

**LANDSCAPE DEVELOPMENT FOR BISWA BANGLA
VISHWAVIDYALAYA,
Bolpur, Birbhum**

**MASTER OF ARCHITECTURE
(LANDSCAPE)**

SAMIRAN MANDAL
2016MLA003



**SCHOOL OF PLANNING AND ARCHITECTURE, BHOPAL
NEELBAD ROAD, BHOURI, BHOPAL - 462030
MAY, 2018**

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Submitted

*In partial fulfillment of the requirements for the
award of the degree of*

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(LANDSCAPE)**

By

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2016MLA003



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MAY, 2018**

Department of Landscape
School of Planning and Architecture, Bhopal



Declaration

I, Samiran Mandal, Scholar No. 2016MLA003, hereby declare that the thesis entitled **Landscape development plan for Biswa Bangla Vishwavidyalaya**, Bolpur, Birbhum, submitted by me in partial fulfillment for the award of Master of Architecture (Landscape), in School of Planning and Architecture Bhopal, India, is a record of bonafide work carried out by me. The matter embodied in this thesis has not been submitted to any other University or Institute for the award of any degree or diploma.

Samiran Mandal

18.05.2018

Certificate

This is to certify that the declaration of Samiran Mandal is true to the best of our knowledge and that the student has worked under the guidance of the following panel.

RECOMMENDED

Asst. Prof. Sonal Tiwari

ACCEPTED

Prof. Sanjeev Singh
Head, Department of Landscape

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Last but not the least; I would like to express my deep respect to all my family members for good wishes, blessings and mental and financial support without which it would have been difficult task for me to complete the project successfully.

Samiran Mandal

18th May, 2018

Abstract

This thesis aims to develop a university campus plan to create a regional model of planning, design and environmental stewardship in response to the intrinsic character of **Santiniketan** where the users will experience the charm and beauty of rural environment in integration to the concept of a modern campus.

An institutional campus is a place for thousands of students, faculties and co-worker where students spent 1/3rd of their lifetime. The faculties and co-workers are associate with it till age of 60 or more and may as well call it as their 2nd home.

Almost in every institution in India, classes are held within the boundary of four walls on a routine basis. This may be associated with various issues like physical and behavioral issues, mental fatigue and depressive or bipolar episodes. Researchers like 'Kaplan & Kaplan' has proved that exposure in natural environment, wilderness experience can uplift people peoples mode and enhance their ability to mental focus.

This study will attempt to uncover all the planning aspect of an ideal campus through various literature and case studies. It will also try to explain the concept of campus planning, landscape character and environmental stewardship of **Tagore's (Rabindranath Tagore) 'Visva Bharti'** university through the analysis of different **spaces, forms and functions**. This will also incorporate the different **values** of landscape which will be implemented or act as a guidelines for the development of the new **Biswa Bangla Vishwavidyalaya** (University).

The study will be summed up as **comprehensive landscape development plan** with a well-defined and aesthetically suitable outdoor environment for interaction and rejuvenation of the users on physical, mental and spiritual grounds.

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CHAPTER 1: INTRODUCTION

1.1 Background

'Uni-versity' means "one including all", a single, unified community of individuals of different experience living, working and studying together to assimilate knowledge, improve skills and developed character (Kanvinde 1969). A university campus has been compared to a city on a small scale because it provides most of the needs for the university community. Unlike a city however, the university is noncommercial and primarily a space for study. The campus therefore, ought to be a unified cluster of buildings with the integration of interactive open space providing a unique environment for living and studying. It should ideally be a quiet, comfortable oasis apart from normally busy, noisy, congested world. In this sense a campus should be a residential suburb or park than a city. An ideal university campus should not be isolate from its surrounds and it should consider the natural setting.

"A campus is the mirror of a college or university's soul, reflecting its history, its culture and image, its management style, and even its future. It tells all who visit it how it thinks about itself and the way it expects others to judge it (Colorado n.d.)."

Santiniketan is a famous place in West Bengal for **Visva Bharti University**, established in 1921 by Nobel laureate poet Rabindranath Tagore in the calm and chaos free natural environment. The *robust and inclusive* character of the campus offers an extraordinary space for study which increases the quality of life of the daily users. Tagore's ideology of teaching: **"go beyond the confines of the classroom"** also strikes the entire world (Pal 2016). Rabindranath Tagore conceived 'Visva Bharti' as a center **"for communion of the world with India"**.

But due to some ignorance and degradation in quality of Visva Bharti University's educational system (article 2017), the West Bengal government announced to propose another University where the design will be based on Rabindranath's art form and ideology as prevailing in the Visva Bharti University (Hindu 2017).

This thesis aims to develop a university campus plan to create a regional model of planning, design and environmental stewardship in response to the intrinsic character of **Santiniketan**, where the users will experience the charm and beauty of rural environment in integration to the concept of the modern campus.

1.1.1 Need of the study

A campus university is comprised of the four elements: **students, faculties, physical facilities as well as the academic programme.**

The quality of education is interdependent among the quality of campus environment (physical facilities), the quality of the educational experience and ultimately the quality of the graduate.

It is obvious that the quality of academic content is most important, but it depends on the quality of the **social-living-work-study** environment of a college or university campus (Kanvinde 1969).

Indian campus planning and design have only been here for 30-40 years. After independence in India, providing educational facilities and awareness generation of education for everyone was the only focus. The arrangement of class rooms, teachers and residents hall was enough for an educational campus. The campus planning history might not be good for India but from the ancient time, the teaching methodology was so unique in the form of '**Tapoban & Gurukul**' where students could learn the bookish knowledge as well from the nature. They used to live in the nature instead of bringing the nature into a boundary of four walls. Many educational campuses have been erected after independence to compete globally. Rapid changes have come in the educational system by adopting new methodology & technology and also the effect of urbanization has moved away the students from nature.

In India, there are 642 universities, 34908 colleges and 11356 standalone institutes. They enroll 28.56 million students annually and the no. may increase in recent years. The teacher-student ratio is 25.6 (AISHE 2011-12). A huge no of people are associated with the institutions and spent their lives there.

So the **quality of an educational campus environment** is equally important along with the academic content for the future of India. Here, **finding out the suitable relationship between nature & built structures with the users in the context of urban growth** where crisis of spaces is one of the major objective of the study.

1.1.2 Intention of the study

The intent of selecting this project is to explore the regional as well the micro level study simultaneously. The regional level study will analyse the subtle landscape character of the study area to response its context.

The main objective is to generate a regional model of planning and design and to offer an environmental stewardship.

However, at the micro-level, importance will be given to the programmatic layout of the campus by providing lively cum interactive open spaces and also special attention towards users and their experiential value.

For the campus planning process, **participation of users** is very much important. Earlier the process was only between the developer and the architect. But incorporation of users view in campus master planning will justify the campus open spaces.

Earlier landscape spaces were treated as a leftover in campus design and also in other projects. The main focus was to place the buildings with limited attention to the surroundings. So integrating the open spaces and built form with surroundings with respect to users need is the main challenge.

1.2 Thesis formulation

1.2.1 Aim and Objectives

Aim: Develop a campus master plan in continuation of Tagore's Visva Bharti by responding to the intrinsic character Santiniketan and with the Tagore's ideology of learning (Visva Bharti).

Objectives:

- To understand the concerns in campus planning and design.
- Generate a design language to respond sensitively to the site and its surrounding while planning the campus.
- To understand the Philosophy and design language of Visva Bharti University, Santiniketan.
- To propose a **comprehensive sustainable landscape design proposal** through creating well defined functional as well as aesthetically suitable outdoor environment.

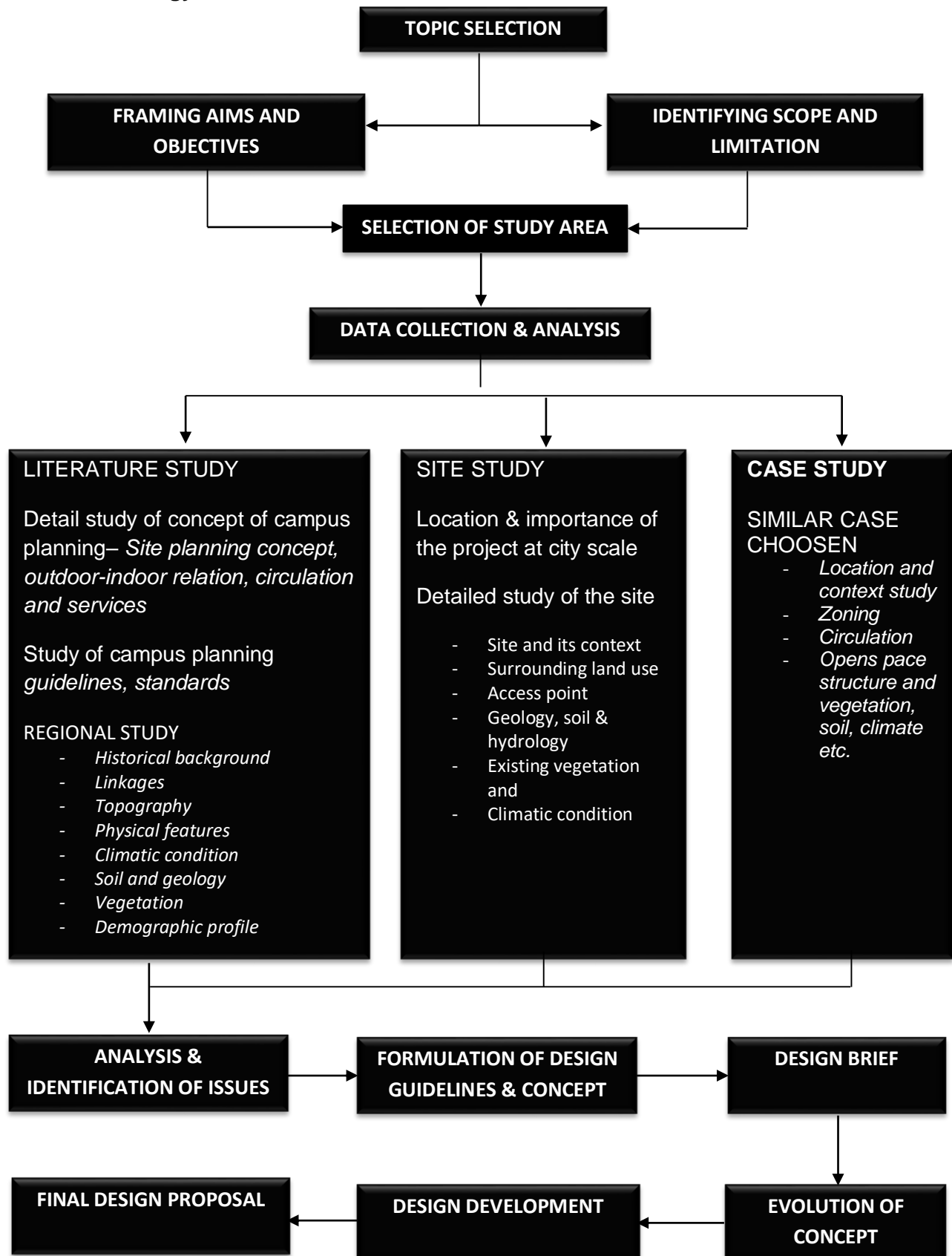
1.2.2 Scope

- Landscape character assessment of Visva Bharti University, Santiniketan to generate design language.
- To prepare a program of outdoor spaces.
- Deal with zoning, site planning, and building cluster etc.
- Development of a best suited landscape proposal and it's all supporting layers.

1.2.3 Outcomes

- Identification of issues and concerns in the proposed campus.
- Landscape Master plan of Viswa Bangla University.
- Detailing of Proto type area.
- New and modern benchmark in respect of campus design which will be become a guiding principles.
-

1.2.4 Methodology



CHAPTER 2. SITE ANALYSIS

2.1 Location

The site of the proposed Biswa Bangla University, Birbhum is situated 3.5 kilometer away from Bolpur railway station and 6.5 kilometer away from Visva Bharti University adjacent to WEBEL, IT Park.



Figure 2 Map of India showing the state of West Bengal



Figure 1 Map of West Bengal showing the district Birbhum

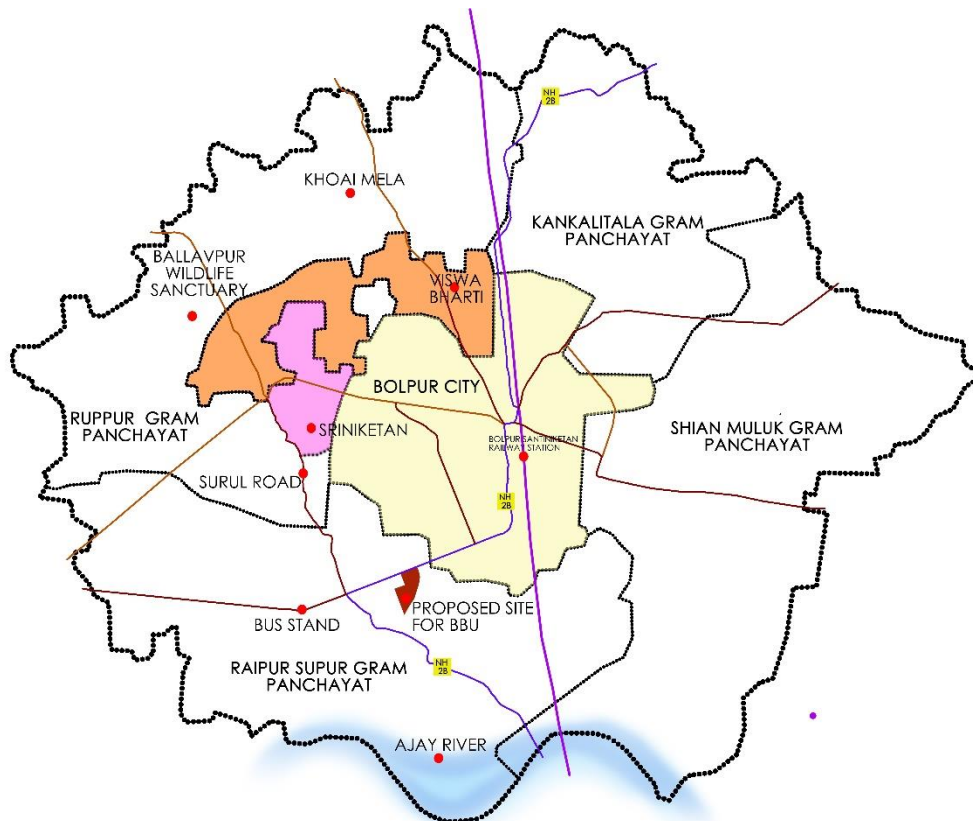


Figure 3 Map of Sriniketan-Santiniketan Planning area

2.2 Site Description

The area of proposed Biswa Bangla University site is 33.5 acres. The site has a visibly gentle slope towards the NH2B road. The highest elevation is 47.5m and the lowest elevation is 43.5m. The land was previously used as farm land so there is no vegetation present. Presence of red soil is also observed.



