitaceae

14. *Diplocyclos palmatus* (L.) Jeffrey

Family: Ebenaceae

15. *Diospyros melanoxyton* Roxb.

Family: Erythroxylaceae

16. *Erythroxylum monogynum* Roxb.

Family: Euphorbiaceae

17. *Euphorbia laeta* Heyne ex Roth
18. *Securinega leucopyrus* (Willd.) Muell.-Arg.

19. *Tragia involuocrata* L.

Family: Fabaceae

Sub-family: Caesalpinioideae

20. *Cassia auriculata* L.

Sub-family: Faboideae

21. *Abrus precatorius* L.

22. *Butea monosperma* (Lam.) Taub.

23. *Crotalaria* sp.

Sub-family: Mimosoideae

24. *Acacia nilotica* ssp. *indica* (Bentham) Brenan

25. *Acacia* sp.

26. *Pithecellobium dulce* (Roxb.) Benth

Family: Flacourtiaceae

27. *Flacourtia indica* (N. Burman) Merrill

Family: Lamiaceae

28. *Leucas hirta* (Roth) Sprengel

Family: Meliaceae

29. *Cipadessa baccifera* (Roth) Miquel

Family: Menispermaceae

30. *Cocculus hirsutus* (L.) Diels

Family: Poaceae

31. *Heteropogon contortus* (L.) Pal.-Beauv. ex Roemer & Schultes

32. *Aristida hystrix* L. f.

33. *Cymbopogon citratus* (DC.) Stapf

34. *Digitaria ciliaris* (Retz.) Koeler

35. *Themeda triandra* Forskal

Family: Rubiaceae

36. *Canthium parviflorum* Lam.

Family: Rutaceae

37. *Toddalia asiatica* var. *floribunda* Gamble

Family: Scrophulariaceae

38. *Striga asiatica* (L.) Kuntze

39. *Tridax procumbans*

Invasive Plant species in Grassland

Family:

1. Mesquite *Prosopis juliflora*

Family:

2. Lantana *Lantana camara*

Family:

3. Eupatorium *Eupatorium perfoliatum*

Family:

4. *Stachytarpheta indica*

Trees species planted recently in the Grassland and Grassland Scrub

Family: Moraceae

1. *Artocarpus heterophyllus* Lam.

2. *Ficus religiosa* L.

Family: Proteaceae

3. *Grevillea robusta* A.Cunn. ex R.Br.

Family: Anacardiaceae

4. *Mangifera indica* L.

Family: Muntingiaceae

5. *Muntingia calabura* L.

Family: Fabaceae

Sub-family: Faboideae

6. *Pongamia pinnata* (L.) Pierre

7. *Tamarindus indica* L.

Family: Myrtaceae

8. *Psidium guajava* L.

9. *Syzygium cumini* (L.) Skeels

Family: Meliaceae

10. *Swietenia mahagoni* (L.) Jacq.

Family: Combretaceae

11. *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.

Family: Malvaceae

12. *Thespesia populnea* (L.) Sol. ex Correa

Mammals

1. Slender Loris *Loris lydekkerianus*
2. Common Mongoose *Herpestes edwardsii*
3. Jackal *Canis aureus naria*
4. Indian Fox *Vulpes bengalensis*
5. Palm squirrel *Funambulus palmarum*
6. Indian Mole rat *Bandicota bengalensis*
7. House Mouse *Mus musculus*
8. Indian Field Mouse *Mus booduga*
9. Black-naped Hare *Lepus nigricollis*
10. Wild Boar *Sus scrofa*
11. Common Leopard *Panthera pardus*

Reptiles

1. Garden Lizard, *Calotes versicolor*
2. Peninsular Rock Agama *Psammophilus dorsalis*
3. Ratsnake *Ptyas mucosus*
4. Common Cobra *Naja naja*
5. Russell's Viper *Daboia russelii*

Birds

Order: Galliformes

Family: Phasianidae

1. Grey Francolin *Francolinus pondicerianus*
2. Common Quail *Coturnix coturnix*
3. Rain Quail
4. Jungle Bush Quail *Perdica asiatica*
5. Grey Junglefowl *Gallus sonneratii*
6. Indian Peafowl *Pavo cristatus*

Order: Pelecaniformes

Family: Ardeidae

7. Cattle Egret *Bubulcus ibis*
8. Indian Pond Heron *Ardeola grayii*

Order: Falconiformes

Family: Accipitridae

9. Crested Honey Buzzard *Pernis ptilorhynchus*

10. Black-winged Kite *Elanus caeruleus*
11. Black Kite *Milvus migrans*
12. Brahminy Kite *Haliastur indus*
13. Egyptian Vulture *Neophron percnopterus*
14. Short-toed Snake Eagle *Circaetus gallicus*
15. Marsh Harrier *Circus aeruginosus*
16. Hen Harrier *Circus cyaneus*
17. Pallid Harrier *Circus macrourus*
18. Pied Harrier *Circus melanoleucos*
19. Montagu's Harrier *Circus pygargus*
20. Shikra *Accipiter badius*
21. Eurasian Sparrowhawk *Accipiter nisus*
22. White-eyed Buzzard *Butastur teesa*
23. Indian Spotted Eagle *Aquila hastata*
24. Greater Spotted Eagle *Aquila clanga*
25. Tawny Eagle *Aquila rapax*
26. Steppe Eagle *Aquila nipalensis*
27. Booted Eagle *Aquila pennata*
28. Common Buzzard *Buteo buteo*

Family: Falconidae

29. Common Kestrel *Falco tinnunculus*
30. Red-necked Falcon *Falco chicquera*
31. Peregrine Falcon - *Falco peregrinus*

Order: Otidiformes

Family: Otididae

32. Lesser Florican *Sypheotides indicus*

Order: Charadriiformes

Family: Turnicidae

33. Barred Buttonquail *Turnix suscitator*

Family Charadriidae

34. Yellow-wattled Lapwing *Vanellus malabaricus*
35. Grey-headed Lapwing *Vanellus cinereus*

Order: Columbiformes

Family: Columbidae

36. Rock Pigeon *Columba livia*
37. Laughing Dove *Streptopelia senegalensis*
38. Spotted Dove *Streptopelia chinensis*
39. Eurasian Collared Dove *Streptopelia decaocto*

Order: Psittaciformes

Family: Psittacidae

40. Rose-ringed Parakeet *Psittacula krameri*

Order: Cuculiformes

Family: Cuculidae

41. Pied Cuckoo *Clamator jacobinus*

42. Common Hawk-Cuckoo *Hierococcyx varius*

43. Indian Cuckoo *Cuculus micropterus*

44. Common Cuckoo *Cuculus canorus*

45. Asian Koel *Eudynamys scolopacea*

46. Blue-faced Malkoha *Phaenicophaeus viridirostris*

47. Greater Coucal *Centropus sinensis*

Order: Strigiformes

Family: Tytonidae

48. Barn Owl *Tyto alba*

Family: Strigidae

49. Short-eared Owl *Asio flammeus*

50. Oriental Scops Owl *Otus sunia*

51. Indian Scops Owl *Otus bakkamoena*

52. Indian Eagle-Owl *Bubo bengalensis*

53. Brown Fish Owl *Ketupa zeylonensis*

54. Mottled Wood Owl *Strix ocellata*

55. Jungle Owlet *Glaucidium radiatum*

56. Spotted Owlet *Athene brama*

57. Brown Hawk Owl *Ninox scutulata*

Order: Caprimulgiformes

Family: Caprimulgidae

58. Indian Jungle Nightjar *Caprimulgus indicus*

59. Sykes's Nightjar *Caprimulgus mahrattensis*

60. Indian Nightjar *Caprimulgus asiaticus*

61. Savanna Nightjar *Caprimulgus affinis*

Order: Apodiformes

Family: Apodidae

62. House Swift *Apus affinis*

63. Alpine Swift *Apus melba*

Order: Coraciiformes

Family: Coraciidae

64. Indian Roller *Coracias benghalensis*

Family: Alcedinidae

65. White-throated Kingfisher *Halcyon smyrnensis* (Breeding resident)

Family: Meropidae

66. Green Bee-eater *Merops orientalis*

Order: Bucerotiformes

Family: Upupidae

67. Hoopoe *Upupa epops*

Order: Passeriformes

Family: Pittidae

68. Indian Pitta *Pitta brachyura*

Family: Aegithinidae

69. Common Iora *Aegithina tiphia*

Family: Campephagidae

70. Black-headed Cuckoo-shrike *Coracina melanoptera*

Family: Laniidae

71. Brown Shrike *Lanius cristatus* (Regular winter visitor)

72. Bay-backed Shrike *Lanius vittatus*

73. Long-tailed Shrike *Lanius schach*

Family: Oriolidae

74. Indian Golden Oriole *Oriolus kundoo*

Family: Dicruridae

75. Black Drongo *Dicrurus macrocercus*

76. White-bellied Drongo *Dicrurus caerulescens*

77. Ashy Drongo *Dicrurus leucophaeus*

Family: Corvidae

78. House Crow *Corvus splendens*

79. Jungle Crow *Corvus macrorhynchos*

Family: Paridae

80. Cinereous Tit *Parus cinereus*

Family: Alaudidae

- 81. Jerdon's Bushlark *Mirafra affinis*
- 82. Ashy-crowned Sparrow-Lark *Eremopterix griseus*
- 83. Rufous-tailed Lark *Ammomanes phoenicura*
- 84. Greater Short-toed Lark *Calandrella brachydactyla*
- 85. Oriental Skylark *Alauda gulgula*

Family: Pycnonotidae

- 86. Red-whiskered Bulbul *Pycnonotus jocosus*
- 87. Red-vented Bulbul *Pycnonotus cafer*
- 88. White-browed Bulbul *Pycnonotus luteolus* [34]

Family: Hirundinidae

- 89. Sand Martin *Riparia riparia* (Vagrant)
- 90. Plain Martin *Riparia paludicola* (Vagrant)
- 91. Barn Swallow *Hirundo rustica*
- 92. Pacific Swallow *Hirundo tahitica*
- 93. Red-rumped Swallow *Cecropis daurica*
- 94. Streak-throated Swallow *Hirundo fluvicola*

Family: Phylloscopidae

- 95. Greenish Warbler *Phylloscopus trochiloides*

Family: Acrocephalidae

- 96. Blyth's Reed Warbler *Acrocephalus dumetorum*
- 97. Sykes' Warbler *Iduna rama*

Family: Cisticolidae

- 99. Zitting Cisticola *Cisticola juncidis*

- 100. Jungle Prinia *Prinia sylvatica*
- 101. Ashy Prinia *Prinia socialis*
- 102. Plain Prinia *Prinia inornata*
- 103. Common Tailorbird *Orthotomus sutorius*

Family: Timaliidae

- 104. Tawny-bellied Babbler *Dumetia hyperythra*

Family: Leiothrichidae

- 105. Large Grey Babbler *Turdoides malcolmi*
- 106. Yellow-billed Babbler *Turdoides affinis*

Family: Sylviidae

- 107. Lesser Whitethroat *Sylvia curruca blythi*
- 108. Yellow-eyed Babbler *Chrysomma sinense*

Family: Zosteropidae

109. Oriental White-eye *Zosterops palpebrosus*

Family: Sturnidae

110. Grey-headed Starling *Sturnia malabarica*

111. Brahminy Starling *Sturnia pagodarum*

112. Rose-coloured Starling *Sturnus roseus*

113. Common Myna *Acridotheres tristis*

114. Jungle Myna *Acridotheres fuscus*

Family: Turdidae

115. Indian Robin *Saxicoloides fulicatus*

116. Siberian Stonechat *Saxicola maura*

117. Pied Bushchat *Saxicola caprata*

Family: Dicaeidae

118. Pale-billed Flowerpecker *Dicaeum erythrorhynchos*

Family: Nectariniidae

119. Purple-rumped Sunbird *Nectarinia zeylonica*

120. Purple Sunbird *Cinnyris asiaticus*

Family: Ploceidae

121. Baya Weaver *Ploceus philippinus*

Family: Estrildidae

122. Red Munia *Amandava amandava*

123. Indian Silverbill *Euodice malabarica*

124. White-rumped Munia *Lonchura striata*

125. Scaly-breasted Munia *Lonchura punctulata*

126. Black-headed Munia *Lochura malacca*

Family: Motacillidae

127. White-browed Wagtail *Motacilla maderaspatensis*

128. Grey Wagtail *Motacilla cinerea*

129. Richard's Pipit *Anthus richardi*

130. Red-throated Pipit *Anthus cervinus*

131. Paddyfield Pipit *Anthus rufulus*

132. Blyth's Pipit *Anthus godlewskii*

133. Tree Pipit *Anthus trivialis*

Amphibians

1. Common Toad *Duttaphrynus melanostictus*

Spiders

1. Erisid Spider *Stegodyphus sarasinorum*
2. Signature Spider *Argiope argentata*
3. Giant Wood Spider *Nephila maculate*

Butterflies

Family: Papilionidae

1. Common Rose *Pachliopta aristolochiae*

Family: Nymphalidae

2. Blue Pansy *Junonia orithya*
3. Chocolate Pansy *Junonia iphita*
4. Common Fourring *Ypthima huebneri*
5. Lemon Pansy *Junonia lemonias*
6. Plain Tiger *Danaus chrysippus*
7. Striped Or Common Tiger *Danaus genutia*
8. Yellow Pansy *Junonia hierta*

Family: Lycaenidae

9. Dark Grass Blue *Zizeeria karsandra*
10. Lesser Grass Blue *Zizina otis*
11. Tiny Grass Blue *Zizula hylax*
12. Slate Flash *Rapala schistacea*

Family: Hesperidae

13. Indian Grizzled/Indian Skipper *Spialia galba*
14. Pale Palm Dart *Telicota colon*

Source of Information

Plants: Dr. A. N. Sringeswara & Dr. Sahana Vishwanath

Mammals, Reptiles and Amphibians: Arun Nadavar & Vinay Kumar Thimmappa

Birds: Dr. S. Subramanya

Spiders: Vinay Kumar Thimmappa

Butterflies: Rohit Girotra & Vinay Kumar Thimmappa

Report of the Task Force on

Grasslands and Deserts



सत्यमेव जयते

**Government of India
Planning Commission**

New Delhi

Report of the Task Force on
Grasslands and Deserts



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Executive Summary

Grasslands and deserts are the most neglected ecosystems by the Ministry of Environment and Forests which looks after biodiversity conservation in India. Protection, development and sustainable use of grasslands are very important for the rural economy and livestock. India has more than 500 million livestock, more than 50 percent of the fodder for this livestock comes from grasslands. Many natural grasslands (e.g. wet grasslands of *terai*, *shola* grasslands of the Western Ghats, dry grasslands of Deccan) have been converted to plantations, sometimes even in Protected Areas. Some of the most threatened species of wildlife are found in the grasslands and deserts (e.g. Great Indian Bustard, Lesser Florican, Indian Rhinoceros, Snow Leopard, Nilgiri Tahr, Wild Buffalo etc). Despite the importance of grasslands and deserts for biodiversity conservation, livestock dependency and for poverty alleviation, we still do not have Grassland Development and Grazing Policy in place.

The major recommendations of the Task Force for Desert and Grasslands are follows:

1. *There is an urgent need for a **National Grazing Policy** to ensure the sustainable use of grasslands and biodiversity conservation. For implementation of the various recommendations of the National Grazing Policy and R&D, we need funds to the tune of Rs 100 crore.*
2. *Necessary modification would be required in the new **EIA guidelines** by including ecologically fragile and environmentally sensitive areas where prior EIAs will have to be made mandatory. Also, presence of representatives from identified institutions and experts should be made mandatory during public hearing whenever an EIA is done in the grassland and desert ecosystems so as to review the identified impacts, prediction and mitigation.*
3. *Considering a wide range of activities and programmes under each Ministry and R & D Institutions, it would be extremely important to identify some of the cross cutting themes and launching the **Integrated Research and Development Programmes** in the grasslands and deserts. (Rs 50 crore)*
4. *It is recommended that a network of grassland ecologists be established and a country wide **Long Term Ecological Research (LTER)** needs to be initiated in representative biogeographic zones. These LTER sites could then serve as*

- ecological benchmarks for future training, teaching as well as monitoring sites. Simultaneously the nodal agencies need to take up the new dimensions of grassland ecology including impact of climate change and land use practices within and around grassland and desert ecosystems. (Rs. 50 crore)*
5. *Considering bustard species, and Snow Leopard as flagship species of grasslands (hot and cold deserts), there is an urgent need to start multiple-state and multiple-departments, centrally-sponsored **Project Bustard** and **Project Snow Leopard**, on the same pattern of Project Tiger and Project Elephant. (Rs 15 crore each project).*
 6. *There is an urgent need to increase grasslands and desert ecosystems in Protected Area system, especially in the Thar Desert and the cold desert of Ladakh and Sikkim which are grossly under-represented. The Desert National Park located in Jaisalmer and Barmer should be declared as a **Biosphere Reserve**. (Rs 30 crore).*
 7. *The Ministry of Environment and Forests (MoEF), Government of India should start a division or section to look after the grasslands issues, on the pattern of Wetland Division to be headed by a Joint Secretary.*

Species to benefit through better protection of grasslands and deserts, ecosystems and habitats to benefit from protection of Grasslands and deserts, protected areas to benefit from protection of grasslands and deserts are at Appendices – I, II and III respectively.

