

TRIBAL HOMESTAY RESORT

(SYNANTHROPIC DESIGN)

A THESIS

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Architecture degree

By

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DEPARTMENT OF ARCHITECTURE
SCHOOL OF BUILDING AND ENVIRONMENT

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY) Accredited

With Grade “A” by NAAC

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PLACE: Chennai

A handwritten signature in blue ink, appearing to read 'Daffnee D.', with a stylized flourish at the end.

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **Sathyabama Institute of Science and Technology** for their kind encouragement in doing this Thesis and for completing it successfully. I am grateful to them.

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DAFFNEE D

THESIS SYNOPSIS

The Soliga tribe, deeply rooted in their reserve forest, faces the harsh reality of limited economic opportunities within their ancestral lands. As some members seek employment outside their traditional habitat, they are forced to sacrifice their cherished cultural practices and heritage. They also have threat of Human-Wildlife Conflict, further distancing them from the natural environment. This poignant shift underscores the ongoing struggle to balance economic necessity with the preservation of identity and cultural richness among the Soliga tribe.

The tribal Home stay initiative offers indigenous communities a chance for economic growth and cultural preservation. By hosting tourists seeking authentic experiences, tribal families earn income and showcase their heritage. The addition of a bamboo construction workshop provides valuable skills and promotes eco-friendly housing. Together, these initiatives empower tribes economically while preserving their cultural identity.

For construction locally available materials (Bamboo) are used for wall and roof materials. Uses bamboo, a local and sustainable material, for building. They also employ synanthropic design methods to lessen Human-Wildlife Conflict (HWC) and promote peaceful coexistence with wildlife. This approach allows guests to live close to nature, experiencing wildlife while minimizing potential conflicts.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This unique settlement serves as a tribal Home stay, an experimental project designed to blend tradition with modernity, fostering cultural exchange and sustainable development. this hamlet acts as a bridge between the tribal way of life and contemporary living. As a Pilot Program, this satellite hamlet aims to introduce sustainable practices and modern amenities without compromising the cultural fabric of the community.

This satellite hamlet serves as a model for future development in other tribal hamlets. The gradual implementation of these practices is tailored to the pace at which the community adapts, ensuring a harmonious blend of tradition and progress. It's a journey of co-creation, where the tribal people actively contribute to shaping their evolving lifestyle.

Visitors to this pilot tribal Homestay witness not only the beauty of the landscape but also the resilience of a community embracing change while preserving its cultural roots. It is a living testament to the possibility of sustainable development in satellite hamlets, where tradition and progress coexist, each enriching the other in a delicate dance of adaptation and preservation through SYNANTHROPIC DESIGN.

1.2 NEED OF THE PROJECT

Economic empowerment within the Soliga tribe through tourism and traditional craftsmanship, preserving their cultural heritage by promoting indigenous customs and construction methods, and providing visitors with immersive wildlife encounters..

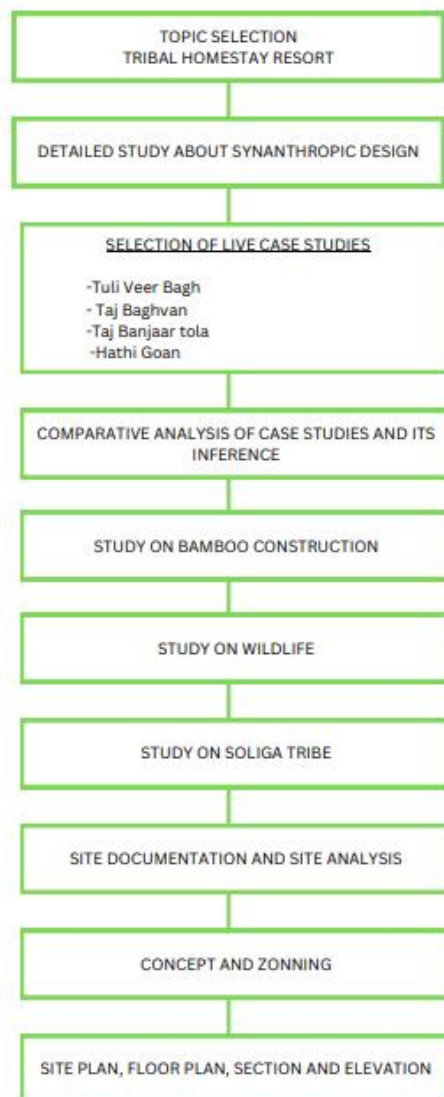
1.3 AIM AND OBJECTIVE

(a) To design Tribal Homestay Resort to let the users experience tribal culture and wildlife.

(b) Constructions using bamboo.

(c) Incorporating synanthropic design strategies.

1.4 METHODOLOGY



CHAPTER 2

LITERATURE CASE STUDIES

2.1 SYNANTHROPIC DESIGN

Synanthropic means when an undomesticated organism and especially an animal (such as a mouse, pigeon, or raccoon) that lives in close association with people and benefits from their surroundings and activities.

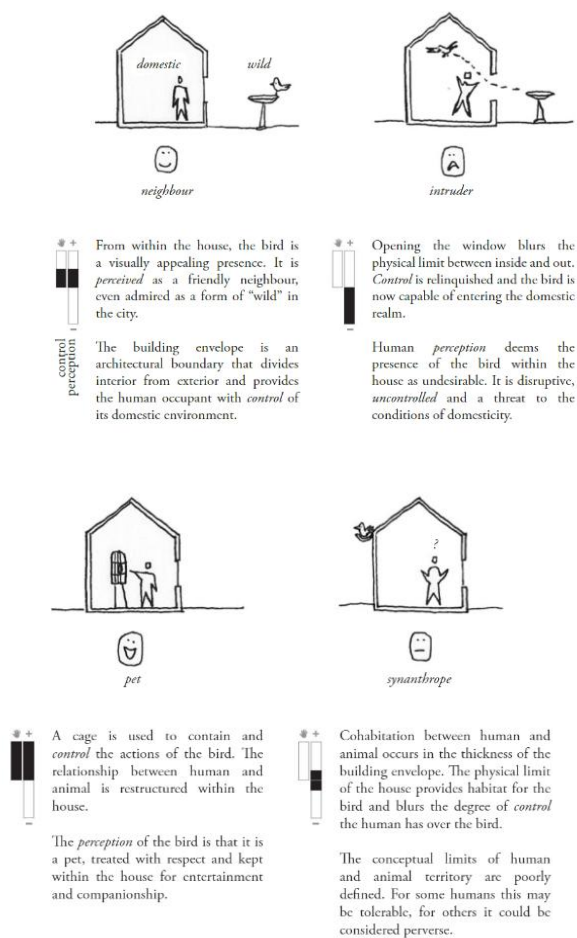


Fig 2.1: Human Animal Interaction

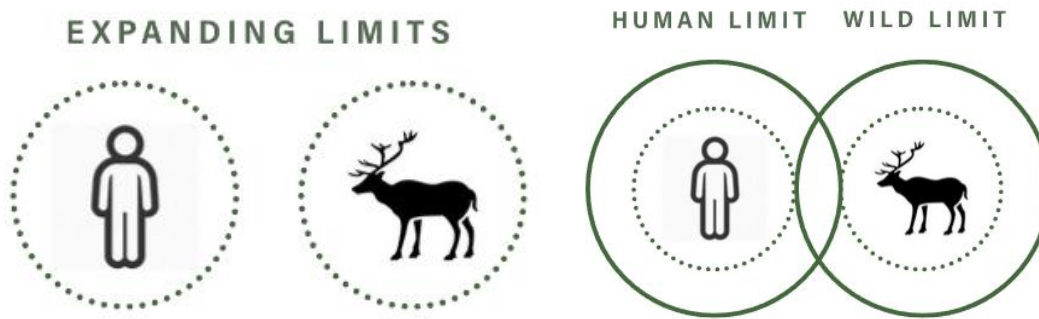
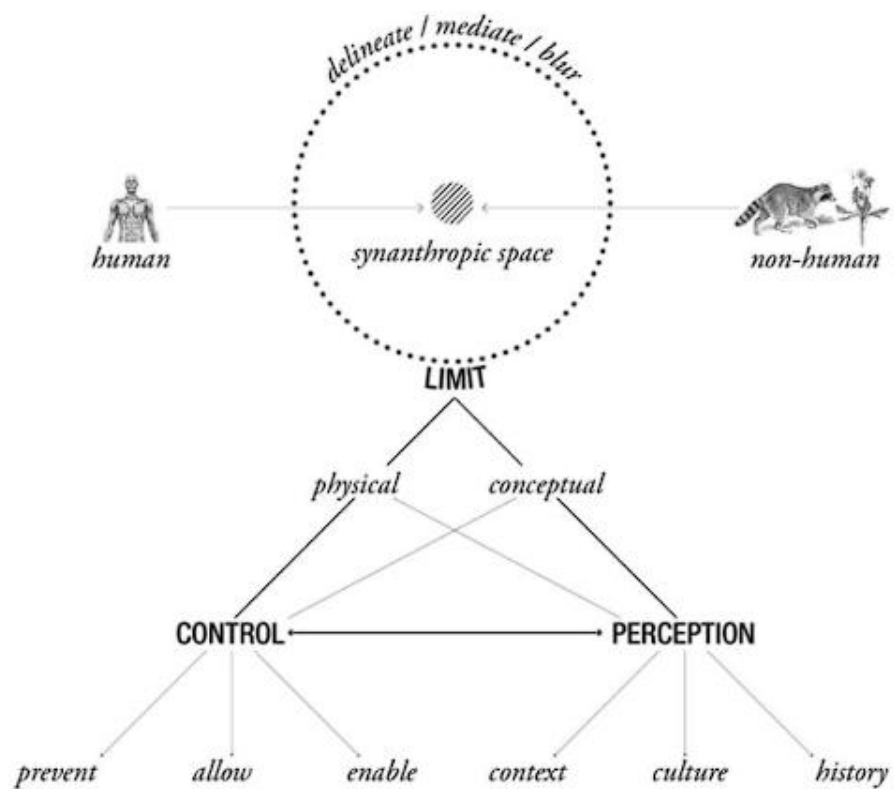


Fig 2.2 : Expanding Limits



STRUCTURE OF PHYSICAL & CONCEPTUAL LIMITS

Fig 2.3 : Structure of Physical and Conceptual Limits

SYNANTHROPIC DESIGN

Synanthropic Suburbia explores the tension between humans and synanthropic species animals who benefit from living in close proximity to people but remain beyond their control. It re-imagines human and animal interactions through a series of Ecological. Prosthetics which subvert conventional housing typologies and enable multi-species relationships. These subtle, architectural retrofits restructure the behavior's and territorial boundaries of six animal species and their human neighbors.

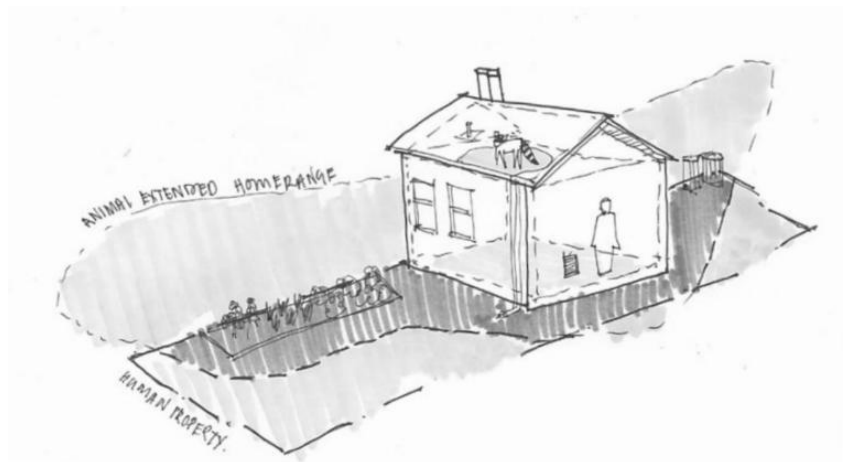


Fig 2.4 : Intersecting Human and Animal Territories

A Concept of the paleo-synanthropic niche. This niche was associated with human (hunting) behavior and was site-independent. Late Pleistocene humans created a stable food resource in a micro environment that was safe from large predators and accessible to small, opportunistic carnivores for a long time. B.The paleo-synanthropic niche moved with the migrations of human groups. The niche may have evolved independently in different human groups and allowed the occupants to move between these groups. Thus, the paleo-synanthropic niche would have been available for a very long time as long as Late Pleistocene humans had the same impact on nature by providing enough food waste and a predator-free micro-environment. The synanthropic niche that was occupied by foxes was occupied by the dogs, and/or genetic wolves, which were influenced by humans.

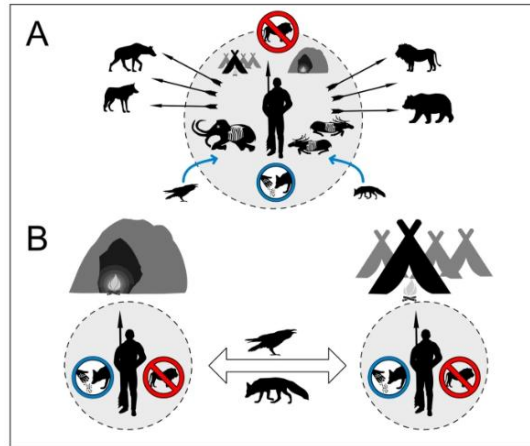


Fig 2.5 : Paleo-Synanthropic Niche

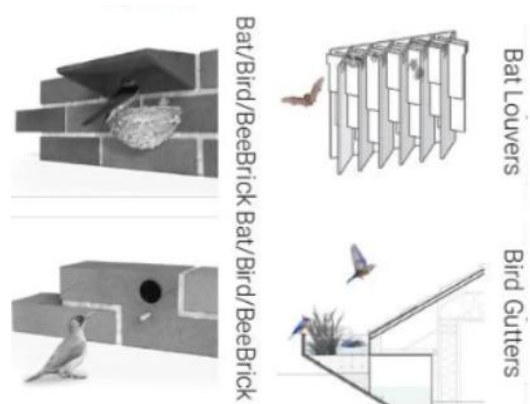


Fig 2.6 : Synanthropic Design Elements

2.1.1 INTERFACE:

Synanthropic design builds bridges, not walls, between humans and urban wildlife. Green walls and roofs offer havens for pollinators and birds, while wildlife corridors weave through our concrete jungles, guiding furry friends home. Night lights dim, respecting moonlit dances, and sound barriers hush the city's roar, creating sanctuaries of quiet amidst the urban hum. This collaborative canvas, painted with community knowledge, technology's brushstrokes, and nature's inspiration, is where cities become symphonies of shared existence, not just human monologues. From tiny urban birds to soaring imaginations, synanthropic design builds a future where every city dweller, feathered or finned, can truly call it home.

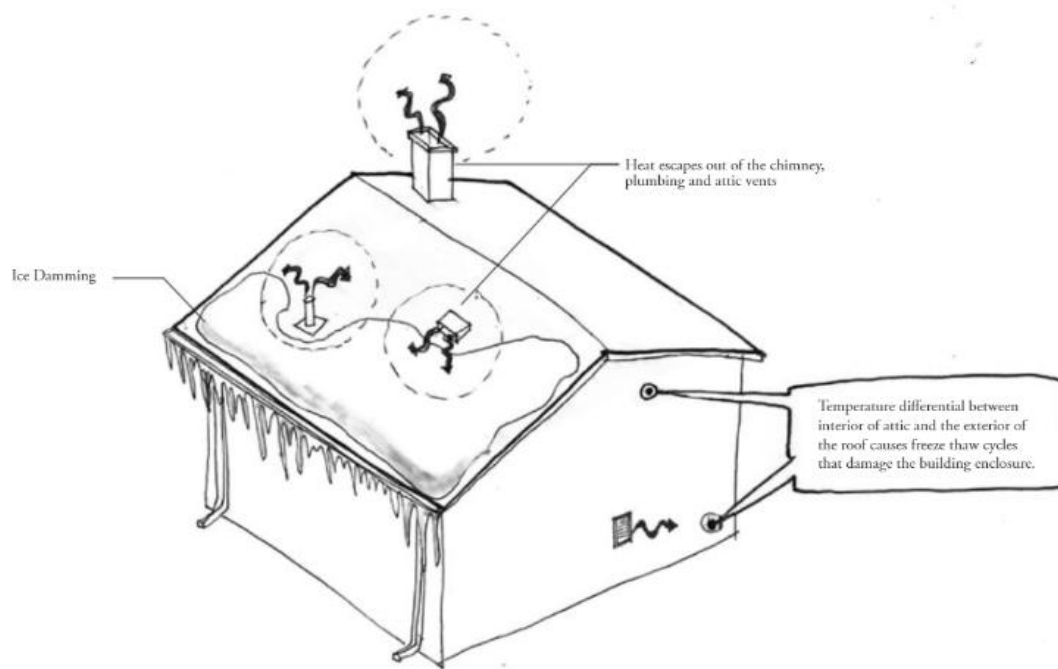


Fig 2.7 : Interface Vulnerability

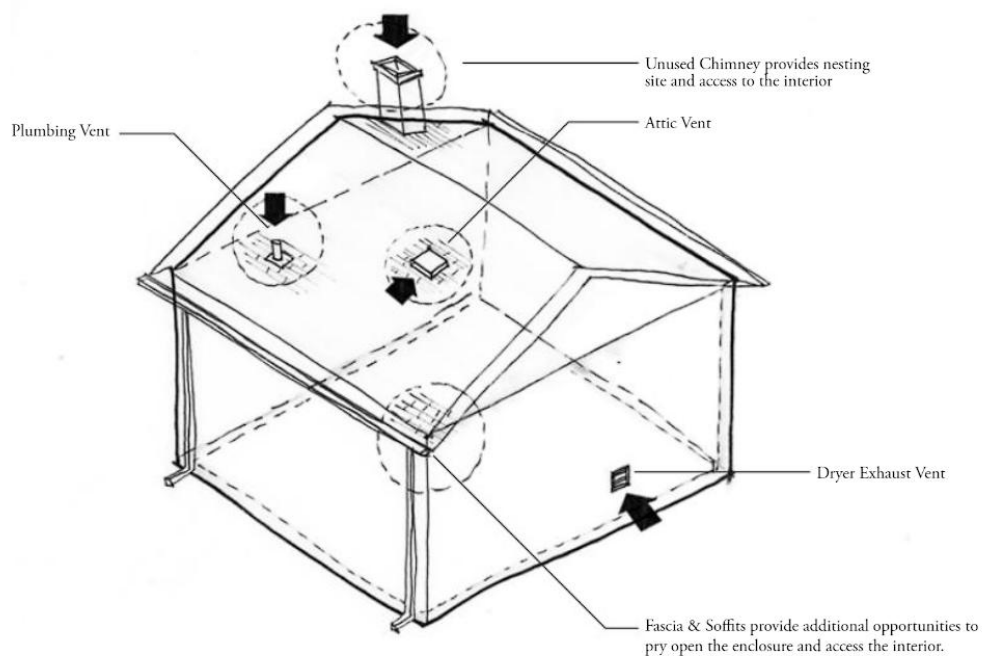
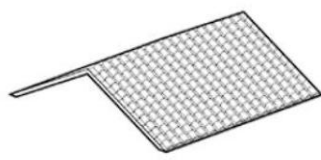
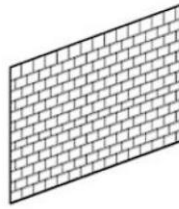


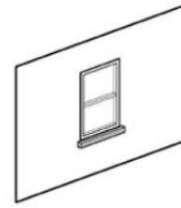
Fig2.8 : Interface Opportunities



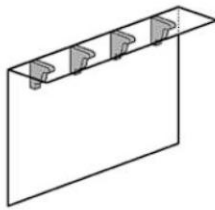
TERRACOTTA TILE
bat



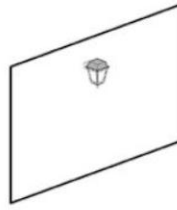
WOOD SIDING
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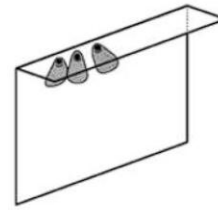
WINDOW SILL
robin



ARCHITECTURAL DETAILS
sparrow, robin



LIGHT FIXTURE
robin

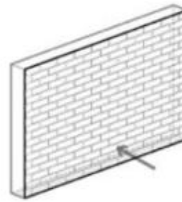


SOFFIT
swallow

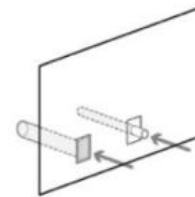
Fig 2.9 : Surface Interface



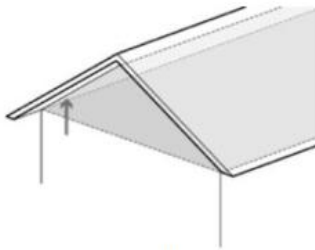
CHIMNEY
squirrel, raccoon, chimney swift



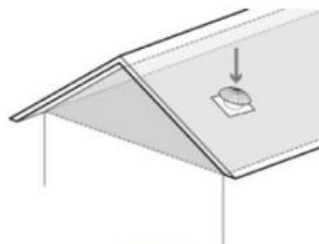
CRACKS & WEEP HOLES
rat, mouse



EXHAUST VENT
rat, mouse



SOFFIT
squirrel, raccoon



ATTIC VENT
raccoon

Fig 2.10 : Volumetric Interface

CHAPTER 3

CASE STUDIES

3.1.1 WHY NAGPUR ?

Choosing Nagpur as a case study is a strategic decision, given its designation as the "Tiger Capital." Situated in the central part of India, Nagpur serves as a gateway to several prominent tiger reserves in the region, including Kanha Tiger Reserve. The city's significance in tiger conservation is underscored by its geographical proximity to these reserves and its role as a hub for wildlife enthusiasts and researchers.