Site from NH2B towards south



In side site to NH2B



Site from WEBEL towards east



Flat land- no vegetation cover



Depression found inside



Red soil

2.3 Site surroundings

The site is surrounded by agricultural land. Some sparsely developed settlement is situated around the site. The major development is coming up as the Geeta Bitan Housing complex in front of the proposed site. The region is connected by NH2B road. The nearest railway station is Bolpur which is about 3.5 kilometer away and Suratheshwar Sib Mandir is the nearby Bus Stop.



1 WEBEL Building



2 Front- adjacent NH2B, Drain



3 West side- Farm Land



4 East side- Settlement



5 NH2B Road- 8.5 m ROW



6 North-east side farm land



7 Back side- Canal & Farm land



8 North-east side nala- bridge



9 East side farm land

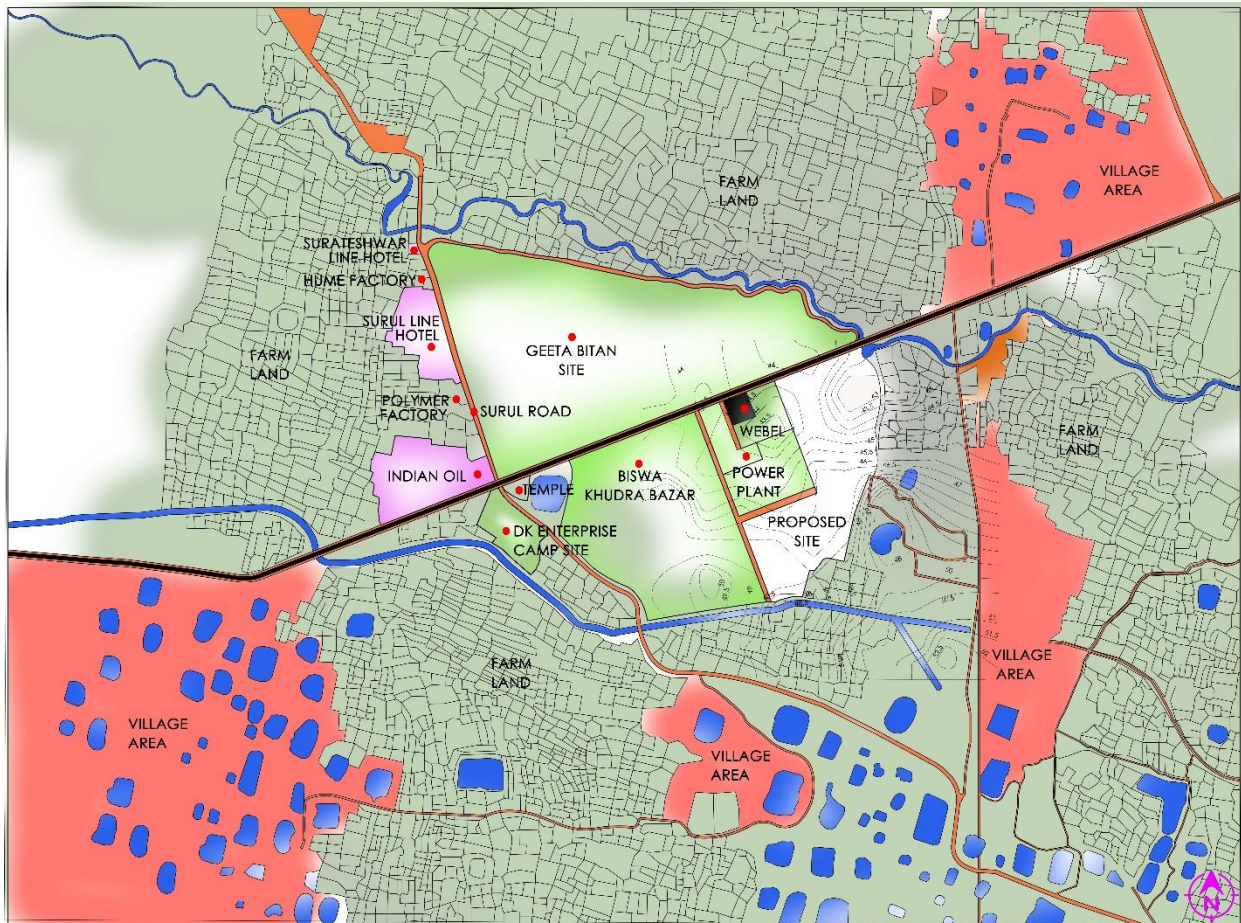


Figure 4 surrounding land use of the proposed site

2.4 Land use

The site is permitted for construction of residential structures by Sriniketan Santiniketan Development Authority as per 2025- Proposed Land use Map.

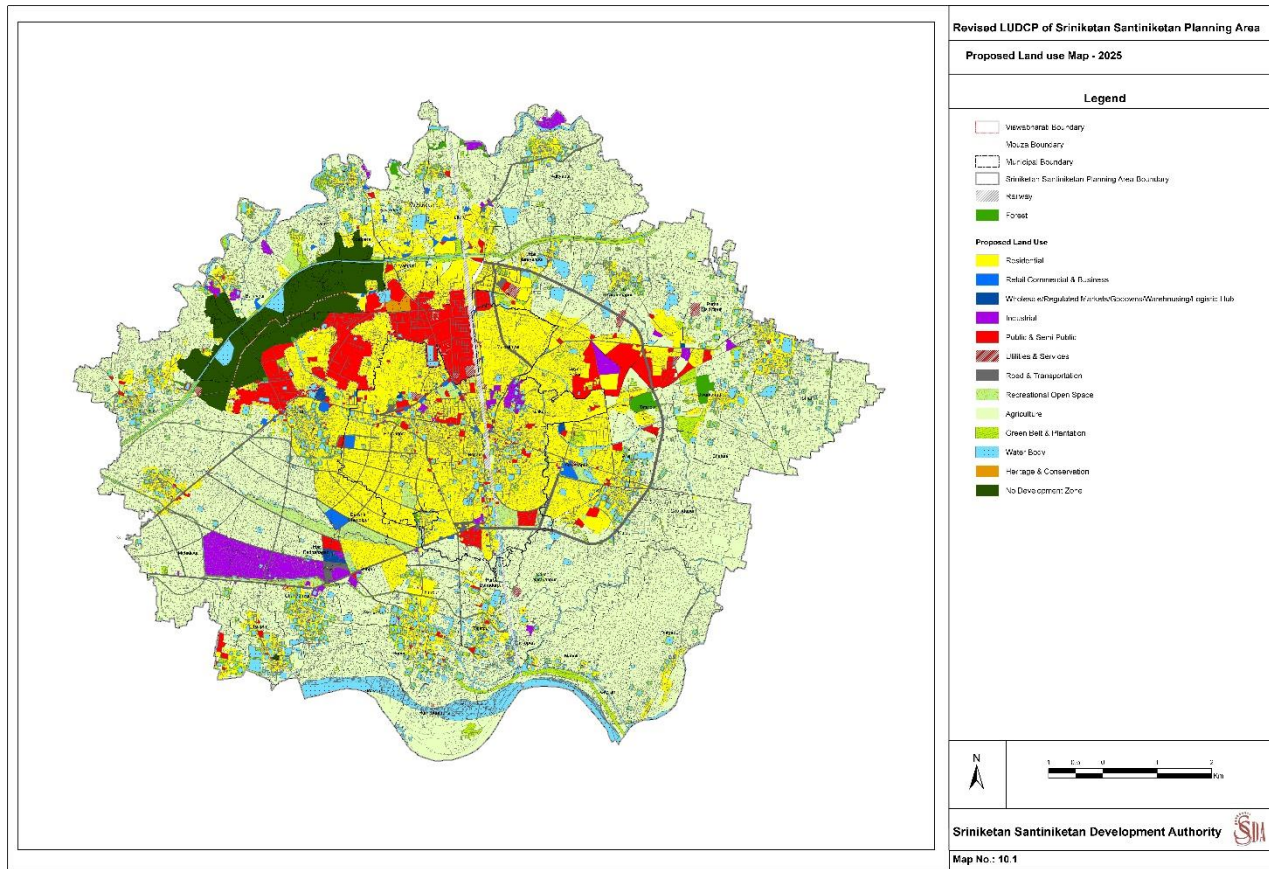


Figure 5 Revised LUDCP Sriniketan-Santiniketan Planning area, Birbhum

2.5 Physical Features

2.5.1 Topography

- The site is generally flat with a mild slope towards north and the highest elevation is 47.5m and the lowest elevation is 43m.
- The site is allocated on the 8.5m width front road (NH2B).

2.5.2 Soil

The Red and laterite soil are light textured, porous, gravelled, with poor inorganic matter, including phosphate and bases. The PH of this soil is acidic in nature varying from 4.8 to 6.0. The water holding capacity is very poor and porous in nature so soil erosion is high.

2.5.3 Hydrology

The hydrological system is based on two sub-watershed of Ajay and Kopai River. The Ajay River divides two districts named Bardhaman and Birbhum.

The source of water is from groundwater through deep tube wells and a project name **Indo-German water supply project**, in association with Bolpur Municipality and Bolpur Sriniketan Panchayat Samiti for residential & academic use is present.

The under-ground water table is good due to heavy rainfall averaging at 1287 mm (78% of total rainfall occurs within the monsoon month of June to Sept.) of the district per year. Water level is available at a depth of less than 30m as per Bhuvan Map and 3m-7m as per SSDA.

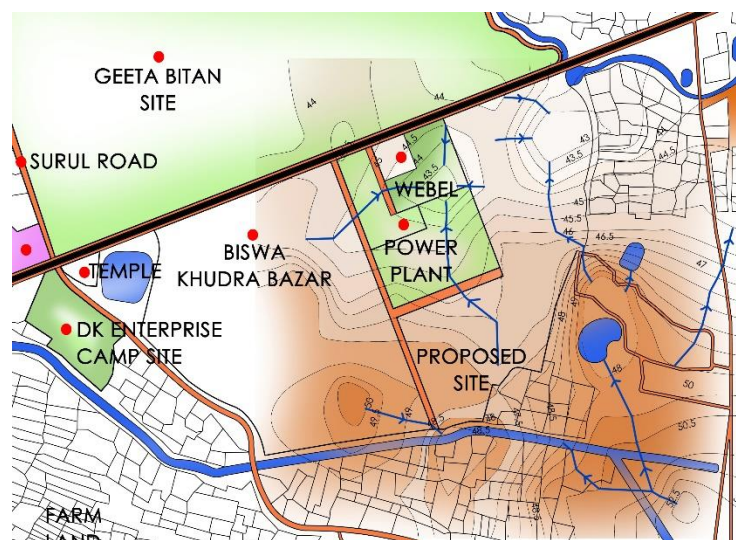
2.5.4 Drainage

The site has gentle slope and it is towards the NH2B (north side). A proposal of drain is there in front of the proposed site to carry its water further to the Ajay River.