Report of the Task Force on Grasslands and Deserts

The Planning Commission (Environment and Forests Division), vide letter number M-13033/1/2006-E&F, dated 21 August, 2006 constituted a Task Force on Grasslands and Deserts for the Environment and Forests Sector for the Eleventh Five-Year Plan (2007-2012). The composition of the Task Force was as follows:

Dr. Panjab Singh, Chairman

Dr. Asad R. Rahmani, Bombay Natural History Society, Mumbai

Mr. Sonam Wangchuk, SECMOL, Ladakh

Dr. Charudatta Mishra, Nature Conservation Foundation, Mysore

Dr. K. D. Singh, International Forestry Expert, Ex-FAO, New Delhi

Dr. Pratap Narain, Director, CAZRI, Jodhpur

Dr. K. A. Singh, Director, IGFRI, Jhansi

Mr. Sanjay Kumar, DIGF, MoEF

Mr. Sonam Wangchuk and Dr. Charudatta Mishra regretted their inability to participate in this Task Force due to their other commitments . In order to have representative from high altitude grasslands and cold desert, the Chairman co-opted the following two experts:

Dr. G. S. Rawat, Wildlife Institute of India, Dehradun

Dr. Raghunandan Singh Chundawat, International Snow Leopard Project

The Terms of References of the Task Force were as follows:

- 1. Review the current laws, policies, procedures and practices related to conservation and sustainable use of grasslands and desert ecosystems and recommend correctives.*
- 2. Similarly review the institutional and individual capacities available to address issues related to conservation and sustainable use of grassland and desert ecosystems and recommend how they may be adequately strengthened.*

3. *Assess the current issues and systems of integrating concerns relating to fragile grassland and desert ecosystems into other sectors (ministries, departments) and to recommend required new or remedial measures.*
4. *Review the current EIA laws, policies, procedures and practices as being applied in the grasslands and desert ecosystem context and recommend corrective measure to address significant issues that specifically arise in the context of these fragile ecosystems.*

The Task Force held three meetings in Delhi on 13 October, 1 November, and 20 November 2006. In addition to these meetings, informal email or telephone discussions were held by members and draft notes were exchanged.

Introduction

Grasses and their values have been recognized since time immemorial as the present day cereal crops are the cultivated varieties of their wild ancestors. Use of grasses, as food resources or as fodder has led to extensive breeding programs and improvement in pasture land. In India concept of scientific pasture management has not been properly planned, despite the fact that India has one of the largest livestock populations in the world, with an estimated 520 million heads. Efforts in India for pasture management have been confined either to improvement of existing grasslands or introduction of suitable exotics. There is no sound management plan for the development of pasture land and protection of existing patches of grassland, some of which are unique and harbour rich fauna. We have not even fully documented the value of these grasslands in terms of their biological diversity.

Grasslands evolved under a system of grazing, drought and periodic fire and almost all the existing grasslands are maintained by either of these or a combination of all these factors. Tropical grasslands, which are in the mid successional stage, are largely maintained by annual or biannual burning in most of the protected areas (sanctuaries and national parks). Whereas in unprotected areas they are maintained by livestock grazing and other biotic factors. As a seral community, the development of sere is often checked by environmental conditions and is retained as a subclimax rather than climax as in semi-arid and arid areas. In areas of high rainfall, forest is the climax vegetation and wherever grasslands exist, they are due to clear felling of forests or due to edaphic and fluvial factors (e.g. *terai* grasslands of northern India). Maintenance of these mid successional grasslands, especially as a wildlife habitat to protect some of the key grassland species thus depends upon careful planning and management of these grasslands.

Whyte (1957) has classified Indian grasslands into eight types but Champion & Seth (1968) recognized only three broad categories. Between 1954 and 1962, the Indian Council of Agricultural Research conducted grassland surveys and classified the grass cover of India into five major types (Dibadghao & Shankarnarayan 1973):

1. ***Sehima-Dichanthium* Type:** These are spread over the Central Indian plateau, Choto-Nagpur plateau and Aravalli ranges, covering an area of about 17,40,000 km². This region has an elevation between 300 and 1200 m. There are 24 species of perennial grasses, 89 species of annual grasses and 129 species of dicots, including 56 legumes. This is also a rich wildlife area, with a large number of protected areas, especially forest protected areas (sanctuaries and national parks).
2. ***Dichanthium-Cenchrus-Lasiurus* type:** These are spread over an area of about 436,000 km², including northern parts of Delhi, Aravalli ranges, parts of Punjab, almost whole Rajasthan, and Gujarat, and southern Uttar Pradesh. The elevation of this region is not high, between 150 to 300 m. There are 11 perennial grass species, 43 annual grass species, and 45 dicots including 19 legumes. This area has many protected areas, mainly in the hilly regions, but the *Lasiurus indicus* dry grassland of the Thar desert is under-represented in the PA system. These grasslands are extremely important for the survival of certain bird species.
3. ***Phragmites-Saccharum-Imperata* type:** These types of grasslands cover about 2,800,000 km² in the Gangetic Plains, the Brahmaputra Valley and the plains of Punjab and Haryana. The elevation of this region between 300 to 500 m. There are 10 perennial grasses, 26 annual grasses, and 56 herbaceous species, including 16 legumes. The Gangetic Plain is one of the most thickly populated regions in the world so original grassland type is almost gone. Some wet grasslands survive in protected areas of the *terai* region and the Brahmaputra floodplains. These wet grasslands harbour many globally threatened wildlife species.
4. ***Themeda-Arundinella* type:** These grasslands cover about 230,000 km² and include the states of Assam, Himachal Pradesh, Jammu and Kashmir, Manipur, Uttar Pradesh and West Bengal. The elevations ranges between 350 and 1200 m. There are 37 major perennial grass species, 32 annual grass species, and 34 dicots including 9 legumes.
5. **Temperate and alpine cover:** These are spread across altitudes higher than 2100 m and include the temperate and cold desert areas of Himachal Pradesh, Jammu and Kashmir, Uttar Pradesh, West Bengal and the north-eastern states. There are

47 perennial grasses, 5 annual grasses and 68 dicots, including 6 legumes. These high altitude grasslands harbour wildlife not generally found in other parts of the country. This area is also under-represented in the PA system.

Depending upon the biotic influences and local variations in topography and soil structures, these five broad categories can still be subdivided into several grass associations.

Another unique type of grassland type is the **Shola grassland** of the Western Ghats. This type is generally over looked or clumped with other grassland type. However, Shola grasslands are unique as they are confined to the high altitude (>1700 m) in the Western Ghats and interspersed with tropical forests (generally found in the mountain folds and valleys). Shola grasslands are maintained by fire and frost and appear to be climax vegetation as an ancient and geographic relict species of ungulate (Niligir Tahr) is found in the shola grasslands and no where else in the world.

The grasses are considered to be the most evolved species of plants. They are remarkable as they have short life cycle yet a long life i.e. take a short time from germination to reach maturity. Unlike trees, when cut, they sprout back almost instantaneously. They are capable of supporting or converting into incredibly huge amounts of biomass. They also support a rich and diverse variety of fauna. They are efficient in absorbing rain water and play vital role in water retention and hydrology of an area.

Grassland Protection

Grasslands are not managed by the Forest Department whose interest lies mainly in trees, not by the agriculture department who are interested in agriculture crops, nor the veterinary department who are concerned with livestock, but not the grass on which the livestock is dependent. The grasslands are the 'common' lands of the community and are the responsibility of none. They are the most productive ecosystems in the subcontinent, but they belong to all, are controlled by none, and they have no godfathers.

All types of grassland ecosystems are under tremendous grazing pressures. For example, in the semi-arid grasslands, the carrying capacity is 1 Adult Cattle Unit (ACU) per ha (Shankar and Gupta 1992), but the stocking rates are as high as 51 ACU per ha, while in

the arid areas, the carrying capacity is 0.2-05 ACU per ha but the stocking rates are 1 to 4 ACU per ha (Raheja 1966).

Fodder production

Punjab and Haryana have large areas under intensive fodder production where 1 ha of fodder cropped area supports 11-12 ACU (Singh and Misri 1993). This proves that livestock production is more efficient from cultivated fodder than from the degraded grazing lands.

Wildlife of the Indian grasslands

Some of the rarest species of wildlife are found in the grasslands, many of them totally dependent on them. The Bengal Florican, One-horned Rhinoceros, Pygmy Hog, Hispid Hare, Wild Buffalo, Hog Deer, Swamp Deer in *terai* grassland, the Great Indian Bustard in dry, short grasslands, the Lesser Florican in moonsonal grasslands of western India, and the Nilgiri Tahr in the *shola* grasslands of the Western Ghats are some examples. According to reports of the Wildlife Institute of India (WII), less than 1% of the grasslands come under the Protected Area Network. With a livestock population of more than 500 million and growing, the grasslands are under tremendous biotic pressure, mainly grazing and conversion to other uses. Presence of such a huge livestock population and dependence of the rural population on it, proves that protection, restoration and sustainable use of grasslands are important policy and ecological imperatives. Besides, providing habitat, shelter, and food, both to livestock and wildlife, the grasslands also serve important catchment for rivers, streams, reservoirs, dams, check-dams and village ponds. In short, grasslands with forest and other natural vegetative cover greatly help in the water regime and hydrological cycle. Therefore, it is imperative to recognize the ecological, hydrological, economic and sociological role of grasslands as a source of survival for millions of livestock and rural people, as protector of soil and water, of rare wildlife species and biodiversity conservation in general.

Grasslands and deserts are the only breeding grounds of a number of avian species, whose nesting time is the monsoon. Due to the presence of crops in the fields, the monsoon is the period most affected by the free-ranging livestock, who have nowhere else to go. This is the time when the grass grows. If grass is over-grazed at this time, it not only prevents fodder production and seed formation, but also nests of ground-living birds are trampled. No grasslands, however resilient, can bear the overuse and abuse that they are subjected to.

Arid and Semi-arid grasslands

The dry desert occupies nearly 10% of India's geographical area, mainly in Rajasthan and Gujarat. One of the smallest deserts in the world, the Indian Thar desert has a high avian diversity, from its location on the cross-roads of the Palaearctic and Oriental biogeographic regions. As the Thar desert is not isolated, avian endemism is very low. Although no detailed work on the avifauna of the Indian Thar has been done, nearly 300 species of birds have been recorded. Important desert species are the Great Indian Bustard *Ardeotis nigriceps*, Houbara Bustard *Chlamydotis undulata*, Cream-coloured Courser *Cursorius cursor*, Hoopoe Lark *Alaemon alaudipes*, various species of sandgrouse, raptors, wheatears, larks, pipits and munias. In the Rann of Kutch of Gujarat, both Greater *Phoenicopterus roseus* and Lesser *Phoeniconaias minor* flamingoes breed when conditions are suitable. These nesting colonies come under increasing pressure due to tourist disturbance and a large number of nests have been reported to be destroyed. As the site of nesting colonies shift, depending upon inundation, it is difficult to protect them.

In the Thar desert, there is one national park named the Desert National Park (3,162 sq km). Technically, it is a wildlife sanctuary. There are five more wildlife sanctuaries of 12,914 sq km in this zone. On paper, 7.45% of the desert is under the PA network. However, the ground situation is very different. There are 44 villages inside the Desert NP, and more than half of the Little Rann Wildlife Sanctuary (4,953 sq km) is under human occupation. Similarly, the Kutch Desert Sanctuary (7,506 sq km) is under military occupation, being located in the border area. Besides over-grazing, expansion of agriculture, salinization due to wrong irrigation practices, the desert ecosystem is also being altered due to invasive species such as *Prosopis chilensis*.

Semi-arid is a region with a rainfall varying from 400 to 1000 mm and it is dominated by grass and shrub species. The semi-arid region shows high avian numbers, especially granivorous species such as finches, munias, larks, doves and pigeons. It has dry deciduous forest, but extensive tracts of grasslands are seen in the Deccan plateau in central India, the Malwa plateau in western India, and in the Saurashtra region and Kutch in Gujarat. The semi-arid region merges with the arid on the western side and with the Gangetic plains in the north. More than 100 bird species use the semi-arid grasslands for foraging and/or nesting. A majority of species (83%) are present in other grassland types or even small grassland patches within forests, but 17 species are exclusively present in this zone. Only four species are found in the Semi-arid and Deccan regions and nowhere

else. They are the Malabar Crested Lark *Galerida malabarica*, Syke's Crested lark *Galerida deva*, Green Munia *Lonchura formosa* and the Rock Bush Quail *Perdicula argoondah*. Brown Rock Chat *Cercomela fusca* is another endemic bird found in Arid, Semi-arid and the Gangetic plains. Perhaps the most endangered species of the semi-arid grasslands is the Lesser Florican *Sypheotides indica*. Its main breeding areas used to be the grasslands of the Malwa plateau, Kutch and Suarashtra, but due to destruction of grasslands, this bird has disappeared from most of its range.

The Semi-arid grasslands occurring in eastern Rajasthan, Gujarat, western Madhya Pradesh, and parts of Uttar Pradesh, Haryana, Punjab and southern parts of Jammu & Kashmir, constitutes about 5,48,850 sq km or 16.60% of India's geographical area. In the semi-arid zone, there are 8 national parks, totaling 1,319 sq km or 0.24%, and 83 wildlife sanctuaries, covering nearly 14,000 sq km or 2.56% of surface. Some sanctuaries are on paper only, with no effective control and management.

Some of the Protected Areas of arid and semi-arid grasslands have an important genetic resource in the form of grass and shrub species, which are important for ecological and food security of the country. Therefore, these PAs and other types of protected areas should not be considered as important only for wildlife conservation but should be considered as gene banks. For example, most of our cereals have originated from wild grasses. Arid and semi-arid areas also have important breeds of livestock that also need protection. Therefore, protection and enhancement of PAs in arid and semi-arid regions and also protection of wildlife outside PA system should be given high priority and should be integrated in the over-all land-use policy of the country.

Thar Desert

The Thar Desert is one of the smallest deserts in the world, but it exhibits a wide variety of habitats and biodiversity. It is the most thickly populated deserts in the world with an average density of 83 persons per sq. km, whereas, in other deserts, the average is only seven persons per sq. km (Baqri and Kankane 2001). It is considered an important desert in terms of its location where Palaeartic, Oriental and Saharan elements of biodiversity are found.

Despite its comparatively small area, the Thar Desert has a high avian diversity, from its location on the crossroads of the Palaeartic and Oriental biogeographic regions. As the Thar desert is not isolated, avian endemism is very low. To the west, it is connected through the Sind plains with the Persian and then the Arabian deserts, to the northeast

with the Gangetic plains, and to the east, it joins the Semi-Arid biogeographic zone. In the south, it merges with the Rann of Kutch. Therefore most species of birds of the Thar are widely distributed.

Between 250 to 300 species have been reported from the Thar desert. This variation is mainly due to the fact that some authors include Kutch, parts of Saurashtra and the western side of the Aravalli mountains in the Thar desert while others have more a restrictive definition of the desert that includes only nine districts of western Rajasthan and Kutch in Gujarat. In the Rajasthan part of the Thar, nearly 250 species have been reported (Rahmani, 1997a, 1997b). Tremendous changes in the avifaunal structure of the Thar desert are taking place due to the Indira Gandhi Nahar Project (IGNP) and species never seen earlier are now regularly found near the canal (Rahmani 1997a, 1997b; Rahmani and Soni 1997). However, this project is playing havoc with the desert ecosystem by changing the crop pattern, traditional grazing regime and because of colonization by new people who do not have the same conservation value system which the desert people had. Due to easy availability of water everywhere, unsustainable livestock grazing is taking place and the famous Sewan grasslands which have survived for hundreds of years with low grazing pressure now under tremendous pressure. These grasslands are the major habitat of the highly endangered Great Indian Bustard *Ardeotis nigriceps*, and the winter migrant Houbara or the Macqueen's Bustard *Chlamydotis macqueeni*.

Other important desert species are the Cream-coloured Courser *Cursorius cursor*, Greater Hoopoe-Lark *Alaemon alaudipes*, various species of sandgrouse, raptors, wheatears, larks, pipits and munias. In the Rann of Kutch of Gujarat, both Greater *Phoenicopterus roseus* and Lesser *P. minor* flamingoes breed when conditions are suitable. These nesting colonies come under increasing pressure due to tourist disturbance, and a large number of nests have been reported to be destroyed. As the sites of the nesting colonies shift, depending upon inundation, it is difficult to protect them.