Nagpur's commitment to environmental stewardship and tiger conservation initiatives is reflected in its policies, educational programs, and collaborative efforts with wildlife organizations. Studying Nagpur provides a unique opportunity to delve into the intersection of urban development, conservation practices, and the coexistence of a bustling city with the thriving tiger populations in the surrounding natural habitats. This case study aims to explore the balance achieved between urban life and wildlife preservation in Nagpur, shedding light on innovative approaches and successful models for harmonious cohabitation.

3.1.2 LIST OF TIGER RESERVE FOREST IN NAGPUR :

- Kanha Tiger reserve - 60 tigers
- Navegaon Nagzira Tiger Reserve - 6 tigers
- Pench Tiger Reserve - 53 tigers
- Bor Wildlife Sanctuary - 3 tigers
- Tadoba-Andhari Tiger Reserve - 88 tigers
- Meghlat Tiger Reserve - 42 tigers

3.1.3 USERS OF TIGER RESERVE FOREST :

Nagpur attracts wildlife enthusiasts, mainly of domestic origin, with 82.7% being young middle-class families. These visitors prioritize quality accommodation, food, and camp facilities, often opting for overnight stays. Family travelers constitute 45.8%, while 28% and 17% travel with friends or as educational groups. The region accommodates special interests, with 7.77% bird watchers and 11.95% photographers. Mass arrivals include school children and educational groups (4.73%). Elite tourists with high expectations also contribute. Overall, Nagpur's protected areas cater to a diverse clientele, majorly comprising large, middle-income, young, and domestic tourists seeking a rich wildlife experience.

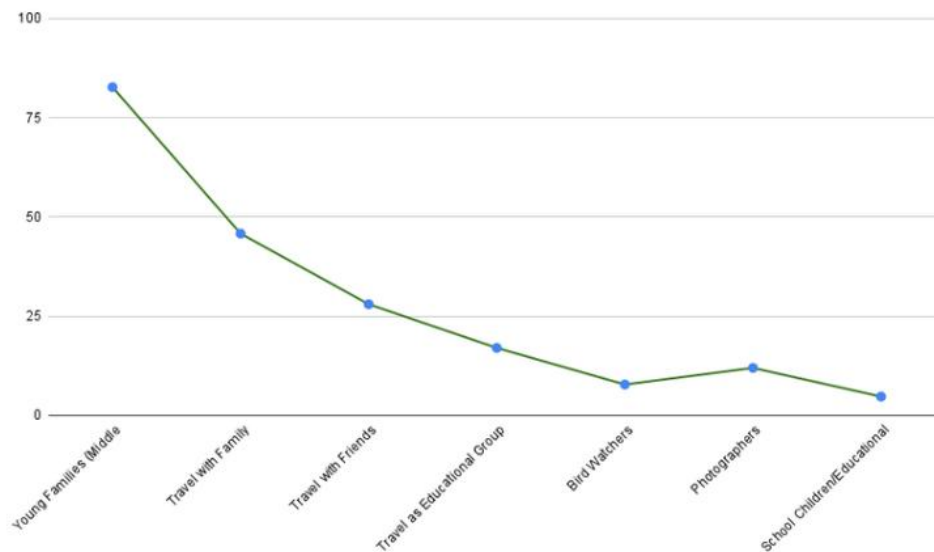


Fig 3.1: Users of Reserve Forest

3.1.4 HOW SMALL INTERVENTIONS CREATES AN IMPACT ON HWC ?:

A small intervention can indeed have a significant impact on Human-Wildlife Conflict (HWC) mitigation. can contribute significantly to reducing instances of Human-Wildlife Conflict and fostering a more harmonious relationship between communities and wildlife. Moreover, they often empower local communities to take ownership of conflict mitigation efforts, promoting sustainability and long-term coexistence.

Pench Tiger Reserve starts dairy project in buffer zone to reduce pressure on forest areas

Apart from helping the villagers earn more, the move is also aimed at stopping cattle from grazing in the forest by promoting stall feeding and reducing potential conflicts with wild animals

June 04, 2023 09:15 am | Updated 12:24 pm IST - Nagpur

PTI

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To curb man-animal conflict, Pench Tiger Reserve to promote lemongrass

Lemon grass acts as a bio-fence which deters most of the wild animals. Crop depredation is a major issue in agricultural fields near forest...

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Pench Tiger Reserve is one of the major Protected Areas of Satpura-Maikal ranges of the Central Highlands, which is among the most important...



Fig 3.2: Human Wildlife Conflict

3.2.1 TULI VEER BAGH, PENCH

Location - Pench National Park

Building type - Resort

Plot Area - 20.0 acres

Total No.of Rooms - 17

3.2.2 SPATIAL ANALYSIS:

The Resort contains two times of rooms that is, cottages and luxury resort. The pool is in between both the dinning area. The services area is behind the reception. The rooms are places along the edge of the forest.

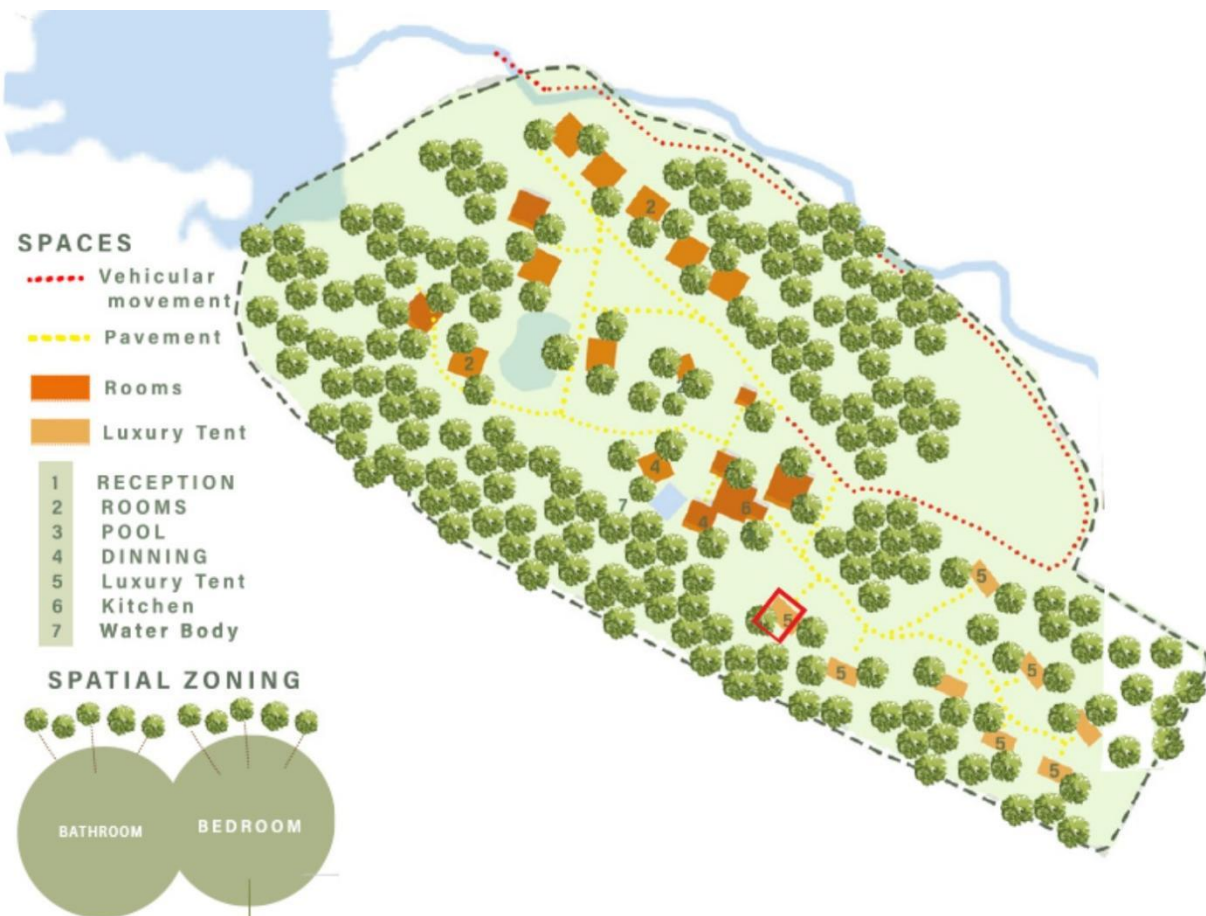


Fig 3.3:Tuli Veer Bagh Site Plan



Fig 3.4: Floor Plan



Fig 3.5: Elevation

3.2.3 MATERIAL ANALYSIS:

The fabric used for the construction of luxury tents is usually PVC/ POLYCOTTON which is not a permanent structure making it eco-friendly for the environment and is also safe for the wild. This fabric material also assures the safety of the users as its tear strength ranges from 520-580N. Using semi permanent structures cause minimal ecological footprint.



RECEPTION



ROOMS



DINNING



LOUNGE



SWIMMING POOL



LUXURY TENT

Fig 3.6: Tuli Veer Bagh Views

3.3.1 TAJ BAGHVAN

Location: Pench national park

Architect: Chris Browne

Plot Area: 17.0 acres

Total no. of rooms: 12

3.3.2 SPATIAL ANALYSIS:

The resort has 12 Machaan that are placed at the edge of the site facing the stream. The swimming pool is placed near the dinning which also faces the stream. The resort has three zones, two facing the stream with 6 rooms are present towards the west and 3 rooms preset towards the east and one inside the dense vegetation.



Fig 3.7: Taj Baghvan Site Plan

3.3.3 SPATIAL ANALYSIS:

Baghvan Wildlife Resort has 12 stand-alone suites with two bedrooms. Each suite consists of two inter- linked buildings. The interlink leads you to the bathroom equipped with twin hand basins, indoor & out- door showers, and separate WC. There is also a Machaan, a rooftop platform. The place has a complete arrangement of mosquito net and overhead fan.



Fig 3.8 : Ground Floor Plan



FIRST LEVEL - MACHAAN

Fig 3.9 : First Floor Plan



GROUND LEVEL - BEDROOM

Fig 3.10 : Bedroom Floor Plan

3.3.4 VEGETATION:

Vegetation not only enhance the visual appeal of the surroundings but also serve as a protective buffer, creating a natural shield that safeguards the resort's compound. With their dense and compact growth patterns, form a secondary layer of defense. These shrubs are carefully chosen for their ability to thrive in the local climate and soil conditions. Low-lying bushes, adorned with vibrant flowers and foliage, not only contribute to the aesthetics of the resort but also serve a practical purpose by acting as a natural fence.

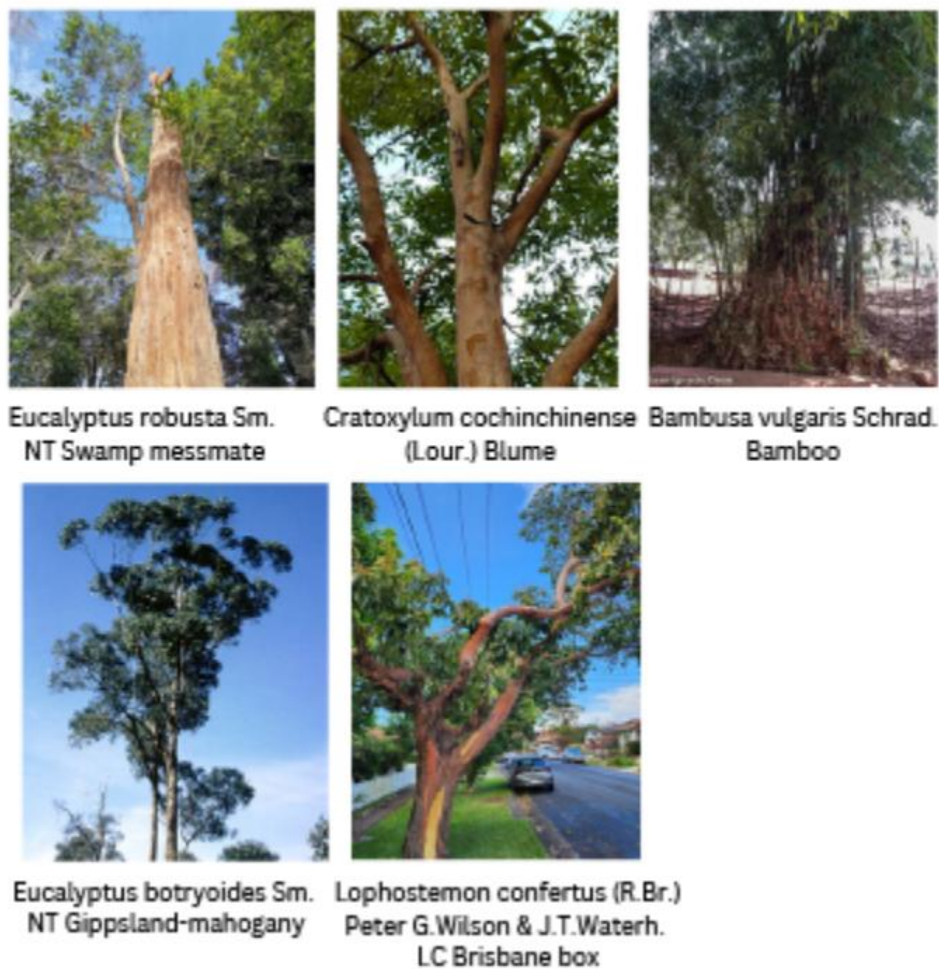


Fig 3.11 : Vegetation in Taj Baghvan

3.3.5 WILDLIFE:

A common idea associated with watering holes is that, due to the common need for water, predator animals will not attack prey animals in the vicinity of the watering hole. Waterholes are vital to the ecosystem; bustling oases where elephants, lions, leopards and hundreds of other species meet and compete for water. But little is known about how they support so much life.

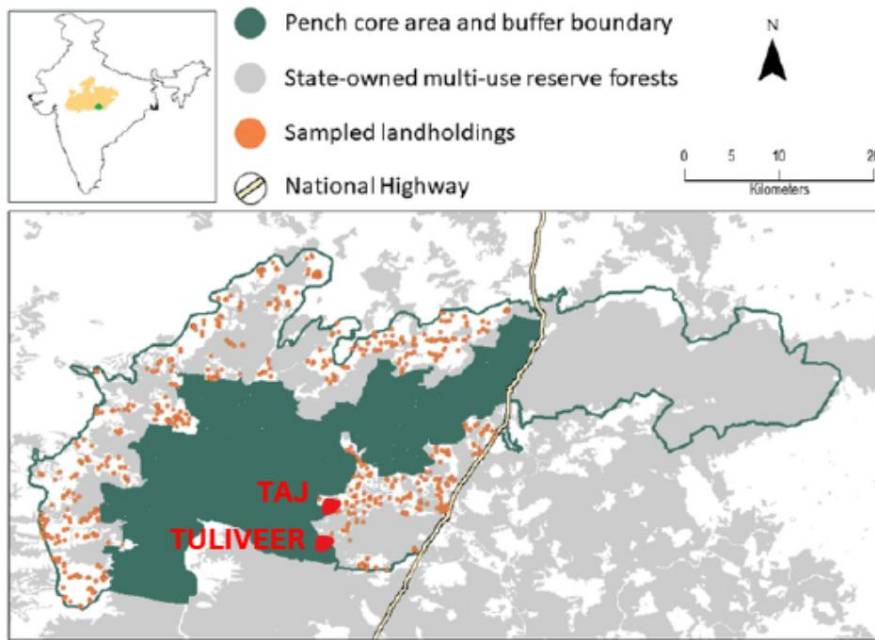


Fig 3.12 : Wildlife Corridor

The buffer zone, often a transition area between human activities and protected wilderness, serves as a crucial habitat for a diverse array of wildlife. This unique setting provides a sanctuary for flora and fauna, allowing for the coexistence of nature



Fig 3.13 : Wildlife Spotting In Pench

3.3.6 SITE VISIT:



INFORMAL RECEPTION



MACHAAN



DINNING



LOUNGE



SWIMMING POOL



ENTRANCE



BEDROOM

Fig 3.14 : Taj Baghvan views

3.4.1 TAJ BANJAAR TOLA, KANHA

Banjaar Tola's 18 tented suites seamlessly marry opulence with eco-conscious design, leaving a minimal footprint in the pristine riverine environment. Elevated on platforms, each suite boasts expansive glass doors unveiling private decks that command breath-taking river views. Inside, the ambiance is set by pressed bamboo floors, soft fabric hues, and bespoke driftwood furniture, creating an ethereal feel. Guests can unwind on a luxurious king-sized bed indoors or bask in the natural beauty on deck beds.