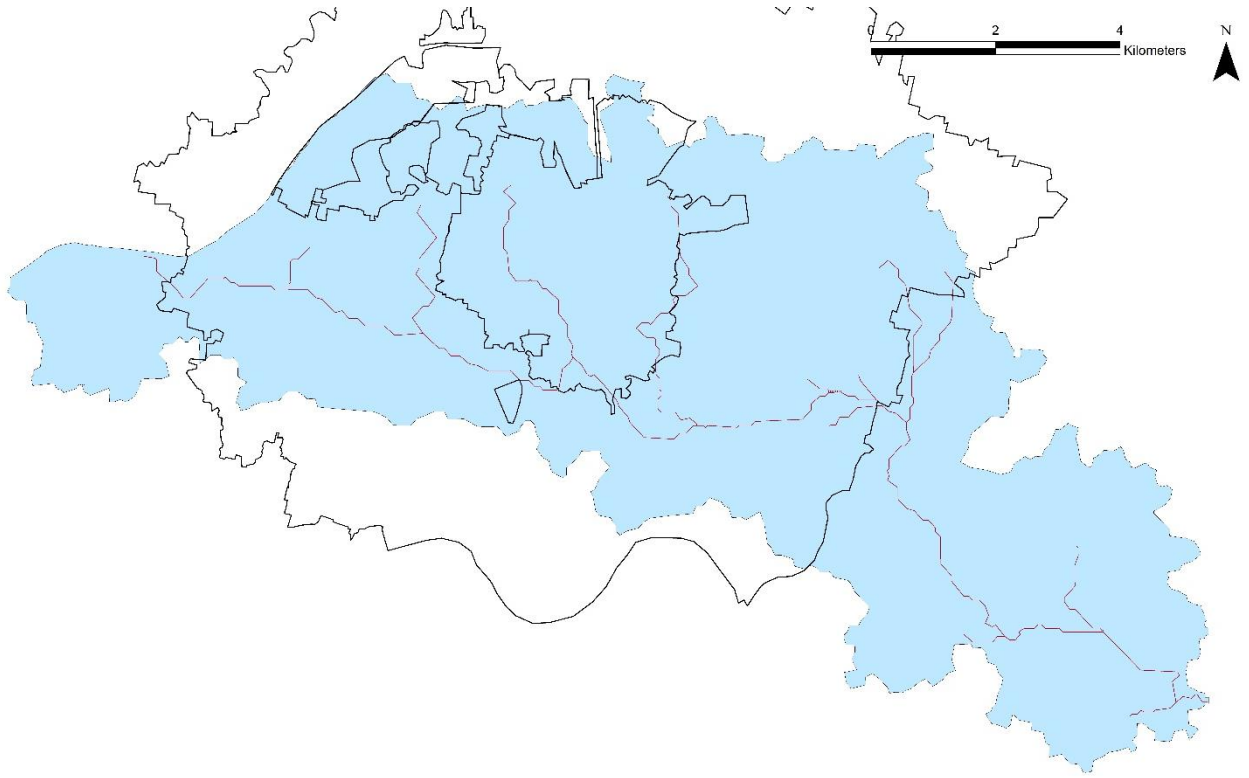
The soil has the tendency of eroding. Precautions are necessary.



Open drain adjacent to the proposed



Hydrology: Natural drainage pattern shown the direction of water flow



The watershed figure showing that one main stream is flowing in front the proposed site which is connecting with the Ajay River ahead. So the proposal of drains will be so as per slope to allow water to flow under gravity and with proper management of water.

2.5.5 Vegetation

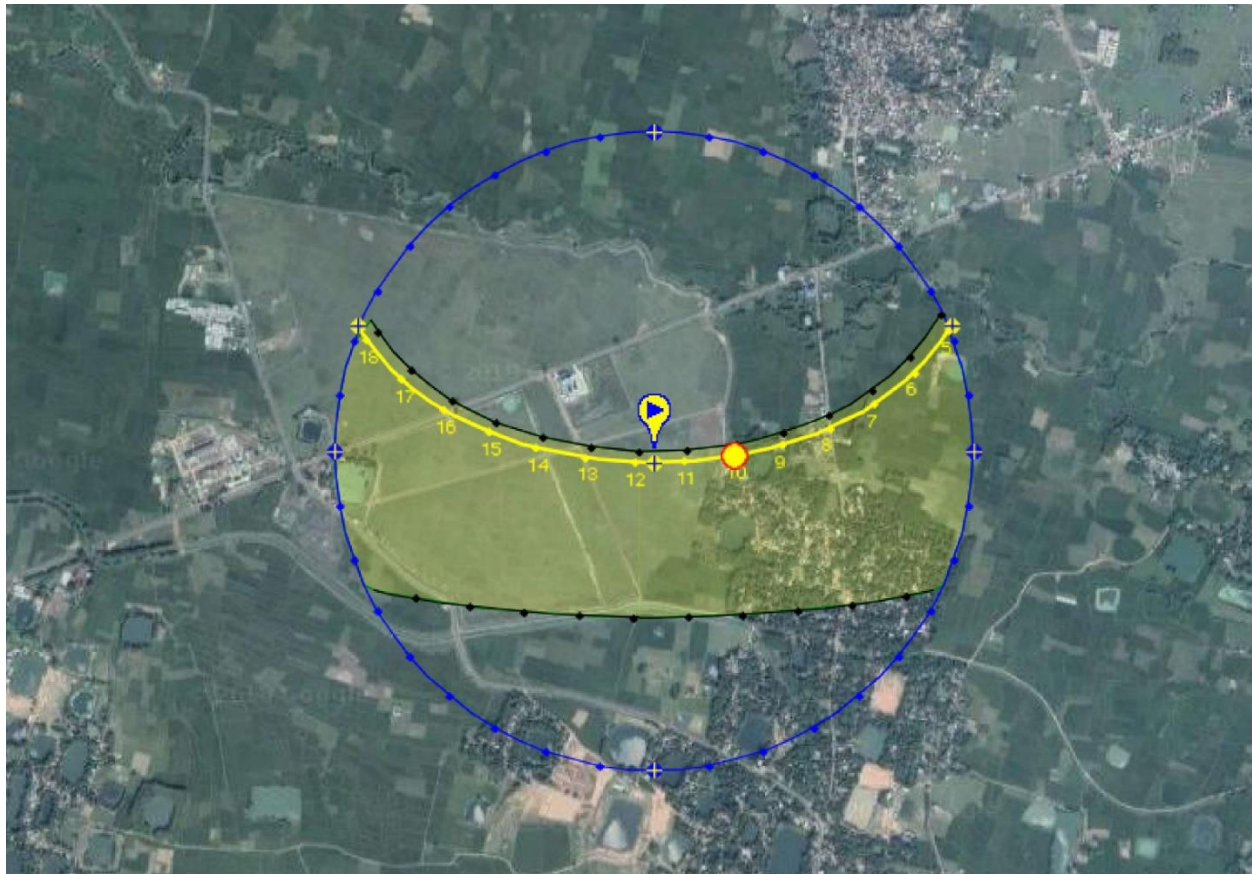
Previously the site was used as farm land and so there is no vegetation present. No plant has been cut. One medium size plant of *Acacia nilotica* could be seen in the north side along NH2B road. It is one the native species of the study area.



Photo: Panoramic view of the site showing no vegetation cover

2.6 Micro-Climate

2.6.1 Shadow analysis



Summer Sun Analysis:



22 May 4 pm



SUMMER SUN

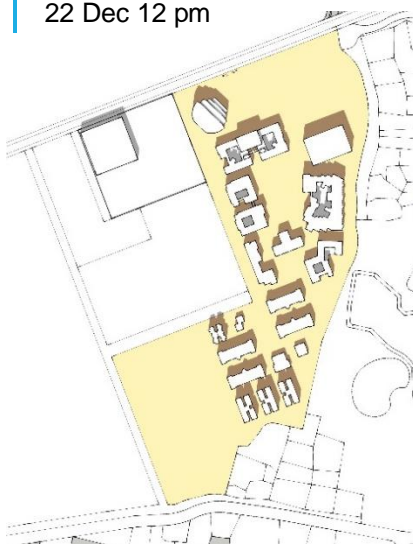
- Higher sun position compare to winter sun.
- Direct summer sun on ground and building surface will increase heat gain which will increase the conventional energy demand.
- Strategic planting require to mitigate the negative effect of summer sun.
- Ever green tree should propose to undesirable summer sun.

Winter Sun Analysis:

22 Dec 10 am



22 Dec 12 pm



22 Dec 02 pm



22 Dec 04 pm

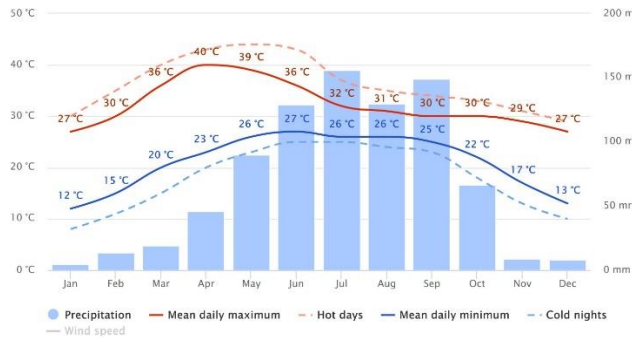


WINTER SUN

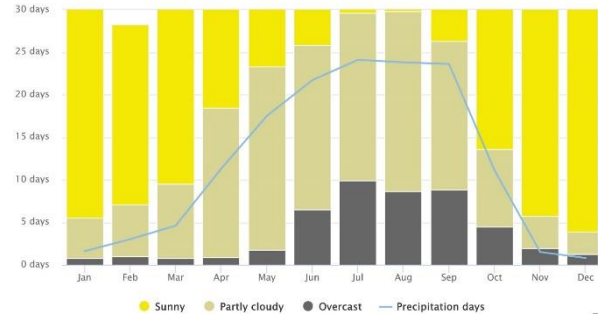
- Lower sun position compare to summer sun.
- Strategic planting require to allow winter sun.
- Deciduous tree should propose welcome winter sun which will reduce the conventional energy demand for building (e.g heater).

2.6.2 Wind analysis

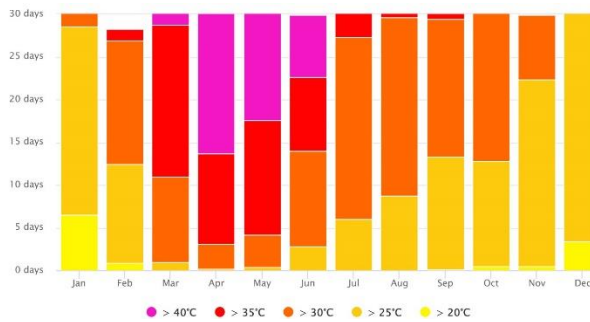
Average Temperatures and Precipitation:



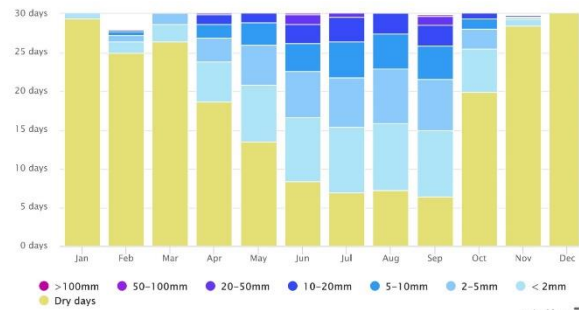
Cloudy, Sunny, Precipitation Days:



Maximum Temperatures:



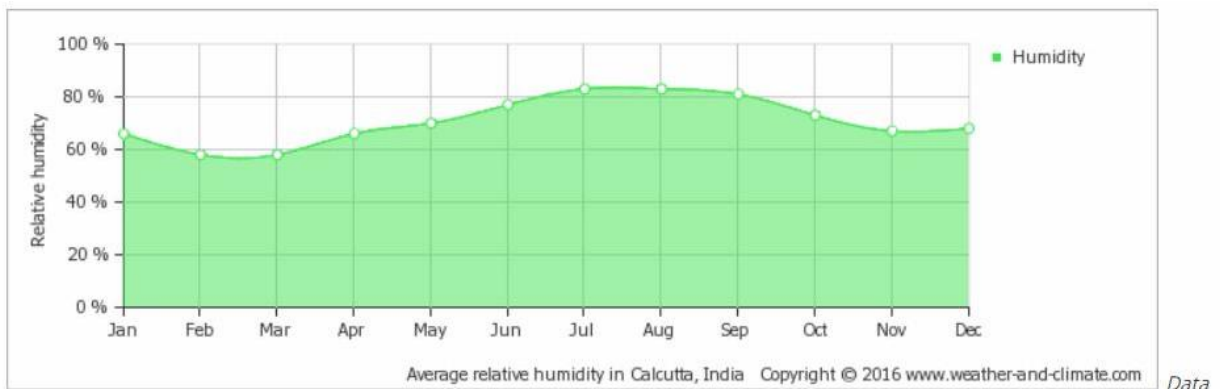
Precipitation amounts:



Average Humidity in Bolpur:

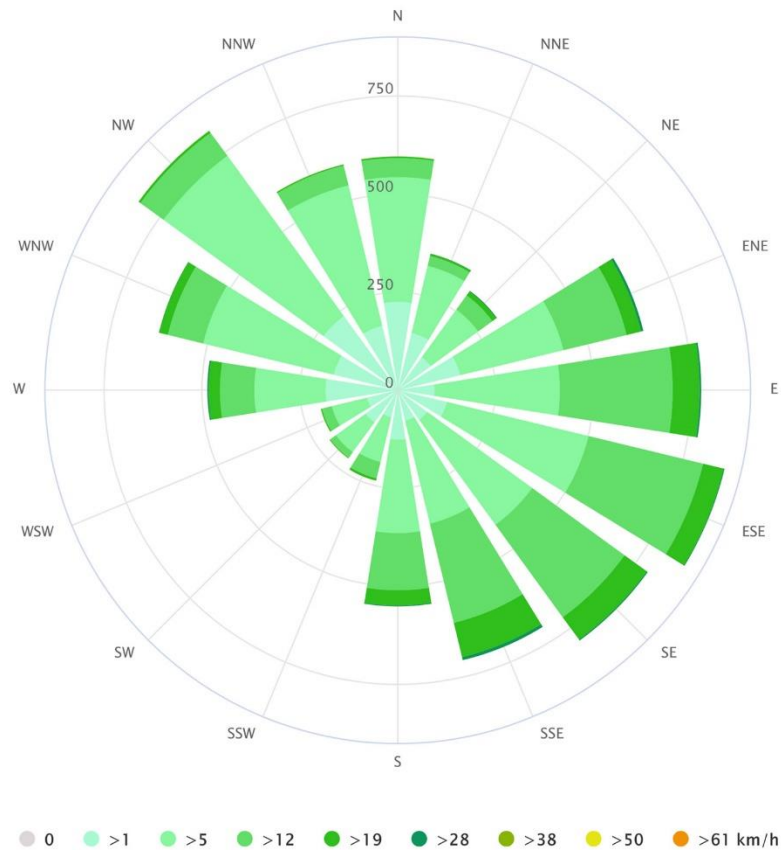
- On an average July is the most humid.
- On an average, March is the least humid months.
- The average annual percentage of humidity is 71.0%.