In the Thar desert, Rodgers *et al.* (2000) have listed one national park of 3,162 sq. km. and five wildlife sanctuaries of 12,914 sq. km. On paper, 7.45% of the desert is under the PA network. However, the ground situation is very different. There are 44 villages in the Desert National Park, and more than half of the Little Rann Wildlife Sanctuary (4,953 sq. km) is under human occupation. Similarly, the Kutch Desert Sanctuary (7,506 sq. km) is under military occupation, being located in the border areas. There are only two PAs in the Thar desert with legally no human occupation: the seven sq. km Tal Chhaper

Blackbuck Sanctuary in Rajasthan and the two sq. km Lala Bustard Sanctuary in Gujarat, both are IBAs.

Cold Desert of the Indian Trans-Himalayas

The Indian Trans-Himalayas, also known as the Indian cold desert, support very sparse vegetation. Based on the physiognomy, three categories of natural vegetation are clearly discernible namely, Alpine Arid Scrub (AAS) or Steppe formations, Alpine Arid Pastures (AAP), and Marsh Meadows (MM). The AAS vegetation is dominated by the *Artemisia-Caragana*, *Hippophae-Myricaria*, and *Ephedra gerardiana* communities. The AAPs are largely dominated by graminoids while the MMs have a preponderance of sedges. The plant community structure and composition are strongly influenced by the microtopography and soil moisture. Accordingly, various habitats such as moist slopes, riverine areas, sandy plains, field borders, valley bottoms, rubble slopes, scree slopes, and marsh meadows exhibit distinct formations and communities. The characteristic species in the Trans-Himalayas are the species of *Saussurea*, *Potentilla*, *Corydalis*, *Astragalus* and *Oxytropis*. In general, the Indian Trans-Himalayas is poorer in floral diversity as compared to the moist alpine meadows of the Greater Himalayas. A small portion of the Indian Trans-Himalayas is represented in the Central Himalayas (Sikkim) which is relatively higher in terms of species diversity compared to the northwestern region. This region is characterized by low primary productivity, harsh climatic conditions, and specialized growth forms (Kachroo *et al.* 1977).

The Trans-Himalayas (4,500 to 6,000 m) consisting of Ladakh in Jammu and Kashmir, Lahul-Spiti in Himachal Pradesh, and a small area of Sikkim is a part of a much larger Tibetan plateau of Tibet and China, consisting of about 2.6 million sq. km. It has high mountains, deep valleys and flat, arid plains. Many major rivers, for example, the Brahmaputra, Sutlej and Indus start from this region but much of this has internal drainage system where the rivers end in vast lakes. Such lakes and marshes, mostly saline, are important as breeding grounds for birds such as the Black-necked Crane *Grus nigricollis*, Bar-headed Goose *Anser indicus*, Great Crested Grebe *Podiceps cristatus*, and others. While the flat plains provide habitat to the Tibetan Sandgrouse *Syrrhaptes tibetanus*, Horned Lark *Eremophila alpestris* and various species of wheatears *Oenanthe*. The Tibetan Snowcock *Tetraogallus tibetanus* and the Himalayan Snowcock *Tetraogallus himalayensis* can be seen on the treeless mountains, sometimes both the species occurring in the same area. There is no truly endemic or restricted-range bird species in this region. The Tibetan Eared Pheasant *Crossoptilon harmani*, often

considered to be a subspecies of the White Eared Pheasant *Crossoptilon crossoptilon*, is found at the edges of mixed broadleaf-coniferous forests, rhododendron, juniper and deciduous scrubs and grasslands, between 3,000 to 5,000 m. It is listed as Near Threatened (BirdLife International 2001). It is locally common and has adapted to disturbed habitats (Ali and Ripley 1987, Grimmett *et al.* 1998). Recent surveys have indicated that its population must be greater than 10,000 individuals (McGowan and Garson 1995). Where unmolested, it becomes exceedingly tame, coming to monasteries in the remoter areas to be fed by Buddhist lamas, and even eating out of their hand (Ali and Ripley 1987). In India, it is found in parts of the Lohit, Siang and Subansiri districts of Arunachal Pradesh.

Shola grasslands of the Western Ghats

The Western Ghats, a chain of ancient mountains parallel to the west coast of the Indian Peninsula occupies only *c.* 5% of India's land area (about 1,32,606 sq. km), yet it harbours nearly 27% of its total flora. The Western Ghats, with a latitudinal range of more than 10 degrees, lies more or less parallel to the west coast of India. Its forests are one of the best representatives of Non-Equatorial Tropical Forests in the world (Pascal 1982). Wet Evergreen Forests are mostly confined to the windward side of the Western Ghats where the rainfall exceeds 2,000 mm. Areas 1,800 m asl in the Western Ghats are dominated by natural grasslands and adjacent pockets of Montane Evergreen Forests frequently termed as Shola-Grassland Complex.

Terai Grasslands

About 3,54,800 sq. km in area, the Gangetic Plains are one of the most fertile areas of the world, with a nearly 3,000 year history of human occupation. It is also one of the most densely populated areas of the world. The twin combination of a long history of human occupation and dense and still growing human population has resulted in an almost complete conversion of the original vegetation into cropland and human settlements. The Gangetic Plains are drained by numerous rivers and streams, the most famous obviously is River Ganga.

There is practically no natural vegetation left in the Gangetic Plains, except in the region known as *terai*, which is sandwiched between the *bhabhar* tract of the Sub-Himalayas and the main Gangetic Plain. The tall, moist grasslands of the *terai*, interspersed with the Sal *Shorea robusta* forest contain some of the most endangered bird species of India (Rahmani 1988, Javed and Rahmani 1998) such as the Swamp Francolin, Bengal

Florican, and Finn's Weaver *Ploceus megarhynchus*. Javed and Rahmani (1998) have recorded 330 species from the Dudwa National Park which is perhaps the best *terai* forest left in north India.

New special schemes for biodiversity conservation of grasslands and deserts

Poaching of tigers and threats of de-notification of legally protected wildlife habitats have dominated the media so much recently that slow disappearance of other endangered wild animals has been overlooked. Not many people know that the Great Indian Bustard, endemic to the Indian subcontinent, is now on the brink of extinction. Not only is it locally extinct from almost 90% of its former range, it has also disappeared even from three sanctuaries made especially for its protection, 25 years ago. Earlier it was mainly poaching and habitat destruction that resulted in such a pitiable situation of this grand bird of the Indian grassy plains. Now mismanagement of the habitat, sentimental protection of certain problem animals, insecure and confusing tenurial systems, apathy and ignoring of scientific advice would exterminate this species from some of the especially notified bustard areas. Similarly, the Lesser Florican has lost most of its grassland habitat during the last 20-30 years. It now survives in scattered pockets only.

Project Tiger and Project Elephant schemes of the Government of India have shown that by identifying an indicator species and focussing attention on it and its habitat, a substantial part of our natural ecosystems which benefit an array of threatened species can be protected. Bustard species can be considered as indicators of grassland ecosystems and by conserving the bustards and their habitats, a very large number of species dependent on the healthy grasslands will also be protected. Keeping in view that these magnificent birds are now on the verge of extinction, there is an urgent need to launch Project Bustards and immediately provide all the necessary inputs at the highest level to ensure their survival. Project Bustards should be launched on the same lines as Project Tiger and Project Elephant by the Government of India to save all the four Bustard species namely, the Great Indian Bustard, the Bengal Florican, the Lesser Florican and the migratory Houbara Bustard (Macqeen's) from imminent extinction, and their habitats.

Taking into consideration all these factors, the Government of India should be encouraged to start '**Project Bustard**' on the lines of Project Tiger and Project Elephant, with the following objectives:

*To immediately constitute a Task Force for the purpose of establishing **Project Bustard** on the lines of Project Tiger and Project Elephant. Project Bustard should be financed in the 11th Five Year Plan, with the following objectives:*

- 1. To conserve all the four species of bustards in India, along with the involvement of local communities living in and around the identified bustard and floricans habitats.*
- 2. To strictly protect the habitat and all the four species of bustards and their associated species in India.*
- 3. To establish interstate cooperation among the Range States to provide protection of the habitat and the birds.*
- 4. To identify areas which could be declared as bustard sanctuaries, Conservation Reserves or Community Reserves as envisaged in the Wild Life (Protection) Act, 1972 and the declaration of Ecological Sensitive Zones under the Environment (Protection) Act, 1986.*
- 5. To provide necessary financial, management and scientific inputs required to protect the habitat within and outside the protected areas and all the bustards species.*
- 6. To plan and implement, with the involvement and consent of state governments and local communities, landscape level strategies for grassland management, both within and outside biodiversity/wildlife reserves;*
- 7. To provide necessary financial, management and scientific inputs required to protect the habitat within and outside the protected areas and all the bustards species.*
- 8. To plan and implement, with the involvement and consent of state governments and local communities, landscape level strategies for grassland management, both within and outside biodiversity/wildlife reserves.*
- 9. To start a long term Conservation Breeding Programme at least for the Great Indian Bustard.*
- 10. To produce educational material in local languages on grassland ecosystems and bustards for publicity in schools, colleges, and sanctuaries.*

*To initiate discussions on and finalize a **National Grazing and Grassland Policy** in which Bustard conservation is centrally integrated.*

Even the National Forestry Commission has recommended to start new centrally-funded schemes on the pattern of Project Tiger and Project Elephant.

Recommendations of the National Forestry Commission to start new centrally-sponsored project:

*[171] Project Elephant and Project Tiger have shown that by targeting rare and flagship species, many habitats and associated species can be saved. However, there are many species/habitats that are not covered by these two Central government schemes, e.g. grasslands, wetlands, high altitude mountain, riverine and marine environment. Certain species and their habitats need urgent attention of the Ministry of Environment and Forests and state governments to formulate projects in the fashion of Project Tiger. **The snow leopard, the great Indian bustard, the Gangetic dolphin and the dugong are prominent examples for this purpose.***

*[172] To protect the highly endangered great Indian bustard (less than 500 left in the whole world), lesser florican, Bengal florican and other grassland associated flora and fauna, **Project Bustard** should be initiated. As protection of grasslands would greatly benefit livestock, the Ministry of Agriculture and Animal Husbandry should also be involved. These bustards are found in at least ten states of India and therefore, it is vital to develop a centrally coordinated and funded scheme.*

*[173] The snow leopard of the Himalaya is one of the most famous flagship species of the ecosystem where it lives. This ecosystem is also very fragile and coming under increasing human impact. Most of the rivers of north India originate from snow leopard habitats, so it is in the national interest to protect and nurture such habitats. As the snow leopard is found in five states (Jammu and Kashmir, Himachal Pradesh, Uttaranchal, Sikkim and Arunachal Pradesh), it is necessary to develop a centrally funded and coordinated scheme called **Project Snow Leopard**. An attempt had been made in this direction in the 1980s, but Ministry of Environment and Forests later merged the scheme with the ongoing C.S.S on development of national parks.*

Protected Area (PA) network

In India, we have nearly 95 national parks and 500 wildlife sanctuaries. Most of these PAs are in the forest ecosystems. According to the report of the Forestry Commission (2006), nearly 40% of these PAs suffer from livestock grazing and fodder extraction. There are only a handful of PAs having grasslands. Notable ones are Velavador National Park (34 km²) in Gujarat, Desert National Park (3,162 km² but less than 100 km² really

protected), Kaziranga National Park (>500 km², 60% wet grassland), Manas Tiger Reserve (>500 km², 40% under wet grassland), Sailana Florican Sanctuary (2.50 km² grassland) in Gujarat.

Legal protection to grasslands

The grasslands are the most neglected, abused and least protected ecosystems in India. They remain unprotected unless they are notified as Protected Areas under the Wild Life (Protection) Act, 1972 or notified as Protected or Reserve Forest under the Indian Forest Act, 1927. Most of the States have excluded the grasslands and have not identified them as “deemed forest” by the State Expert Committee’s pursuant to the landmark order dated 12.12.1996 in the Forest Matter (T. N. Godavarman Thriumalpad V. Union of India and others in W.P. (C) No. 202/95). As per the said order of 12.12.1996, word ‘forest’ should be given a wide and liberal interpretation. Excluding grasslands and including lands only with tree cover as ‘forest’ is against the letter and spirit of the said order thereby denying the protection under the Forest (Conservation) Act, 1980 (F. C. Act). In view of the fact that the grasslands have spontaneous natural vegetative growth, these should also be treated as ‘forest land’ for the purposes of the Forest Conservation Act and restrictions on diversion of such lands for non-forest use should be applicable to these critical ecosystems as well.

The central government should invoke the provisions of the Articles 251 and 254 of the Constitution to direct state governments to instruct Revenue Departments not to divert any grassland identified in the landscape for bustard/florican protection. Such areas can be declared as community or conservation reserves. Some areas can be identified as Ecologically Fragile Zones under Section-5 of the Environment Protection Act, 1986. There should be some legal and social protection of these grasslands from invasion of nomadic graziers, especially during the growing period of the grasses.

Applicability of the provisions of the Environment (Protection) Act, 1986

Section 3 of the Environment Protection Act, 1986 empowers the Central Government to take all such measures as is deemed necessary or expedient for the purpose of protecting and improving the quality of the environment. Further, environment is defined under Section 2A to include “water, air and land and the inter-relationship which exist among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property”.

Section 3(3) empowers the Central Government to constitute an authority for exercising the powers and functions under Section 5 of the Act.

Section 5 of the Act empowers the Central Government in the exercise of its powers and performance of its functions under the Act to issue directions in writing to any person, officer or any authority and such person, officer or authority shall be bound to comply with such directions.

The **National Environment Policy 2006** (NEP) states that while conservation of environmental resources is necessary to secure livelihoods and well-being of all, the most secure basis for conservation is to ensure that people dependent on particular resources obtain better livelihoods from the fact of conservation, than from degradation of the resource. While this can be taken as a guideline for further environmental planning, the NEP totally misses out the Grassland Ecosystems. Many of the grasslands in the country are sensitive to climate change, developmental pressures and invasion by alien invasive plants.

By issuing an appropriate notifications under Section 5 of the Environment (Protection) Act, 1986, the Central Government can constitute and declare Ecological Sensitive Areas or zones for the better protection of the environment and in particular with respect to the grasslands. In case such a notification is issued there would be no need to acquire land or shift people, as has been done in the case of Matheran and Mount Abu areas. This procedure has a clear advantage over declaration of national parks and sanctuaries under the Wild Life (Protection), Act 1972.

Recommendations of the Task Force

1. Certain grasslands viz., Shola – grasslands of Nilgiris, Sewan grasslands of Bikaner, Jodhpur and Jaisalmer, semi-arid grasslands of Deccan, Rollapadu grasslands in the semi-arid tracts of Andhra Pradesh, Banni Grasslands of Gujarat and Alpine Grasslands of Sikkim and Western Himalaya be recognized as ecologically sensitive ecosystems and any development projects in these areas will have to undergo stringent environmental impact assessments.

2. A coordinated effort towards conservation and management of Alpine Meadows (Bugyals): Most of the alpine areas fall under one or other category of 'forested land' or Van Panchayat. However, no concerted efforts have been made towards conservation and management of these areas so far. In some of the high altitude protected areas there

are conflicts between the local people and PA management regarding the rights for livestock grazing and collection of non-timber forest produce. Hence there is a need to (i) rationalize the boundaries or establish Community Reserves to cater the need of villagers as well as threatened wildlife species, (ii) strengthen the existing PAs, (iii) evolve valley/area specific grazing plans in a participatory manner involving the local and migratory graziers, animal husbandry department, tourism department and Indian army as the case may be so that some of the heavily degraded Bugyals could be brought under a recovery plan.

National Grazing Policy

Despite the fact that India has one of the largest livestock populations in the world, with an estimated 520 million heads, we do not have a grazing or grassland policy on ground! Though the Government of India has formulated 'Draft Grazing and Livestock Management Policy (1994)', and 'Draft National Policy for Common Property Resource Lands (CPRLs)', these policies have not been implemented effectively in the field. In the Draft Grazing and Livestock Management Policy, emphasis has been given to develop large blocks of grass reserves away from human habitation for higher production (in arid and semi-arid regions) and as fodder banks for drought years. The CPRLs seeks to provide support to the people and their production systems through restoration, protection, regeneration, upkeep and development of grasslands. There is no sound management plan for the development of pasture land and protection of existing grasslands, some of which are unique and harbour rich fauna. We have not even fully documented the value of these grasslands in terms of their biological diversity. The famous Sewan grasslands of Jaisalmer and Bikaner, and the Banni grassland of Kutch have been neglected, resulting in over-grazing, spread of invasive species such as *Prosopis chilensis* and conversion to agricultural crops with dubious results. The highly productive wet terai grasslands of the Gangetic and Brahmaputra floodplains are under-represented in protected area network of India, except some areas such as Kaziranga, Dudhwa, Jaldapara national parks.