3.4.2 SPATIAL ANALYSIS:

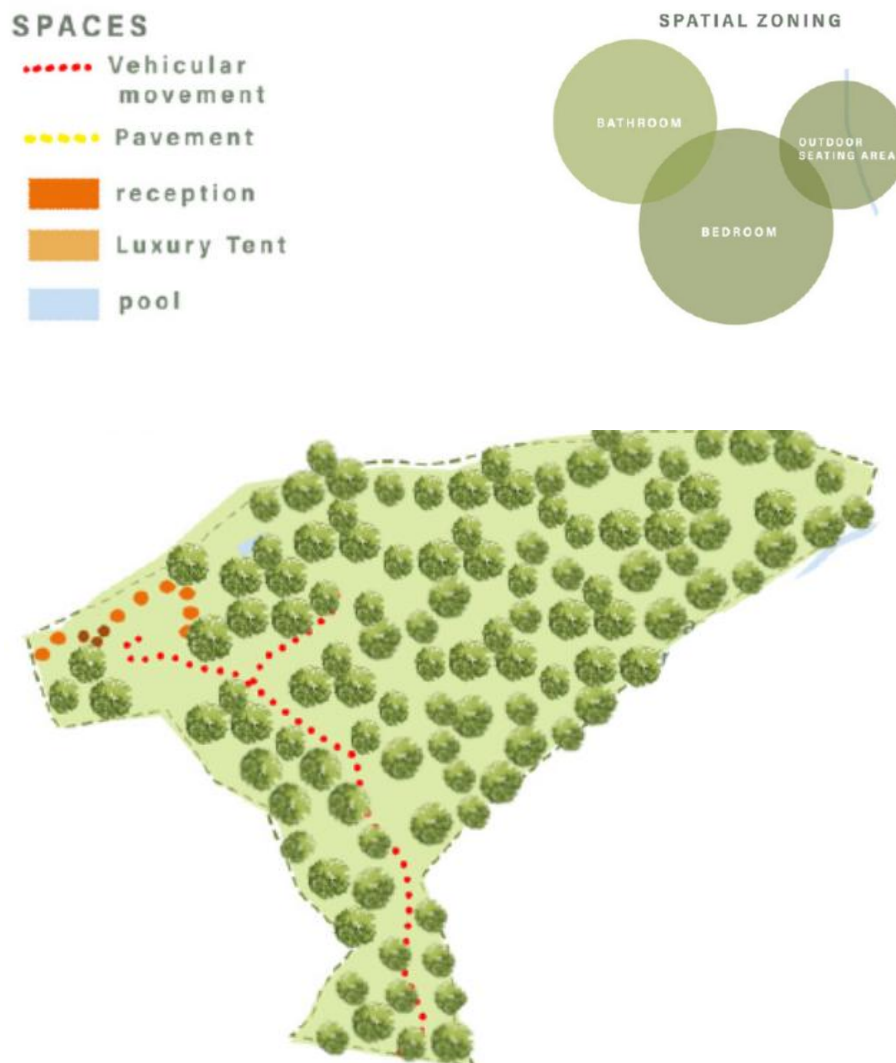


Fig 3.15 : Taj Banjaar tola site plan

3.4.2 SPATIAL ANALYSIS:



Fig 3.16 : Tent plan



Fig 3.17 : Elevation

3.4.3 DRAINAGE SYSTEM :

Halon, Banjar and Surpan comprises the main drainage system. The entire area is a part of Narmada Catchment. The Reserve consists of two ecological units formed by the Halon VaHey in the east and Banjar VaHey in the west. The area represents typical deciduous forest of the tropical region. Geographically, the Maikal range is the most important terrain feature in the Buffer Zone. It forms the watershed between rivers the Narmada and the Mahanadi. This hill-range continues to the west as the Garhi range, bifurcating the Narmada catchment between the Banjar, to the south-west and west, and the Halon, to east and the north-east. The Banjar enters the Balaghat district from the eastern part of the Rajnandgaon district of Chhatisgarh State. It flows on to the Mandla district through the Baihar plateau. The Halon river originates near Sanwahi and Badalpani villages, and flowing through the Garhi and Sijhora forest ranges, it joins the Budhner near Ghughri village. The elevation varies from 450 to 940 m. Motinala, Garhi, and to some extent the Sijhora range harbours highest elevated sites. The same forest ranges have slopes ranging from 23° to 40° . Lower elevations and slopes (0° to 11.3°) occur in the Khatia, Khapa and Samnapur ranges. Many spurs branch out to the north from the main Maikal and the Bhaisanghat ridges, and divide the headwaters of the Halon into a number of tributaries, viz. the Phen, Gourdhuni, Kashmiri and the Gondla.



Fig 3.18 : View from the Stream

3.4.4 SYNANTHROPIC STRATEGIES :

Steep Slopes: Built on a steep slope makes it challenging for predators to climb or descend, especially larger ones. Imagine a mountain lion trying to navigate a sheer cliff face to reach a condor's nest perched high .

Natural Barriers: Contours often involve natural obstacles like ravines, gullies, or bodies of water that act as additional deterrents for predators.

Strategic Positioning: Utilizing dense vegetation provides additional concealment for structures built on a contour. A bird's nest tucked under a rocky overhang becomes less noticeable to a hungry hawk.

Elevated Vantage Point: Built on a higher point on the contour allows inhabitants to spot approaching predators from afar, giving them precious time to seek refuge or prepare defenses. A meerkat colony perched on a mound within their burrow system can quickly alert each other to the presence of a fox.

Sound Amplification: The shape of a contour and the fabric material can amplify sounds, allowing inhabitants to hear approaching predators even before they come into sight. A spider web built across a narrow passageway can vibrate and alert the spider to any movement nearby.



Fig 3.19 : Site Section of Taj Banjaar

3.5.1 HATHI GOAN

LOCATION : RAJASTAN

ARCHITECT : RAHUL MEHROTRA

PLOT AAREA : 40 ACRES

3.5.2 SITE PLAN :



Fig 3.20 : Site plan

3.5.3 DESIGN CONCEPT :

The water body was a critical component of the design, as it also facilitated the bonding between the mahout and elephant, through the process of bathing an important ritual both for the health of the elephant as well as their attachment to their keeper.

The architect has focused on creating a tropical environment for the elephants, with the help of water bodies, pathways and forest area.. Unlike other architecture projects, this project has landscape as the Centre and architecture has evolved around it. Focusing on the landscape and using the precious resource of water as the central instrument.

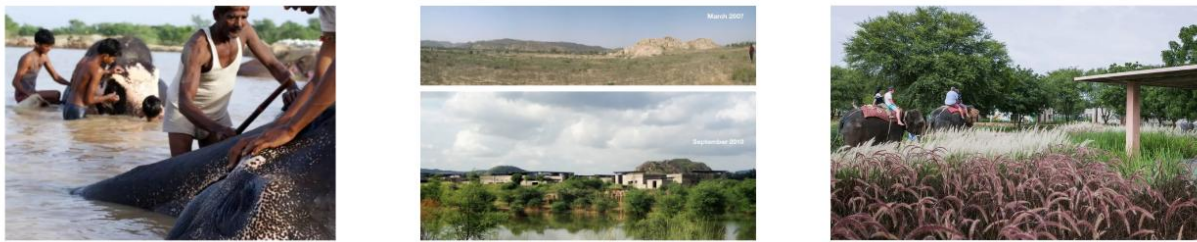


Fig 3.21 : Hathi Goan Landscape

3.5.4 TOPOGRAPHY :

Working with the idea to create a sustainable living habitat for the elephants as opposed to a conventional 'zoo' the primary determinant towards the planning of the site was articulated through the understanding of its topography.

The analysis was not only restricted in identifying build-able and non build-able zones for development but also to ascertain landscape planning techniques towards a water sensitive planning approach.

The topography analyzed provided a certain pattern of development that would allow the entire site to be developed in an accretive as well as an open ended

manner where both the built fraction and the un-built components would be equated and correlated through the common understanding of site potential and landscape system integration. Such an understanding provided a concept to articulate the site through an instrumental engagement with ecological processes as well as with the function of landscape infrastructure to meet the demands and needs of the elephant habitat.



Fig 3.22 : Hathi Goan Topography

3.5.5 SYNANTHROPIC STRATEGIES :

Establishment of a balanced ecosystem in this degraded site formed the crux of the design policy, an approximation of the natural habitat of the elephants. The selection of species for multi-storied vegetation is derived from the larger region, more specifically based on the ecosystem of the Aravali ranges.

Zone-wise interpretation of the vegetation, such as the definition of the perimeter and microcosms of grasslands and wetlands, are characteristics that modulate visual access to the elephant habitat. The root system of the indigenous plant palette stabilizes the topsoil layer in this erosion-prone site in conjunction with other soil conservation measures.

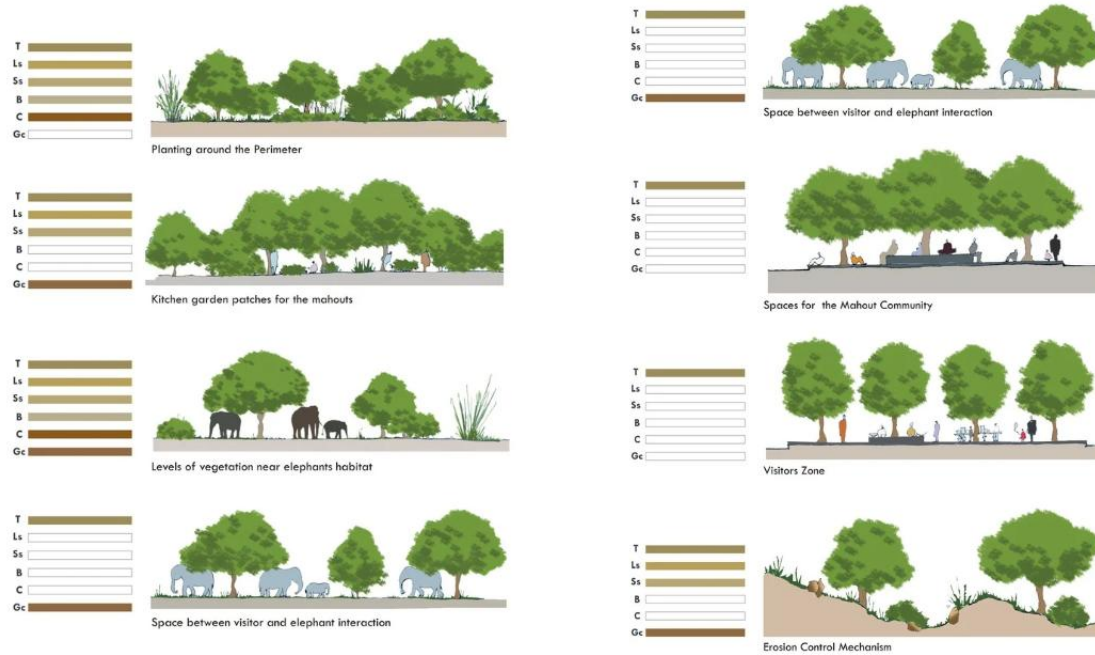


Fig 3.23 : Hathi Goan site Vegetation as Synanthropic Element



Fig 3.24 : Hathi Goan site Vegetation plan

Understanding the Elephant Community



Roof Plan



First Floor Plan



Ground Floor Plan

Fig 3.25 : Hathi Goan plan

3.6.1 COMPARATIVE STUDY :

CASES	ELLOBRATION	ILLUSTRATION
TAJ, KANHA	DESIGN STATERGIES USED IN TAJ, KANHA FOR SYNANTHROPIC DESIGN ARE : DENSE VEGETATION NEAR THE BOUNDARY, BUILT ON AN ELEVATED PLATFORM AND STEEP SLOPES, POSITIONED NEAR A WATER BODY, USE OF FABRIC AS CONSTRCTION MATERIAL TO REDUCE SOUND AMPLIFICATION, USE OF NATURAL BARRIERS SUCH AS CONTOUR, TREES , WATER BODIES.	 
TAJ , PENCH	DESIGN STATERGIES USED IN TAJ, PENCH FOR SYNANTHROPIC DESIGN ARE : DENSE VEGETATION NEAR THE BOUNDARY, BUILT ON AN ELEVATED PLATFORM FROM THE WATER BODY, POSITIONED NEAR A WATER BODY, USE OF NATURAL BARRIERS SUCH AS CONTOUR, TREES , WATER BODIES.	 
TULIVEER BAGH	DESIGN STATERGIES USED IN TULIVEER BAGH, PENCH FOR SYNANTHROPIC DESIGN ARE : DENSE VEGETATION NEAR THE BOUNDARY, USE OF NATURAL BARRIERS SUCH AS CONTOUR, TREES	 
HATHIGOAN	DESIGN STATERGIES USED IN HATHIGOAN FOR SYNANTHROPIC DESIGN ARE : DENSE VEGETATION NEAR THE BOUNDARY, USE OF NATURAL BARRIERS SUCH AS CONTOUR, USING PLANTATION STATERGIES TO DIRECT THE ELEPHANT, LARGE ELEPHANT ROOMS ADJACENT TO ITS MAHOUT HOUSE.	 

CHAPTER 4

DATA COLLECTION

4.1.1 BAMBOO STUDY :

The plant genus Bambusa, also known as bamboo, belongs to the family of evergreen cereal plants. About 1300 plant subspecies make to the genus, which has 130 species. In the humid tropics, bamboo is largely found in Asia's tropical and subtropical regions. Bamboo is one of the fastest growing plants in the world and may grow up to 0.75 meters each day. Depending on the genus, **its height can range from 20 to 50 cm to 40 meters**. Long, curly bamboo lianas can be up to 120 cm long.

The growth of tropical species of bamboo may be influenced by the amount of humidity, and the activity of growth increases during the rainy season. Climate conditions can also affect the development and growth of bamboo. Not all varieties of bamboo can be used in the construction sector. Bamboo cannot be used in the construction business if it fails a particular processing step. For bamboo to be used as a building material, it must first be harvested and protected from insects.



Figure 1 Availability of bamboo in the world. Source (Chair of Architecture and Construction Dirk E. Hebel, 2012)

Fig 4.1 : Availability of Bamboo in the World

4.1.2 TYPES OF BAMBOO IN BR HILLS :

- Bambusa bambos (Giant Thorny Bamboo)
- Dendrocalamus strictus (Male Bamboo)
- Bambusa vulgaris (Common Bamboo)
- Thyrsochloa oliveri (Spiny Bamboo)
- Melocanna baccifera (Muli Bamboo)

4.1.3 UTILIZING BAMBOO IN THE CONSTRUCTION INDUSTRY:

- When using bamboo, it is important to ensure that it is dried during the drying process, as wet bamboo can cause kinks and is not suitable for use in constructions, **Bamboo should be at least three years old. Utilize mature bamboo that is four to six years old.**
- Bamboo needs to be insect-**insect-treatment-decontaminated**.
- Bamboo flowers should not be used in building as they may cause the bamboo to wither.
- Before using, it is wise to **check for cracks as these can cause kinks**.
- The type, length of the bed, thickness of the walls, and harvesting season all affect how long bamboo will last.

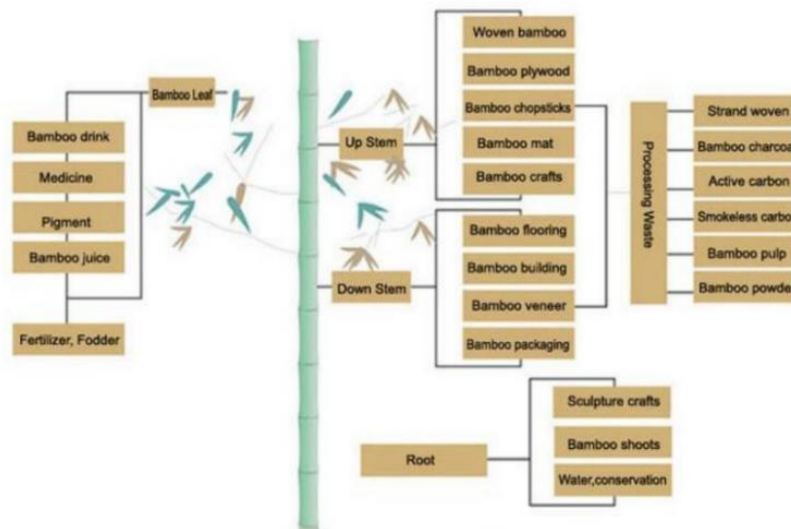


Fig 4.2: Utilizing Bamboo In The Construction

4.2.1 PREPARATION METHODS OF BAMBOO:

Resilience of bamboo. A portion of the inner wall that is soft will deteriorate more quickly than the outside hard part and the bottom part of the culms. Bamboo and wood share some qualities, although bamboo's micro structure has different properties. In a similar vein, bamboo's structure prevents the release of harmful deposits .

Bamboo is still regarded as a poor man's material because it is difficult to pick up properly and is prone to improper handling; many people don't treat it, which causes their buildings to collapse in a matter of years; the majority of bamboo-producing nations are also under informed about professional treatment; as a result, not all of the methods they employ result in good results, which causes bamboo to be used in construction.

The selection of an effective course of treatment depends on a number of variables:

- **Dry or green bamboo,**
- **Round bamboo or half bamboo,**
- End applications, including those that come into touch with the ground, are exposed to the atmosphere, are covered, are structural or not,
- Scale; the volume to be treated and the length of time available.
- **Both biotic (fungi and insects) and abiotic (fissures and weathering) factors could contribute to degradation.** Bamboo can be treated for long-term use, which is more affordable and environmentally friendly. The lifespan of bamboo can also be extended to 50 years with the use of correct techniques.

The two most prevalent insects in bamboo are **beetles and termites**. Due to the starch and other carbohydrates in bamboo, there is a considerable **risk of pest illness**. Before dying, adult beetles lay eggs in bamboo apertures.

The eggs hatch into larva that eat bamboo from the inside out. Since bamboo is protected, the third stage is pupation, which is an ideal environment for breeding. The beetle gnaws holes in the bamboo and leaves during the fourth stage. They go back to bamboo to lay eggs. Not a single bamboo forest can be destroyed by this perpetual cycle.

4.2.2 MOLD AND SPORES

If bamboo is not entirely dry, mold and spores are frequently present. Additionally, sending bamboo in sea freight containers to the global market can also have an impact on the growth of mold and spores. The spore can be produced until the fluid fully evaporates thanks to the reed's high moisture content. One to two instances of mold growth are possible. For instance: **Flame (heat treatment) is frequently used to alter the look of Phyllostachys Aurea bamboo.** The *Guadua angustifolia* species of thicker bamboo are treated with a boron solution. Apply heat treatment to green bamboo to remove the majority of the moisture that is still inside the canes. **Boron treatment is applied to the dried bamboo.** Some bamboo items that have been finished are consequently initially more susceptible to molding. Extreme temperature swings may result in condensation inside the container, which promotes the growth of spores and the appearance of mold.

4.2.3 CLEANING

Alternative approaches can be used to fight mold. Using a soft brush and a moist cloth, remove the white spores and bamboo mold from the region. After cleaning the bamboo, use **lemon oil or a vinegar-and-water solution to completely get rid of the mold.** After eliminating the mold, it is advised to apply three coatings of **polyurethane to clean bamboo furniture.** This will guarantee the furniture's preservation. The furniture must be thoroughly dried after being cleaned with **turpentine before being coated with polyurethane.**

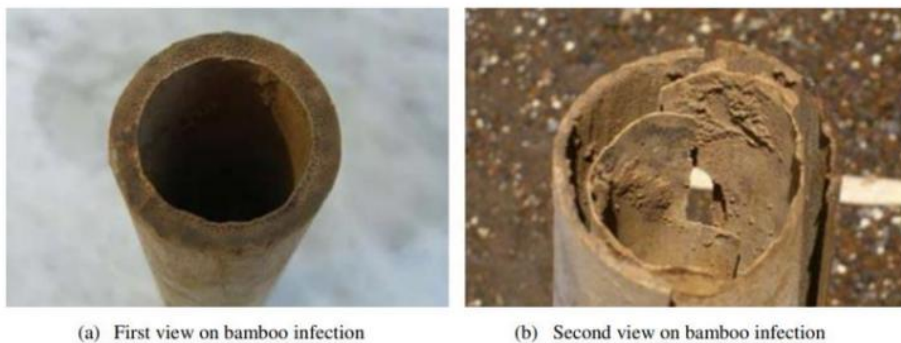


Fig 4.3: Bamboo Infection

4.2.4 SOAKING BAMBOO IN WATER OR LEACHING BAMBOO

Farmers and indigenous groups in Asia and Latin America use the ancient technique of bamboo leaching. Bamboo rafts were used to transport bamboo from the forests and mountains to the cities. Bamboo was typically transported over rivers for up to four weeks, during which time leaching took place. The poles' starch content was decreased, boosting the material's longevity. The practice of submerging bamboo in water is still practiced, particularly when bamboo needs to be transported from distant locations. Single leaching aids in the **removal of starch and promotes permeability** for further treatment by diffusion and pressure treatment, but it does not ensure long term protection. This guards bamboo against parasites and beetle attacks.

4.2.5 PROCESS

- Bamboo should be bound together or separated and stored in tanks or under flowing water; bamboo knots should be perforated to allow water to quickly seep into the bamboo canes;
- Bamboo storage in the tank. Weekly water changes are required to prevent the growth of bacteria that can create an offensive odor and bamboo discoloration.
- Loading must be used to fully submerge bamboo in water.
- After being extracted, bamboo should occasionally be submerged in water before receiving additional chemical treatment. Bamboo should be submerged for a minimum of three to four weeks. Bamboo that has been leached for three months or more may develop an epidermal stain.