The mean monthly relative humidity over the year in Bolpur, India



Source: Weather station Kolkata, India (136.3KM).

Wind Rose:



THE SITE AT A GLANCE

Location: Bolpur, Birbhum, West Bengal

Site surroundings: Residential, Institutional, Commercial and industrial use

Connectivity: The region is connected with NH2B road, Bolpur is nearest railway station

Land use: Residential land as marked by SSDA

Topography: Gently sloped towards NH2B (North side)

Hydrology: Major rivers are Ajay & Kopai. Under ground water table is less than 30m

Soil: Red and laterite soil

Vegetation: No existing vegetation

CHAPTER 3. REGIONAL STUDY: BRIEF HISTORY OF SRINIKETAN-SANTINIKETAN PLANNING AREA

Birbhum is the northern most district of Burdwan Division. It lies between 23°32'00"N to 24°35,00,N Latitude and 87°05'25"e to 88°01'40"e Longitude. The shape of the district looks like an isosceles triangle.

3.1 Historic Background

The beginning of Sriniketan-Santiniketan planning area (SSPA) dates back to 1850s when Bolpur, the core of SSPA, was a small village (presently a town of Birbhum district of West Bengal). After the proposal of Sahibgunj Loop Line of Eastern Railway in 1859, the main phenomenon for development of Bolpur and the area around was chalked out.

Later, in 1863, the current Santiniketan at Bolpur previously known as Bhubandanga named after Bhuban Sinha, was leased to Maharshi Debendranath Tagore, who found it very peaceful and named it as Shantiniketan, which means abode (*niketan*) of peace (*shanti*). Here, the journey of an experimental school to Tagore's Visva Bharti was started many years ago. By 1951, it had become one of India's central universities and became internationally famous over the time.

3.2 Demographics

Bolpur – Sriniketan CDB is an administrative division in Bolpur Subdivision of Birbhum district. It has an area of 333.92 Sq. km. and population of 282763. The Block consists of 169 villages distributed over 9 GPs namely Bahiri-Panchosowa, Kankalitala, Kasba, Raipur Supur, Ruppur, Sarpalehanna-Albandha, Sattore, Shian-Muluk & Singhee; a municipality: Bolpur Municipality and a census town, Surul, falling under Ruppur GP (SSPA 2016).

SSPA comprises of 44 Mouzas and it is under the jurisdiction of Bolpur Police Station. It has an area of 106.43 Sq.km. The below table outlines major demographic facts and figures associated with SSPA.

SSPA–Demographics 2001 and 2011						
Year	Bolpur Municipality	Ruppur GP	Kankalitala GP	Raipur Supur GP	Shian Muluk GP	SSPA (Total)
1961	23335	8510	3762	11305	6329	53241
1971	38436	14508	5257	14217	9447	81865
1981	38436	14508	5257	14217	9447	81865
1991	52866	18464	6794	16950	12631	107705
2001	65693	22128	8662	19073	15036	130592
2011	80210	27618	9985	20867	18508	157188

Population of SSPA: Source: Census of India 1961- 2011

SSPA–Demographics 2001 and 2011		
Description	Census 2001	Census 2011
Population	130592	157188
Urban Population	65693	92370
Rural Population	64901	64818
Male Population	66168	79184
Female Population	64426	78004
SC Population	32286	38314
ST Population	12178	16007
No. of Households	27926	37197
Avg. Household Size	4.7	4.2

Population of SSPA 2001 & 2011: *Source: Census of India 1961- 2011*

Literacy Rate of SSPA

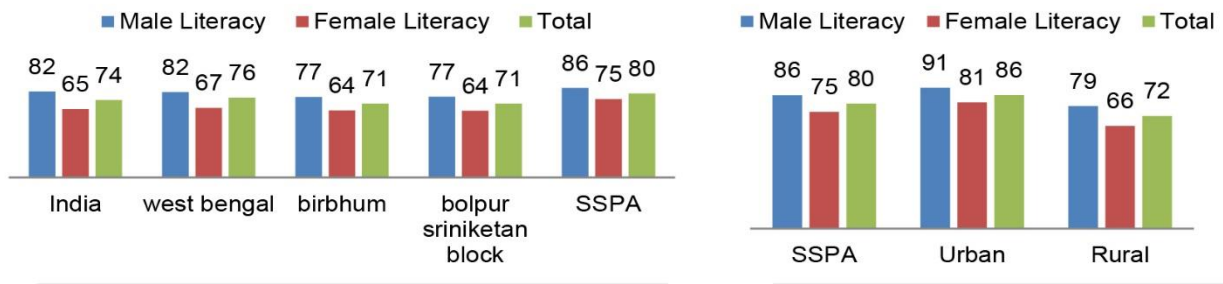


Fig: Comparison of Literacy rate *Source: SSPA report*

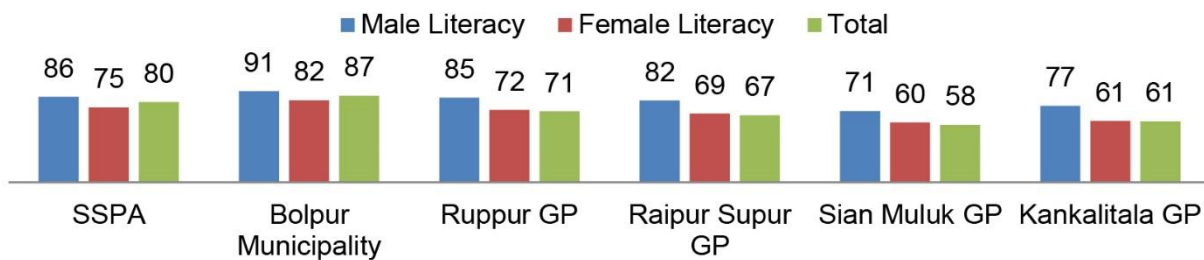


Fig: Literacy rate within SSPA *Source: SSPA report*

3.3 Physical and Geographical Characters of the region

3.3.1 Climate

The climate of Birbhum district is distinguish by heavy **hot summer, high humidity and well distributed rainfall** during the monsoon. **Winter**, from **middle of November to the end of February** is followed by **summer** from **March to May**. The **south west monsoon** remains till **September from June, October and the first half of November** makeup the **post monsoon** season.

The average **annual rainfall** in the district is **1,303.7 mm (51.33 inch)**.The rainfall during the monsoon months of **June to September is about 78 percent of the annual rainfall**.

Temperature begins to rise from the beginning of March and **May is the hottest month** with the mean daily **maximum temperature of 39.7°C** and the mean daily **minimum of 26.3°C**. The maximum temperature could be observed during April to the early part of June, sometimes it rises up to 45°C to 46°C.

This drop in temperatures could observed from middle of November. **January is the coldest month** with mean daily maximum temperature of **25.4°C** and the **mean daily minimum of 12.9°C**. The minimum temperature may goes down to 6°C or 7° C.

Prevailing wind direction: In **Summer:** East/South-East wind and in **winter**– North-West wind.

In the month May and the post monsoon season, storms and depressions from the Bay of Bengal often reach the district and its neighbourhood which offers heavy rain with high winds. Mostly thunderstorms occur in the afternoons of the hot season. Along with it, heavy rains and occasional hail & severe squalls. These thunderstorms are called as “Norwesters” and locally known as *kalbaisakhi*.

3.3.2 Topography

Birbhum is a part of the Rarh region; the soil and landscape is almost similar to Rarh areas of Burdwan, Murshidabad, Midnapur and Bankura. The western part is comprising of Khayarasole, Dubrajpur, Rajnagar, Mahammad Bazar, Suri and Rampurhat. The high lands to the west are located on the hard nonporous crystalline rocks, while the rest is of the Gondwana sediments, die Tertiaries, the laterites and the alluvium. The Gondwanas and the Tertiaries, probably extend below the detrital laterites and the alluvium. These sedimentaries in their turn are underlain by basic lava flows, some outcrops of which are found in the Nalhati thana.

Almost the entire area of the district surface is broken by a series of undulations, the general trend of which is from north-west to south-east. Near the western boundary they rise into high ridges capped by laterites and are separated by valleys, a mile or more width. These ridges are actually spurs but appear like sea-cliffs. To the south east these upland ridges and their ramifications disappear gradually and the valleys become shallow, and gradually merge into the broad alluvial plains of the Gangetic delta (Asanta 2010).

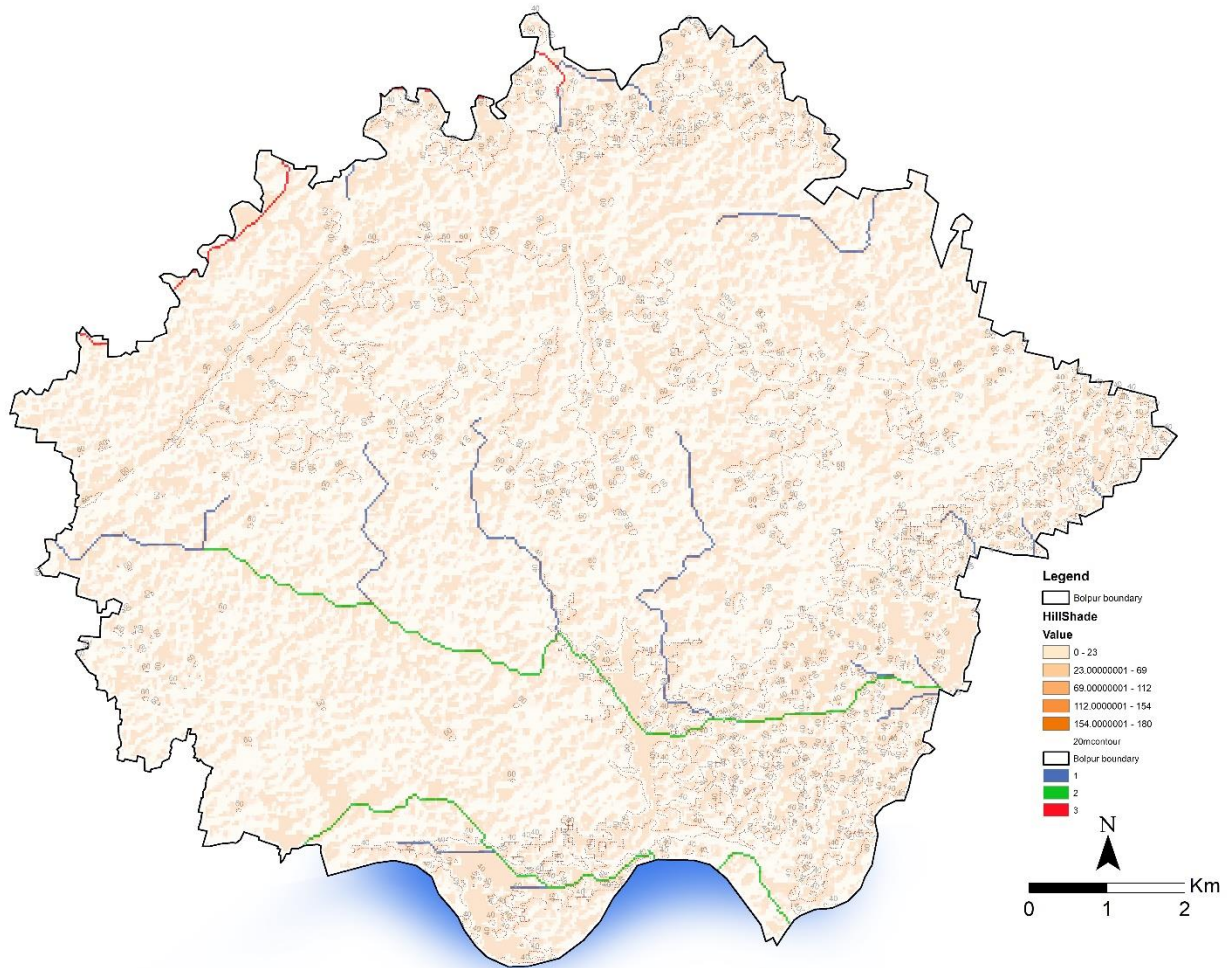


Figure 6 Topographical map of Sriniketan-Santiniketan Development Area

The topography varies from 60m to 20m towards Kopai River and 60m to 40m towards Ajoy River. The slope of the region varies within 1%- 25%.

3.3.3 Geology and Soil type

Birbhum district is known as the land of red soil, it is noted for its topography and its cultural heritage which is unique. Its unique character differentiates it from the other districts of West Bengal. The western part of Birbhum district is a densely vegetated region, a part of the **Chhota Nagpur Plateau**. This region gradually merges with the fertile farmlands which is composed of alluvial deposition in the east.

The soil type of the area, mostly neighbouring the Santal pargana district is almost lateritic interspersed with exposed granite veins at places, high medium texture top soil with

undulated topography. The old alluvial is also found along with the layer of clay, gravel, sand and *ghuting*. The water holding capacity is very poor. The **PH ranges from 4 to 6.5**.

The Rarh plain of Birbhum is known as the land of **red soils**. The region belongs to old alluvial type, predominate character of these soil is the presence of **pebbles and sand**. The western part of the region shows the presence of laterite soils and along the river banks the soil is sandy and loamy. The soil contains iron and lime and very small quantity of humus which is not helpful for agriculture.