The importance of rotational or seasonal grazing, some control on free ranging animals, total protection of selected grassland plots to serve as nucleus for seed bank, secure tenure for pastoralists (both resident and nomadic) over pastures, and genetic improvement of livestock (using indigenous breeds, not exotics ones) have not been taken in to consideration in animal husbandry programmes of the country. In our country, only livestock is considered as wealth, not the grasslands on which this livestock depends

nor the traditional knowledge that helps maintain this livestock! Interestingly, protection of fodder producing, natural grasslands greatly help in the protection of many endangered species. For example, in Maharashtra, in the late 1970s, a large number of plantation and grassland plots were developed under the Drought-Prone-Areas-Programme (DPAP). The main aim of DPAP was to take conservation measures for the protection of over-used land which was suffering from severe overgrazing and soil erosion. The DPAP not only helped in achieving its aim in certain areas but it also resulted in restoration of wildlife, especially the Great Indian Bustard, Blackbuck and Grey Wolf.

Grasslands are not managed as an ecosystem in their own right by the Forest Department whose interest lies mainly in trees, not by the Agriculture Department who are interested in agriculture crops, nor the Veterinary Department who are concerned with livestock, but not the grass on which the livestock depends. Grasslands are the 'common' lands of the community and while there have been robust traditional institutions ensuring their sustainable management in the past, today due to take-over by government or breakdown of traditional institutions they are the responsibility of none. They are the most productive ecosystems in the Indian Subcontinent, but they belong to all, are controlled by none, and they have no godfathers. Indeed they are often looked at as 'wastelands' on which tree plantations have to be done, or which can be easily diverted for other uses. Such diversions often put even more pressure on adjoining ecosystems for grazing and fodder removal, resulting in a cascading chain of degradation. The lack of clear tenure to local communities, confused land records between the Revenue and Forest departments, and other such issues of land rights and responsibilities also compound the problem.

The Forest Policy of 1894 was the most elaborate of all the policies in explaining the modalities of grazing in protected forests. The Forest Policy of 1954 was extremely critical of unrestricted and uncontrolled grazing and refuted it as contrary to scientific management of forests. However, it also admitted that in some forest/grassland types, limited grazing does not do much harm, and may actually improve the grassland/forests. Dhebar Commission (Schedule Areas and Schedule Tribes Commission, 1966) recommended that the Forest Department should promote growth of improved varieties of grasses in forest areas and grazing fees should be regulated. The National Commission on Agriculture (NCA) (1976) recommended strict control on grazing and regulation on grazing. It also recommended that grazing by goats in forest should be prohibited and sheep allowed only in specially marked grasslands under strict rotational control. The NCA also recommended the promulgation of grazing rules by each state specifying the grazing rates and providing for the manner in which grazing should be permitted. The

National Forest Policy (1988) is in consonance with the previous policy on the issue of grazing, except for an important qualifier that grazing in forest areas should be regulated with the involvement of the local community. The Expert Committee to review the National Forest Policy 1988, and its implementation under the chairmanship of Mr. C. D. Pandya, IGF (Retd.), also recommended that “A National Grazing Policy should come into effect at the earliest.”

Fodder grasslands of northwest India

The traditional utilisation of grasslands in Saurashtra, Kutch, eastern Gujarat, western Madhya Pradesh and southeastern Rajasthan, a drought prone area, evolved to cater to two basic needs – fodder and grazing. Traditionally every village or cluster of villages used to set aside certain areas for livestock grazing, called *goucher*, and protected other areas from grazing, where the grass was allowed to grow long, to be subsequently harvested and stored for later use. These protected grasslands were called *vidi*, *veeds*, *bheeds* or *rakhals*. They were crucial to rural economy as the fodder produced was used both during the lean summer months and to tide over drought periods. With the promulgation of Land Ceiling Act, after India’s Independence, and population pressures, the land use practices have been altered. Land set aside for grazing (*goucher*) has been encroached upon for agriculture, industrial development and urbanization, as a result of which protected fodder producing grasslands came under increasing pressure of livestock grazing. Despite these pressures, there are still some extant grasslands, especially in Gujarat and eastern Rajasthan. For instance, in Saurashtra and Kutch there are 137 reserved *vidis* covering a total area of 63,292 ha. The reserved *vidis* are managed by the Forest Department while the non-reserved *vidis* are given to various agencies for protection, e.g. *Gaushalas* and *panjrapoles* (trusts that maintain aged cattle), Maldhris cooperative societies, village *panchayats* and milk cooperatives. There are 471 non-reserved *vidis* in Saurashtra and Kutch, covering an area of 57,602 ha. While the condition of reserved *vidis* is generally good (e.g. Rampura grassland in Dahod), the non-reserved *vidis* are in terrible condition due to mismanagement, corruption and neglect.

Recommendations of the Task Force

1. *Currently “The Cattle Trespassers Act’ formulated in 1871 is the only Act applicable to regulate grazing in public and forest land. As the existing Act is outdated and inadequate, there is an urgent need for a **National Grazing Policy** to ensure the sustainable use of grasslands.*

2. *Plantation of Prosopis juliflora in all grassland habitat must be completely banned, as this exotic spreads very rapidly and covers the grassland.*
3. *Grass growers co-operatives on the lines of Tree Grower Co-operative and Milk Co-operatives should be started.*
4. *The Department of Animal Husbandry must encourage and implement schemes that promote the concept of fewer but better quality livestock, particularly in areas which have protected grasslands to reduce grazing pressure.*
5. *There should be strict laws to stop encroachment of goucher land.*
6. *Fodder produced from reserved vidis (as in Gujarat) should be given to local people on priority basis, before it is exported to other districts/regions. Once the local people benefit, they would develop a stake in protection of grasslands.*
7. *Map all critical grasslands and desert habitats as a comprehensive land/water use plan of the country.*
8. *Build in to a policy statement that critical habitats identified in such mapping will not be converted to tree plantations, will not be classified as 'wastelands' and thereby given over to all kinds of developmental activities, and will not be redistributed for relocation or under land reforms.*
9. *Provide a range of incentives to farmers and pastoralists to continue traditional practices that are beneficial for wildlife and help in sustainable use of grasslands and deserts.*
10. *Encourage and provide appropriate legal backing to community conserved areas containing grasslands and deserts (e.g. Blackbuck protection by Vishnois).*
11. *Assist communities in regenerating and restoring degrading grasslands/deserts.*

The National Forestry Commission has recently given recommendation for the conservation of grasslands and deserts. We fully endorse these recommendations:

Recommendations of the National Forestry Commission on Grasslands (p. 61)

5.5 Recommendations

[1] As a statewide application may not be feasible to implement, it is recommended that specific crucial grasslands be selected for effective conservation, as part of the Protected Area network, or as a part of watershed management under the EPA. Grazing would have to be regulated and fires prevented. Each area must have prescribed management practices, the emphasis being on harvesting grass rather than grazing it, which would result in augmentation of both the generation of grass as well as its nutrition value.

[2] A policy should be formulated to regulate inter-state movement of livestock to enable the States to control grazing pressure on eco-sensitive areas.

[3] The animal husbandry departments should relate the number of goats and sheep to the availability of natural fodder especially in such areas where these animals could cause further degradation to natural ecosystems.

[4] Efforts be enhanced to improve cattle quality, as it is proven that improved varieties tend to be stall-fed and sent less to free-graze on rangelands.

[5] The provision of a sustainable supply of fuel be undertaken by a newly created Fuelwood Mission. Not only will this mitigate the drudgery of millions of women who have no option but to forage for every possible scrap of fuel, but also will reduce pressure on trees and shrubs whereby our remaining forest and trees will be well-protected This can be started initially with a phased programme in and around forests and Protected Areas.

[6] Alternative sources of fuel, especially LPG connections, need to be provided to rural areas in and around forests. Solar energy also needs to be given a much greater impetus, especially in the mountainous and other areas where energy needs are greater and the sunshine available for a greater number of days in a year.

[7] The sale of fuelwood head loads from forests by individual sellers must stop. Headloads should only be permitted for bonafide personal use of the local communities, as earlier. The forest departments should bring out fuelwood to depots and supply wood to those who are the current head loader-seller and who derive their livelihood from such sale, at subsidized / no loss basis, rather than the head-loaders being allowed to go into the forest.

[8] In the interest of the survival of the land, people, forests and the practice of shifting cultivation itself, jhum be regulated to a more sustainable level. This can only be achieved by the State Governments themselves, with active assistance of the Government of India.

[9] Some young members of the present generation of tribals are not keen to continue with jhum in many areas, and jhuming itself is becoming less and less remunerative. People are looking for

alternatives like settled agriculture, horticulture and animal husbandry, which must be extended to them forthwith.

[10] The main objective of forest management should be ecological security. For assessing the effectiveness of forests in contributing to ecological security on the basis of a number of parameters and paradigms such as volume of growing stock, biodiversity, health of forest soil, soil moisture, hydrology, carbon sequestration and crown density, the scope of work of the Forest Survey of India (FSI), Dehradun should be expanded and adequate infrastructure be provided for this purpose. Monitoring of ecological security should be done at five year's interval and a national level report should be published by the FSI. In addition, the FSI should undertake research required to conduct necessary forest surveys and assessments.

Improving Fodder Scenario in India: Grassland/Range Management Options

Rangeland is a broader term than grasslands, including regions where even woody vegetation is dominant. It is a term looking at the land from the viewpoint of livestock production. It also serves as a habitat for wildlife. The main floral component of rangelands is grass or grass like vegetation. At a global level, rangelands provide fodder for over 360 million cattle and 600 million sheep and goat, accounting 9 per cent of world's beef and 30 per cent of sheep and goat meat. It offers livelihood to an estimated 100 million people in arid areas and probably a similar number in other zones through livestock production.

In India, grazing based livestock husbandry continues to play an important role in rural economy of the country as around 50 per cent animals depend on grazing in forests and other grazing areas in many parts of the country. Total area available for grazing in the country is in the range of about 40 per cent of the land area. In states like Himachal Pradesh, Uttaranchal, Jammu & Kashmir, Meghalaya, Nagaland and Arunachal Pradesh over 70 per cent of land area is utilized as grazing ground. In the states like Rajasthan, Madhya Pradesh, Maharashtra and Karnataka also vast areas are used for grazing.

Since India is characterized by tropical monsoon climate and active growth in grazing lands occur only during monsoon months, there is surplus fodder during rainy months and deficits of various levels in other months. Thus there is already growing emphasis on **animal feed security systems** and **fodder banks** to overcome such problems. The surplus production from grasslands during rainy season is to be carefully preserved in various forms to meet the forage requirements of the lean periods. The post harvest technologies such as biomass processing, enrichment and densification appear to be the key for better animal husbandry in the deficit zone.

Under poor soil, water and nutrient situations where cropping is not possible *Silvipasture Systems*, integrating woody perennials and pasture species, can serve the twin purpose of forage and firewood production and ecosystem conservation. ***It has been possible to increase land productivity from 0.5-1.5 t/ha/yr to about 10 t/ha/yr on a rotation of 10 years through such interventions.***

In order to reduce grazing pressure, the concept of **hortipasture**, utilizing land in the orchards by developing pasture stands, should be encouraged.

The prevailing view of looking at grasslands as a single use (forage for domestic animals or wildlife habitat) should be replaced by looking them for multiple uses, incorporating sustainable use, ecosystem functions and biodiversity conservation.

Recommendations of the Task Force for grassland and desert management:

1. Detailed and updated GIS based inventory of degraded rangelands in each agro-ecological zone and also measurement of the impact of rehabilitation programmes.
2. Higher priority on generation of information on temperate grasslands with emphasis on (i) low input, clover based sheep grazing system; (ii) ideal pasture for mixed grazing systems; (iii) inventory of grazing routes and grazing systems; (iv) designing of suitable production system for migratory graziers of Himalaya and the *Thar* desert.
3. To develop a policy of regulated grazing that is managed on scientific principles so that desirable vegetation development could be ensured. As the grazing policy alone can not mitigate the problems of forage availability in the country, a matching approach on fodder production, agro-waste-use and fodder trees should be brought under one umbrella in form of a national fodder mission.
4. Development of Common Property Resources (CPRs) available with village *Panchyats* through improved pasture/silvipasture systems is undertaken by dairy/livestock cooperatives/associations.
5. The practice of stall-feeding should be encouraged among livestock owners in order to prevent over grazing consequent depletion of available forest fodder resources. This should be one of the main issues in the forests being developed under Joint Forest Management programmes (JFMs).

6. In arid and semiarid regions of the country, large blocks of lands away from human habitations could be developed as grass reserve and their production may be preserved in form of hay in fodder banks. The technology of densified bales or enrichment in form of feed blocks may be practiced for ease in transport and enhancing forage quality.
7. In undertaking large-scale range and pasture development programmes, poor availability of quality seeds of range species is often a critical problem. The focus should be on:
 - Research on forage seed standards and seed technology including emphasis on pure germinating seeds (PGS) in grasses.
 - Encouragement and incentives to farmers with small farm holding for forage seed production in a participatory mode.
 - Establishment of a nodal agency to coordinate production and marketing of quality range seeds, both at regional and national levels, involving commercial seed companies, NGOs and farmers' cooperatives etc.
8. There is a need of capacity building at various levels for the rangeland development and seed production of range species activities with the objective of restoring range health.
9. Demonstration of range improvement and management technologies at different locations should receive higher priority and the feed back from the actual beneficiaries and the farmers in the vicinity should be properly accounted for further refinements in the technology.

TOR 2: Institutional and individual capacities to address the issues of grasslands and deserts...

IGFRI and CAZRI exclusively deal with grassland and desert ecosystems respectively. They have adequate capacities and capabilities to address the respective issues. However, their geographical coverage and overall approach (ecosystem services and intrinsic values) needs to be broadened. Gujarat based GUIDE has come up recently to deal with desert ecosystems. However, it is inadequately funded and has limited manpower. Other Institutes and individuals such as BNHS, WII, Universities, BHU, and some of the State Forest Research Institutes have taken up short term studies in some of the grasslands. Despite the available expertise within the existing institutes and with individuals, there

are no long term ecological studies and monitoring programmes for representative grasslands.

Recommendations of the Task Force

It is recommended that a network of grassland ecologists be established and a country wide Long Term Ecological Research (LTER) needs to be initiated in representative biogeographic zones. These LTER sites could then serve as ecological benchmarks for future training, teaching as well as monitoring sites. Simultaneously the nodal agencies need to take up the new dimensions of grassland ecology including impact of climate change and land use practices within and around grassland and desert ecosystems.

TOR 3: Integrating various sectors...

As many as 11 Central Ministries through their research and development institutes, several autonomous bodies and community institutions, universities, local, national and international NGOs have a stake on the conservation, development and utilization of natural resources of grasslands and desert ecosystems (Table).

Table: Various Ministries, Corresponding R & D Institutions and Key areas of work:

SN	Ministries / Sectors	Major Institutions	Key Areas of R & D
1	M/o E & F	ICFRE, BSI, ZSI, WII, FSI, GBPIHED	Basic inventory of Flora and Fauna, Ecology
2	M/o Science & Technology	DBT, DST, CSIR, IIRS, WIHG, Universities, Institutes	Resource Use, Technological Intervention
3	M/o Defence	DRDO, Eco-Task Force, Adventure Cell	Protection of boundaries and areas adjacent to international boundaries
4	M/o Agriculture	ICAR, DARE, AHDP	Development of Agriculture and Animal Husbandry
5	M/o Tourism & Culture	Culture, Tourism	Develop tourism and cultural heritage
6	M/o HRD	Schools, Colleges, Universities, IITs	Academic Activities

SN	Ministries / Sectors	Major Institutions	Key Areas of R & D
7	M/o Rural Development	Land Resource, Water Development, Rural Development	Land and Water Resource Utilization, Rural Development
8	M/o Health	NMPB	Medicinal Plants and Health
9	M/o Tribal Affairs		Tribal Development
10	M/o Mines	GSI	Geological Exploration
11	M/o Commerce & Industry		Industrial Development
12	State Departments	Forest, Agriculture, Animal Husbandry, Rural Development	Livelihoods and BD Conservation
13	NGOs	Local, National, International	Conservation of featured species

Recommendations of the Task Force

Considering a wide range of activities and programmes under each Ministry and R & D Institutions, it would be extremely important to identify some of the cross cutting themes and launching the **integrated research and development programmes** in the grasslands and deserts. Some of the programmes which involve multiple stakeholders are as follows:

- i. **Rangeland Management:** Key stake holders being Wildlife Departments, Animal Husbandry, Rural Development, culture and tourism.
- ii. **Integrated Watershed Development:** Integrate soil and water conservation, NTFPs, Biodiversity Conservation and rural livelihoods.
- iii. **Project Snow Leopard:** Taking Snow Leopard as an apex species of trans-Himalayan Ecosystems, all the programmes of Ministry of Defence, Animal Husbandry and Forest / Wildlife Departments need to be integrated.

- iv. **Project Bustard:** Taking four bustards species as flagship species of grasslands, Project Bustard should be started involving Agriculture, Forestry, Wildlife Conservation, Animal Husbandry Departments.