Fig 4.4: Soaking Bamboo

4.3.1 CHEMICAL TREATMENT OF BAMBOO

METHOD OF TREATMENT, SOLUTION ARRANGEMENT AND RATIO:

SOAKING TECHNIQUE:

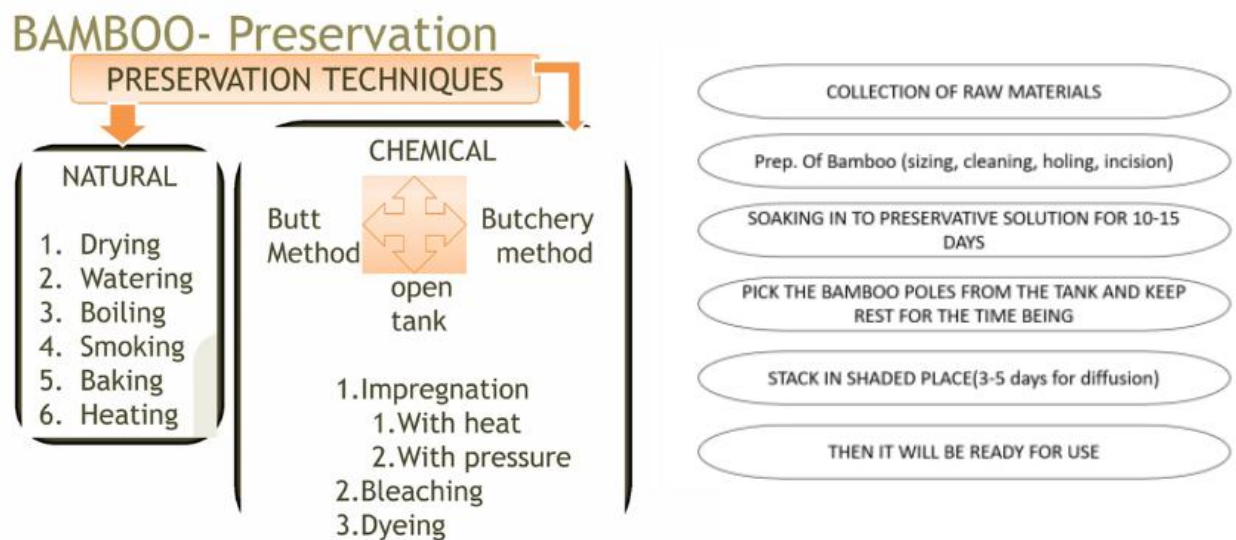
- Cutting raw bamboo into lengths of 6.0 meters, cleaning the nodes, making an incision, and finally drilling a hole.
- Placing 300–400 bamboo poles (there are 6 tanks/plant) in each tank and maintaining a proper weight over it.
- Submerging bamboo poles in a 1:1 chemical solution of borax and boric acid at a 10% concentration.
- After 10–12 days, remove the bamboo poles from the tank and let them dry for 3-5 days in a shaded area.

4.3.2 BAMBOO POLES DRYING

Because bamboo is a hygroscopic material—a substance that readily absorbs moisture—drying bamboo takes a long time. Humidity ranges from 50% to 60%, depending on the variety of bamboo and the meteorological circumstances at the time of cutting. The bamboo can shrink from 10% to 16% in diameter and from 15% to 17% in wall thickness throughout the drying process. Bamboo is typically and well-known Ly dried by "drying in the air." All bamboo is put out and stored after chemical treatment under a tarp or a roof.

- Important considerations for drying bamboo include preventing humidity, insects, and fungal infections, and protecting the bamboo from direct ground contact.
- It is important to refrain from adjusting the humidity. Long-term exposure to direct sunlight can cause cracks in round poles, which should be avoided. However, the bamboos can be dried in the open sun once they have been cut into lengths.
- Infection of the entire storage space should not occur in time to remove infected clusters.

- If there is bamboo in a room, the air should circulate.
- Vertical packaging allows the bamboo to dry faster and is less susceptible to fungal contamination. However, it is beneficial to adhere to the polar directions in order to avoid curvature or to offer a strong support structure.
- Big sheets of plastic, glass, or separators, are frequently used for horizontal placement of big quantities of bamboo. Because the lower batch of bamboo is more susceptible to weight-related cracking, it is not laid in thick layers and is thoroughly inspected.
- For even drying, bamboo needs to be twisted in a longitudinal orientation every 15 days. The air-drying process requires six to twelve weeks. The bamboo's dampness and thickness may have a role in this.



- COLLECTION OF RAW MATERIALS
- Prep. Of Bamboo (sizing, cleaning, holing, incision)
- SOAKING IN TO PRESERVATIVE SOLUTION FOR 10-15 DAYS
- PICK THE BAMBOO POLES FROM THE TANK AND KEEP REST FOR THE TIME BEING
- STACK IN SHADED PLACE(3-5 days for diffusion)
- THEN IT WILL BE READY FOR USE

Fig 4.5: Bamboo Preservation Technique

4.4.1 BAMBOO ARCHITECTURE IN INDIA

- Traditional bamboo architecture
- Modern bamboo architecture

4.4.1 TRADITIONAL BAMBOO ARCHITECTURE

In South India, bamboo was utilized for roof construction in flat lime surkhi roofs and sloped roofs in wattle and daub systems with composite mud plastering.

1.	Foundation and Structure	Building on Stilts: Beam and Post system with bamboo in combination with local wood. In this case the flooring is made from bamboo in various ways.
		Local stone foundation with mud base with column and beam system with bamboo in combination with local wood. These houses have mud flooring.
2.	Wall	<i>Ekra</i> system- Walls made from woven bamboo mats with either strips or flattened Bamboo. They are either left exposed or plastered with mud or lime depending on the climate conditions. If thermal mass is required, plastering is done. But if ventilation and lighting is required, the wall is left exposed.
		The Assam system. Walls with wattle and daub method with widely spaced frame made of bamboo splits covered with mat, jute or mesh plastered with mud or lime mortar.
3.	Roof	Sloped roof- Almost the whole structure is made from bamboo in combination with local wood. Roofing material generally used is thatch, terracotta tiles and more recently tin or sheets.
		Flat roofs- Two methods were used. Some places bamboo was used for the under structure in combination with wood with lime <i>surki</i> slab on top. In the second system, bamboo was used as reinforcement in the lime <i>surki</i> slab.
4.	Doors and Windows	a. They are generally made of bamboo in combination with wood, or some places with only bamboo depending on economical and climatic considerations.



Fig 4.6: Bamboo in Foundation

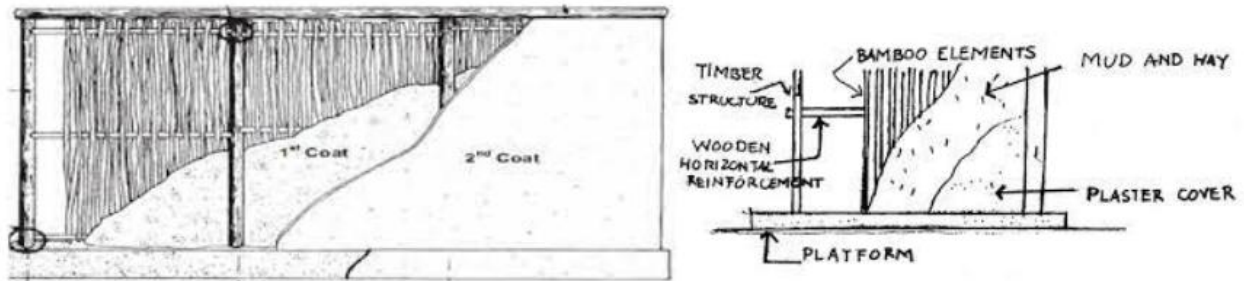


Fig 4.7: Bamboo walls



Fig 4.8(a): Bamboo Roofing

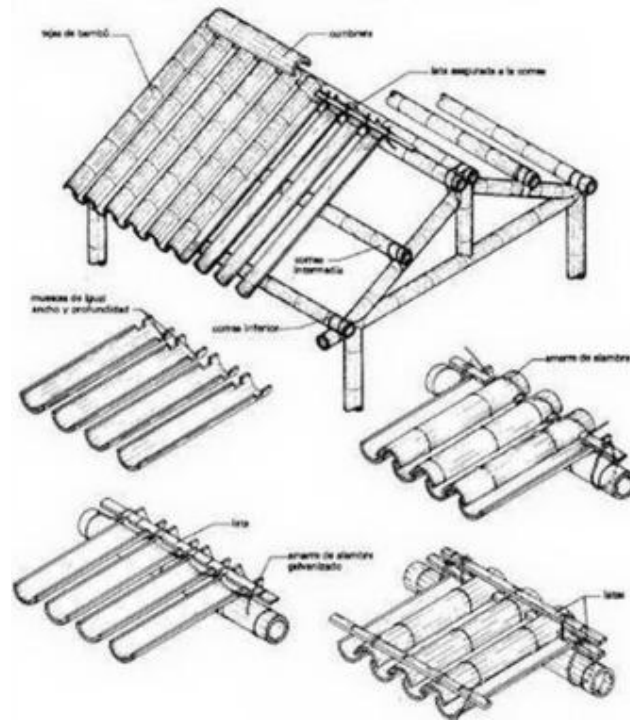


Fig 4.8(b): Bamboo Roofing

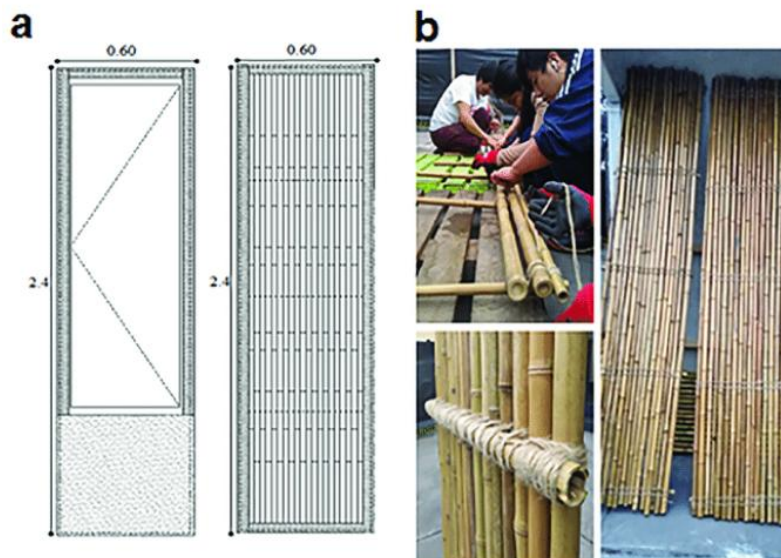


Fig 4.9 : Bamboo Door



Fig 4.10 : Bamboo Flooring

4.4.2 FOR FOUNDATIONS: BAMBOO



Fig 4.11 : Bamboo planted directly on the ground



Fig 4.12 : Bamboo anchored to rock or precast concrete footings

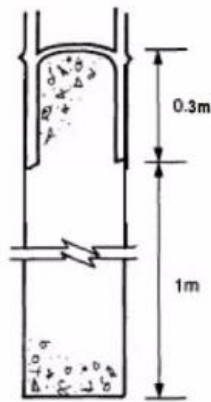


Fig 4.13 : Concrete or bamboo composite columns

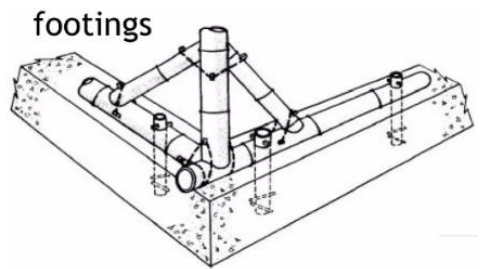
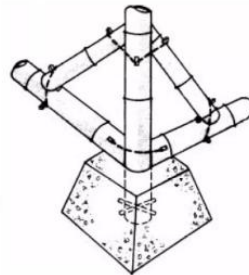


Fig 4.14 : Bamboo incorporated into concrete footing

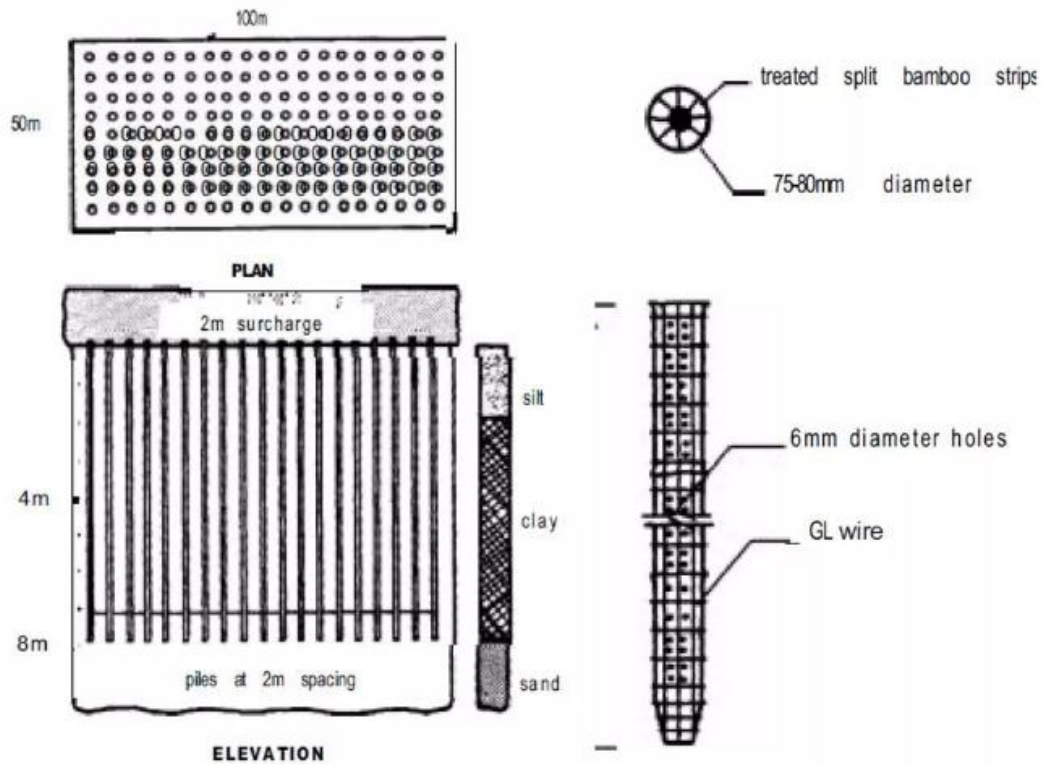


Fig 4.15 : Concrete or bamboo composite columns

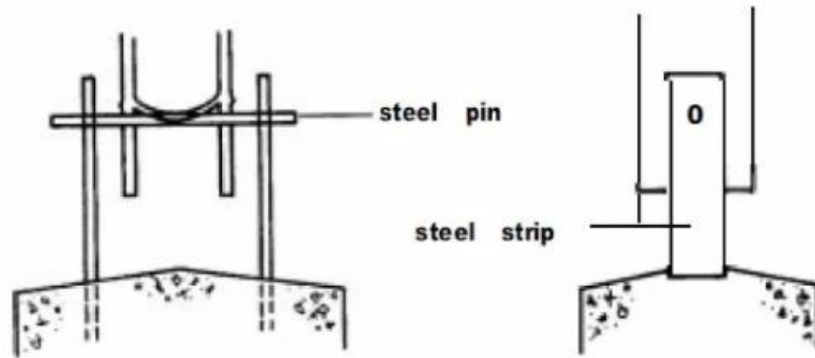


Fig 4.16 : Interchangeable Bamboo foundation

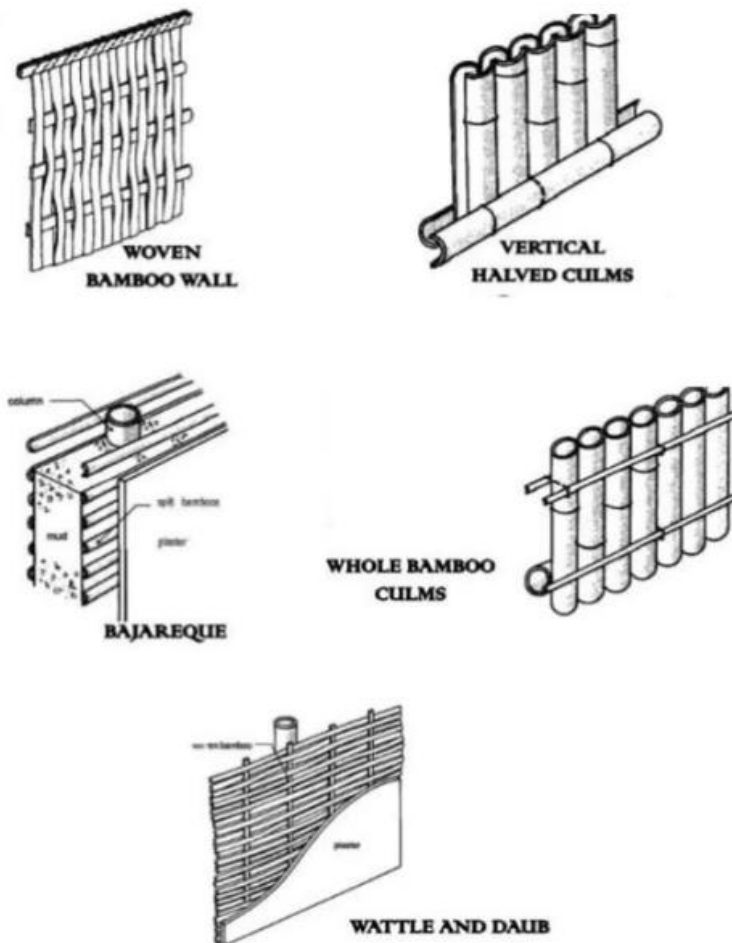


Fig 4.17 : For walls construction : Bamboo

4.5.1 BAMBOO PLANTATION :

Selecting the ideal location for a bamboo plantation is crucial for its long-term success. **Bamboo thrives in tropical and subtropical climates with warm temperatures, high humidity, and access to water.** Consider proximity to a **water source for easier irrigation and maintenance.** Accessibility for maintenance, **harvesting, and transportation should also be prioritized.** Choosing a location with **ample space for root development** is essential to prevent encroachment on surrounding structures. Opting for a site near your home or structures simplifies maintenance tasks and monitoring plant progress. Additionally, easy access to transportation routes streamlines harvesting and utilization of bamboo. Researching clumping bamboo species with non-invasive growth habits is advisable for controlled expansion.

In the BR hills, where the climate is generally **tropical or subtropical, the best time to plant bamboo is typically at the onset of the monsoon season. This usually occurs in the months of June to August,** depending on the specific region. Planting during this period ensures that the young bamboo **shoots receive ample water** from the monsoon rains, which is crucial for their initial growth and establishment. Additionally, **the warm and humid conditions during the monsoon season are favorable** for bamboo growth. By planting during this time, you give the bamboo plants the best chance to establish a strong root system and thrive in the local climate.

The 6 simple steps for propagating bamboo by branch cutting include:

- Observation
- Harvesting
- Cleaning
- Planting
- Watering
- Sheltering

4.5.2 COMPARATIVE STUDY :

Bamboo Species	Characteristics	Common Uses	Mature Height (m)	Advantages
Dendrocalamus strictus (Dragon Bamboo)	High strength, Fast-growing, Thick culms (stems), Good for poles, Can be susceptible to borer attacks	Furniture, construction (beams, walls), scaffolding	20-25	Strong, fast-growing, good for poles, good diameter for larger applications
Bambusa arundinacea (Giant Reed)	Very high tensile strength, Largest diameter, Grows in clumps, Requires more processing for some uses	Construction (beams, scaffolding), pulp and paper, biofuel	30-40	Tallest bamboo, excellent tensile strength for large structures, good for biomass production
Phyllostachys bambusoides (Golden Bamboo)	Moderate strength, Attractive golden culm color, Slender culms, Good workability	Flooring, furniture, crafts, fencing	7-12	Beautiful golden color, good for decorative uses, easy to work with
Dendrocalamus brandisii (Brandis Bamboo)	High strength, Versatile, Grows in clumps, Good for tropical climates	Construction (beams, walls), furniture, pulp and paper	12-18	Strong and versatile for general construction, good paper pulp production
Bambusa balcooa (Balcooa Bamboo)	Moderate-high strength, Straight culms, Good flexibility, Grows in dense clumps	Flooring, furniture, crafts, utensils	15-20	Straight culms for consistent use, good workability for intricate crafts, moderate strength for various applications

4.6.1 SOME CHARACTERISTICS OF BAMBOO GROVES CAN CREATE A DETERRENT EFFECT ON SOME ANIMALS:

- **Dense growth:** Thickets of bamboo can form a dense barrier that is difficult for some animals to penetrate. This discourages larger predators that might not want to squeeze through the dense network of canes.
- **Thorns (on some species):** Certain bamboo species, like some thorny bamboos (Bambusa Bambos) or certain climbing bamboos, have sharp thorns on their culms (stalks) and internodes (sections between nodes). These thorns can deter smaller animals or those with a sensitive aversion to prickly sensations.
- **Noise:** The rustling of dry bamboo leaves in the wind can create a lot of noise. This might startle or disorient some animals, especially those unfamiliar with the sound.