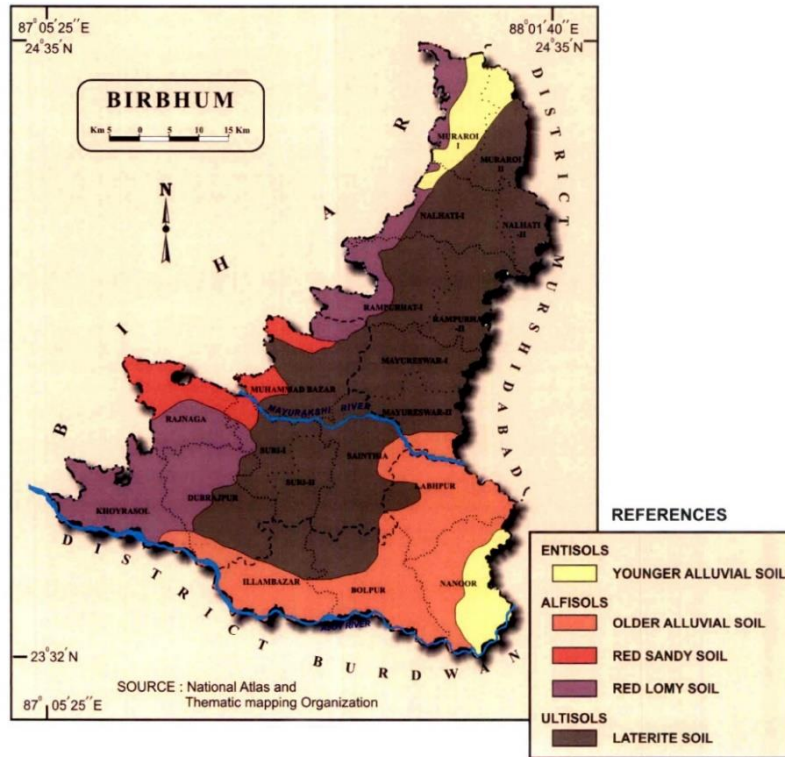


Figure 7 Soil map of Birbhum

3.3.4 Hydrology

The hydrological system is based on two sub-watershed of Ajay and Kopai River. The Ajay River divides two districts named Bardhaman and Birbhum.

The source of water is from groundwater through deep tube wells and a project name **Indo-German water supply project**, in association with Bolpur Municipality and Bolpur Sriniketan Panchayat Samiti for residential & academic use.

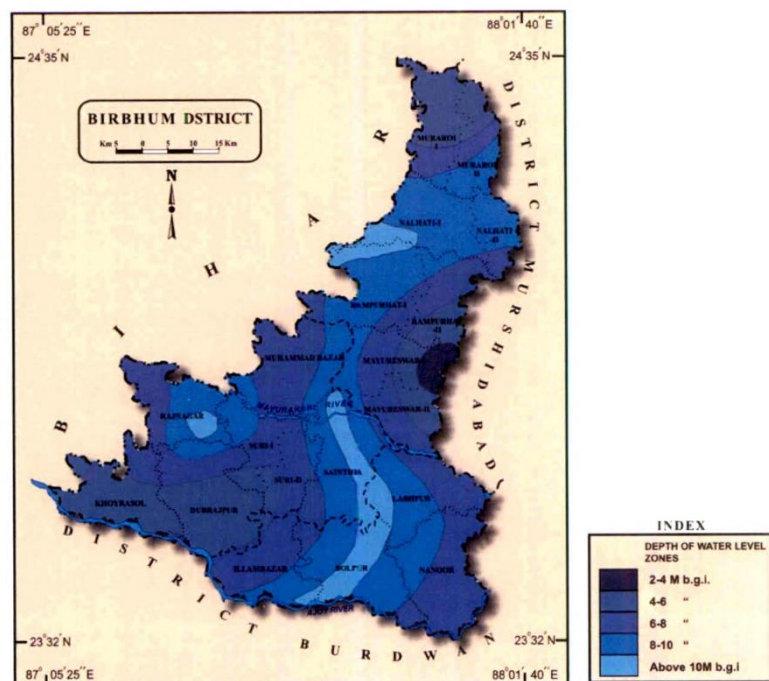


Figure 8 Ground water table of Birbhum District

The under-ground water table is good due to heavy rainfall averaging 1287 mm (78% of total rainfall occurs within the monsoon month of June to Sept.) of the district per year. Water level is available at a depth of less than 30m as per Bhuvan Map and 3m-7m as per SSDA.

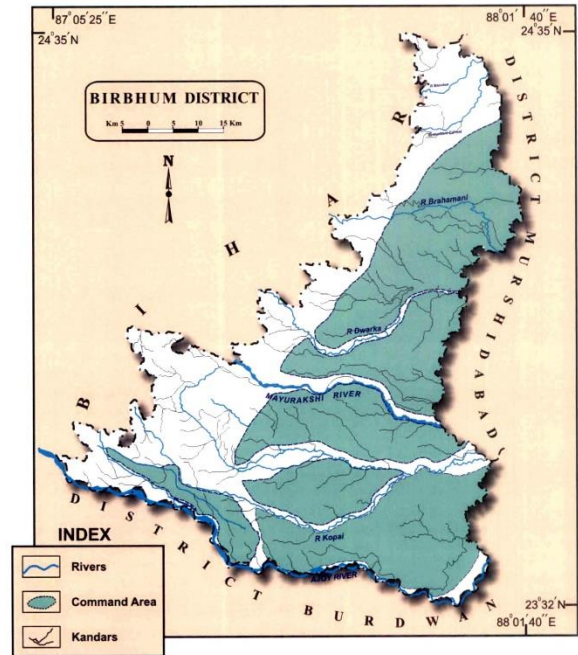


Figure 9 Drainage network of Birbhum District (Asanta 2010)

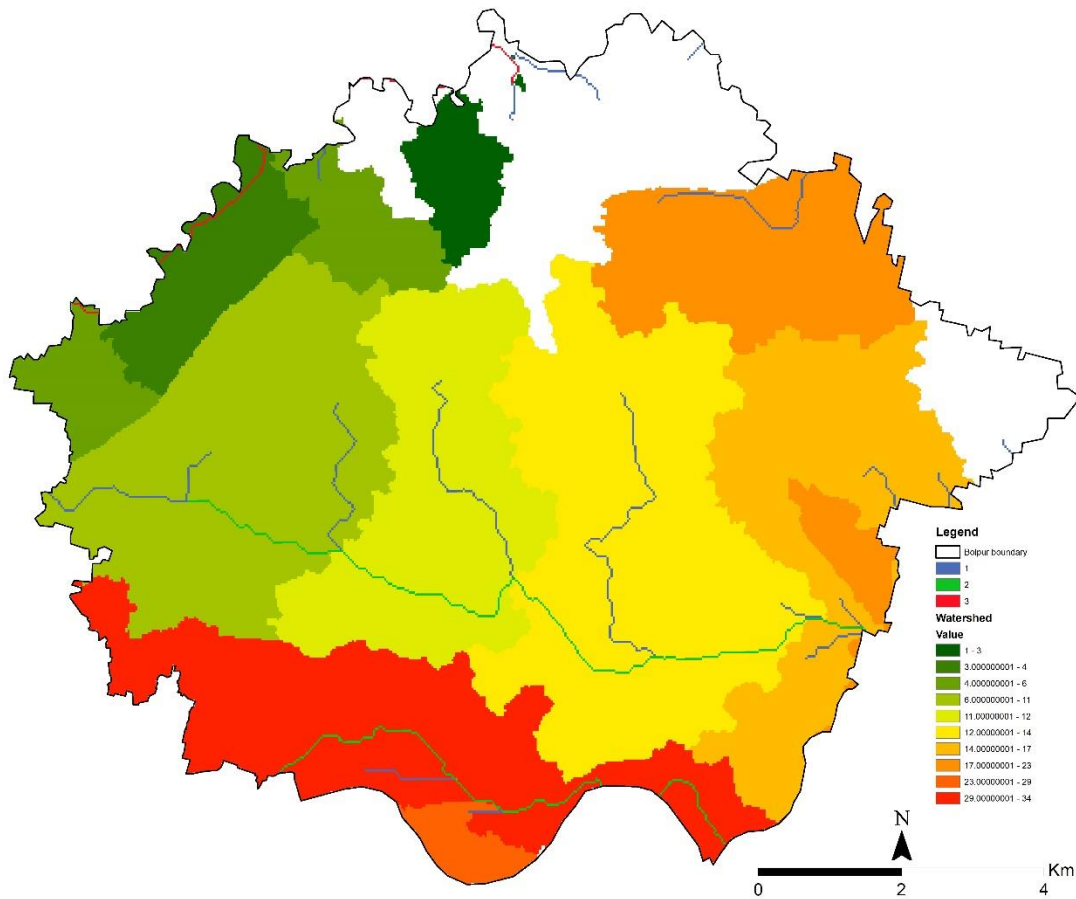


Figure 10 Fig: Streams and watershed of SSDA

3.3.5 Major road network of the region

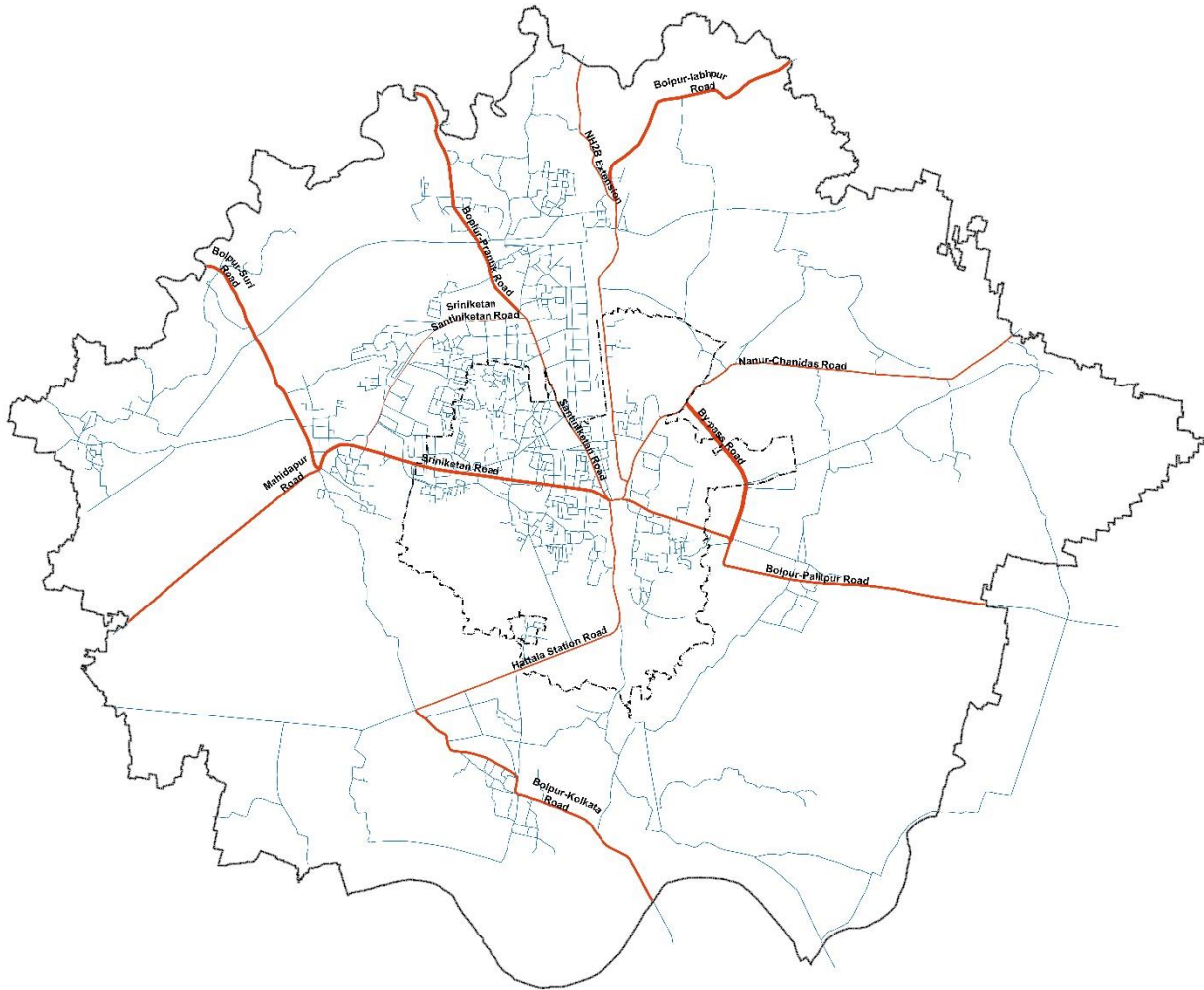


Figure 11 ad network map of SSDA

The SSDA is well connected through road as well as railway. The nearest railway station is Bolpur & Prantik railway station. The rail line was constructed in 1859 to connect Kolkata and Shahebganj which opened a new corridor to attract tourist. National Highway no. 2B which connects Suri to Bardhaman is also lying at western border of the Park.

3.3.6 Native Flora & Fauna

The forest of Birbhum belongs to tropical dry deciduous type. Sal tree (*Shorea robusta*) is one of the famous tree of the region. Along the road of SSDA region sal, palm and eucalyptus trees could be seen here and there. Locals collect firewood from nearby forest. The Sal tree leaves is one of the major raw material for handicrafts which is also collected from the Sal forest.