TOR 4: Review of EIA Practices, Procedures

The MoEF has issued new EIA guidelines in September 2006 by modifying the earlier EIA notification of dated 27.01.1994. The new EIA guidelines have become stringent for the larger projects and rather soft for the smaller development projects. For example, in earlier guidelines, EIA was mandatory for all tourism projects in the mountain areas (above 1000 m MSL) with investment of more than Rs. 5 crores. However, in the new guidelines this requirement has been withdrawn. While it may facilitate early clearance of tourism project in the mountain areas, but in ecologically fragile areas such as Ladakh, such a project may appear to be small but actual impact of tourism development such as diversion of water courses, modification of wildlife habitat may have severe environmental implications.

Recommendations of the Task Force

1. Necessary modification would be required in the new EIA guidelines by including ecologically fragile and environmentally sensitive areas where prior EIAs will have to be made mandatory. Also, presence of representatives from identified institutions and experts should be made mandatory during public hearing whenever an EIA is done in the grassland and desert ecosystems so as to review the identified impacts, prediction and mitigation.

Appendix I

Species to benefit through better protection of Grasslands/Deserts

Species	Schedule of WPA	Habitat
Tibetan Antelope	I	Cold Desert
Tibetan Gazelle	I	Cold Desert
Tibetan Wolf	I	Cold Desert
Red Fox	I	Cold Desert
Black-necked Crane	I	Cold Desert, Grassland
Blackbuck <i>Antelope cervicapra</i>	I	Short grass plains
Chinkara <i>Gazella bennettii</i>	I	Desert, open scrub
Brow-antlered Deer <i>Cervus eldi</i>	I	Wet grassland
Swamp Deer <i>Cervus duvauceli</i>	I	Wet grassland
Hog Deer <i>Axis porcinus</i>	III	Wet grassland
Caracal <i>Felis caracal</i>	I	Hot Desert, grassland
Desert Cat <i>Felis libyca</i>	I	Hot Desert
Jungle Cat <i>Felis chaus</i>	II	Hot Desert, scrub jungle
Desert Fox <i>Vulpes vulpes</i>	II	Hot Desert
Indian Fox <i>Vulpes bengalensis</i>	II	Hot Desert, grassland
Hispid Hare <i>Caprolagus hispidus</i>	I	Wet grassland
Wild Ass <i>Equus khur</i>	I	Hot Desert
Grey Wolf <i>Canis lupus</i>	I	Hot Desert, grasslands
Golden Jackal <i>Canis aureus</i>	II	Hot Desert, grassland, etc
Pygmy Hog <i>Sus salvinius</i>	I	Wet grassland
One-horned Rhinoceros <i>Rhinoceros unicornis</i>	I	Wet grassland
Wild Buffalo <i>Bubalus bubalis</i>	I	Wet grassland, Forest
Agra Monitor Lizard <i>Varanus griseus</i>	I	Hot Desert, grassland
Spiny-tailed Lizard <i>Uromastix hardwickii</i>	II	Hot Desert, grassland
Great Indian Bustard <i>Ardeotis nigriceps</i>	I	Hot Desert, grassland
Lesser Florican <i>Sypheotides indica</i>	I	Grassland
Bengal Florican <i>Houbaropsis bengalensis</i>	I	Wet grassland
Houbara <i>Chlamydotis macqueeni</i>	I	Hot Desert
Swamp Francolin <i>Francolinus gularis</i>	IV	Wet grassland
Laggar Falcon <i>Falco jugger</i>	I	Hot Desert, grassland
Saker Falcon <i>Falco cherrug</i>	I	Hot Desert, grassland
Peregrine Falcon <i>Falco peregrinus</i>	I	Hot Desert, grassland, etc
Red-headed Falcon <i>Falco chicquera</i>	I	Hot Desert, grassland
Lesser Kestrel <i>Falco naumanni</i>	IV	Hot Desert, grassland, etc
Tawny Eagle <i>Aquila rapax</i>	IV	Hot Desert, grassland, etc
Steppe Eagle <i>Aquila nipalensis</i>	IV	Hot Desert, grassland, etc
Imperial Eagle <i>Aquila heliaca</i>	IV	Hot Desert, grassland, etc
Lesser Spotted Eagle <i>Aquila pomarina</i>	IV	Hot Desert, grassland, etc
Common Buzzard <i>Buteo buteo</i>	IV	Hot Desert, grassland, etc
Long-legged Buzzard <i>Buteo rufinus</i>	IV	Hot Desert, grassland, etc
Upland Buzzard <i>Buteo hemilasius</i>	IV	Hot Desert, grassland, etc
All species of Harriers <i>Circus</i> spp.	IV	Hot Desert, grassland, etc
Short-toed Snake Eagle <i>Circaetus gallicus</i>	IV	Hot Desert, grassland, etc
Red-headed Vulture <i>Sarcogyps calvus</i>	IV	Hot Desert, grassland, etc
White-backed Vulture <i>Gyps bengalensis</i>	I	Hot Desert, grassland, etc

Report of the Task Force on Grasslands and Deserts

Long-billed Vulture <i>Gyps indicus</i>	I	Hot Desert, grassland, etc
Slender-billed Vulture <i>Gyps tenuirostris</i>	I	Hot Grassland, Forests etc
Eurasian Griffon <i>Gyps fulvus</i>	IV	Hot Desert, grassland, etc
Egyptian Vulture <i>Neophron percnopterus</i>	IV	Hot Desert, grassland, etc
Lesser Adjutant <i>Leptoptilos javanicus</i>	IV	Wet grassland
Greater Adjutant <i>Leptoptilos dubius</i>	IV	Wet grassland
Jerdon's Babbler <i>Chrysomma altiloquax</i>	IV	Wet grassland
Black-breasted Parrotbill <i>Paradoxornis flavirostris</i>	IV	Wet grassland
Marsh Babbler <i>Pellorneum palustre</i>	IV	Wet grassland
Finn's Baya <i>Ploceus megarhynchus</i>	IV	Wet grassland
Nilgiri Tahr	I	Shola grassland

Appendix II

Ecosystems and Habitats to benefit from Protection of Grasslands/Deserts

Habitats/Ecosystems	States
Cold Desert	Jammu & Kashmir, Uttranchal, Himachal, Sikkim, Arunachal
Dry Grasslands	Rajasthan, Gujarat, Punjab and Haryana
Hot Desert	Rajasthan, Gujarat, Punjab and Haryana
Tropical short grass plains	Rajasthan, Gujarat, Madhya Pradesh, Maharashtra Andhra Pradesh, Karnataka
Wet grasslands	Uttar Pradesh, Bihar, West Bengal, Assam, Arunachal
Shola Grasslands	Kerala, Tamilnadu, Karnataka, Maharashtra

Appendix III

Protected Areas to get greater benefit from Protection of Grasslands/Deserts

States	Name of national park/sanctuary
Rajasthan	Desert NP, Talchapper, Gajner
Gujarat	Desert Wildlife Sanctuary, Narayan Sarovar, Lala and Naliya, Wild Ass Sanctuary, Velavador
Madhya Pradesh	Sailana, Sardarpur, Dahod grasslands
Maharashtra	Bustard Sanctuary, Rehukuri
Karnataka	Rannibennur,
Andhra Pradesh	Rollapadu,
Uttar Pradesh	Dudwa, Katerniaghat, Kishenpur, Sohagi-Barwa
Bihar	Valmiki Tiger Reserve
West Bengal	Jaldapara, Gorumara
Assam	Manas, Kaziranga, Pobitora, Laokhowa-Burachapori, Orang, Sonai-Rupai
Arunachal Pradesh	D'Ering Memorial Sanctuary

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಸಂಖ್ಯೆ: ಅಪಜೀ 6291 ಪರಿಸರ-ಬಿ 2013

ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಸಚಿವಾಲಯ,
ಬಹುಮಹಡಿ ಕಟ್ಟಡ,
ಬೆಂಗಳೂರು, ದಿನಾಂಕ:30.05.2013.

ಇಂದ

ಸರ್ಕಾರದ ಕಾರ್ಯದರ್ಶಿಗಳು,
(ಪರಿಸರ ಮತ್ತು ಜೀವಿಶಾಸ್ತ್ರ)
ಪರಿಸರ ಮತ್ತು ಜೀವಿಶಾಸ್ತ್ರ ಇಲಾಖೆ.

ಇವರಿಗೆ

ಸದಸ್ಯ ಕಾರ್ಯದರ್ಶಿ,
ಕರ್ನಾಟಕ ಜೀವ ವೈವಿಧ್ಯ ಮಂಡಳಿ,
ವನವಿಕಾಸ ಕಟ್ಟಡ, ನೆಲ ಮಹಡಿ,
18ನೇ ಕ್ರಾಸ್, ಮಲ್ಲೇಶ್ವರಂ,
ಬೆಂಗಳೂರು-560 003

ಮಾನ್ಯರೇ,

ವಿಷಯ: The Hesaraghatta Grasslandನಲ್ಲಿ ಇಕೋ ಸಿಸ್ಟಮ್
ಮತ್ತು ಜೀವ ವೈವಿಧ್ಯತೆಯನ್ನು ಕಾಪಾಡುವ ಬಗ್ಗೆ.

ಮೇಲ್ಕಂಡ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ, B.N.M Friends of Nature Club, BNM Educational Institutions, Banagalore ಇವರ ಮನವಿ ಪತ್ರವನ್ನು ಈ ಪತ್ರದೊಂದಿಗೆ ಲಗತ್ತಿಸಿದೆ. ಸದರಿ ಪತ್ರದಲ್ಲಿನ ವಿಷಯದ ಬಗ್ಗೆ ಕೂಲಂಕುಷವಾಗಿ ಪರಿಶೀಲಿಸಿ, ಕಾನೂನಿನಂತೆ ಸೂಕ್ತ ಕ್ರಮ ಕೈಗೊಳ್ಳುವ ಬಗ್ಗೆ ತಮಗೆ ಕಳುಹಿಸಿಕೊಡಲು ನಾನು ನಿರ್ದೇಶಿಸಲ್ಪಟ್ಟಿದ್ದೇನೆ.

ತಮ್ಮ ನಂಬುಗೆಯ,

(ಜಿ.ಹೆಚ್.ಅನಸೂಯಮ್ಮ) 30/5/13

ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ,
(ಪರಿಸರ ಮತ್ತು ಜೀವಿಶಾಸ್ತ್ರ),
ಅರಣ್ಯ, ಪರಿಸರ ಮತ್ತು ಜೀವಿಶಾಸ್ತ್ರ ಇಲಾಖೆ.

ಕರ್ನಾಟಕ ಜೀವವೈವಿಧ್ಯ ಮಂಡಳಿ

ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು.

ಸ್ವೀಕೃತಿ ಸಂಖ್ಯೆ 361

ದಿನಾಂಕ 5/6/13

ಇಲಾಖಾ ಅಧಿಕಾರಿ

ಉಪ ಕಾರ್ಯದರ್ಶಿ

ಸದಸ್ಯ ಕಾರ್ಯದರ್ಶಿ

(ಸದಸ್ಯ ಕಾರ್ಯದರ್ಶಿ)

pl. dis...

5/6



Vidya Amrutham Ashnutha

B.N.M. Friends of Nature Club

B.N.M. Educational Institutions

Post Box No. 7087, 27th Cross, 12th Main, Banashankari II Stage, Bangalore - 560 070.

Narayan Rao R. Maanay
Secretary

Date : 20th April, 2013

To
Principal Secretary to Government
Forest, Ecology & Environment Department
Room No.448, 4th Floor, M S Building
Bangalore 560 001

Handwritten notes in Kannada: 136, 4/5, 629/1, 29/4/2013, and other illegible scribbles.

Dear Sir,

Sub : The Hesaraghatta Grassland

Recently there was news that the Government through Bangalore Development Authority had decided to afforest the remaining grass lands at Hesaraghatta near Bangalore. How this decision was taken and who were the experts consulted is not revealed to the public. We have naturalists, environmentalists and zoologists who are capable of understanding and advising the necessity and importance of the grassland eco system. It seems that none of these people have been consulted. The grassland eco system has its own cycle and supports an unique Bio-Diversity from among the Flora and Fauna like Animals, Birds, Reptiles and the Insect world. This kind of Grassland Eco system is fast disappearing in many places. The Hesaraghatta Grasslands are unique and requires all the efforts to save its Ecosystem. We have dedicated scientists and naturalists who can be consulted and this small patch can be saved. It may also be remembered that it forms part of the Arkavathi River system and plays its role in augmenting water to the parched citizens of Bangalore.

Handwritten notes: s.o., 29/4/2013, env.

You are requested to kindly take all necessary action and advice the concerned personnel to ensure that this beautiful Grassland is saved to nurture all its inhabitants like the Raptors, the Reptiles, other birds and animals which are unique. It is very important to note here that presently we have very few open grassland sites in our state.

Our appeal to you is to save what is left of our once beautiful environment and its ecosystem and take steps to create sanctuaries wherever the place is suitable for the grassland ecosystem. The list of signatures of students and others who are supporting this appeal are attached herewith.

Thanking you,

Yours faithfully,

For B.N.M. Friends of Nature Club

Handwritten signature of Narayan Rao R. Maanay, Secretary

Handwritten notes: 6/5/13, CC:, 7-5-13

- 1. Secretary to Government
Dept. of Forest, Ecology & Environment.
- 2. Principal Chief Conservator of Forests
Aranya Bhavan



Status Survey of Hessarghatta Grasslands

Report Submitted by
S. Subramanya
Professor of Entomology
PHT Scheme, GKVK Campus
University of Agricultural Sciences
Bangalore 560 065

To
The Member Secretary
Karnataka Biodiversity Board
Ground Floor, "VanVikas", 18th Cross, Mallewswaram
Bangalore 560 003
July 2013

Status Survey of Hessarghatta Grasslands

Subject: The Hessarghatta Grassland-reg

Reference: No. KBB/GC/71/13-14/156

As per the request of Karnataka Biodiversity Board (KBB) vide letter under reference, the Hessarghatta lake and its surrounding areas were surveyed along with the staff of KBB namely, Mr. H.S. Devaraj, Mr. S. Murugan, Research Associate Zoology & Mrs. B.P. Vidya Bharathi, Research Associate Botany from Karnataka Biodiversity Board on June 11, 2013 to take stock of tree planting activity and its consequent effect on the grasslands in the area.

While in the field it was noticed that the tree planting activity was wide spread with pits dug using JCB and most of the grassland area was intensely planted with saplings with the inter-plant distance being anywhere between 6-8feet. Majority of the sapling species planted belonged to Pongamia, Bamboo, Neem, Simarouba, Jamun, Rose-apple and a few others.

The following images show the intensity and density of planting:



High intensity of tree planting in the Tree-savanna type of grassland ecosystem at Hessarghatta



Small patch of the tree-savanna type of grassland showing the type of habitat that once existed all over Hessarghatta Lake surroundings prior to tree-planting



Desecration of what was once a fine tree-savanna grassland ecosystem by tree planting



High intensity of tree planting in the open grassland ecosystem



Desecration of what was once a fine open grassland ecosystem by tree planting



Pongamia sapling



Neem sapling



Simarouba sapling



Jamun sapling



Rose apple sapling

Majority of tree saplings planted at Hessarghatta comprise of the above species

Inference:

Grasslands are unique ecosystems that are characteristics of dry open areas where grasses form the predominant vegetation. The grass growth and parchedness of the terrain supports a fauna that is quite unique to the grasslands (Appendix).

The high intensity tree planting at Hessarghatta has completely desecrated the grassland ecosystem due to the planting sapling of trees that are not native to the open and tree-savanna grassland habitats. This desecration and the scale at which tree-planting has been carried out has destroyed the last remaining unique grassland ecosystem in the outskirts of Bangalore.

Close examination of the tree planting activity on Google Earth clearly shows that an enormous area has been covered under the tree-planting activity and destruction of the habitat has been of unprecedented scale and has caused an irreparable damage to the unique grassland ecosystem.



Google Earth imagery showing the extent of tree planting in Hessarghatta Grasslands. The pale white areas marked indicate the extent of area covered under tree planting at Hessarghatta Lake area.

Thus, the intense tree planting has completely altered nature and structure and has destroyed the of the unique grassland ecosystem that existed at Hessarghatta, which was a habitat for equally unique fauna (see Appendix) which include among others, globally threatened species like the Lesser Florican (*Sypheotides indica*), Red-necked Falcon (*Falco chicuera*), which also figure in Schedule-I of the Wildlife Protection Act (1972).

-sd/-

(S. Subramanya)

Biodiversity of Hessarghatta Grasslands

Compiled by:
S. Subramanya
subbu.subramanya@gmail.com

Summary

	Group	Number of species
A.	Plants (including grasses)	
a.	Native and Naturalized Plant Species in Hesaraghatta Grasslands and Grassland Scrub	39
b.	Invasive Plant species in Grassland	4
c.	Trees species planted recently in the Grassland and Grassland Scrub	12
B.	Mammals	10
C.	Reptiles	5
D.	Birds	133
E.	Amphibians	1
G.	Spiders	3
F.	Butterflies	14

A. Plants (including grasses)

a). Native and Naturalized Plant Species in Hesaraghatta Grasslands and Grassland Scrub

Family: Acanthaceae

1. *Andrographis serpyllifolia* (Vahl) Wight
2. *Barleria buxifolia* L.
3. *Lepidagathis cristata* Willd.
4. *Agave sisalana* Perrine ex Engelm.