4.6.2 REASONS TO AVOID BAMBOO IN YOUR SITE :

- **Spreading tendencies:** Many bamboo species are invasive spreaders. They have aggressive root systems that can quickly spread underground, forming dense thickets that can overwhelm other plants and even encroach on buildings and foundations. Choosing clumping bamboo varieties with less aggressive root systems is crucial if planting near structures.
- **Maintenance requirements:** While often considered low maintenance, bamboo can still require some effort to control. Regular trimming and maintenance may be necessary to keep it from spreading beyond its desired area. Additionally, some bamboo species can grow very tall, requiring pruning to maintain a manageable size.
- **Wildlife considerations:** Dense bamboo thickets can attract rodents and other small animals that might become a nuisance. This is especially true if your property is near natural areas where these animals are already present.
- **Limited sunlight for other plants:** Due to its dense growth, bamboo can cast a lot of shade. This might not be ideal if you have other plants on your site that require full sun to thrive.

CHAPTER 5

WILDLIFE

5.1 ANIMALS THAT ARE ATTRACTED TO BAMBOO:

Indian Elephants (*Elephas maximus indicus*): While not exclusive to bamboo forests, **elephants will readily consume bamboo shoots and leaves** when available. Their immense size and strength allow them to break through dense bamboo stands to reach their favorite food.



Gaur (*Bos gaurus*): The largest wild bovine in Asia, the **gaur is a herbivore that grazes on a variety of plants, including bamboo.** Their powerful legs and hooves allow them to navigate through dense forests with ease.



Indian Spotted Deer (*Axis axis*): These spotted deer are browsers that feed on leaves, fruits, and flowers. They will **also consume bamboo shoots and leaves**, especially during the dry season when other food sources are scarce.



Common Langur (*Semnopithecus entellus*): These monkeys are omnivores, but **bamboo shoots and leaves make up a significant portion of their diet**, particularly in the BR Hills where bamboo is abundant. Their nimble bodies and sharp claws allow them to navigate the dense bamboo thickets with ease.



Indian pangolin (*Manis crassicaudata*): This unique mammal is an insectivore, but it also has a fondness for bamboo shoots. **Their sharp claws allow them to dig up bamboo shoots and their long, sticky tongues help them extract termites and ants from the inside of the bamboo.**



5.1 ANIMALS THAT ARE ATTRACTED TO BAMBOO:

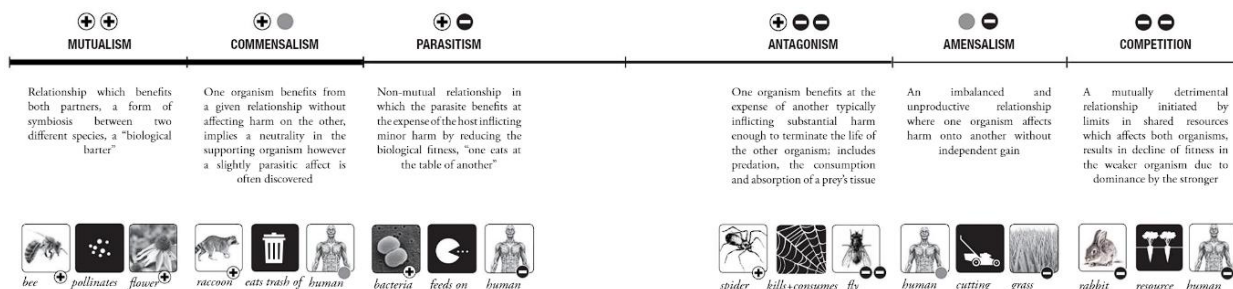
Bamboo forests provide a cool, shady habitat with plenty of hiding nooks and crannies, making it perfect for many reptiles:

- Indian Rock Python (*Python molurus*)
- Indian Wolf Snake (*Lycodon aulicus*)
- Banded Kukri Snake (*Oligodon arnensis*)
- Hardwicke's Gecko (*Hemidactylus triedrus*)
- Indian Monitor Lizard (*Varanus bengalensis*)

Birds that nest in the bamboo forest:

- Brown Shrike (*Lanius cristatus*)
- White-throated Kingfisher (*Halcyon smyrnensis*)
- Pied Fantail (*Rhipidura javanica*)
- Rufous-bellied Woodpecker (*Picoides auratus*)
- Hodgson's Frogmouth (*Batrachostomus hodgsoni*)
-

5.2 ANIMALS CATEGORIZED ACCORDING TO SYNTANTHROPIC :



MUTUALISM	COMMENSALISM	PARASITISM	ANTAGONISM	AMENSALISM	COMPETITION
Rusty spotted cat	Hanuman Langur		Sloth bear	Southern Red Muntjac	Indian giant squirrel
Asian palm civet	Bonnet macaque		Striped hyena	White spotted Chevrotain	Common Giant squirrel
Indian wild pig	Slender Loris		Slender Loris	Chital	
	Jungle cat		Tiger	Sambar	
	Small Indian civet		leopard	Gaur	
	Asian palm civet		leopard cat	Elephant	
	striped neck mongoose		Indian gray wolf	Four horned antelope	
	Common mongoose		Dhole	Blackbuck	
	Ruddy mongoose		Golden Jackal	Indian crested porcupines	
	Otters		Bengal fox	Black - naped hare	
	Thick tailed pangolin				

5.3 SYNANTHROPIC DEISGN STRATERGIES :

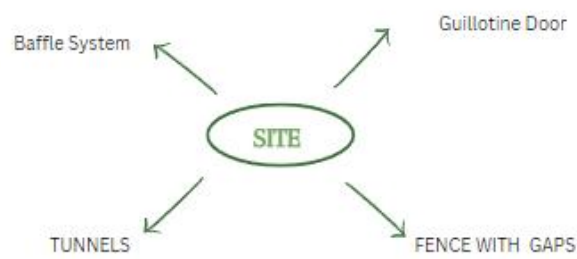


Fig 5.1 : Mutualism

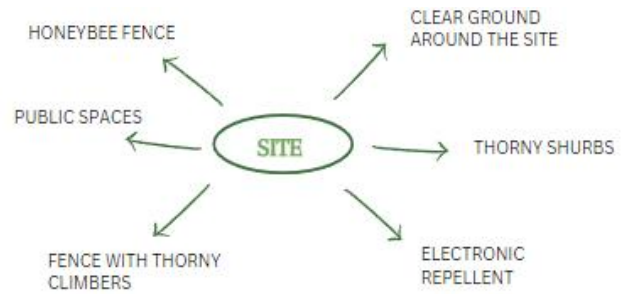


Fig 5.2 : Antagonism



Fig 5.3 : Guillotine



Fig 5.4 : Tunnel



Fig 5.5 : Honeybee Fence



Fig 5.6: Thorny Shrub



Fig 5.7 : Thorny climbers



Fig 5.8 : Electronic Repellent

5.2 ANIMALS CATEGORIZED ACCORDING TO SYNANTHROPY :



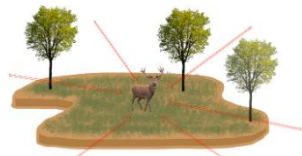
VERY DENSE FOREST
Canopy density exceeding 70%. Sunlight barely reaches the forest floor.



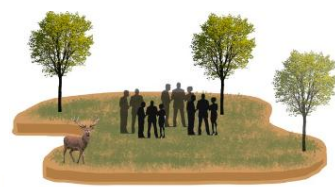
MODERATELY DENSE FOREST
Canopy density between 40% and 70%. This allows some sunlight to penetrate the forest floor.



OPEN FOREST
Canopy density between 10% and 40%. Significant sunlight reaches the forest floor.



With less dense foliage in an open forest, **animals have fewer places to hide**. The open canopy allows for more sunlight to reach the forest floor. This increased light makes it easier to see not only the animals themselves, but also signs of their presence, like tracks, droppings, or disturbed areas on the ground.



Openness: The lack of trees creates a feeling of openness, which can be ideal for larger gatherings where people need space to move around and socialize.

Animal	Habitat	Behavior	Open Grass	Dense Forest
Sloth bear	Forests, grasslands	Solitary, nocturnal, omnivorous	Avoid	May use for travel or finding food sources
Striped hyena	Grasslands, savannas, woodlands	Social, scavenger, carnivorous	Preferred habitat for hunting	Avoid
Slender loris	Rainforests	Solitary, nocturnal, insectivorous	Avoid	Preferred habitat
Tiger	Forests, grasslands, swamps	Solitary, nocturnal, apex predator	May hunt in open grass	Dense forests for cover
Leopard	Forests, grasslands, mountains	Solitary, nocturnal, apex predator	May hunt in open grass	Dense forests for cover
Leopard cat	Forests, grasslands, mountains	Solitary, nocturnal, omnivorous	May hunt in open grass	Dense forests for cover
Indian gray wolf	Grasslands, scrub forests, mountains	Social, apex predator	Preferred habitat for hunting	May use for cover
Dhole	Grasslands, forests, mountains	Social, apex predator	May hunt in open grass	Dense forests for cover
Golden jackal	Grasslands, forests, mountains	Solitary/occasional pairs, opportunistic	May hunt in open grass	May use for cover

Animal	Habitat	Behavior	Open Grass	Dense Forest
Rusty-spotted cat	India and Sri Lanka (moist and dry deciduous forests, scrub forests, grasslands, arid shrublands, rocky areas)	Solitary, nocturnal, excellent climbers, hunt on ground (small rodents, lizards, birds, insects)	Unlikely - avoid open areas	Dense forests for cover, rocky areas for shelter
Asian palm civet	Southeast Asia (including India) (rainforests, evergreen forests, mangroves, urban areas)	Nocturnal, omnivorous (fruits, seeds, insects, small vertebrates), solitary (may come together in groups to feed)	Unlikely - avoid open areas	Rainforests, evergreen forests (upper canopy)

5.3 STRATEGIES FOR COEXISTING WITH THE WILDLIFE

Before planning or building, a study of the area's biodiversity is recommended to understand native animal and plant life, their behavior, circulation patterns, and needs, to avoid conflicts, determine boundary lines, and design based on fauna and flora.

5.3.1 BUILDING IN THE FOREST :

1. Roads and pathways should be planned in a way that they don't cross animal path of circulation.
2. Car parking should be provided at the entrance of the site to insure no car or heavy vehicle moves on site to avoid road-kills, unless dangerous animals are in the vicinity.
3. Animal corridors and walkways should be built on-site, away from human activities, with small pathways concealed by hedges and vegetation for frogs, newts, and lizards.
4. Boundary walls should be eco-friendly and flexible for animals, with a moat provided for dangerous animals. Bio-fencing, such as lemongrass hedge for elephants and agave for wild boars, can help minimize human-animal conflict by providing a natural and economical solution.



Fig 5.9 : Moat

5.3.2 OPEN TO BUILT RELATIONSHIP:

In forest area:

Residential Buildings,

-Built up area **>50%**

-Open area **< 50%**

Institutional Buildings,

-Built up area **>30%**

-Open area **< 70%**

In urban Area:

Residential Buildings,

Built up area **>70-60%**

Open area **< 30-40%**

Institutional Buildings,

Built up area **> 50%**

Open Area **< 50%**

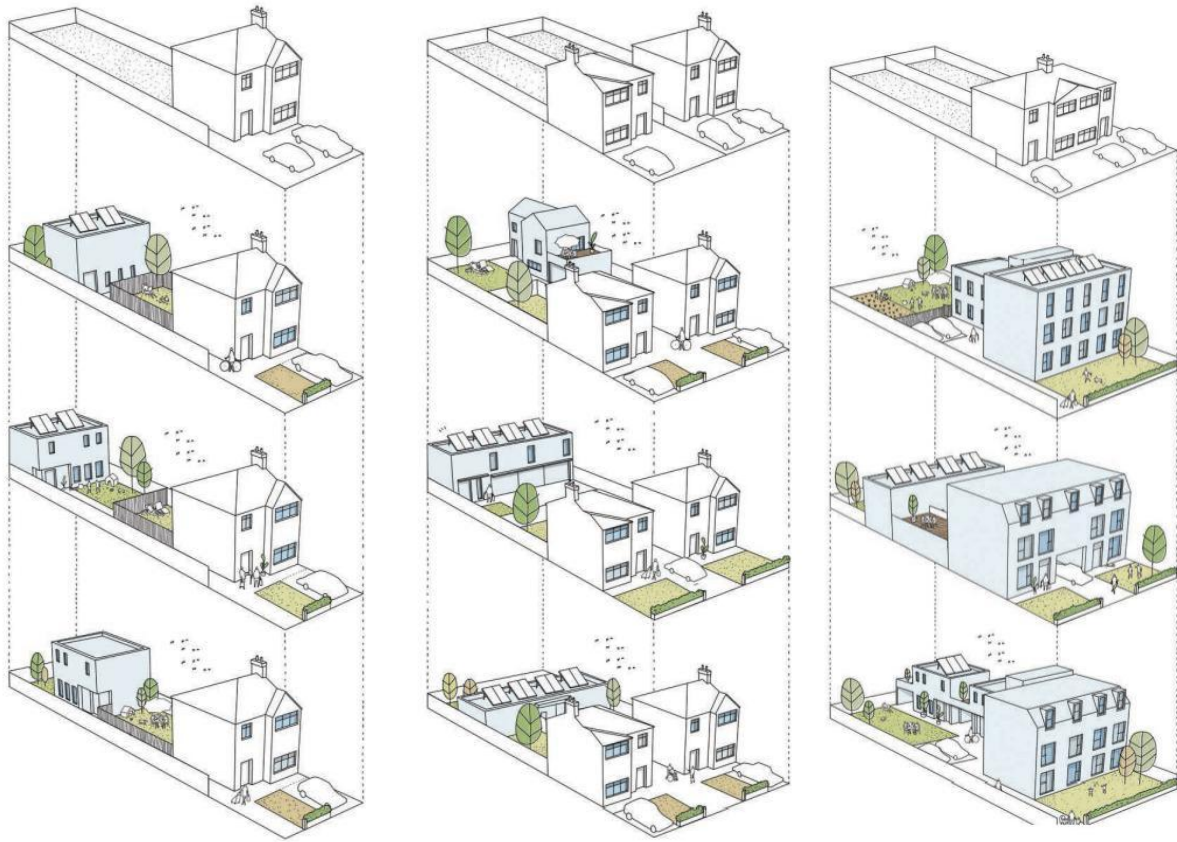


Fig 5.10 : Open Built Relationship

5.3.3 SERVICE:

1. Services should be designed to benefit both wildlife and humans, while ensuring ecological balance in building construction.
2. The drip irrigation system from rainwater harvesting should be utilized to irrigate mosses,

ferns, and bird bath eaves.

3. The integration of natural resources for energy and thermal comfort in heating and ventilation services should be minimized and optimized through careful planning and design strategies, including the use of ventilation exhaust on external facades.

4. Bird baths and feeders can be provided along the gutter line using rainwater harvesting and bird baths.

5. Dragon flies, reptiles, grasshoppers, and other animals can thrive on discarded water, creating wet land that serves as a drinking area. This can be converted into an bios-wale using bio-filter trees, allowing water to be cleaned and recharged before being used for

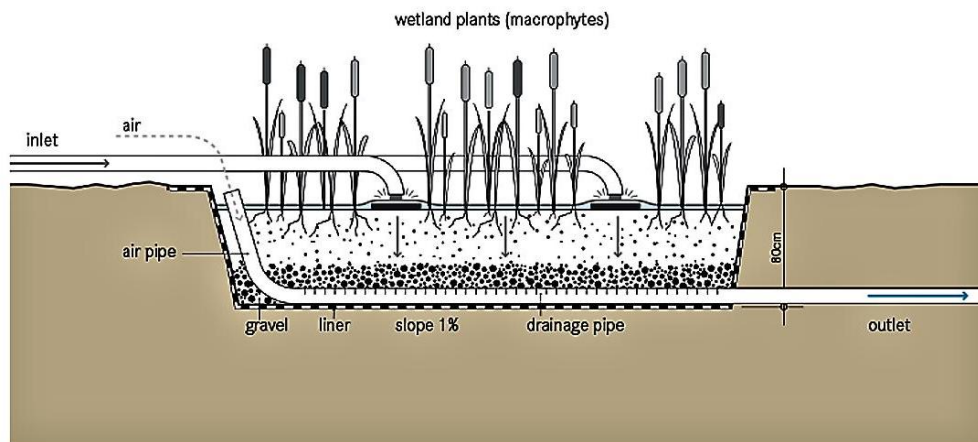


Fig 5.11 : Wetland Filtration system

5.3.4 LIGHTING :

1. The use of street lights with 10lux luminaries, automated by a motion detector, is recommended to minimize blue light and disturbance to wildlife.
2. The PC-amber LED (1800K) is a mix of warm-white and amber LED with optical filters. These lights can house bird/bee nests to avoid losing electricity wires.
3. UV-displaying fixtures should not be installed, and indoor lights should be filtered through windows with double glazed fritting, silk-screening, or ultraviolet coating to reduce bird collision.

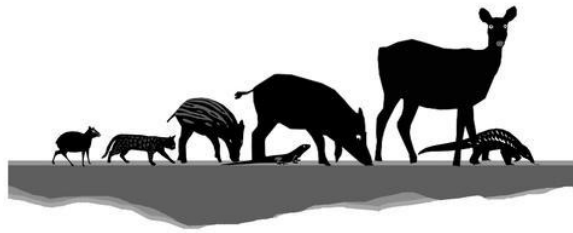


Fig 5.12 : Lighting in forest

5.4.1 RECOMMENDED STRATEGIES FOR A PARTICULAR REGION - BR HILLS

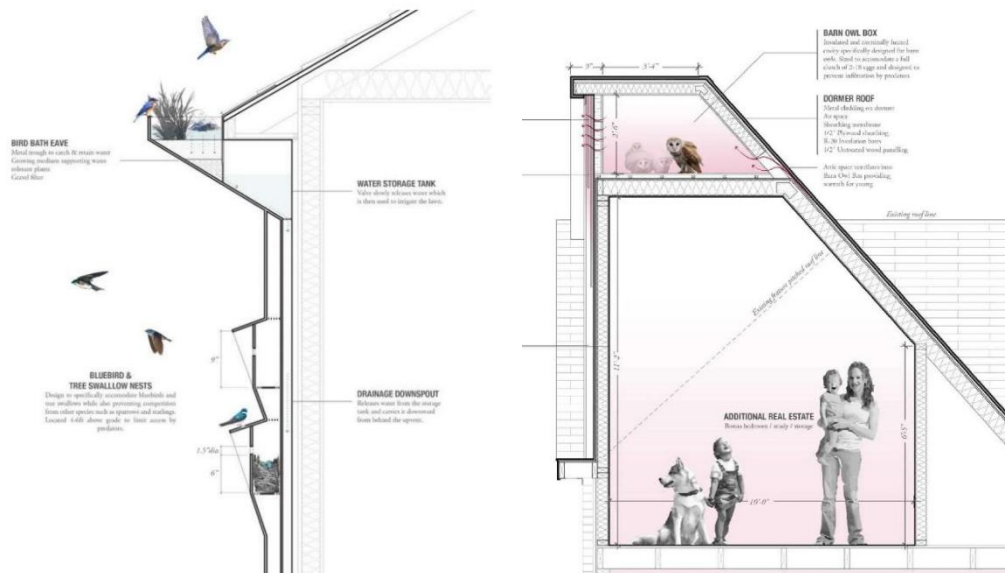
MAMMALS:

Small animals are a significant concern in the landscaping design of a site. To ensure their safety, the design should include small entry exit cutouts with water facilities and feeders, as well as resting areas with HVAC vents. Landscaping should include shaded trees and shrubs retaining ground water, as these animals like to rest in such areas. Additionally, the design should provide welcoming spaces for horses, deer, goats, and Neel Gai, such as planting threes and ruff and thrones shrubs where they can starch and feed.