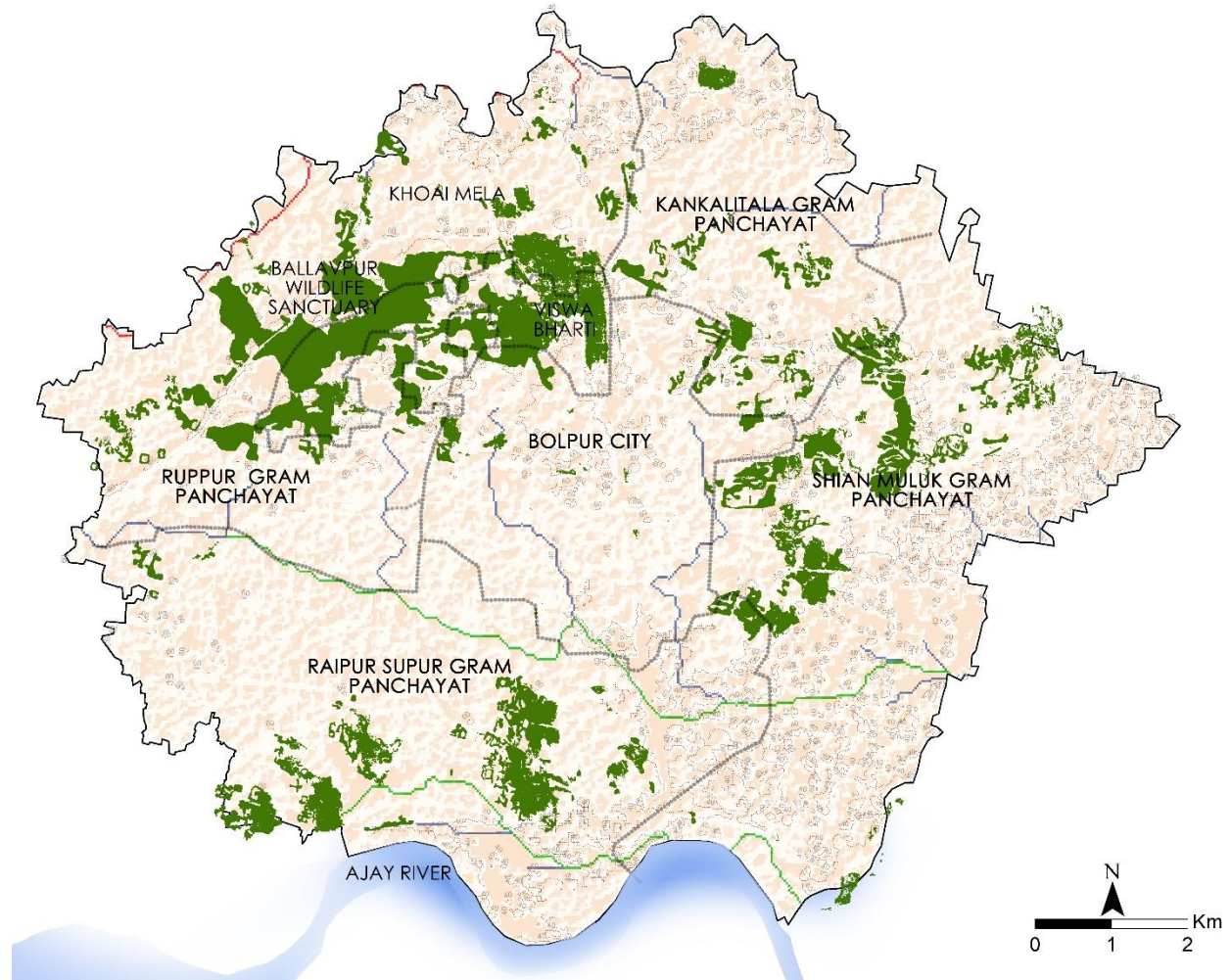


Figure 12 Vegetation map of SSDA

Tree species

SL	Scientific Name	Local Name	Family	Flowering
1	<i>Acacia auriculiformis</i>	Akashmoni	Mimosaceae	Jan-Feb
2	<i>Albizia lebbek</i>	Sirish	Mimosaceae	Apr-Jun
3	<i>Acacia nilotica</i>	Babla	Mimosaceae	Jun-Oct
4	<i>Aegle marmelos</i>	Bel	Rutaceae	May-Jun
5	<i>Alstonia scholaris</i>	Chattim	Apocynaceae	Oct-Jan
6	<i>Artocarpus heterophyllus</i>	Kathal	Moraceae	Jan-Mar
7	<i>Azadirachta indica</i>	Neem	Meliaceae	Mar-Apr
8	<i>Bauhinia acuminata</i>	Kanchan (White)	Fabaceae	Sep-Feb
9	<i>Bombax ceiba</i>	Shimul	Malvaceae	Feb-Apr
10	<i>Borassus fla</i>	Taal	Arecaceae	Mar-May
11	<i>Butea monosperma</i>	Palash	Fabaceae	Feb-Apr
12	<i>Carica papaya</i>	Peypay	Caricaceae	Jan-Dec
13	<i>Cassia fistula</i>	Amaltas	Caesalpiniaceae	Mar-Jun
14	<i>Cassia siamea</i>	Kassod	Caesalpiniaceae	Jun-Sep
15	<i>Cinnamomum tamala</i>	Tejpata	Lauraceae	Mar-May
16	<i>Citrus maxima</i>	Batabilebu	Rutaceae	Feb-Aug
17	<i>Cocos nucifera</i>	Narkel	Arecaceae	Mar-May
18	<i>Dalbergia sissoo</i>	Sishu	Fabaceae	Mar-Apr
19	<i>Delonix regia</i>	Gulmohor	Caesalpiniaceae	Mar-May
20	<i>Emblica officinalis</i>	Amlaki	Euphorbiaceae	Jul-Feb
21	<i>Eucalyptus globulus</i>	Eucalyptus	Myrtaceae	Feb-Mar
22	<i>Ficus benghalensis</i>	Bot	Moraceae	Jan-Dec
23	<i>Ficus hispida</i>	Dumur	Moraceae	Apr-Sep
24	<i>Ficus religiosa</i>	Assatha	Moraceae	Apr-Aug
25	<i>Holarrhena antidysenterica</i>	Kurchi	Apocynaceae	Apr-Oct
26	<i>Lagerstroemia speciosa</i>	Jarul	Myrtaceae	Apr-Aug
27	<i>Litchi chinensis</i>	Lichu	Sapindaceae	Apr-Jun
28	<i>Mangifera indica</i>	Aam	Anacardiaceae	Feb-May
29	<i>Moringa oleifera</i>	Sajina	Moringaceae	Jan-May
30	<i>Morus indica</i>	Tut	Moraceae	Feb-Apr
31	<i>Neolamarckia cadamba</i>	Kadam	Rubiaceae	May-Jul
32	<i>Peltophorum pterocarpum</i>	Radhachura	Caesalpiniaceae	Apr-Sep
33	<i>Phoenix sylvestris</i>	Khejur	Arecaceae	Apr-Jun
34	<i>Psidium guajava</i>	Peyara	Myrtaceae	Apr-Sep
35	<i>Shorea robusta</i>	Shal	Dipterocarpaceae	Feb-Apr
36	<i>Streblus asper</i>	Sheora	Moraceae	Mar-May
37	<i>Syzygium cumini</i>	Kalo jam	Myrtaceae	Apr-May
38	<i>Spondias pinnata</i>	Amra	Anacardiaceae	Mar-Apr
39	<i>Tamarindus indica</i>	Tetul	Caesalpiniaceae	Apr-Jun

Tree species

SL	Scientific Name	Local Name	Family	Flowering
40	<i>Tectona grandis</i>	Segun	Verbenaceae	Jul-Aug
41	<i>Terminalia arjuna</i>	Arjun	Combretaceae	Apr-Jun
42	<i>Terminalia bellirica</i>	Bohera	Combretaceae	Mar-Nov
43	<i>Thevetia peruviana</i>	Kolke	Apocynaceae	Jan-Dec
44	<i>Ziziphus mauritiana</i>	Kul	Rhamnaceae	Oct-Jan
45	<i>Dillenia indica</i>	Chalta	Dilleniaceae	Jun-Oct

Shrubs

SL	Scientific Name	Local Name	Family	Flowering
1	<i>Caesalpinia pulcherrima</i>	Krishnachura	Caesalpinaceae	Jan-Sep
2	<i>Calotropis gigantea</i>	Akanda	Asclepiadaceae	Feb-Oct
3	<i>Cassia occidentalis</i>	Kalkasunda	Caesalpinaceae	Jul-Nov
4	<i>Cestrum diurnum</i>		Solanaceae	Oct-Mar
5	<i>Clerodendrum inerme</i>	Bon mehendi	Verbenaceae	Dec-May
6	<i>Clerodendrum viscosum</i>	Ghetu	Verbenaceae	Dec-Mar
7	<i>Crotalaria pallida</i>	Atasi	Fabaceae	May-Nov
8	<i>Datura metal</i>	Dhutura	Solanaceae	Mar-Dec
9	<i>Duranta repens</i>		Verbenaceae	Jun-Feb
10	<i>Euphorbia pulcherrima</i>	Lalpata	Euphorbiaceae	Nov-Mar
11	<i>Gossypium barbadense</i>	Karpas	Malvaceae	Jun-Oct
12	<i>Hibiscus rosa-sinensis</i>	Joba	Malvaceae	Jan-Dec
13	<i>Ipomoea carnea</i>	Dhol kalmi	Convolvulaceae	Apr-Nov
14	<i>Jatropha gossypifolia</i>	Varenda	Euphorbiaceae	Jun-Dec
15	<i>Justicia adhatoda</i>	Basak	Acanthaceae	Nov-Mar
16	<i>Lantana camara</i>	Chotra	Verbenaceae	Jan-Dec
17	<i>Lawsonia inermis</i>	Mehendi	Lythraceae	Jun-Sep
18	<i>Murraya koenigii</i>	Curry pata	Rutaceae	Mar-Apr
19	<i>Nerium indicum</i>	Karobi	Apocynaceae	Jan-Dec
20	<i>Nyctanthes arbor-tristis</i>	Seuli	Oleaceae	Jan-Mar
21	<i>Opuntia dillenii</i>	Fanimanasha	Cactaceae	Mar-Aug
22	<i>Rauvolfia tetraphylla</i>		Apocynaceae	Apr-Oct
23	<i>Ricinus communis</i>	Rerhi	Euphorbiaceae	Aug-Mar
24	<i>Sida cordifolia</i>	Berala	Malvaceae	Aug-Feb
25	<i>Solanum torvum</i>	Bon begun	Solanaceae	Jun-Apr
26	<i>Tabernemontana divaricata</i>	Tagar	Apocynaceae	Apr-Dec
27	<i>Vitex negundo</i>	Nisinda	Verbenaceae	Jun-Sep

Herbs

SL	Scientific Name	Local Name	Family	Flowering
1	<i>Abutilon indicum</i>	Petari	Malvaceae	Sep-Feb
2	<i>Acalypha indica</i>	Muktojhuri	Euphorbiaceae	Jun-Oct
3	<i>Achyranthes aspera</i>	Apang	Amaranthaceae	Nov-Jan
4	<i>Acorus calamus</i>	Boch	Araceae	May-Aug
5	<i>Aerva lanata</i>	Chaya	Amaranthaceae	May-Oct
6	<i>Ageratum conyzoides</i>	Uchunti	Asteraceae	Nov-Feb
7	<i>Allium cepa</i>	Piyag	Liliaceae	Nov-Feb
8	<i>Alocasia indica</i>	Mancachu	Araceae	Mar-Jun
9	<i>Aloe barbadensis</i>	Ghritakumari	Liliaceae	Oct-Dec
10	<i>Alternanthera sessilis</i>	Sanchi sag	Amaranthaceae	Dec-Mar
11	<i>Amaranthus spinosus</i>	Kanta notey	Amaranthaceae	Jan-Dec
12	<i>Amaranthus viridis</i>	Notey Sag	Amaranthaceae	Jan-Dec
13	<i>Amorphophallus paeoniifolius</i>	Oi	Araceae	Nov-Feb
14	<i>Andrographis paniculata</i>	Kalmegh	Acanthaceae	Nov-Dec
15	<i>Anisomeles indica</i>	Gopali phul	Lamiaceae	Sep-Jan
16	<i>Arachis hypogea</i>	Badam	Fabaceae	Feb-Mar
17	<i>Argemone maxicana</i>	Sialkanta	Papaveraceae	Aug-Feb
18	<i>Bacopa monnieri</i>	Brahmi	Scrophulariaceae	Apr-Dec
19	<i>Basella alba</i>	Pui sak	Basellaceae	Nov-Feb
20	<i>Blumea lacera</i>	Kukursunga	Asteraceae	Nov-Mar
21	<i>Boerhaavia diffusa</i>	Punarnava	Nyctaginaceae	Jul-Sep
22	<i>Canna indica</i>	Sarbajaya	Cannaceae	Feb-Nov
23	<i>Cannabis sativa</i>	Gaja	Cannabaceae	Feb-Apr
24	<i>Catharanthus roseus</i>	Nayantara	Apocynaceae	Jan-Feb
25	<i>Centella asiatica</i>	Thankuni	Apiaceae	Jan-Jul
26	<i>Chenopodium album</i>	Beto sak	Chenopodiaceae	Dec-Apr
27	<i>Cleome viscosa</i>	Hurhure	Capparidaceae	Sep-Mar
28	<i>Colocasia esculenta</i>	Kachu	Araceae	Jan-Dec
29	<i>Commelina benghalensis</i>	Kansira	Commelinaceae	Jul-Nov
30	<i>Coriandrum sativum</i>	Dhone pata	Apiaceae	Dec-Mar
31	<i>Crozophora rotleri</i>	Khudi okra	Euphorbiaceae	Jan-Aug
32	<i>Croton bonplandianum</i>	Bon tulsi	Euphorbiaceae	Jan-Dec
33	<i>Curcuma longa</i>	Halud	Zinzibaraceae	Aug-Sep
34	<i>Cymbopogon citratus</i>		Poaceae	Jul-Sep
35	<i>Cynodon dactylon</i>	Durba	Poaceae	Jan-Dec
36	<i>Cyperus rotandus</i>	Mutha ghash	Cyperaceae	Jan-Dec
37	<i>Dentella repens</i>	Gime sak	Rubiaceae	Jun-Nov
38	<i>Desmodium triflorum</i>	Salpani ful	Fabaceae	Jan-Dec
39	<i>Eclipta alba</i>	Kesuth	Asteraceae	Jan-Dec