Family: Apocynaceae

5. *Carissa paucinerva* A. DC.
6. *Ichnocarpus frutescens* (L.) R.Br.

Family: Arecaceae

7. *Phoenix sylvestris* (L.) Roxb.

Family: Asclepiadaceae

8. *Calotropis gigantea* (L.) R. Br.

Family: Asteraceae

9. *Chromolaena odorata* (L.) King & Robinson
10. *Launaea acaulis* (Roxb.) Babc. ex Kerr
11. *Vicoa indica* (L.) DC.

Family: Celastraceae

12. *Celastrus paniculatus* Willd.

Family: Convolvulaceae

13. *Evolvulus alsinoides* (L.) L.

Family: Cucurbitaceae

14. *Diplocyclos palmatus* (L.) Jeffrey

Family: Ebenaceae

15. *Diospyros melanoxylon* Roxb.

Family: Erythroxylaceae

16. *Erythroxylum monogynum* Roxb.

Family: Euphorbiaceae

17. *Euphorbia laeta* Heyne ex Roth
18. *Securinega leucopyrus* (Willd.) Muell.-Arg.
19. *Tragia involucrata* L.

Family: Fabaceae

Sub-family: Caesalpinioideae

20. *Cassia auriculata* L.

Sub-family: Faboideae

21. *Abrus precatorius* L.
22. *Butea monosperma* (Lam.) Taub.
23. *Crotalaria* sp.

Sub-family: Mimosoideae

24. *Acacia nilotica ssp. indica* (Benth) Brenan

25. *Acacia sp.*

26. *Pithecellobium dulce* (Roxb.) Benth

Family: Flacourtiaceae

27. *Flacourtia indica* (N. Burman) Merrill

Family: Lamiaceae

28. *Leucas hirta* (Roth) Sprengel

Family: Meliaceae

29. *Cipadessa baccifera* (Roth) Miquel

Family: Menispermaceae

30. *Cocculus hirsutus* (L.) Diels

Family: Poaceae

31. *Heteropogon contortus* (L.) Pal.-Beauv. ex Roemer & Schultes

32. *Aristida hystrix* L. f.

33. *Cymbopogon citratus* (DC.) Stapf

34. *Digitaria ciliaris* (Retz.) Koeler

35. *Themeda triandra* Forskal

Family: Rubiaceae

36. *Canthium parviflorum* Lam.

Family: Rutaceae

37. *Toddalia asiatica* var. *floribunda* Gamble

Family: Scrophulariaceae

38. *Striga asiatica* (L.) Kuntze

39. *Tridax procumbans*

b). Invasive Plant species in Grassland

Family:

1. Mesquite *Prosopis juliflora*

Family:

2. Lantana *Lantana camara*

Family:

3. Eupatorium *Eupatorium perfoliatum*

Family:

4. *Stachytarpheta indica*

c). Trees species planted recently in the Grassland and Grassland Scrub

Family: Moraceae

1. *Artocarpus heterophyllus* Lam.

2. *Ficus religiosa* L.

Family: Proteaceae

3. *Grevillea robusta* A.Cunn. ex R.Br.

Family: Anacardiaceae

4. *Mangifera indica* L.

Family: Muntingiaceae

5. *Muntingia calabura* L.

Family: Fabaceae

Sub-family: Faboideae

6. *Pongamia pinnata* (L.) Pierre
7. *Tamarindus indica* L.

Family: Myrtaceae

8. *Psidium guajava* L.
9. *Syzygium cumini* (L.) Skeels

Family: Meliaceae

10. *Swietenia mahogoni* (L.) Jacq.

Family: Combretaceae

11. *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.

Family: Malvaceae

12. *Thespesia populnea* (L.) Sol. ex Correa

A. Mammals:

1. Slender Lloris *Loris lydekkerianus*
2. Common Mongoose *Herpestes edwardsii*
3. Jackal *Canis aureus naria*
4. Indian Fox *Vulpes bengalensis*
5. Palm squirrel *Funambulus palmarum*
6. Indian Mole rat *Bandicota bengalensis*
7. House Mouse *Mus musculus*
8. Indian Field Mouse *Mus booduga*
9. Black-naped Hare *Lepus nigricollis*
10. Wild Boar *Sus scrofa*

B. Reptiles

1. Garden Lizard, *Calotes versicolor*
2. Peninsular Rock Agama *Psammophilus dorsalis*
3. Ratsnake *Ptyas mucosus*
4. Common Cobra *Naja naja*
5. Russell's Viper *Daboia russelii*

C. Birds

Order: Galliformes

Family: Phasianidae

1. Grey Francolin *Francolinus pondicerianus*
2. Common Quail *Coturnix coturnix*
3. Rain Quail
4. Jungle Bush Quail *Perdicula asiatica*
5. Grey Junglefowl *Gallus sonneratii*
6. Indian Peafowl *Pavo cristatus*

Order: Pelecaniformes

Family: Ardeidae

7. Cattle Egret *Bubulcus ibis*
8. Indian Pond Heron *Ardeola grayii*

Order: Falconiformes

Family: Accipitridae

9. Crested Honey Buzzard *Pernis ptilorhynchus*

10. Black-winged Kite *Elanus caeruleus*
11. Black Kite *Milvus migrans*
12. Brahminy Kite *Haliastur indus*
13. Egyptian Vulture *Neophron percnopterus*
14. Short-toed Snake Eagle *Circaetus gallicus*
15. Marsh Harrier *Circus aeruginosus*
16. Hen Harrier *Circus cyaneus*
17. Pallid Harrier *Circus macrourus*
18. Pied Harrier *Circus melanoleucos*
19. Montagu's Harrier *Circus pygargus*
20. Shikra *Accipiter badius*
21. Eurasian Sparrowhawk *Accipiter nisus*
22. White-eyed Buzzard *Butastur teesa*
23. Indian Spotted Eagle *Aquila hastata*
24. Greater Spotted Eagle *Aquila clanga*
25. Tawny Eagle *Aquila rapax*
26. Steppe Eagle *Aquila nipalensis??*
27. Booted Eagle *Aquila pennata*
28. Common Buzzard *Buteo buteo*

Family: Falconidae

29. Common Kestrel *Falco tinnunculus*
30. Red-necked Falcon *Falco chicquera*
31. Peregrine Falcon - *Falco peregrinus*

Order: Otidiformes

Family: Otididae

32. Lesser Florican *Sypheotides indicus*

Order: Charadriiformes

Family: Turnicidae

33. Barred Buttonquail *Turnix suscitator*

Family Charadriidae

34. Yellow-wattled Lapwing *Vanellus malabaricus*
35. Grey-headed Lapwing *Vanellus cinereus*

Order: Columbiformes

Family: Columbidae

36. Rock Pigeon *Columba livia*
37. Laughing Dove *Streptopelia senegalensis*
38. Spotted Dove *Streptopelia chinensis*
39. Eurasian Collared Dove *Streptopelia decaocto*

Order: Psittaciformes

Family: Psittacidae

40. Rose-ringed Parakeet *Psittacula krameri*

Order: Cuculiformes

Family: Cuculidae

41. Pied Cuckoo *Clamator jacobinus*
42. Common Hawk-Cuckoo *Hierococcyx varius*
43. Indian Cuckoo *Cuculus micropterus*
44. Common Cuckoo *Cuculus canorus*
45. Asian Koel *Eudynamys scolopacea*

- 46. Blue-faced Malkoha *Phaenicophaeus viridirostris*
- 47. Greater Coucal *Centropus sinensis*

Order: Strigiformes

Family: Tytonidae

- 48. Barn Owl *Tyto alba*

Family: Strigidae

- 49. Short-eared Owl *Asio flammeus*
- 50. Oriental Scops Owl *Otus sunia*
- 51. Indian Scops Owl *Otus bakkamoena*
- 52. Indian Eagle-Owl *Bubo bengalensis*
- 53. Brown Fish Owl *Ketupa zeylonensis*
- 54. Mottled Wood Owl *Strix ocellata*
- 55. Jungle Owlet *Glaucidium radiatum*
- 56. Spotted Owlet *Athene brama*
- 57. Brown Hawk Owl *Ninox scutulata*

Order: Caprimulgiformes

Family: Caprimulgidae

- 58. Indian Jungle Nightjar *Caprimulgus indicus*
- 59. Sykes's Nightjar *Caprimulgus mahrattensis*
- 60. Indian Nightjar *Caprimulgus asiaticus*
- 61. Savanna Nightjar *Caprimulgus affinis*

Order: Apodiformes

Family: Apodidae

- 62. House Swift *Apus affinis*
- 63. Alpine Swift *Apus melba*

Order: Coraciiformes

Family: Coraciidae

- 64. Indian Roller *Coracias benghalensis*

Family: Alcedinidae

- 65. White-throated Kingfisher *Halcyon smyrnensis* (Breeding resident)

Family: Meropidae

- 66. Green Bee-eater *Merops orientalis*

Order: Bucerotiformes

Family: Upupidae

- 67. Hoopoe *Upupa epops*

Order: Passeriformes

Family: Pittidae

- 68. Indian Pitta *Pitta brachyura*

Family: Aegithinidae

- 69. Common Iora *Aegithina tiphia*

Family: Campephagidae

- 70. Black-headed Cuckoo-shrike *Coracina melanoptera*

Family: Laniidae

- 71. Brown Shrike *Lanius cristatus* (Regular winter visitor)
- 72. Bay-backed Shrike *Lanius vittatus*
- 73. Long-tailed Shrike *Lanius schach*

Family: Oriolidae

74. Indian Golden Oriole *Oriolus kundoo*

Family: Dicruridae

75. Black Drongo *Dicrurus macrocercus*

76. White-bellied Drongo *Dicrurus caerulescens*

77. Ashy Drongo - *Dicrurus leucophaeus*

Family: Corvidae

78. House Crow *Corvus splendens*

79. Jungle Crow *Corvus macrorhynchos*

Family: Paridae

80. Cinereous Tit *Parus cinereus*

Family: Alaudidae

81. Jerdon's Bushlark *Mirafra affinis*

82. Ashy-crowned Sparrow-Lark *Eremopterix griseus*

83. Rufous-tailed Lark *Ammomanes phoenicura*

84. Greater Short-toed Lark *Calandrella brachydactyla*

85. Oriental Skylark *Alauda gulgula*

Family: Pycnonotidae

86. Red-whiskered Bulbul *Pycnonotus jocosus*

87. Red-vented Bulbul *Pycnonotus cafer*

88. White-browed Bulbul *Pycnonotus luteolus* [34]

Family: Hirundinidae

89. Sand Martin *Riparia riparia* (Vagrant)

90. Plain Martin *Riparia paludicola* (Vagrant)

91. Barn Swallow *Hirundo rustica*

92. Pacific Swallow *Hirundo tahitica*

93. Red-rumped Swallow *Cecropis daurica*

94. Streak-throated Swallows

Family: Phylloscopidae

95. Greenish Warbler *Phylloscopus trochiloides*

Family: Acrocephalidae

96. Blyth's Reed Warbler *Acrocephalus dumetorum*

97. Sykes' Warbler *Iduna rama*

Family: Cisticolidae

98. Ashy Prinia or Ashy Wren-warbler

99. Zitting Cisticola *Cisticola juncidis*

100. Jungle Prinia *Prinia sylvatica*

101. Ashy Prinia *Prinia socialis*

102. Plain Prinia *Prinia inornata*

103. Common Tailorbird *Orthotomus sutorius*

Family: Timaliidae

104. Tawny-bellied Babbler *Dumetia hyperythra*

Family: Leiothrichidae

105. Large Grey Babbler *Turdoides malcolmi*

106. Yellow-billed Babbler *Turdoides affinis*

Family: Sylviidae

107. Lesser Whitethroat *Sylvia curruca blythi*

108. Yellow-eyed Babbler *Chrysomma sinense*

Family: Zosteropidae

109. Oriental White-eye *Zosterops palpebrosus*

Family: Sturnidae

110. Grey-headed Starling *Sturnia malabarica*
111. Brahminy Starling *Sturnia pagodarum*
112. Rose-coloured Starling *Sturnus roseus*
113. Common Myna *Acridotheres tristis*
114. Jungle Myna *Acridotheres fuscus*

Family: Turdidae

115. Indian Robin *Saxicoloides fulicatus*
116. Siberian Stonechat *Saxicola maura*
117. Pied Bushchat *Saxicola caprata*

Family: Dicaeidae

118. Pale-billed Flowerpecker *Dicaeum erythrorhynchus*

Family: Nectariniidae

119. Purple-rumped Sunbird *Nectarinia zeylonica*
120. Purple Sunbird *Cinnyris asiaticus*

Family: Ploceidae

121. Baya Weaver *Ploceus philippinus*

Family: Estrildidae

122. Red Munia *Amandava amandava*
123. Indian Silverbill *Euodice malabarica*
124. White-rumped Munia *Lonchura striata*
125. Scaly-breasted Munia *Lonchura punctulata*
126. Black-headed Munia *Lochura malacca*

Family: Motacillidae

127. White-browed Wagtail *Motacilla maderaspatensis*
128. Grey Wagtail *Motacilla cinerea*
129. Richard's Pipit *Anthus richardi*
130. Red-throated Pipit *Anthus cervinus*
131. Paddyfield Pipit *Anthus rufulus*
132. Blyth's Pipit *Anthus godlewskii*
133. Tree Pipit *Anthus trivialis*

D. Amphibians

1. Common Toad *Duttaphrynus melanostictus*

E. Spiders

1. Erisid Spider *Stegodyphus sarasinorum*
2. Signature Spider *Argiope argentata*
3. Giant Wood Spider *Nephila maculate*

F. Butterflies**Family: Papilionidae**

1. Common Rose *Pachliopta aristolochiae*

Family: Nymphalidae

2. Blue Pansy *Junonia orithya*

3. Chocolate Pansy *Junonia iphita*
4. Common Fourring *Ypthima huebneri*
5. Lemon Pansy *Junonia lemonias*
6. Plain Tiger *Danaus chrysippus*
7. Striped Or Common Tiger *Danaus genutia*
8. Yellow Pansy *Junonia hierta*

Family: Lycaenidae

9. Dark Grass Blue *Zizeeria karsandra*
10. Lesser Grass Blue *Zizina otis*
11. Tiny Grass Blue *Zizula hylax*
12. Slate Flash *Rapala schistacea*

Family: Hesperidae

13. Indian Grizzled/Indian Skipper *Spialia galba*
14. Pale Palm Dart *Telicota colon*

Source of Information:

Plants: Dr. A. N. Sringeswara & Dr. Sahana Vishwanath; Email: ansringesh@gmail.com

Mammals, Reptiles and Amphibians: Arun Nadavar; Email: nk_arun@yahoo.com; Vinay Kumar Thimmappa; Email: vinaya.kumar.t@gmail.com

Birds: Dr. S. Subramanya; Email: subbu.subramanya@gmail.com

Spiders: Vinay Kumar Thimmappa; Email: vinaya.kumar.t@gmail.com

Butterflies: Rohit Girotra; Email: rohishwa18@yahoo.co.in; Vinay Kumar Thimmappa; Email: vinaya.kumar.t@gmail.com

WRIT PETITION NO 45759 / 2012 (GM-FOR)

[Notice under Rule 13(a) proviso]

Petitioner

- 1 M/S ARKAVATHI KUMUDAVATHI NADI
PUNSCHEANA SAMITHI, NO.8, AIS BHAVAN
RAJIV GANDHI CIRCLE, SHESHADRIPURAM
BANGALORE-56020
REPRESENTED BY ITS SECRETARY M R SEETHARAM

By Sri T I ABDULLA
Vs

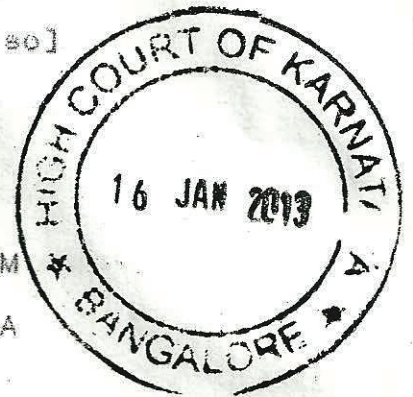
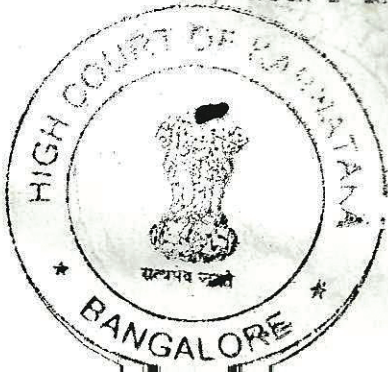
Respondents

- 1 STATE OF KARNATAKA
REPRESENTED BY ITS PRINCIPAL SECRETARY
DEPARTMENT OF FOREST, ECOLOGY AND ENVIRONMENT
MULTISTOREYED BUILDING, DR AMBEDKAR VEEDHI
BANGALORE-560001
- 2 COMMISSIONER
DEPARTMENT OF ANIMAL HUSBANDRY AND VETERINARY SERVICES
MULTISTOREYED BUILDING, BANGALORE-560001
- 3 THE DIRECTOR
DEPARTMENT OF INFORMATION, NO.17, VARTHA SOUDHA
INFANTRY ROAD, BHAGAVAN MAHAVEER ROAD
INFANTRY ROAD, BANGALORE-560001
- 4 THE CHEIF WILDLIFE WARDEN
ARANYA BHAVAN, 2ND FLOOR, 18TH CROSS
MALLESHWARAM, BANGALORE-560003
- 5 STATE BORAD FOR WILDLIFE
V V TOWER (MAIN) 8TH FLOOR
DR B R AMBEDKAR VEEDHI, BANGALORE-560001
REPRESENTED BY ITS SECRETARY
- 6 SREE KANTEERAVA STUDIOS
3RD CROSS, NANDINI LAYOUT
BANGALORE-560096
REPRESENTED BY ITS DIRECTOR

Whereas, a Writ Petition filed by the above named petitioner under Article 226 of the Constitution of India, as in the copy annexed hereunto, has been registered by this court.