BIRDS:

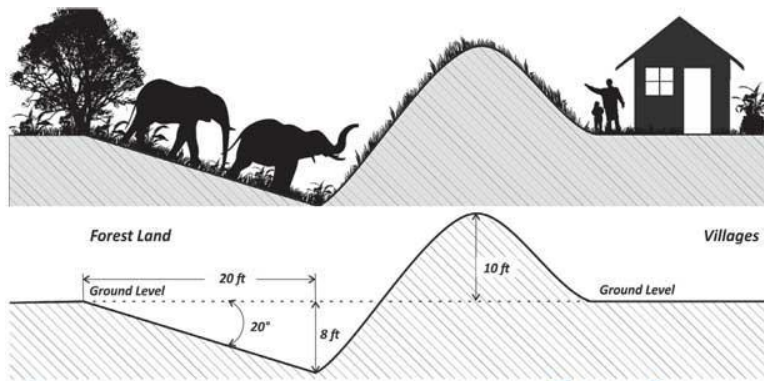
Hollow brick nesting, bird baths, and supported structures with plantations are effective ways to accommodate small birds in landscapes, Meadows, and wetland features. These habitats provide insect-rich habitats and seed food throughout winter, attracting evergreen trees and hawthorns like Bougainvillea.



Large mammals:

Insuring boundaries are at least 4 M with no tree outside side is near to the boundary, moat along the site can be provided to insure such animals can't enter site. Proper placement of opening in windows should be done insuring animals can't climb inside. Kitchen ventilation

should be placed opposite to windward side and should always open above the building. Landscaping can be done to repel animals like hyena, wild-dogs and wild boars.



CHAPTER 6

SOLIGA TRIBE

6.1.1.THE SOLIGA TRIBE :

Soliga is an ethnic group of India. Soliga, sometimes spelled solega, sholaga, and shlaga, the majority of its members reside in Mysuru and Tamilnadu, districts of Chamrajanagar and Erode, which are located in southern Karnataka's Biligiriranga hills and neighbouring ranges. For the tribal communities, the forest is not just only a source of food but also a part of their identity. Numerous people are also gathered in and around the BR Hills in th Karnataka districts of Chamarajanagara and Yelandur. According to the census 2011, the population of Karnataka soligas was 33,871. In Tamilnadu they were called sholaga and soligas population was 5,965. The Dravidian language sholaga is spoken by the Soliga. Not only a Soliga they will speak Kannada and Tamil.

GEOGRAPHICAL LOCATION

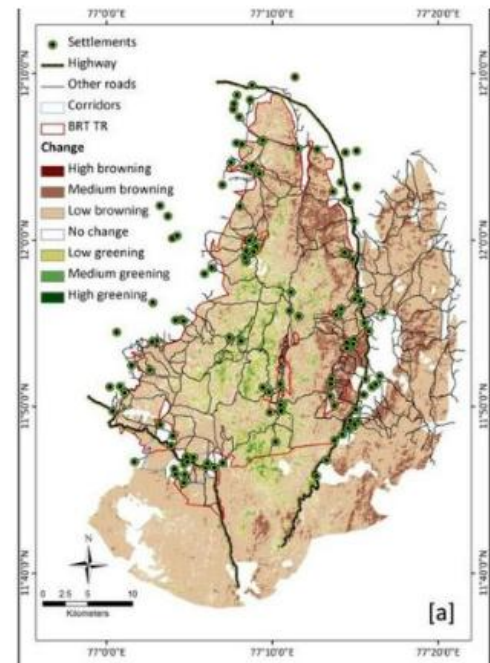
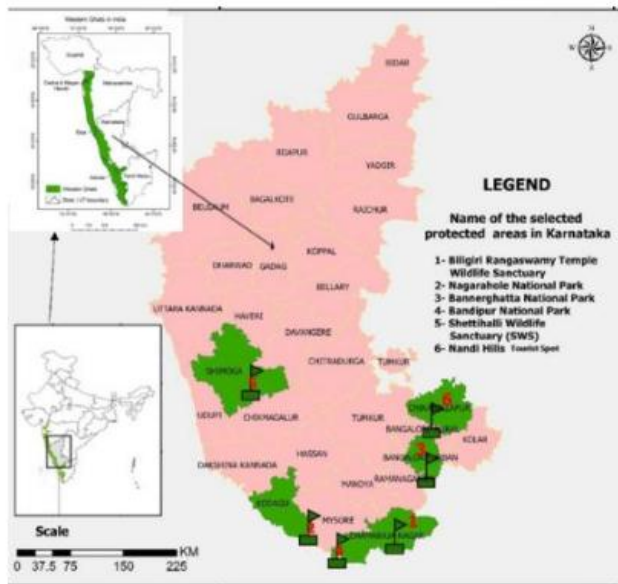


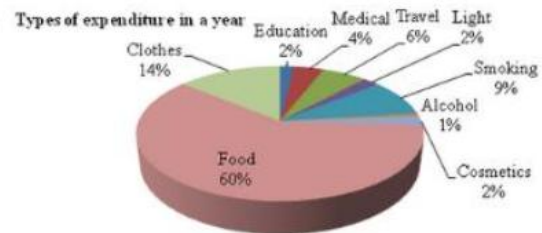
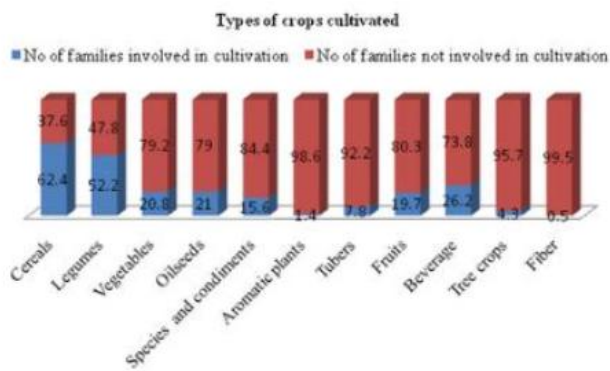
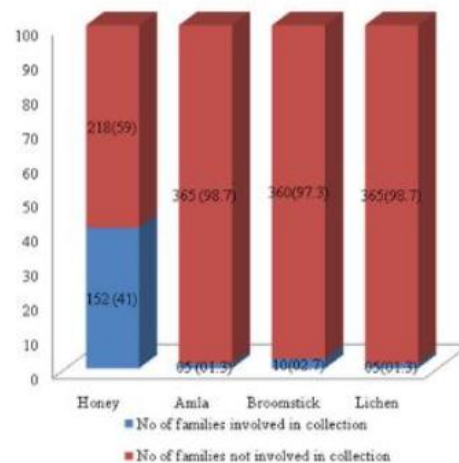
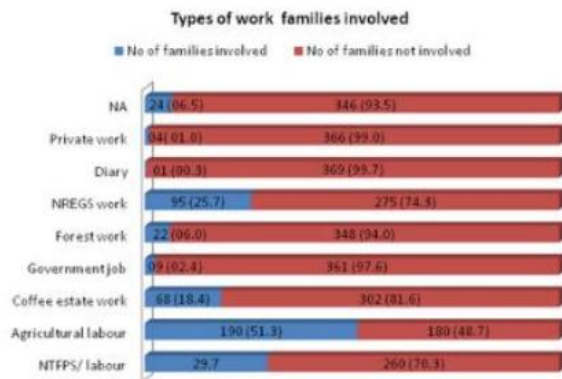
Fig 6.1 : Soliga Tribe location

6.1.2 PRIMARY OCCUPATION :

Soliga, the dominant tribal community in the BRTWS, are highly dependent on the forest for their basic living requirements such as food, fodder, fiber, fuel wood as well as other spiritual and socio-cultural needs.

The collection of NTFPs is the main source of income for Soligas. After being declared a wildlife sanctuary in 1974, the cultivation of coffee, pepper, and other cash and non-cash crops has become important. Fuel wood is one of the primary sources of energy for household cooking. On average, a household collects 3,715kg of fuel wood per year from the forest.

Primary occupation						Secondaroccup
Age in years	Agriculture (%)	Wage labour (%)	Government job (%)	Other works (%)	Total (%)	Agriculture (%)
20-25	6(2.18)	2(2.4)	0(00)	0(00)	8(2.1)	0(00)
26-30	12(04.37)	13(15.5)	0(00)	0(00)	25(06.7)	3(16.7)
31-35	29(10.5)	19(22.6)	1z(11.0)	1(33.3)	50(13.5)	1(05.5)
36-40	34(12.4)	15(18.0)	4(44.5)	2(66.7)	55(15.0)	6(33.4)
41-45	42(15.3)	11(13.0)	1(11.1)	0(00)	54(14.6)	3(16.7)
46-50	52(18.9)	7(08.3)	2(22.2)	0(00)	61(16.5)	3(16.7)
51-55	22(08.0)	5(06.0)	1(11.1)	0(00)	28(07.6)	1(05.5)
56-60	28(10.2)	7(08.3)	0(00)	0(00)	35(09.4)	1(05.5)
61-65	24(08.7)	2(02.3)	0(00)	0(00)	26(07.0)	0(00)
66-70	25(09.1)	3(03.6)	0(00)	0(00)	28(07.6)	0(00)
Total	274(100)	84(100)	9(100)	3(100)	370(100)	18(100)



6.1.3 LIFESTYLE

Traditionally, the Soliga people have been forest dwellers and have a deep connection to the forests of the BR Hills. They rely on a subsistence lifestyle, engaging in activities like shifting cultivation (known as "Podu" or "Kumari"), hunting, gathering, and beekeeping. However, in recent years, there has been a shift toward settled agriculture and other livelihoods.

6.1.4 HOUSING

Soliga tribe housing is typically characterized by simple, traditional huts made of bamboo, mud, and thatch. These huts have low heights, compact designs, and open floor plans. They often feature a central fireplace for cooking and heating. While some Soliga families have transitioned to more modern housing, traditional huts are still symbolic of their forest-based way of life.

6.1.5 BELIEF AND RELIGION :

The Soliga tribe, residing in the Biligiri ranganathan Hills of southern India, practice an animistic and nature-based religion. They worship the elements and spirits of the forest, believing that mountains, rivers, trees, and animals possess spiritual significance. Deities and forest spirits are central to their beliefs, and rituals and offerings are performed to appease these beings. Sacred groves are maintained to honor these spirits, and their religious practices are intertwined with their daily lives, agricultural cycles, and community well-being.

6.1.6 ART AND CULTURE

The art and culture of the Soliga tribe, indigenous to the Biligiri ranganathan Hills in southern India, are deeply intertwined with their forest-based way of life. They create intricate bead work and handicrafts inspired by nature, such as baskets, jewelry, and clothing adorned with colorful bead designs. Music and dance are integral to their traditions, often featuring performances that mimic the sounds and movements of animals and celebrate their close connection to the natural world.

6.2. MATERIAL CULTURE :

A house is built by the consolidated efforts of the members of a family. **The time taken for building a house usually is not more than two days if the persons engaged are three.** Before constructing a house, the rite of castor seeds (Allushastra) as described earlier, is observed on the selected plot. **The whole structure of the house rests on six wooden Kave (forked posts) symmetrically.** The length of the two central posts on which the roof rests is about seven feet and of the remain in four posts which support the roof is nearly four feet. The roof is slanting on both sides, with the bamboo rods radiating and the Sarabu (spliced bamboo rafters) supporting the roof structure. They are **tied together by means of the Seve (a kind of creeper)** or other fibers. The roof is thatched with the Bane (a kind of wild variety) grass. **The wooden posts supporting the roof are fixed in the ground below the ground level to the depth of about one foot.** These posts are stripped off the bark and they are not fashioned. The wooden posts used in the construction are such that they are not easily affected by the vermins and moths.

6.3. HOUSE PLANNING:

The houses are mainly of a **single-room apartment**. The four walls are made of **spliced bamboo wattle intertwined with several wooden and hard bamboo rods**. These walls, in many cases, are not daubed with earth plaster or any other material, but mud pilings at the walls rising from the floor both from inside and outside, are made in order to have the proper setting of the wattle walls. **An Atta (attic) is made inside the house at a height of four feet from the ground floor**, which is used for keeping baskets, grains, clothes, etc. Doors are made of bamboo wattle alone. **The doors have no hinges**, but they are fastened to the walls by fiber threads. **There is no device for locking the door**. The materials used for building houses are locally available. Wood, bamboo, and **Bane grass grow in abundance in the forests** and are easily procurable. Men bring materials like wood and bamboo, and women bring grass for thatching the roof. Men build the houses, while women co-operate with them in plastering the floor with mud, making wattle-walls, etc. A well-built house lasts for about four to five years. Because of pestilence of vermin and white ants, the houses do not last longer. As the Soliga have to abandon their habitat after a lapse of four years, **they do not build firm and durable houses** .

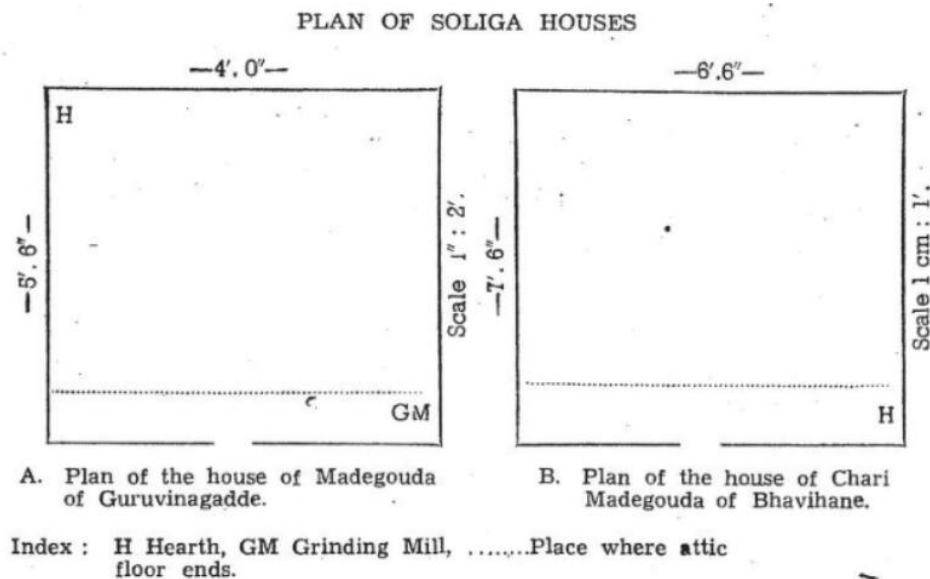


Fig 6.2 : Soliga Tribe House Plan

6.5 HOUSE DIMENSION:

The usual **height of a Soliga house is about four feet at the entrance** and nearly **six feet in the center where the roofs incline**. There is only **one entrance to the house**, that is, from the front side. The smoke has to escape through one way, that is, from the clefts of the wattle-walls. Owing to inadequate ventilation, the area around the fire place is covered with a **thick coating of black soot**. Most of the household equipment are hung from the wooden pegs or bamboo rods of the walls. The attic is used for keeping big baskets, pottery, etc.



Fig 6.3 : Soliga Tribe House

6.4 ACTIVITIES :

The space in the apartment in a house is small and serves both for cooking and sleeping purposes. Generally, the **Soliga sleep at night in the open yard outside their houses by the side of fire**. The Soliga are fond of fire for two reasons. First, it protects them from biting cold in die Hills; and secondly wild animals including elephants do not come near them for fear of fire.

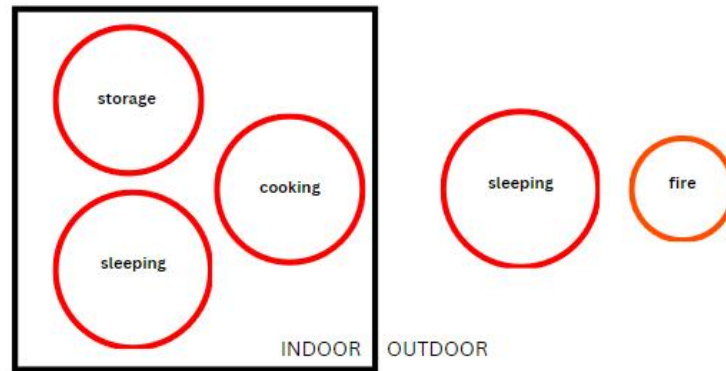


Fig 6.4 : Activity In a Soliga House

6.5 TREE HOUSE:

In the forest fields, Kavalu Kottige (guarding houses) are built. Garret sheds are built on the branches of trees as watching house. From these places the Soliga can easily guard the standing crops. **Men use the garret sheds and guarding houses as sleeping apartments**, specially during the ripening of crops and harvesting season when the menace of marauding beasts is great. **Women live in the houses during day time, but sleep outside on the open yard by the side of fire during nights.** Guarding houses sometimes act as resting places by visitors who happen to stay overnight in the far off settlements of the Soliga.



Fig 6.5 : Soliga Tribe Tree House

6.6 PERSONAL HYGIENE:

The Soliga men do not take bath regularly. Once in a week or fortnight, youngsters take bath while elderly persons take bath casually. Women do not take bath regularly. But on festive occasions, the Soliga take bath without any exception.

Owing to the nature of their work, such as climbing trees, digging edible roots etc., clothes often become dirty. Yet they do not wash them frequently. Some Soliga were justifying the habit of not taking bath regularly and not washing their clothes by saying that because of their muddy smell elephants which are in plenty where the Soliga live, scent their aroma and therefore it was advantageous for them as they could freely move in the elephant infested area, without any fear for the wild animals.

6.7 PERSONAL HYGIENE:

The form of cultivation practiced in the Hills is shifting cultivation. This method is generally known as Podu 1 cultivation, or Kalakotlu (hoe) form. The Podu cultivation is done mainly on hill slopes and mountain ridges in the forests after the local communities are formed. It is considered beneficial to cultivate on such places for reasons of safety from the menace of wild beasts, specially elephants. Small patches of land on the hill slopes are cleared off the forest growth, and cultivation is done on such lands for a period of four years.



Guruvinagadde settlement



Articles of basketry



Earthen-ware



A Soliga elder (dress of male)



Kallugudi (the temple of the dead)



Soliga couple

Fig 6.6 : Soliga Tribe Household

6.7 ASPECTS OF CULTURE CONTACT AND TRIBAL PROBLEMS:

It has been pointed out earlier that the tribal societies are under going transformation owing to the contact with their neighbouring socio-cultural systems. In the case of the Soliga, the impact of culture contact with other people has brought about certain changes in the social, economic, and religious life of the tribal people. In their social life, changes are largely brought about in material aspects, such as, dress, house types, agricultural tools, etc.



Fig 6.7 :Change in Soliga Houses

The Soliga largely depend on their herbal medicines and in the efficacy of the priests' ritual power of curing diseases. The Soliga claim that they know of a certain herbs by which child-birth is controlled. But they do not like to divulge information on the herb. i.e. Modern medicines, however have not influenced the people very much despite their contact with other cultures.



Fig 6.8 : People of Soliga Tribe

The Soliga largely depend on their herbal medicines and in the efficacy of the priests' ritual power of curing diseases. The Soliga claim that they know of a certain herbs by which child-birth is controlled. But they do not like to divulge information on the herb. i.e. Modern medicines, however have pot influenced die people very much despite their contact wit other cultures.



Fig 6.9 : Herbs in Br Hills

The subsistence economy of the Soliga was one of the shifting cultivation and collection of forest produce. But there was marked improvement in the form of agricultural practices, as in at least two settlements.

TABLE 4 VARIOUS ECONOMIC ACTIVITIES OF THE SOLIGA AND THE RITUAL ACTIVITIES ASSOCIATED WITH THEM IN A CALENDAR YEAR					
Sl. No.	Calendar month	Month according to the Soliga	Major traditional economic activities		Specific ritual activities associated with them
			Agricultural, i.e., Podu cultivation	Collection of minor forest produces	
1.	February-March	Ugadi	Clearing off of the forest growth, weeds, stumps etc. in the Podu fields.	Collection of barks of <i>cassia fistula</i> , and <i>terminalia chebula</i> .	—
2.	March-April	Jatre	Burning the dried weeds, forest growth etc., in the Podu fields.	Same as above.	—
3.	April-May	Teppa	Sowing maize, pulses, and castor seeds. Broadcasting the Ragi millet.	Same as above.	—
4.	May-June	Adre	Removing weeds grown in maize and millet plants.	Same as above.	Collection of honey
5.	June-July	Kakkat	Reaping the maize	Same as above.	—
6.	July-August	Sarawana	Threshing the maize	Collection of Pachi.	—
7.	August-September	Gowri	Removing weeds grown in millet for the second time	Same as above.	—
8.	September-October	Marlame	Same as above	Same as above.	—
9.	October-November	Divalige	Harvesting of the millet	—	Collection of honey
10.	November-December	Kiri Divalige	Harvesting pulses	Collection of <i>cassia fistula</i> and <i>terminalia chebula</i> .	—
11.	December-January	Sankranti	Harvesting castor	Same as above.	—
12.	January-February	Sivaratri	—	Same as above.	—

The State Government has constructed 30 houses for colonizing the Soliga in Yarkanagadde. Out of them, only 17 families moved to those houses after a lot of persuasion. Initially, when the houses were built, the Soliga were not willing to live in them, but later agreed on account of the efforts of the Block Development Officer who persuaded some Soliga to settle down. But the Soliga living in the colony were not willing to stay for longer time. In view of the nature of their local community, and the economic activities, the tribals desire to live in the interior settlements. This is the psychological barrier which does not remedy the problem of their settlements despite building many more colonies.

6.8 Restrictions in cultivation :

Restrictions on the podu cultivation practiced by the Soliga have made them suffered much. **Now that shifting to different areas in the forest is not possible, the people have to stay in the same place for several years.** The traditional method of podu cultivation does not yield enough crops. The forest fields being on slopes of the Hills, use of plough, either wooden, or iron becomes hazardous and unrewarding. Unless the problem of settling the Soliga in larger and comparatively plain areas the modern agricultural methods are of very little use.

The great problem that is faced by the tribals in the various settlements in **the Hills is the ravage of wild animals. Elephants, bores, and wild buffaloes** devastate whatever crop is grown in the forest fields by the traditional podu cultivation. This problem cannot be solved until the Soliga are settled in places which are free from the menace of wild animals.

Unemployment problem among the tribals is very great. Consequently, therefore, they are underfed and undernourished. There is ample scope for developing the area for the cash crop cultivation, industries etc., which in turn would provide employment to the tribals in greater measure.

Cash crops like Potato, rubber, coffee, tea, etc., could be raised. **Bamboo and honey are plentiful.** The Soliga can take to **cottage industries like basketry, and honey collection** in improvised method, profitably. More incentive be given for taking to **silk (cocoon rearing) industry** by the tribals so that more and more people can involve in themselves in bettering their living conditions economically. **There are greater potentialities for rearing poultry farms, sheep breeding and animal husbandry.**

6.9 Restrictions in cultivation :

Their immediate neighbor are the non-tribal people of the Temple villages, whose impact is great on the Soliga. The following diagram shows the types of other cultural groups with whom the Soliga come in contact.

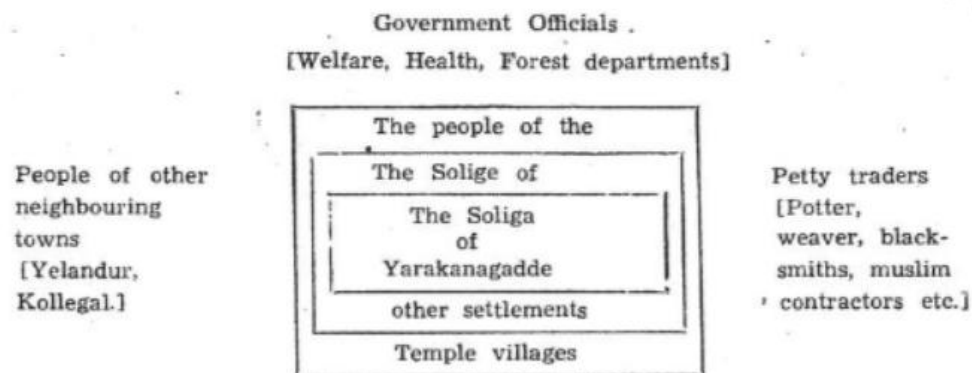


Fig 6.10 : People of the neighbouring village

6.10 FESTIVAL:

The most important festivals which the Soliga observe are :

(1) Rotti Habba; (2) Hosa Ragi Habba.

Rotti Habba : The rotti habba is celebrated once a year by members of a local community. For observing the festival the elders take active interest in collecting contributions from every house in a settlement and bear collective responsibility. A Monday, or a Friday during the months of March and April is selected for its observance.

Hosa Ragi Habba : This festival is observed by individuals in order to propitiate their family deities. Cooperation from kinsfolk who are agnates is sought, and it is readily availability. Agnatic relatives help the individuals both by kind and manual labour since the family deities usually belong to descendants of the same lineage.



Fig 6.11 : Festival

6.10 RAIN-MAKING AND RAIN-STOPPING FESTIVAL :

There are no ritual experts associated with 'rain-making'. But there is a belief that if propitiation is done to the deity known as Kadubina Basaveswar, rains are sure to come. In the absence of rains, the Soliga of a settlement propitiate the deity, who is giver of rains. The shrine of the : Kadubina Basaveswar is situated about eight miles away from the Temple village. The Soliga priest, or any elderly person performs the ritual.



Fig 6.12 : Rituals and Temple of Soliga Tribe

6.10 DRESS, MUSIC , ART AND CRAFT:

Dress : Men wear Pancha of four yards in length which is wrapped round the waists, covering the knees. A Kavacha (tailor—stitched shirt) is worn by men. The dress of **women** consists of Sele (sari) and Ravike (bodice). The sari which is of five yards in length is worn round tire waist hanging up to the feet.

Music and dance: The most important recreational activities of the Soliga are singing and dancing during festive occasions. The Soliga songs have profound poetic feeling. They are sung during the two great festivals of the tribe, namely, the Hosa Ragi and the Rotti Habba.

Musical instruments: The most important musical instrument is the **Tala (cymbal)** which are made of brass and always used in a pair. The rhythmic clapping of cymbals provides resolute music to the dancers. The simple drum known as **Halage** which is strained across an iron rim by means of goat-hide, is played by striking the membrane by stickbeaters.

The **Kombu (brass trumpet)** is also in vogue. For makings the drum the Soliga purchase the iron frame from the shops, and prepare themselves the remaining part. **Koralu (flute):** Koralu is also in use. It is prepared locally out of small bamboo stems.

Arts and Crafts: If art is understood as a mere attempt to reveal aesthetic activity, it may be observed that among the Soliga, such art is expressed through the drawings made on the articles of wood and bamboo, namely, the wooden pillow, the wooden handle and. bam-boo containers.

The presence of superior quality of wood particularly is an important factor which makes the Soliga hew a few carvings on wood. The Soliga carvings are not followed by any interpretation. Only one or two persons are said to be knowing the art of drawing on wood and bamboo.

CHAPTER 7

SITE STUDY AND ANALYSIS

7.1 SITE STUDY:

Site is located in a Biligiri Ranganatha Hills. Site is in the south of the BR Hills. Total site is 90 acres.



Fig 7.1 : Site Location

7.2 SITE JUSTIFICATION AND FEASIBILITY:

Site is located in the south of the BR Hills on the road . The surroundings of the site is Dense Forest area. The site was selected in a place where there is more wildlife spotting like Tiger, Boar, Spotted Deer, Asian Civet, Wild Cat, Elephant, Cheetah.



Fig 7.2 : Wildlife Spotting

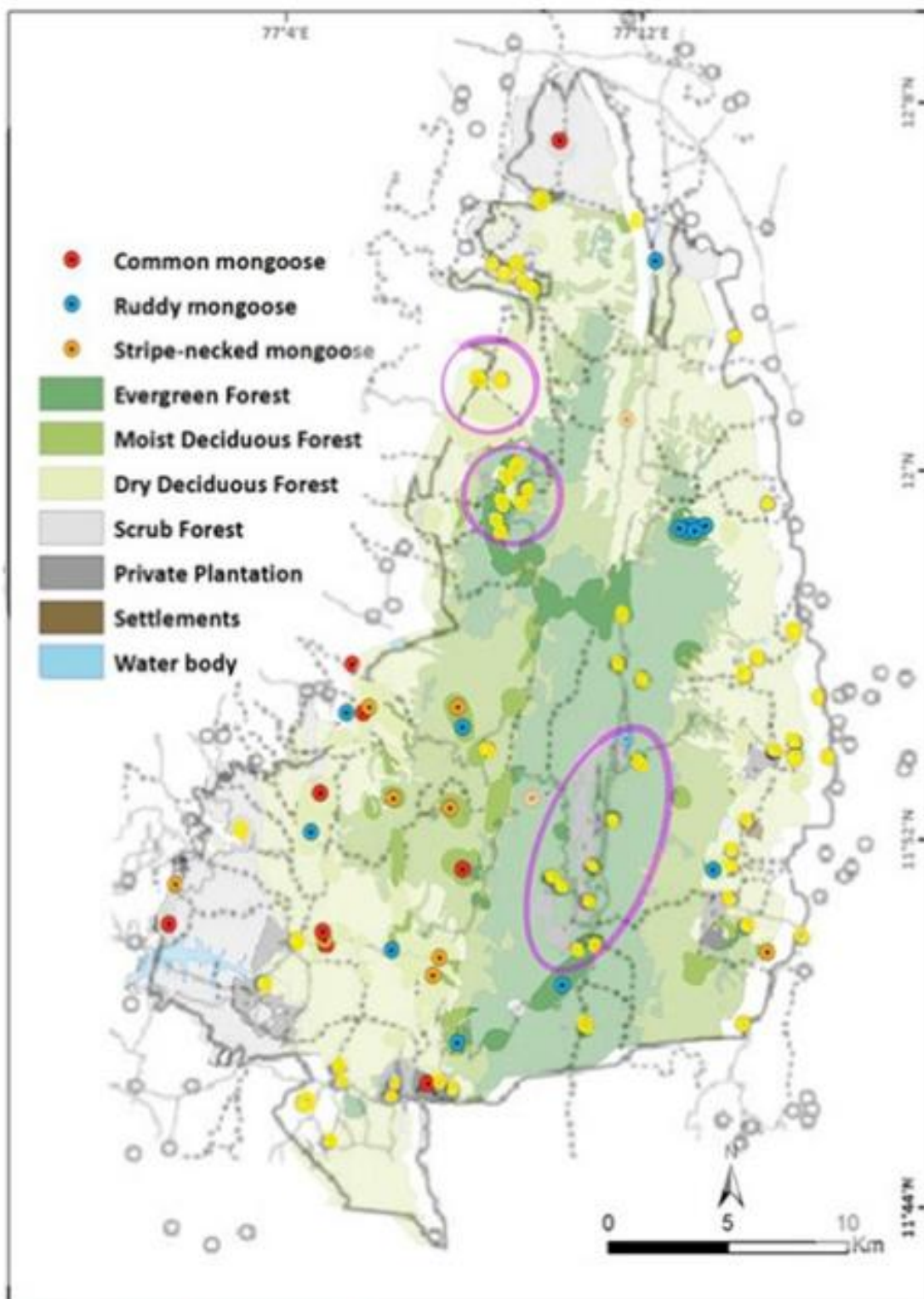


Figure 4. Detections of mongooses in BRT

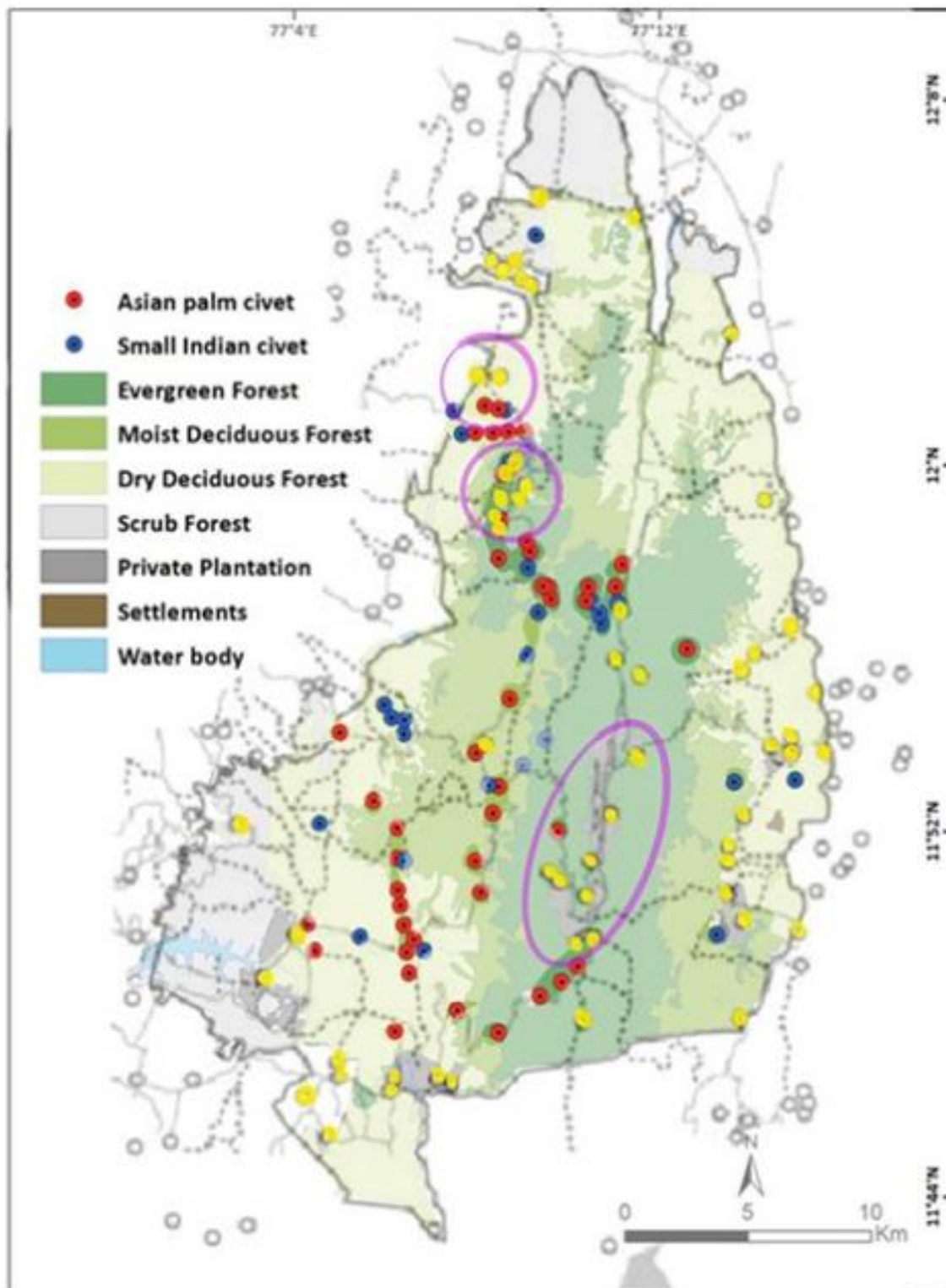


Figure 2. Detections of civets in BRT

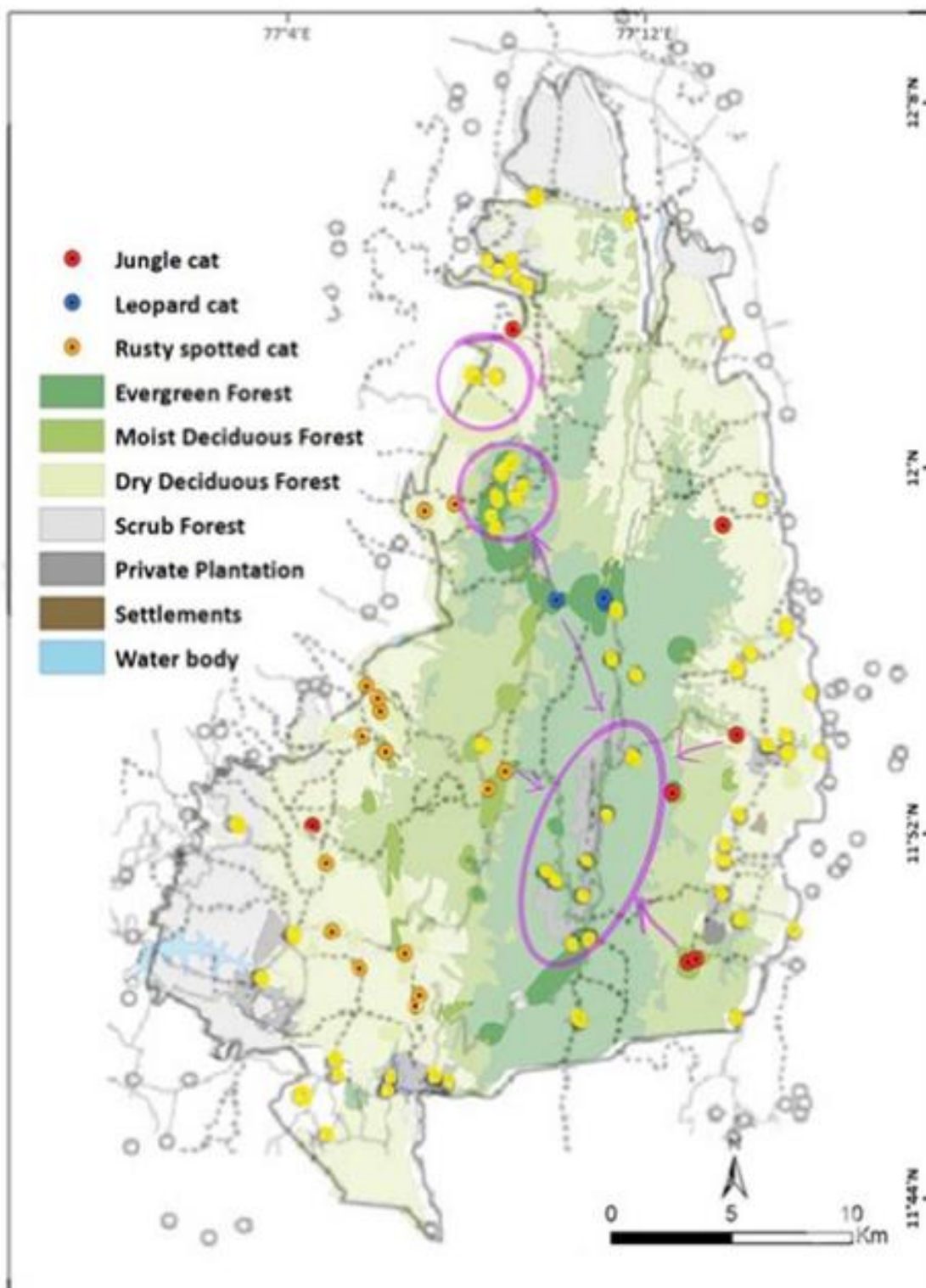


Figure 3. Detections of small cats in BRT

7.3 ACCESSIBILITY :

Nearest airport : Mysore (86 km) , banglore (180 kms) , coimbatore (180 kms)

Nearest railway station : Chamarajnagar (27 kms) , mysore (86 kms)



Fig 7.3 : Latitude - 11.927960 longitude - 77.222659

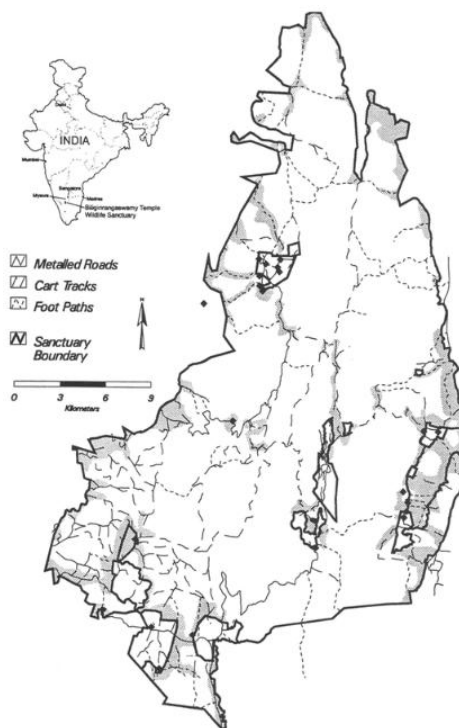


Fig 7.4 : Transportation and Road Network

7.4 CLIMATIC ANALYSIS :

The hills experience a wide range of temperatures, with lows dipping to 9°C (48°F) and highs soaring to 38°C (100°F). This variation is partly due to the hills' elevation, which ranges from 600m to 1200m above the surrounding plains.