Notice is hereby given to you to appear in this court in person or through an Advocate duly instructed or through some one authorized by law to act for you in this case, at 10.30 AM in the forenoon within 10 days of the service of this notice to show cause why rule nisi should not be issued.

If you fail so to appear on the said date or any subsequent date to which the matter may be posted as directed by the court, without any further notice, the petition will be dealt with, heard and decided on merits in your absence.



Contd..2/-

This certificate copy contains 2 pages
and a court fee stamps of Rs. 4 is affixed

INTERIM ORDER

Pending issue of Rule nisi in the aforesaid Writ Petition it is hereby ordered by this Court on

Friday THE 04th DAY OF January 2013
PRESENT

The Hon'ble ACTING CHIEF JUSTICE
AND
The Hon'ble Mrs. Justice B.V.NAGARATHNA

as follows:-

Sri R.G.Kolle. AGA takes notice for respondent Nos.1 to 5.
Issue notice to respondent No.6.

Parties are directed to maintain status-quo of the lands
in question until further orders.

Sd/-
Ag. CHIEF JUSTICE

Sd/-
JUDGE.

COPY

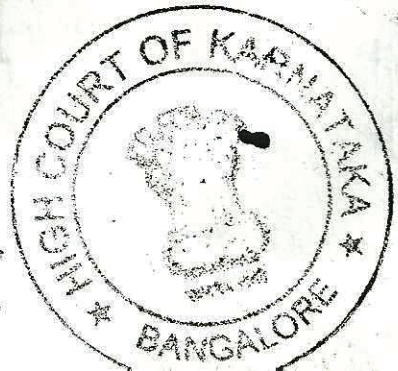
ASSISTANT REGISTRAR

Note:- It is prayed to restrain the respondents from alienating or
diverting Survey No.82, 83, 92, 94, 99, 95, 98, 97, 100 and 101 of
Kodihalli Village, Madhure Hobli, Doddebhallapur Taluk totally measuring
302 acres from Grasslands to any other purpose including commercial
purpose.

'TRUE COPY'

Section Officer,
High Court of Karnataka,
Bangalore-560 001.

Assistant Registrar



- a) The date on which the application was made 7/1/13
- b) The date on which charges are paid and entry is made in the court records 7/1/13
- c) The date on which the charges and all charges if any are deposited 7/1/13
- d) The date on which the copy is made 7/1/13
- e) The date of notifying that the copy is ready for delivery 7/1/13
- f) The date on which the copy is delivered 7/1/13

For Banker

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಸಂಖ್ಯೆ: ಪಸಂಮೀ 46 ಸಲೆವಿ 2013

ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಸಚಿವಾಲಯ
ವಿಕಾಸ ಸೌಧ

ಬೆಂಗಳೂರು, ದಿನಾಂಕ: 03.04.2013

ಇವರಿಂದ :

ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು,
ಪಶುಸಂಗೋಪನೆ ಮತ್ತು ಮೀನುಗಾರಿಕೆ ಇಲಾಖೆ,
ಬೆಂಗಳೂರು.

ಇವರಿಗೆ :

ಶ್ರೀ.ಮಂಜುನಾಥ್ ಜಿ.
ಕೋ-ಆರ್ಡಿನೇಟರ್,
ಅರ್ಕಾವತಿ-ಕುಮುದ್ವತಿ ನದಿ ಪುನಶ್ಚೇತನ ಸಮಿತಿ (ಲಿ),
ನಂ.3, ಎ.ಐ.ಎಸ್ ಭವನ,
ರಾಜೀವ್ ಗಾಂಧಿ ವೃತ್ತ, ಶೇಷಾದ್ರಿಸುರಂ,
ಬೆಂಗಳೂರು - 560 020.


ಮಾನ್ಯರೇ.

ವಿಷಯ: ಮಾಹಿತಿ ಹಕ್ಕು ಕಾಯ್ದೆಯಡಿ ಹೆಸರಾಚ್ಚು ಸಮೀಪದ
ಕೋಡಿಹಳ್ಳಿಯ ಪ್ರಸ್ತಾಪಿತ ಚಿತ್ರನಗರಿಯ ಕುರಿತು.


ಉಲ್ಲೇಖ: ನಿಮ್ಮ ಅರ್ಜಿ ದಿನಾಂಕ 20.03.2013.

ಮೇಲ್ಕಂಡ ವಿಷಯ ಹಾಗೂ ಉಲ್ಲೇಖಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ, ಮಾಹಿತಿ ಹಕ್ಕು ಕಾಯ್ದೆಯಡಿ
ನೀವು ಕೋರಿರುವಂತೆ ಪತ್ರ ಸಂಖ್ಯೆ: AHF/PRS/79/2012 ದಿನಾಂಕ 12.04.2012 ರ
ದೃಢೀಕೃತ ಪ್ರತಿಯನ್ನು ಇದರೊಂದಿಗೆ ಲಗತ್ತಿಸಿ ಕಳುಹಿಸಿಕೊಡಲಾಗಿದೆ.

ತಮ್ಮ ನಂಬುಗೆಯ


(ಸರಸಾ). 03.04.13

ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ
ಪಶುಸಂಗೋಪನೆ ಮತ್ತು ಮೀನುಗಾರಿಕೆ ಇಲಾಖೆ
(ಪಶುಸಂಗೋಪನೆ)


03/04

URGENT

Telephone : 080-22353911

Fax : 080-22253734



MANJULA, IAS
Principal Secretary to Government
Animal Husbandry &
Fisheries Department

Karnataka Government Secretariat
4th Floor, Vikasa Soudha
Dr. B.R. Ambedkar Veedhi
Bangalore - 560 001.

AHF/PRS/79/2012

Date: 12.04.2012

Note

The Department of Tourism has proposed a Draft Cabinet Note on the development of government land in Kodihalli village on PPP basis. The proposal of the Tourism Department has been examined by the Department of Animal Husbandry & Veterinary Services. The department's views are as follows:

1. The land in question measuring 347.12 acres in Kodihalli village, Doddaballapur Taluk, Bangalore Rural District belongs to the Department of Animal Husbandry & Veterinary Services. This land has been leased to the Karnataka Film Development Corporation (KFDC) in the year 1972, for the purpose of using it for film industry with a condition that if the land is put to any other use, it is liable to be resumed to the Government. The Department of Animal Husbandry & Veterinary Services has been corresponding for the transfer of the said land back to the department, as it was not put to the purpose for which it was intended within the stipulated time, and certain extent of lands have also been sub-leased contrary to the terms and conditions of the lease.

2. It must be mentioned here that the total extent of land in Kodihalli and surrounding villages is about 3459.20 acres.

A number of central institutions and State Government farms like the Livestock breeding farm, Central duck breeding farm, Central inland fisheries research institute, and Central poultry farm etc have been established in the lands abutting the leased land. Thus, the predominant activities are research, farming, extension etc in this area.

3. It is also pertinent to note here that Kodihalli is one of the villages coming in the catchment area of Arkavathi River and Tippagondanahalli reservoir catchment. The Tippagondanahalli Reservoir receives inflows from two streams namely Kumudvathi & Arkavathi. The Government vide its order No.FEE 215 ENV 2000 dated 18.11.2003 has notified the steps to be taken in order to protect the Tippagondanahalli Reservoir catchment. In the above notification, the Government has categorized the Tippagondanahalli reservoir catchment into four zones and accordingly, specified the regulated/restricted activities for each zone. The Karnataka State Pollution Control Board has also taken a decision not to accord consent for any industry, as this is bound to change the surface contours and affect the catchment's drainage pattern. The intent of the Government was to protect the catchment area of T.G.Halli Reservoir as over a period of time inflows to the T.G.Halli Reservoir have been decreased. These decisions were also based upon the recommendation made in a study done by the ISRO. In fact, the ISRO has recommended formation of a Conservation Zone covering the entire T.G.Halli Reservoir catchment and adopting

suitable land utilization strategy etc. A committee has also been set up under the Chief Secretary vide UDD 71 MNE 2009 dated 18/1/2012 to monitor the measures being taken to improve inflows into T.G Hali reservoir and to rejuvenate Arkavathi and Kumdvathi rivers. When the Government is regulating and restricting the land use in private lands, it does not make sense to divert the available government land for other purposes instead of preserving and protecting the same in its present condition.

(S)

4. Moreover, the land which is proposed to be developed as a tourist attraction is grassland (widely known as Hesarghatta grasslands). It may be mentioned here that Task Force on Grasslands and Deserts, Planning Commission, GOI has recommended sustainable use of grasslands and protection of the existing grasslands as besides providing habitat, shelter and food both to livestock and wildlife, the grasslands also serve as an important catchment for rivers, streams, reservoirs, dams etc., and also breeding grounds of a number of avian species.

5. This Department had received a petition from Arkavathi-Kumdvathi Nadi Punshchetana samithi requesting to preserve the said land as a grass land as it is the last remaining grass land around Bangalore and apart from being a part of catchment area for Arkavathy river, it is also a wintering ground for birds from Central Asia and beyond. An online petition to request the Government to shelve all plans for theme park etc is signed by close to 1200 people as on this day. I am mentioning

this only to buttress the point that there is public opinion in favour of preserving the said land as grassland, which needs to be given a serious consideration.

6. A study done by Shri S.Subramanya, professor of G.K.V.K and a member of Bombay National Society, Mumbai on the Biodiversity of Hesaraghatta Grasslands indicates that this land hosts 39 native species of scrubs, 10 species of mammals, 5 species of reptiles, 133 species of birds apart from butterflies etc. While film city, theme park etc may be important and there may be a need for a tourist attraction in Bangalore, it would be a travesty to destroy the existing eco-systems for this purpose. This grassland is a Nature's theme park where different varieties of flora and fauna thrive. The best contribution that one could make for Bangalore and future generations is to protect it as such.

7. On the above grounds, this department is of the opinion that it is not advisable to develop this land on the lines suggested by the Tourism Department. This department is also of the considered view that this particular piece of land be left as grassland and returned to the Animal Husbandry Department for protecting and preserving it as such.

(Handwritten Signature)
(V.MANJULA)

To,
The Chief Secretary,
Government of Karnataka,
Vidhana Soudha.

(Handwritten Signature)
ಸರಸಾ

(Handwritten Signature)
Office of the Chief Secretary
to Government of Karnataka
Vidhana Soudha, Bangalore-560 001

ಸರ್ಕಾರದ ಅಧಿಕಾರ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ
ಇವುಗಳನ್ನು ಬಳಸುವುದಕ್ಕೆ ಅವಕಾಶ
(ಪ್ರಕಟಣೆಗಾಗಿ) 4

Proceedings of the meeting of Heads of various farms at Hessarghatta under the Chairmanship of Dr.S.Yathiraj, Dean, Veterinary College, KVAFSU, Hebbal, Bangalore held on 05.05.2012.

As per the instructions of the Principal Secretary, Dept. of Animal Husbandry and Fisheries, GOK, the Dean, Veterinary College, KVAFSU, Hebbal, Bangalore visited Hessarghatta Farm on 05.05.2012 and had discussions with the Heads of various centres / farms to discuss about the bio-security threats to the animal husbandry activities in and around Hessarghatta in view of **Establishment of Theme Park related to Film Industry.**

MEMBERS PRESENT:

- 1) Dr.S.Yathiraj, Dean, Veterinary College, KVAFSU, Hebbal, Bangalore
- 2) Dr.Vinod Bhat, I/c.Director, CFSPTI, GOI, Hessarghatta
- 3) Dr.Guna Sekaran, M, Superintendent, Central Cattle Breeding Farm, GOI, Hessarghatta
- 4) Dr.Rajeshwara Rao, Director, CPDO, GOI, Hessarghatta (was not available as he was in another meeting)
- 5) Dr.Mahesh, Additional Director, Nandini Sperm Station, KMF, Hessarghatta
- 6) Dr.T.S.Manju, Deputy Director, AH & VS, LBF, Hessarghatta
- 7) Dr.R.K.Chaluvaiah, Deputy Director, AH &VS, LBF, Hessarghatta
- 8) Deputy Director, State Poultry Farm, Hessarghatta
- 9) Deputy Director, AH & VS, SLBTC, Hessarghatta
- 10)Dr.Lokesh, Veterinary Officer, Pig Breeding Station, Hessarghatta.

Dean, Veterinary College, Bangalore Dr.S.Yathiraj, had the meeting at CFSPTI, Hessarghatta and appraised about the purpose of the meeting. All the members visited the various farms and also the area marked for the **Theme Park Related to Film industry** and the observations / opinion by the committee are as follows:

- 1) Dean Dr.S.Yathiraj, outlined about the general points regarding Bio-security in the farm and highlighted about the impact of growing human population in the area in terms of environmental pollution, disease spread, rodent and flies menace, increase in migratory bird population, destruction of crop / fodder agricultural crops and the economic loss and the same were discussed and the points drawn thereon have been outlined and the same has been enclosed as **ANNEXURE – I.**
- 2) As per the **Map** (Not to the Scale - **ANNEXURE – II**) provided by Dr. Chaluvaiah, Deputy Director, LBF, Hessarghatta, it can be construed that the area proposed for theme park related to film industry is adjacent to the existing CCBF, CFSPTI,

CPDO and AQCS with a common border and these farms have been in existence prior to Independence. These have been established in this area for the very reason that they are away from human dwelling / industry / public enterprises etc.

- 3) The livestock / birds / fish housed in these farms are of great genetic potential and some are imported and a high level of productive germplasma have been maintained.
- 4) Currently, Government of Karnataka has made all efforts in this area for the last 5 to 10 years to sanitize this area of around 10 kms. in the form of ring vaccination against major diseases like Foot and Mouth, HS, BQ, Anthrax etc. Any intervention by way of increasing activity / movement of humans is likely to increase the risk of infection and spread of diseases.
- 5) Heads of various farms indicated that this area is under the notified area of Arkavathi and Kumadvathi river catchment area.
- 6) Any form of increased human activity in this area will be a great threat to the breeding activities which are the primary source of breeding material to the state and country which has a direct impact on the milk production of state in turn gravely effects the economy and livelihood security of farmers.

OPINION

In order to maintain highest order of bio-security in terms of maintaining disease free animals in the zone, sustainable livestock, poultry and fish production, rural economy, any enterprising activity which enhances human movement around the existing farms should not be encouraged.


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ANNEXURE - I

GENERAL OBSERVATIONS AND POINTS ABOUT THE LIVESTOCK, POULTRY AND FISH FARMS IN HESSARAGHATTA

The various State and Central livestock and poultry farms and centres that exist in Hesaraghatta, Bangalore include;

I. STATE FARMS

- 1) **State Semen Collection Centre (SSCC)** – with a total of 70 animals comprising HF, Jersey, Hallikar and Amruthmahal bulls for the supply of semen to Department of Animal Husbandry and Veterinary Services.
- 2) **Livestock Breeding Farm (LBF)** – with dairy animals and calf bulls maintained for supplying bull calves to SSCC.
- 3) **Rabbit Breeding Farm (RBF)** – for supply of rabbits and also conducts training for farmers.
- 4) **Piggery Breeding Station** – with about 100 pigs maintained mainly for breeding. Involved in giving training and supply of piglets to farmers.
- 5) **State Poultry Farm (SPF)** – has maintained parent stock of Giriraja birds for supply to Department of Animal Husbandry and also conducts training for farmers.
- 6) **State Livestock Breeding and Training centre** – Jersey bull mother farm. Has maintained about 150 Jersey cows.
- 7) **Frozen Semen Bank** - Collection and preservation of Semen for breeding purpose and supplies semen to the whole of Karnataka.
- 8) **Fish Breeding Farm** – Department of Fisheries, Government of Karnataka.