Modern Architectural Considerations: Sustainable Materials, Double-layered Walls , Rainwater Harvesting , Bio-climatic Design.Traditional Building Practices: Mud and Timber Houses , Sloping Roofs

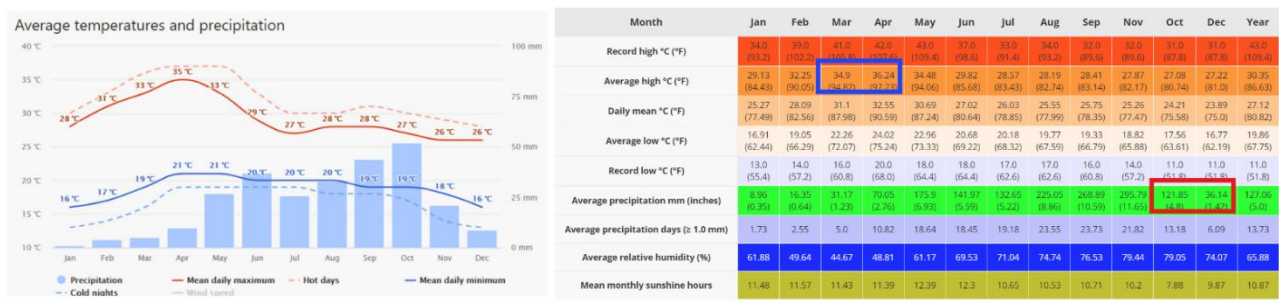


Fig 7.5 : Macro climate

7.5 TOPOGRAPHY :

BR Hills in Karnataka, India, is a beautiful place with lots of hills, valleys, and forests. The hills are tall, reaching about 1,550 meters high, and they're part of a bigger mountain range called the Eastern Ghats.

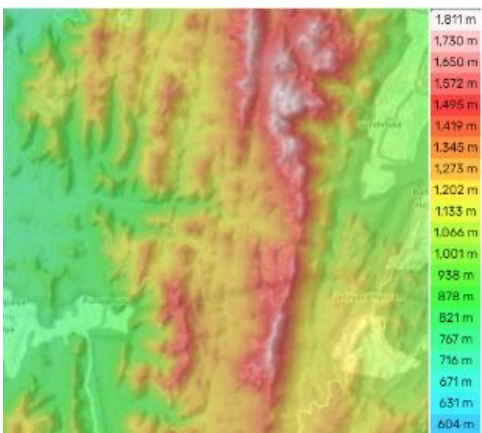


Fig 7.6 : Topography

7.6 CONTOUR :

The North side of the site has a gradual slope of 0 - 12 % from the road to the east of the site and has steep slope of the north side forming a saddle in the middle. while the south side has steep slope with a slope percentage of 13 - 25% . The vegetation along the north side has a moderate to high density vegetation while the south has low to moderate density vegetation.

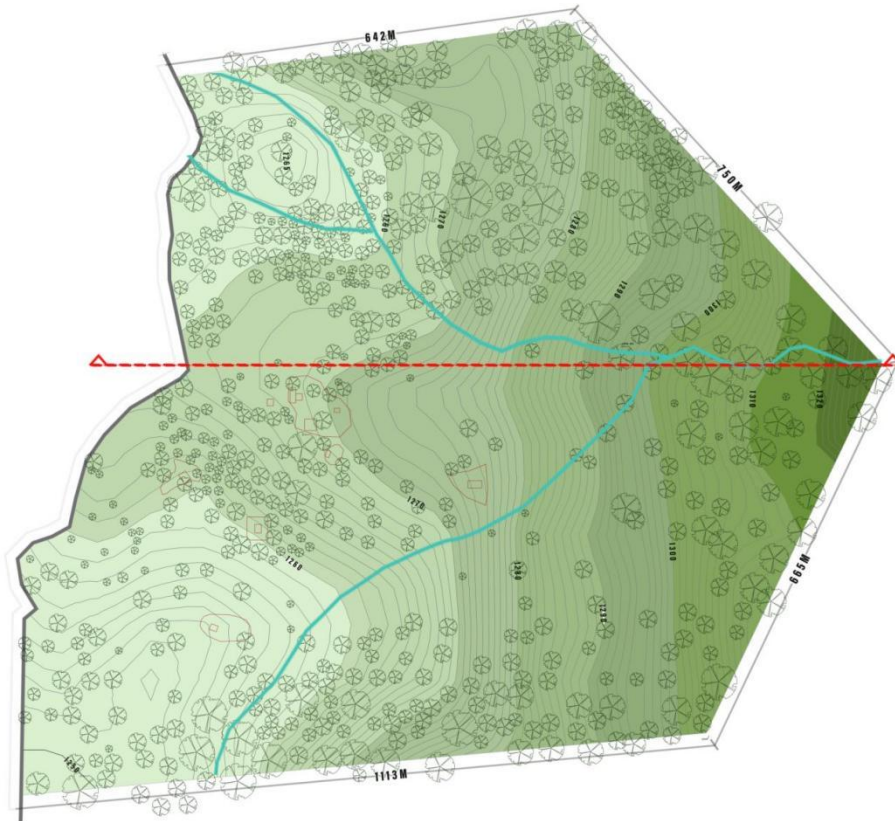


Fig 7.7 : Contour map

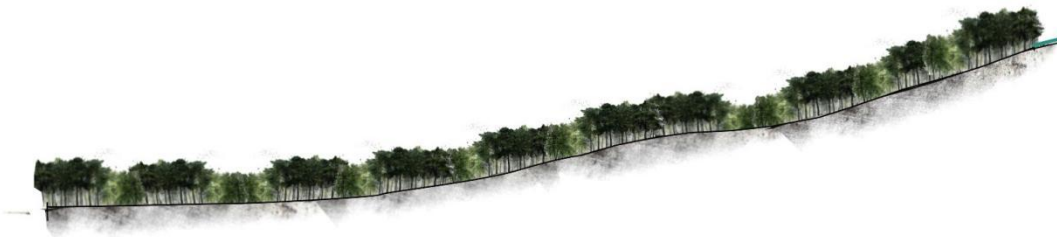


Fig 7.8 : site section

SLOPE :

Large animals find it hard to navigate steep slopes due to their size, making balance difficult and raising injury risks. Their high center of gravity and muscle structure aren't ideal for precise movements on steep terrain, limiting their control.

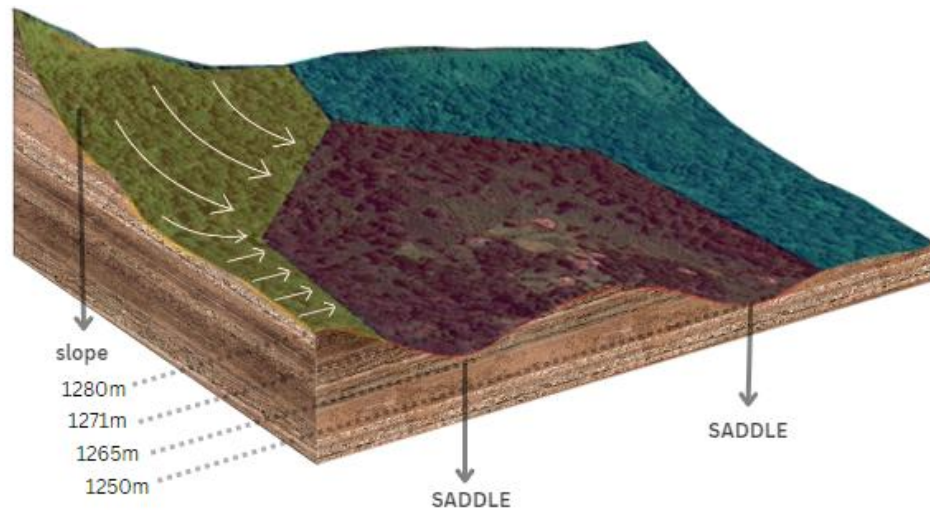


Fig 7.9 : Site Slope

7.6 CATCHMENT ZONE :

Just 3 kilometers away from the site lies a water body, serving as the catchment zone for the surrounding area. This body of water, perhaps a meandering river, plays a crucial role in collecting and storing rainwater that falls within its catchment area.

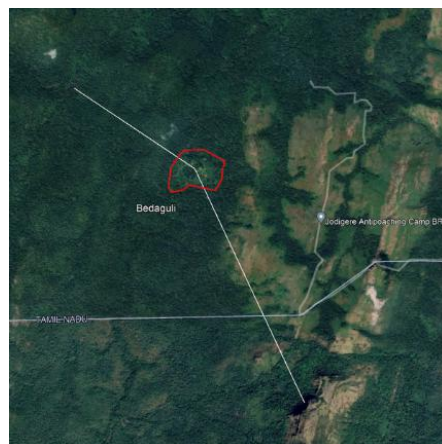


Fig 7.10 : Catchment Zone

7.7 NEARBY HAMLETS :

Near the site, nestled within the surrounding landscape, lie 6 to 8 hamlets, each with its own unique charm and character.



Fig 7.11 : Neighbouring hamlet

7.8 VEGETATION :

Vegetation can act as a boundary in many ways! Depending on the context, it can be a physical barrier, an ecological separator, or even a symbolic dividing line.

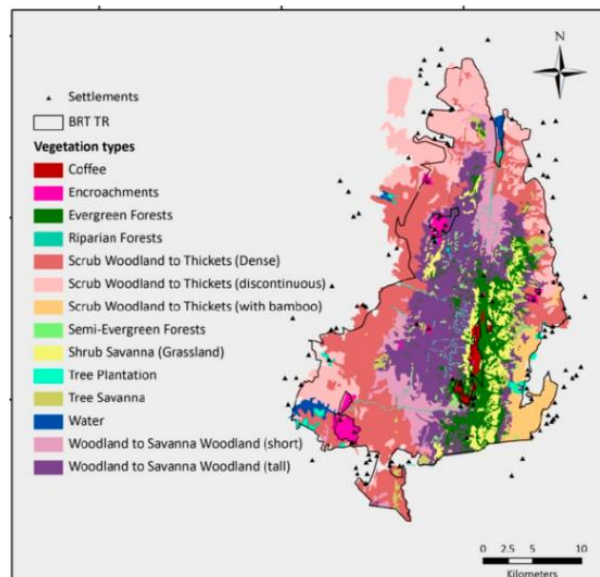


Fig 7.12 : Vegetation Map

Host	Family	Local name	Part used	Host	Family	Local name	Part used
<i>Acacia catechu</i> WILD	Fabaceae	Kaggali	Leaves, bark, gum	<i>Acalypha indica</i> L.	Euphorbiaceae	Kuppi	Leaves
<i>Aegle marmelos</i> L. Corr	Rutaceae	Bael patre/belwa	Leaves, fruit	<i>Achyranthes aspera</i> L.	Amaranthaceae	Uttarani	Whole plant
<i>Alangium salifolium</i> (L.F) WANG	Alangiaceae	Ankola	Leaves, fruit, root	<i>Acorus calamus</i> L.	Acoraceae	Baje	Rhizome, root
<i>Adirachna indica</i> A Juss	Meliaceae	Bevu	Leaves, bark	<i>Aerva lanata</i> R.USS	Amaranthaceae	Himilika	Whole plant
<i>Careya arborea</i> ROXB	Lecythidaceae	Delli	Leaves	<i>Aloe vera</i> (L) Burm.f	Aloaceae	Loisara	Leaves, pulp, leaf juice
<i>Cassia fistula</i> L.	Caesalpinaceae	Kakke	Leaves, bark	<i>Alternanthera sessilis</i> (L) R.Be	Amaranthaceae	Honagone	Whole plant
<i>Citrus medica</i> L.	Rutaceae	Madaia	Leaves, fruit, seeds, pulp	<i>Amaranthus dubius</i> Mart	Amaranthaceae	Dantu	Leaves, flower, stem
<i>Couroupita guianensis</i> Aubl	Lecythidaceae	Lingada	Leaves, fruit	<i>Andropogon paniculata</i> (Burm f) Wall	Acanthaceae	Nela bevu	Leaves, stem
<i>Elaeocarpus ganitrus</i> Roxb	Elaeocarpaceae	Rudrasksha	Leaves, fruit, bark	<i>Asparagus racemosus</i> Willd	Liliaceae	Shatavari	Whole plant
<i>Emblia officinalis</i> L.	Euphorbiaceae	Bettada nellikai	Leaves, fruit, seeds, roots, bark, flower	<i>Bacopa monnieri</i> (L) Pennell	Plumbaginaceae	Neeru brahmi	Whole plant
<i>Ficus racemosa</i> L.	Moraceae	Atti	Leaves, fruit, root, bark, latex	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Komme	Leaves, roots, seeds
<i>Ficus religiosa</i> L.	Moraceae	Arali	Bark	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Gandukalinga	Leaves, rhizome
<i>Ficus Benghalensis</i> L.	Moraceae	Aalada	Bark, aerial root, tender leaf	<i>Cassia tora</i> L.	Caesalpinaceae	Chagathe gida	Leaves, seeds
<i>Gymnosporia montana</i> (Roth) Beuth	Celastraceae	Kankada	Leaves, roots	<i>Chlorophytum laxum</i> R.Br	Liliaceae	Bicheni grass	Leaves, roots
<i>Helicteres isora</i> L.	Sterculiaceae	Peda muri	Fruits, Bark, roots,	<i>Centella asiatica</i> (L) Urban	Apiaceae	Ondelaga	Whole plant
				<i>Cissampelos pareira</i> L.	Menispermaceae	Kodupalli/ pareira bevu	Leaves, seed, bark, root
				<i>Cleome viscosa</i> L.	Cleomaceae	Kadu sasive	Leaves, seeds

Fig 7.13 : List of Trees



Fig 7.14 : Vegetation in the site

THREAT:

The problem with *lantana camara* is that it kills native species of plants on which herbivores thrive. These herbivores do not consume *lantana* because of certain chemical properties in it which has led to man-animal conflict.

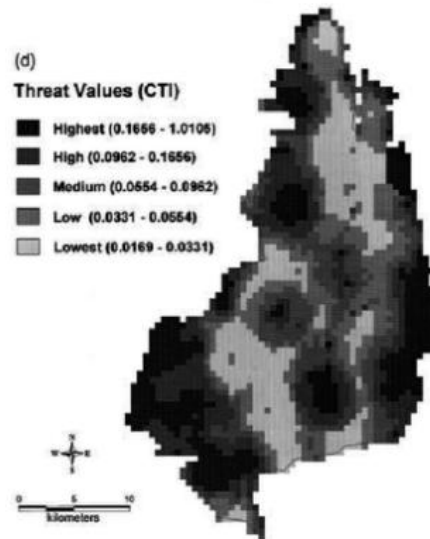


Fig 7.15 : Lantana Map

7.9 WILDLIFE SPOTTING :

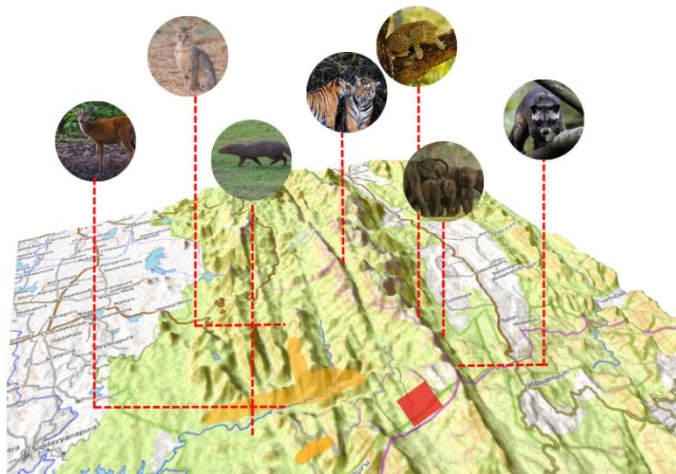


Fig 7.16 : Wildlife sighting location

7.10 FACILITY :

B.R.Hills rural tourism is very famous in attracting the visitors and increasing the visitors year by year. Being the most enchanting religious place, the study area records that there is no good infrastructural condition and visitors are not interesting in staying at this place.

Parking vehicles at B.R Hills is one of the major issues created by the increasing vehicles and the road traffic. The availability of parking space is a tough task in any tourist places. In rural tourism, places for parking is charged very less compared to other tourists places, because this place is sustainable movement of developing also. Here in this hill the parking place is not very well maintained and no security for vehicles.

In spite of having the faults, the B.R Hills maintenance faculties are tried hard to give the best possible and minimum facilities such as the police station for security purpose for visitors and food serving small hotels, free use of toilet rooms and bathrooms and two hospitals. The study area also identified few costly resorts and lodges for visitors around the nearby place.

Parking facilities and entry charges in B.R.Hills

Vehicle	charges
Two-wheeler	10/- Rupees
Jeep/car	25/- Rupees
Tempo	30/- Rupees
Bus/mini bus	50/- Rupees

Facilities in B.R.Hills

Police station	1
Hotel	5
Check post	2
Toilet/bath rooms	2
Hospital	2
Lodges/resorts	8

Flow of visitors in B.R. Hills

Years	No of visitors
2011	724349
2012	949876
2013	927037
2014	1259092
2015	1334910
2016	5600725
2017	4568571
2018	4494731

Source: district tourism department

7.12 ROADS :

Transportation to B.R Hills is at very good condition of pucca roads. The road for hill station is very narrow and its width of road is seven meters. The distance between Yelandur to B.R Hills is 25 Km and there is sufficient bus facility is provided to B.R hills. On special days and on special occasions there is special bus availability and there is no permanent bus stand in study area.



Fig 7.18 : Roads in BR Hills

7.13 SOLID WASTE MANAGEMENT :

Solid waste management are controlled and instructed to avoid solid wastes. All the places around are cleanly maintained to balance eco system and cleanliness of the place. To avoid and control of waste products there are check post to dump wastes. Here very few amount of solid waste are found at this area. After collection of solid wastes they dump and burn it at pits only.



Fig 7.19 : SOLID WASTE MANAGEMENT

AREA STATEMENT

AREA STATEMENT				
SPACE	TOTAL UNIT	PERSON PER UNIT	SQM PER UNIT	TOTAL AREA
PRIVATE SPACES				
Dorm	8	6	150	1200
Bedroom				45
Dinning				24
Toilet				3
Cacoon stay	8	2	130	760
Bedroom				16
living				31
Dinning				21
Toilet				7
Tribal home	9		75	900
Bedroom	2			16
kitchen				10
living				16
Dinning				10
Toilet	2			3
PUBLIC SPACES				
Work shop	1		372	672
Reception	2		600	1200
Tribal dinning (with kitchen)	1		446	446
kitchen				84
Dinning				223
Additional				139
Activity area	2		240	480
tribal market	8		80	640
Play Area	1		650	650
PARKING	108		13824	13824
SPA	3		50	230
Garden				flexible space
Bamboo Garden				8419 sq.m
	CIRCULATION	1500 - 2600 sq.m		10419 sq.m

ARCHITECTURAL DESIGN

7.14 TOURIST ATTRACTION IN BR HILLS :

BR Hills offers a perfect blend of natural beauty, adventure, spirituality, and cultural immersion, making it a must-visit destination for travelers seeking an authentic and enriching experience.



7.11 WATER SUPPLY :

Water supply has a long depressing story at Hill stations. Whereas drinking water facility seems to be very sufficient at this place. Water outlets like bore wells and water tanks are situated at the top side of the hill station which is maintained by the temple administration committees. They even take the responsibility of generating the bore systems in lifting water from underground waterbed to tanks which help in providing drinking water facility to visitors. At present, B.R Hills is having 4 Stand tanks and 6 of 1000 liters tanks.



Fig 7.17 : Water source

7.12 DRAINAGE SYSTEM :

Drainage system for waste water at the hill station is maintained properly. The proper delivering of sewage water from one place to drainage easily during rainy season, the hill stations can be seen with drainage constructed to flowing to down wastewater.

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