II. CENTRAL FARMS

- 1) **Central Frozen Semen Production and Training Institute** - has maintained Jersey bulls and cows (70 and 60 nos.).
- 2) **Central Cattle Breeding Farm (CCBF)** – has maintained 200 HF females – mainly for production of male calves.
- 3) **Central Poultry Development Organization and Training Centre (CPDO)** – has maintained Poultry farm, duck farm, Emu farm, Ostrich farm, Turkey farm and Quails farm. The centre is also involved in providing training to farmers.

- 4) **Central Fodder Seed Production Farm** – mainly for production of fodder seeds.
- 5) **Animal Quarantine Certification Service (AQCS)** – this has been created to house imported Animals for surveillance and monitoring in order to prevent entry of any new infection/s to the animals in Karnataka.
- 6) **Indian Institute of Horticulture Research (IIHR).**
- 7) **Central Institute for Fresh Water Aquaculture (CIFA) and Central Inland Fisheries Research Institute (CIFRI)** – serves as a centre for providing seeds and breeding stock to farmers.

III. **NANDINI (KMF)**

- 1) **Nandini Sperm Station** – has maintained 90 males (F.F and Jersey) for semen collection.
- 2) **Jersey Female Stock**
- 3) **Bull Mother Farm**

IV. **UNIVERSITY FARMS:**

- 1) **Fisheries Research and Information Centre (FRIC)** – This is a breeding centre and supplies seeds to the farmers.

All the farms located at Hessarghatta have agricultural lands for fodder crop production.

The above information indicates that Hessarghatta is an area where various Veterinary establishments exist with livestock, birds and fishes that are mainly reared for breeding purpose.

Industrialization or human encroachment of such an area for any reason like building apartments, hotels, theme parks, amusement parks which increase human movement to the area has multifaceted effects and may destroy or disorganize the farm animal's ecosystem especially its health.

Further growing human population in this area may cause:

Environmental Pollution – water pollution, air pollution, noise pollution - through human habitation wastes-night soil, human urine, town refuse, sewage, sludge and also through traffic congestion.

Disease spread – due to human movement in and around the livestock and poultry farms who may be carrying infectious pathogens. The disease spread may be from animals to humans (Zoonosis) or from humans to animals (anthroozoonosis).

Rodent and fly menace - rodents and flies may get attracted to the human wastes and their population in human dwelled areas may increase. Rodents are major vectors and reservoirs of poultry and zoonotic pathogens, including *Pasteurella multocida*, *Salmonella typhimurium* and *S. enteritidis*. Mice amplify environmental contamination and will infect poultry and products. Rodents serve as mechanical transmitters of infectious agents such as influenza and infectious bursal disease viruses and *Salmonella* and *Pasteurella* spp.

Increase in migratory bird population – The change in landscape due to growing human population can change the migratory pathway of birds, which may get attracted to nutrient rich stopovers of human habitats.

Destruction of crop/fodder agricultural land - Human habitation may destroy or affect the agricultural land used for fodder production for the animals.

Economic loss – through death of diseased animals, loss of breeding bulls and non-availability of semen for artificial insemination.

Disease spread

According to the Center for Disease Control (CDC), approximately 75 percent of the newest emerging infectious diseases affecting humans are diseases of animal origin. They also report that approximately 60 percent of all human diseases are zoonotic - meaning they can spread from an animal to a human. More than ever before, human encroachment into new environments is leading to an increased contact between humans and animals. One of the most significant outcomes of this is the emergence and re-emergence of zoonoses.

Some of the important zoonotic diseases include Anthrax, Tuberculosis, Brucellosis, Cryptosporidiosis, Giardiasis, Salmonellosis, E.coli infection, Salmonellosis, leptospirosis, Listeriosis, Rabies, Tularaemia, Q fever etc. The spread of infection to humans is due to the close contact of animals with humans or contamination of water source.

On the contrary, diseases may spread to livestock and poultry through humans. An increase in the movement of humans in the areas of animal habitat may transmit the disease to animals and poultry. People are considered to be one of the biggest risks insofar as carrying pathogens onto livestock and chicken farms, particularly on their footwear, clothing, hands and even vehicles. All of these diseases can limit productivity from lower milk production to reduced milk quality, from impaired reproduction to reduced calf survivability, from chronic debilitating infection to death. Any one of these diseases can become established in a naïve, resident herd.

Threat to health of humans, livestock and poultry through Migratory birds

Billions of birds are involved in annual migrations in which they carry and deliver microbes over thousands of miles. On arrival at their destination, and at nodal stop-off points, there is the potential for a gloriously complex interchange of microbes between resident and migrant birds of different countries.

Migratory birds especially wild birds are threat to health of not only livestock and poultry but also to humans. They are viewed as vectors, polluters and pests. Migratory birds can play a role in the spread of infectious diseases. Their ability to travel over long distances and through a variety of habitats exposes them to a wide range of microorganisms.

They are the sources of a variety of diseases such as,

Psittacosis (ornithosis, parrot fever), caused by the bacterium *Chlamydophila psittacci*, is carried by budgerigars, parrots, cockatoos and pigeons, both in the wild and in captivity, and by doves, birds of prey and shore birds in the wild. Humans and other Psittasine birds are susceptible

Avian Influenza (Bird flu) is caused by influenza A virus subtype H5N1 which specifically infects birds. It has a reservoir in wild birds where virulent strains periodically evolve and cause disease. Poultry, particularly chickens, are highly susceptible and the current highly virulent strain can kill them on the same day that symptoms appear. Control measures include biosecurity (prevention of small wild birds gaining access to poultry houses), slaughter of infected birds, vaccination and restrictions of bird movements and trade. Up to now the problem has been largely economic with millions of chickens slaughtered. However, this strain of bird 'flu has already killed people in south-east Asia through contact with dead or diseased chickens and has jumped the species barrier by infecting pigs, tigers and civet cats, it seems only a matter of time before person-to-person transmission evolves. A hugely impressive worldwide surveillance operation is in place and many countries are stockpiling vaccines against this eventuality.

West Nile Virus (WNV) is endemic in parts of North Africa and the Middle East and appeared in the USA in 1999. Since then it has spread to all of the mainland US states and into Mexico. Wild birds are the amplifying host for the virus and in the US over 160 species have been infected. Its expansion across North America has been due to

migratory birds, some of which fly huge distances, and by local birds such as songbirds. It is transmitted from bird to bird and from birds to humans and horses by mosquitoes.

Lyme disease, caused by the bacterium *Borrelia burgdorferi*, is usually associated with deer and rodents. However, seabirds and ground-foraging birds, such as grouse and pheasant, are reservoirs for both the bacteria and the ticks that transmit them to other animals and humans.

Wild birds as polluters

Wild birds excrete a variety of human gastrointestinal pathogens in their droppings, including the bacteria *Campylobacter*, *Listeria*, *Salmonella*, *Aeromonas*, *Vibrio cholerae*, *Yersinia* and *Escherichia coli* O157, the protozoa *Giardia* and *Cryptosporidium*, as well as the bacterial indicators of pollution, faecal coliforms and enterococci. Therefore, wherever wild birds congregate, they are likely to pollute their immediate environment with some or all of these pathogens.

Birds and the pollution of water bodies

Migratory birds are a major source of faecal pollution for drinking water reservoirs. Farm ponds, with their resident and migrating ducks, geese and wildfowl, are a particularly rich source of pathogens, such as *Salmonella* and *Campylobacter*, for livestock. Migrating birds have the potential to bring new, more virulent strains into the farm environment. In addition faecal contamination of crops by birds is an important issue, particularly for growers of salad vegetables such as lettuce and spring onions.

Importance of animal/bird biosecurity

Human dwelling into livestock and poultry farm areas can affect the biosecurity of the animals and birds. Biosecurity is a practice implemented to reduce the risk of disease agents moving on to farms from outside sources. Biosecurity in livestock and poultry farms may be breached by

- intruders such as wild birds, rodents, flies, dogs, cats
- feed, water contamination, air pollution, medication
- movement of humans who may introduce pathogens
- introduction of new animals, maintenance of several types of animals, bad management, sanitation etc.

The biosecurity measures include conceptual biosecurity, structural biosecurity and operational biosecurity.

Conceptual Biosecurity: The primary level represents the basis of all programs to prevent disease. Conceptual biosecurity includes selecting the location of a complex or

operation in a specific area to separate different types of poultry, reduce bio-density, and avoid contact with free-living birds. Siting of farms in relation to public roads and service facilities such as hatcheries, feed mills, and processing plants has a profound impact on the effectiveness of a program to maintain optimal standards of production. Decisions concerning conceptual biosecurity influence all subsequent activities relating to prevention and control of disease. Generally, defects in conceptual biosecurity cannot be changed in response to the emergence of new diseases which may result in severe losses or even failure of an enterprise.

Structural Biosecurity: The second level of biosecurity includes considerations such as the layout of farms, erection of fences, construction of drainage, all weather roads, equipment for decontamination, bulk feed installations, change rooms, exclusion of rodents and wild birds, and the interior finishes in houses. Structural biosecurity can be enhanced in the intermediate term with appropriate capital investment. Remedial action may often be too late to respond to the emergence of a new disease or an epornitic of a catastrophic infection such as highly pathogenic avian influenza.

Operational Biosecurity: The third level comprises routine managerial procedures intended to prevent introduction and spread of infection within a complex or enterprise. These activities can be modified at short notice to respond to disease emergencies. Constant review of procedures, participation by all levels of management and labor and appropriate monitoring of the health status and immunity of flocks contributes to effective operational biosecurity.

Structural Biosecurity in poultry farms:

Multiplier breeder farms should be at least 3 km away from any commercial human activity / enterprise.


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exploited opportunistically by birds of prey. Huge concentrations of predators, including many hawks, kites, and eagles, follow swarms of locusts in the Old World tropics or attend bush fires, where they catch more insects than vertebrates (del Hoyo *et al.* 1984).

Although the principal food of White-eyed Buzzards is orthopterous insects and small reptiles, they also catch a variety of mammalian- and herpeto-fauna (Roberts 1991). At Tal Chhapar a sudden profusion of locusts/grasshoppers is exploited opportunistically by White-eyed Buzzards and for four to five weeks these birds appear to feed exclusively on insects. It is difficult to say why only juveniles are attracted to the area during monsoon and post monsoon months.

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Fig. 2. Juvenile White-eyed Buzzard *Butastur teesa*

Photo: Gobind Sagar Bhardwaj

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Occurrence of Lesser Florican *Sypheotides indicus* in Bangalore, Karnataka, India

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Raghavendra, M., 2011. Occurrence of Lesser Florican *Sypheotides indicus* in Bangalore, Karnataka, India. *Indian BIRDS* 7 (5): 140–142.
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On 18 December 2011 I visited the dry Lake bed at Hesarghatta, located about 23 km north-west of Bangalore, intending to photograph birds. When I reached the site at 0730 hrs, it was cold, and as the sun had not come out, I waited. The light improved after 20 min, and a harrier flew over my car. As I was ruining my chances for photography, I spotted a medium-sized land bird crossing the road about 15 m from the car. At first glance, I thought it was a juvenile junglefowl, but on seeing the structure of the head, I got a doubt that it could be a bustard. I slowly moved my car to the place where the bird had crossed the road, and was able to spot it amidst thick grass. I photographed it for the record, before it vanished silently into the grass (Fig. 1). After waiting for a few minutes for the bird to show up again, I decided to get out of the car and find the bird. For a few more minutes I scanned the area but could not spot the bird. Then, all of a sudden, it flew out of the grass about 5 m away from me, flying away to a great distance. I visited the place again on 24 December, and was lucky to sight and photograph the bird again (Fig. 2), but I failed to locate the bird again, when I returned the next day.



Fig. 1. First record shot of the Lesser Florican *Sypheotides indica* female

Photo: M. Raghavendra

Table 1. Historical records of Lesser Florican *S. indicus* in Karnataka

Place	Number of birds	Date/Season	Source
1 South Kanara	Unknown	October to Feb–Mar	Jerdon 1864
2 Mallur (=Malur)	30	Not known	Mcinroy 1880
3 East Mysore	Numerous	Not known	Mcinroy 1880
4 Dharwar	Common	Not known	Butler 1881
5 Belgaum	Few	All year	Butler 1881
6 Bangalore	Numerous	Rains & cold weather	Anderson 1883
7 Shimoga	Good many	Hot weather	Anderson 1883
8 Kanara	Rare	Not known	Barnes 1891
9 Halyal (=Haliyal) North Kanara	1–2	April	Davidson 1898
10 Bangalore	One	14 December 1911	Betham 1911
11 Tumkur	One	Before 1912	Baker 1912
12 Mysore	One	1925–40	Phythian-Adams 1940
13 Hassan district	One	26 May 1952	Worth 1953
14 Belikeri	Female	Not known	Abdulali 1969
15 Tungabhadra, at Tungabhadra Wildlife Sanctuary	Unknown	pre-1956	Goriup & Karpowicz 1985

The bird was found in dry grassland mixed with *Stachytarpheta indica*, *Lantana camara*, and *Parthenium hysterophorus*, and dominated by scattered growth of tall *Prosopis juliflora* bushes (Figs. 3 & 4). The grass was 45 cm tall. At home, I identified the bird as a female Lesser Florican *Sypheotides indicus* with the help of Grimmett *et al.*, (1998).

The Lesser Florican is an endangered endemic bustard (Otididae) of the Indian Subcontinent. Once common and most widely distributed across India, this species has become increasingly rare (Sankaran *et al.*, 1992; Sankaran 1995; BirdLife International 2001). It is known to breed during the south-western monsoon (Jerdon 1864; Baker 1921; Dharmakumarsinhji 1950; Ali & Ripley 2001) from June to September/October, and is said to move in response to rainfall. Its presence at locations can be erratic, with the sudden appearance of large numbers in some seasons (Whistler 1949). During this period, the species is known to show a distinct movement into Gujarat, eastern Rajasthan, western Madhya Pradesh, and north–central Andhra Pradesh, where it congregates in areas of good rainfall (Jerdon 1864; Sankaran *et al.* 1992, 1997; Rasmussen & Anderton 2005). Outside the breeding season, it is known to winter in dry, grassy areas throughout much of India, mainly north-western Bengal, Orissa, east of the Western Ghats, south and east of the Godavari River, and south to Kerala (Sankaran 1995; Rasmussen & Anderton 2005).

In Karnataka, the Lesser Florican has been recorded at nearly 15 locations since the late 1870s (Table 1), with the last one being seen before 1956 at Tungabhadra Wildlife Sanctuary (Goriup & Karpowicz 1985). According to McInroy (1880) 30 birds were shot in one day by two officers of the forest department at 'Mallur' (=Malur) railway station, located about 37 km east of Bangalore while, Davidson is said to have found the species sparingly in (erstwhile) Mysore, but had only seen a single bird on two occasions in Tumkur district, pre-1912 (Baker 1912). Worth (1953) sighted one bird at the '101 mile post' on the Bangalore–Mangalore road, in Hassan district, while Goriup & Karpowicz (1985) mention a pre-1956 record from Tungabhadra Wildlife Sanctuary.

In Bangalore, Anderson (1883) found the species to be numerous during rains and cold weather, while Betham (1912) shot a bird on 14 December 1911 in a scrub forest with scattered paddy fields. Thus, considering the records of the species in Karnataka, the species has not been sighted since pre-1956 in the state, while it has been sighted in Bangalore after 100 years.

Taking into account the above records, I consider the present

sighting of the species at Hesarghatta of particular interest, and its continued presence here over seven days is a strong proof of its occurrence in Bangalore outside its breeding season. This record also gives hope that the Lesser Florican could possibly be found in similar habitats in Bangalore, and also across Karnataka.

The species' habitat is described as, 'tall grassland with scattered bushes, and standing crops of cotton and millets ...' (Ali & Ripley 2001; Rasmussen & Anderton 2005), and the grasslands of Hesarghatta fall within the preferred habitat of the species. BirdLife International (2011) indicates that the species



Photo: M. Raghavendra

Fig. 2. The Lesser Florican *Sypheotides indica* female at Hesarghatta



Fig. 3. The Lesser Florican *Sypheotides indica* habitat at Hesarghatta

is suspected to be declining rapidly owing to ongoing loss and conversion of grassland habitats.

In light of this, and the unfortunate recent decision of the Bangalore Development Authority to take up intensive tree planting in 121 ha grassland area of Hesarghatta, and having planted over 30,000 saplings already (Anon 2011; Nandi 2011; Menon 2011), will alter the florican habitat drastically, and spell doom to its occurrence in the area. Thus, there is an urgent need to put an end to the tree planting activity, and if possible, restore the grassland habitat.

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Fig. 4. Close view of the Lesser Florican *Sypheotides indica* in its typical habitat at Hesarghatta

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