Herbs

SL	Scientific Name	Local Name	Family	Flowering
40	<i>Eichhornia crassipes</i>	Kachuripana	Pontederiaceae	Aug-Jan
41	<i>Eragrostis tenella</i>	Shada fulka	Poaceae	Jun-Aug
42	<i>Euphorbia hirta</i>	Borokorni	Euphorbiaceae	Jan-Dec
43	<i>Evolvulus alsinoides</i>	Sankha puspi	Convolvulaceae	Mar-Aug
44	<i>Heliotropium indicum</i>	Hatisur	Boraginaceae	Feb-May
45	<i>Hygrophylla schulli</i>	Kulekhara	Acanthaceae	Oct-Apr
46	<i>Impatiens balsamina</i>	Dopati	Balsaminaceae	Mar-Oct
47	<i>Ipomoea aquatica</i>	Kalmi Sak	Convolvulaceae	Aug-Jan
48	<i>Kyllinga nemoralis</i>		Cyperaceae	Jan-Dec
49	<i>Leucas aspera</i>	Shet drone	Lamiaceae	Dec-Apr
50	<i>Lindenbergia indica</i>	Basanti ful	Scrophulariaceae	Jul-Jan
51	<i>Malachra capitata</i>	Bon dharos	Malvaceae	Apr-Dec
52	<i>Mazus pumilus</i>		Scrophulariaceae	Jan-Dec
53	<i>Mimosa pudica</i>	Lajjabati	Mimosaceae	Aug-Nov
54	<i>Mirabilis jalapa</i>	Sandhya malati	Nyctaginaceae	Jun-Feb
55	<i>Nicotiana plumbaginifolia</i>	Bon Tamak	Solanaceae	Mar-Oct
56	<i>Nymphaea nouchali</i>	Saluk	Nymphaeaceae	Aug-Nov
57	<i>Ocimum sanctum</i>	Tulsi	Lamiaceae	Jan-Dec
58	<i>Oldenlandia corymbosa</i>	Khet papra	Rubiaceae	Jul-Mar
59	<i>Oxalis corniculata</i>	Amrul	Oxalidaceae	Jan-Dec
60	<i>Parthenium hysterophorus</i>	Bish gach	Asteraceae	Oct-Apr
61	<i>Pedilanthus tithymaloides</i>	Rangchita	Euphorbiaceae	Jan-Apr
62	<i>Phoenix sylvestris</i>	Luchipata	Piperaceae	Jan-Dec
63	<i>Phyla nodiflora</i>	Bhul okra	Verbenaceae	Jan-Dec
64	<i>Physalis minima</i>	Tepari	Solanaceae	Jul-Nov
65	<i>Polygonum hydropiper</i>	Pani marich	Polygonaceae	Feb-May
66	<i>Portulaca oleracea</i>	Nunia sag	Portulacaceae	Jun-Sep
66	<i>Ranunculus scleratus</i>	Bon dhone	Ranunculaceae	Dec-Apr
67	<i>Rorippa indica</i>	Bon sarisha	Brassicaceae	Feb-Apr
68	<i>Ruelia tuberosa</i>	Chatpati	Acanthaceae	Apr-Jun
69	<i>Rumex dentatus</i>	Pahari palang	Polygonaceae	Jan-Apr
70	<i>Rungia pectinata</i>	Pindi	Acanthaceae	Nov-May
71	<i>Saccharum spontaneum</i>	Kaash	Poaceae	Aug-Oct
72	<i>Scirpus articulatus</i>	Chechka	Cyperaceae	Jun-Aug
73	<i>Scoparia dulcis</i>	Jangli-dhone	Scrophulariaceae	Jan-Dec
74	<i>Sida cordata</i>	Berala	Malvaceae	Oct-Dec
75	<i>Solanum nigrum</i>	Kakmachi	Solanaceae	Jan-Dec
76	<i>Tephrosia perpurea</i>	Ban neel	Fabaceae	Oct-Feb
77	<i>Tridax procumbens</i>	Tridaksha	Asteraceae	Nov-Apr

Climbers

SL	Scientific Name	Local Name	Family	Flowering
1	<i>Antigonon leptopus</i>	Anantalata	Polygonaceae	Apr-Sep
2	<i>Aristolochia indica</i>	Iswarmul	Aristolochiaceae	Dec-Feb
3	<i>Bougainvillea spectabilis</i>	Bagan bilash	Nyctaginaceae	Jan-Dec
4	<i>Cardiospermum helicacabum</i>	Latapatkari	Sapindaceae	May-Nov
5	<i>Clitoria ternatea</i>	Aparajita	Fabaceae	Aug-Nov
6	<i>Coccinia grandis</i>	Telakucho	Cucurbitaceae	Sep-Nov
7	<i>Cucurbita maxima</i>	Kumro	Cucurbitaceae Climber	Nov-Jun
8	<i>Cuscuta reflexa</i>	Swarnolata	Convolvulaceae	Jan-Apr
9	<i>Lablab perpureus</i>	Sim	Fabaceae	Nov-Feb
10	<i>Luffa acutangula</i>	Jhinga	Cucurbitaceae	Mar-Aug
11	<i>Mikania micrantha</i>	Tarulata	Asteraceae	Jan-Dec
12	<i>Momordica charantia</i>	Ucche	Cucurbitaceae	Mar-Oct
13	<i>Paederia scandens</i>	Gandal	Rubiaceae	Aug-Nov
14	<i>Quisqualis indica</i>	Madhabilata	Combretaceae	Jan-Dec
15	<i>Tinospora cordifolia</i>	Gulanha	Menispermaceae	Apr-Nov
16	<i>Trichosanthes anguina</i>	Chichinga	Cucurbitaceae	Jun-Oct
17	<i>Trichosanthes dioica</i>	Potol	Cucurbitaceae	Apr-Sep

Fauna:


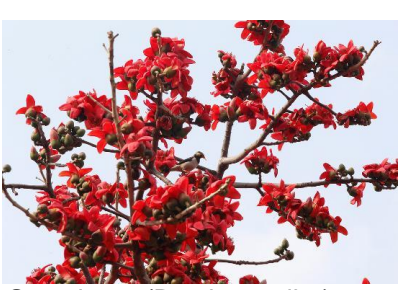


The faunal wealth of the Birbhum district presents a vivid spectrum ranging from mammals and reptiles to bird life. From wetlands of Birbhum district 11 species of berpetofauna, 6 reptiles and 5 amphibians belonging to 7 families were encountered. There are about 36 avifauna species belonging 10 families comprising of water birds, marsh birds and kingfisher have been observed of these, 25 species were resident and 11 species were migratory birds.













List of Resident birds: Podiceps ruficollis (Pallas), Phalacrocorax niger (Vieillot), Ardea alba (Linnaeus), Ardea grayi (Sykes), Ardea purpurza (Linnaeus), Bubulcus ibis (Linnaeus), Egrena garzetta (Linnaeus), Egrena intennedia (Wagler), Nycticorax nycticorax (Linnaeus), Anasomus oscitans (Boddaert), Dendrocygna javanica (Horsfield), Nenasopus coromandelianus (Gmelio), Circus aeruginosus (Linnaeus), Amaurornis phoenicurus (Pennant), Gallinula chloropus (Linnaeus), Porphyrio porphyrio (Linnaeus), Fulica alba (Linnaeus), Metopidius indicus (Latham), Vanellus cinereus (Blyth), Vanellus indicus (Boddaert) etc.

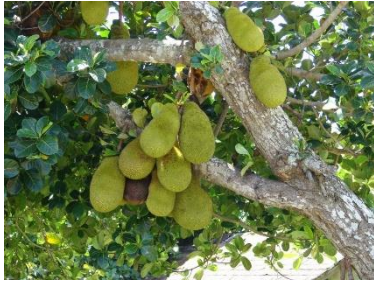
List of Migratory birds: Anser anser (Linnaeus), Anas acuta Linnaeus, Anas crecca Linnaeus, Anas clypeata Linnaeus, Anas poecilorhyncha Forster, Nenasopus rufina (pallas), Aythya juligula (Linnaeus), Tringa nebularia (Gunner), Tringa ochropw Linnaeus, Tringa hypoleucos Linnaeus, Gallinago stenura Bonaparte etc.

List of Reptiles: Lissemys punctata (Bonaterre, Varanus bengalensis (Daudin), Varanus favescentis (Gray), Enhydria enhydria (Schneider), Xenochrophis piscator (Schneider), Naja naja kaoathia (Lacepede), Rana cyanophlyctis Schneider, Rana limnocharis Wiegmann, Microhyla omata (Dumeril & Bibron), Bufo melanostictus Schneide etc (N. C. NANDI 2001).

Native Flora:

		
Sal tree (<i>Shorea robusta</i>)	Khair tree (<i>Acacia catechu</i>)	Kadam (<i>Haldina cordifolia</i>)
		
Khudi Jamb (<i>Antidesma ghaesembilla</i>)	Semal tree (<i>Bombax ceiba</i>)	Pial (<i>Buchanania lanzan</i>)
		
Palas (<i>Butea monosperma</i>)	Katira (<i>Cochlospermum religiosum</i>)	Tendu (<i>Diospyros melanoxylon</i>)
		
Amla (<i>Phyllanthus emblica</i>)	Sidi (<i>Lagerstroemia parviflora</i>)	Kassod (<i>Senna siamea</i>)

 <p>Mahua (<i>Madhuca indica</i>)</p>	 <p>Kaniar (<i>Bauhinia Purpurea</i>)</p>	 <p>Sona (<i>Oroxylum indicum</i>)</p>
 <p>Pea Sal (<i>Pterocarpus marsupium</i>)</p>	 <p>kusum (<i>Schleichera oleosa</i>)</p>	 <p>Indian redwood (<i>Soymida febrifuga</i>)</p>
 <p>Arjun (<i>Terminalia arjuna</i>)</p>	 <p>Bahera (<i>Terminalia bellirica</i>)</p>	 <p>Haritaki (<i>Terminalia chebula</i>)</p>
 <p>Babla (<i>Acacia nilotica</i>)</p>	 <p>Bel (<i>Aegle marmelos</i>)</p>	 <p>Ata (<i>Annona squamosa</i>)</p>



Kanthal (*artocarpus heterophyllus*)



Neem (*Azadirachta indica*)



Amra (*Spondias pinnata*)



Papaya (*Carica papaya*)



Amaltas (*cassia fistula*)



Lebu (*citrus medica*)



Bot (*Ficus benghalensis*)



Peepal (*Ficus religiosa*)



Aam (*Mangifera indica*)



Sajina (*Moringa oleifera*)



Bamboo (*Bambusa arundinacea*)



(Teak) *Tectona grandis*

3.3.7 Agriculture- Pattern, Colour & Texture

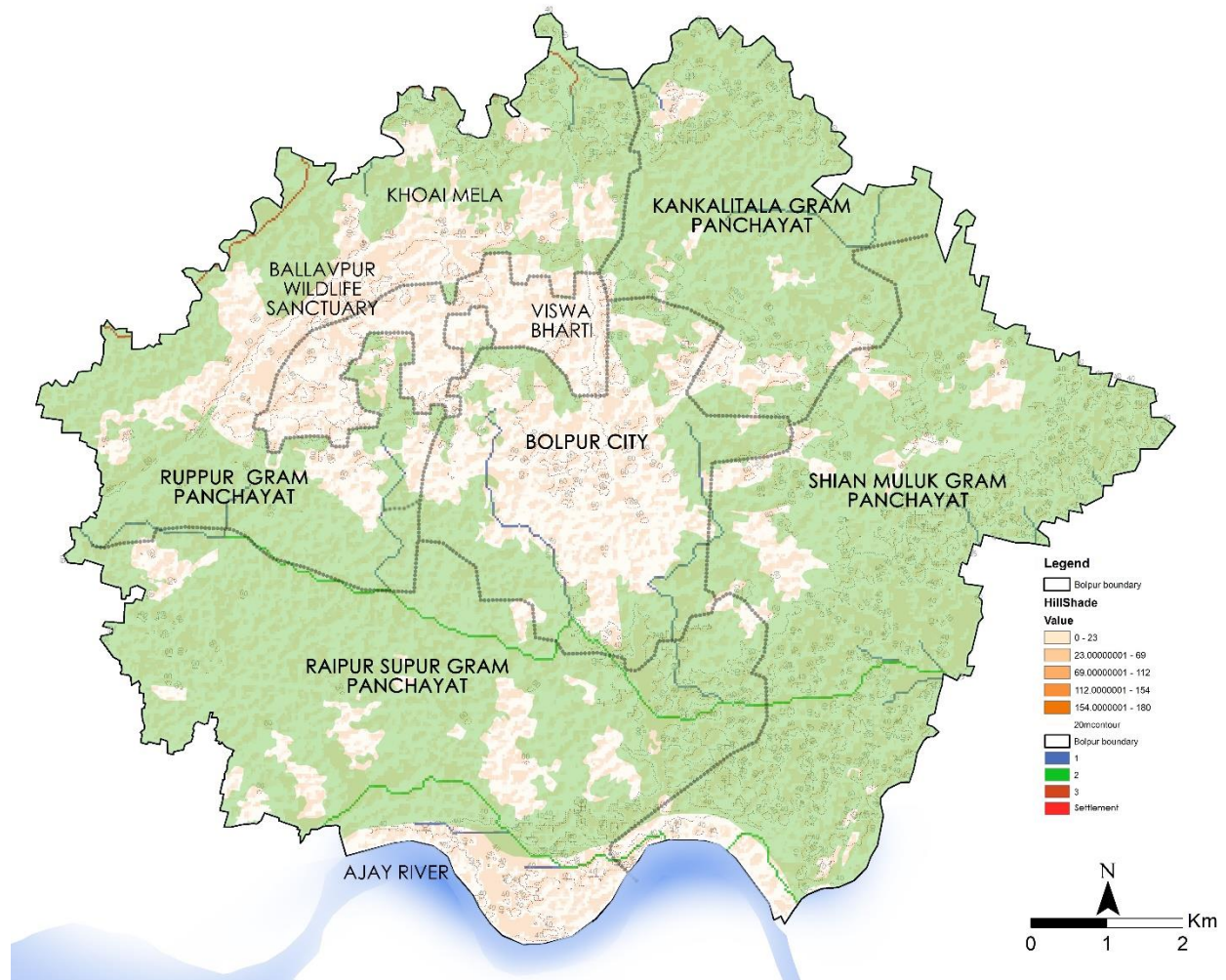


Figure 13 Plan showing the agricultural areas of SSDA

Types of Crop:

a) Kharif Crop

- i) Aus Paddy
- ii) Amon Paddy
- iii) Boro Paddy
- iv) Sugarcane

b) Robi Crop

- i) Wheat
- ii) Mustard

c) Others

- i) Potato
- ii) Jute
- iii) Vegetables

Crop Yield:

Crops	Area (per Ha)	Production (MT)
Aus Paddy	800	252.17
Amon Paddy	6135	765.6
Boro Paddy	2500	112.5
Sugarcane	110	91142
Wheat	765	55.768
Mustard	1050	78.75
Potato	850	196.35
Jute	10	1.8

3.3.8 Settlement pattern of the region

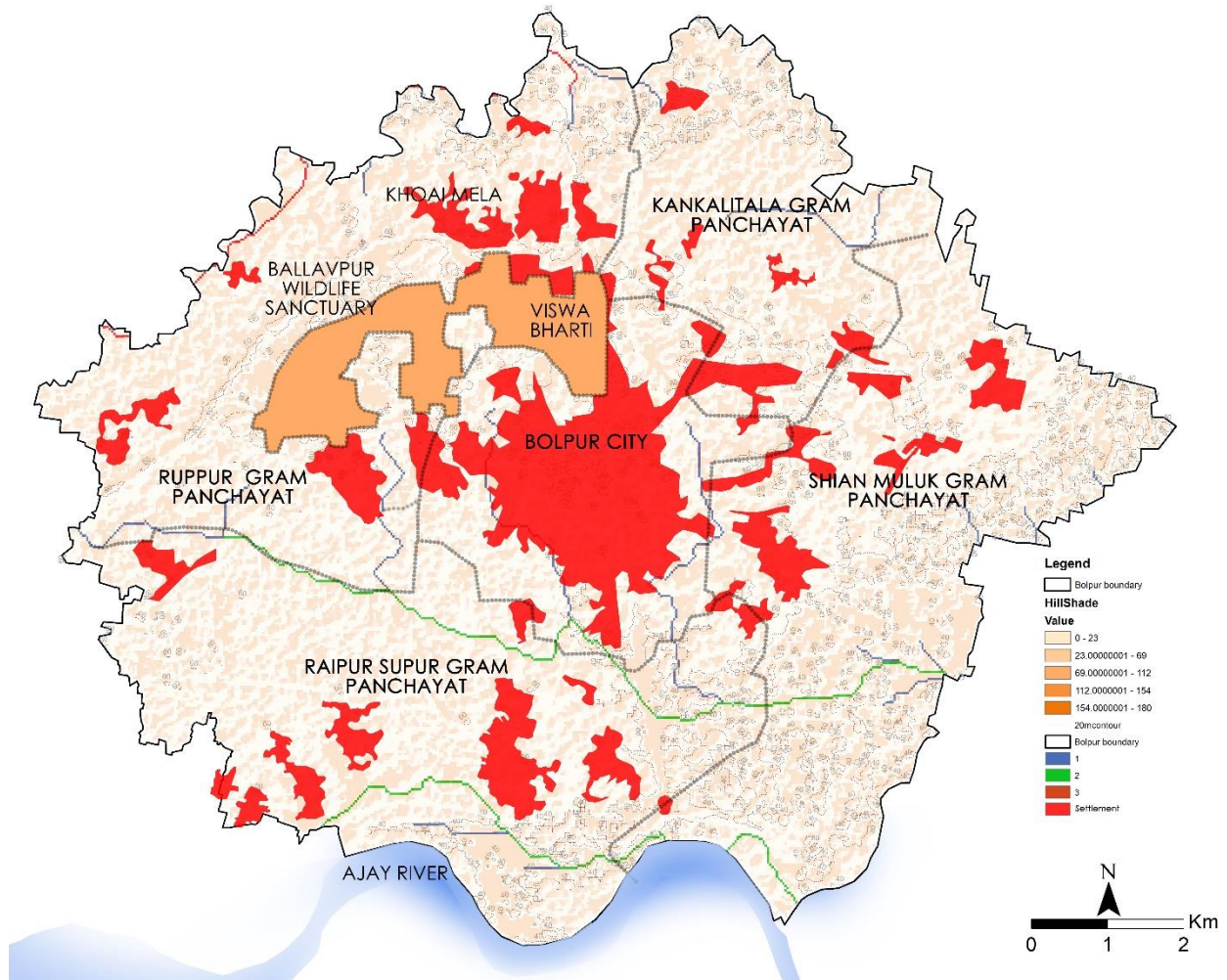


Figure 14 Plan showing various settlement of SSDA

The core settlement is found near Viswa Bharti University. After the establishment of Bolpur railway station in 1859 the growth of the city took its pace. Influence of Viswa Bharti is the main reason of change in land use.

Apart from the big settlement of Bolpur some sparsely developed settlement could be seen around the core city. Dominance of agriculture mainly caused to the development of the settlement and some small industrial area could be seen along the major road network.

CHAPTER 4. APPRAISAL OF THE ARCHITECTS' PROGRAMME

4.1 The design is based on following considerations:

4.1.1 Site:

- The area of site for development of Biswa Bangla University is 33.5 Acres (135569.7 sqm.).
- The site has gentle slope towards the NH2B. The existing slope is in between 1%-3% which is suitable for building development with moderate grading. Suitable for vehicular as well as pedestrians movement.
- The site is allocated on the 8.5m front road (NH2B). The entrance is from front sides.
- Water below ground is available at a depth of 3m-7m as per SSDA.

4.1.2 Building standards and bye-laws:

The proposed development shall be governed by local building bye-laws- *"The West Bengal Municipal (Building) Rules, 2007"*.

- Max. Permissible Ground Coverage = 55% of plot area
- Max. Permissible FAR = 2.5
- Max. Permissible Height = 14.5m.
- Setbacks = 3.5m- Front, 4m- Sides & 5m- Rare side
- Parking: 1-Car & 1-Bus are to be provided for every 500sqm of floor area.

4.1.3 Area Planning:

The basic planning of the university will be governed by *"The West Bengal Municipal (Building) Rules, 2007"* and the area programming has been proved by HIDCO.

Total Site area: 33.5 acres

The project is divided into 3 zones:

1. Zone 1 – Recreational Zone (Auditorium & Sports complex)
2. Zone 2 – Academic buildings
3. Zone 3 – Residential zone

Area requirement:

- **Academic Buildings-** [School of Humanities (A)+ School of Social Sciences (B)+ School of Sciences(C)+ School of Education (D)+ School of Professional Studies (E)+ School of Fine Arts (F)]
- $A+B+C+D+E+F=1305+1300+5700+1320+1300+700=11625$ Sqm.

- **Total requirement for Administrative Block and establishments other than Academic activities-** 9355 sqm.
- **Sports Complex-** 3450 sqm.
- **Residential Building-** [Boys Hostel (G+2): 2 Nos. (A), Girls Hostel (G+2): 2 Nos. (B), Faculty quarter (Stilt+G+3):-3 (C), Staff quarter(G+3)-1 No (D), VC's House (G+1)-(E), Guest House: G+1 (F)]
- $A+B+C+D+E+F=(921 \times 3 \times 2)+(921 \times 3 \times 2)+(646 \times 4 \times 3)+(646 \times 4 \times 2)+(268 \times 2)+(201 \times 2)=24910$ Sqm.
- **Other-** [Library (G+2):(A), Dining (B), Electrical sub-station (C), Driver's & Security room (D), Room for air condition plant (E), Pump House/D.G room (F)]
- $A+B+C+D+E+F=(903 \times 2)+(515 \times 2)+200+250+200+250=3736$ Sqm.

4.1.4 Calculation of Car Parking:

1-Car & 1-Bus are to be provided for every 500sqm of floor area.

- **Area Calculation:**
Academic Building: 11625 Sqm.
Admin Block: 9355 Sqm.
Sports Complex: 3450 Sqm.
Residential Building: 24910 Sqm.
Other: 3736 Sqm.
Total Area: 53076
No of Parking required: 106

4.2 Design Concept:

The main prevailing concept for the development of the Master Plan of proposed Biswa Bangla University is the Tagore's art form and the design language of Visava Bharti (Santiniketan). The architecture has been designed on the basis of Bengal's architecture and culture.

4.2.1 Site Use & Zoning:

- The site has mixed use of buildings e.g. Residential, academic and recreational type.
- The site has been divided in 3 main zone. The front portion has been developed as recreational space by facilitating auditorium and the academic & administrative buildings are in the middle zone. Zone-3 is residential zone.
- Main entrance gate is from the NH2B road. The entry & exit is from the same gate. A separate service entry is there from the corner of the site.
- A common open area is sharing by the academic building blocks and administrative block. It will serve as multi-purpose court.
- Drainage has been proposed with the natural slope.

Observations:

• Zoning:

- The site has been divided in 3 main zone.
- Front as (i) Recreational, in the center (ii) academic & administrative buildings & (iii) Residential & amenities.

• Entry-Exit:

- Main entry-exit gate is from the NH2B road.
- Separate service entry has been provided from the corner of the site.

• Space organisation:

- **Compact** plan. All buildings are within walkable distance.
- **Travel Distance** between Play field, sports complex and hostels is huge.

• Hierarchy of Spaces:

- There is no space hierarchy. Structural open area, spaces between two buildings have same character.
- All buildings have some adjoining functions and for that required space which is missing.

• Social Value: There is opportunities between students & teachers interaction.

• Landscape:

- **Orientation** of buildings is dominating by site form. North-south orientation is absence.
- Mitigation strategy is required from summer sun.
- Position of **central waterbody** is not as per topography



LEGEND	
1. Entry/Exit	11. Library
2. Auditorium	12. School of Social Science
3. Football Ground	13. School of fine arts & Professional studies
4. Seating arrangement	14. Girl's Hostel
5. Sports Complex	15. Director's Residence
6. Administrative Block	16. Kitchen & Dining Hall
7. School of Humanity	17. Faculty Housing
8. School of Education	18. Boy's Hostel
9. Waterbody	19. Staff Quarter
10. School of Science	20. Guest House
	21. Parkings
	22. ESS Block

IDEALISTIC ZONING:

Planning:

- The proposal for the campus had come in **2 phase**. So the Architect's proposal becomes compact.
- **Redesign of Master Plan** was in process.

Parking: Parking for visitor's & auditorium use

Service Entry: Separate from main entry

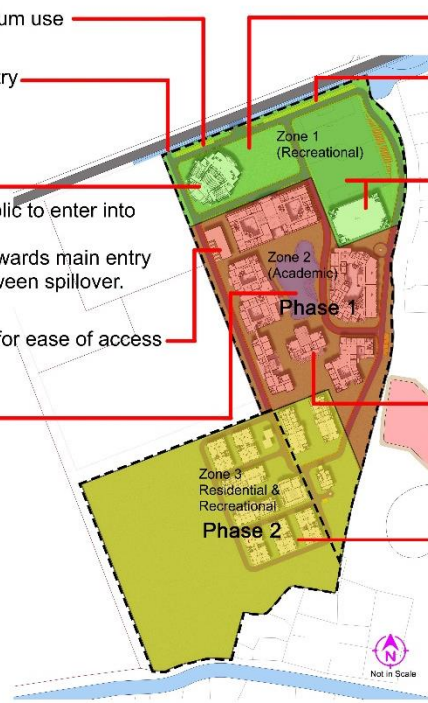
Auditorium:

- Near the main entrance to restrict public to enter into the premises.
- The orientation of the auditorium is towards main entry which discontinues the connection between spillover.

ESS Building: Near service entrance for ease of access & maintenance

Central open space/ Waterbody:

- Used as major circulation space and for aesthetic purpose.
- Waterbody reduce the opportunity of multifunctional use of space.
- Constructed waterbody is not as per topography.



Front Open Space: Offers foreground for the building which complement building architecture

Parking:

- Near the main gate which restricts vehicle entry to the core area.
- No barrier/ buffer is proposed for noise.

Sports complex & play field:

- Sports field act as buffer from NH road.
- Travel distance from residential area is huge.
- Every time has to bisect the academic area to reach sports facilities zone.
- The sports field has been positioned on the lowest level or on depression of the site.
- Orientation of seat is west faced so glare will appear directly to face

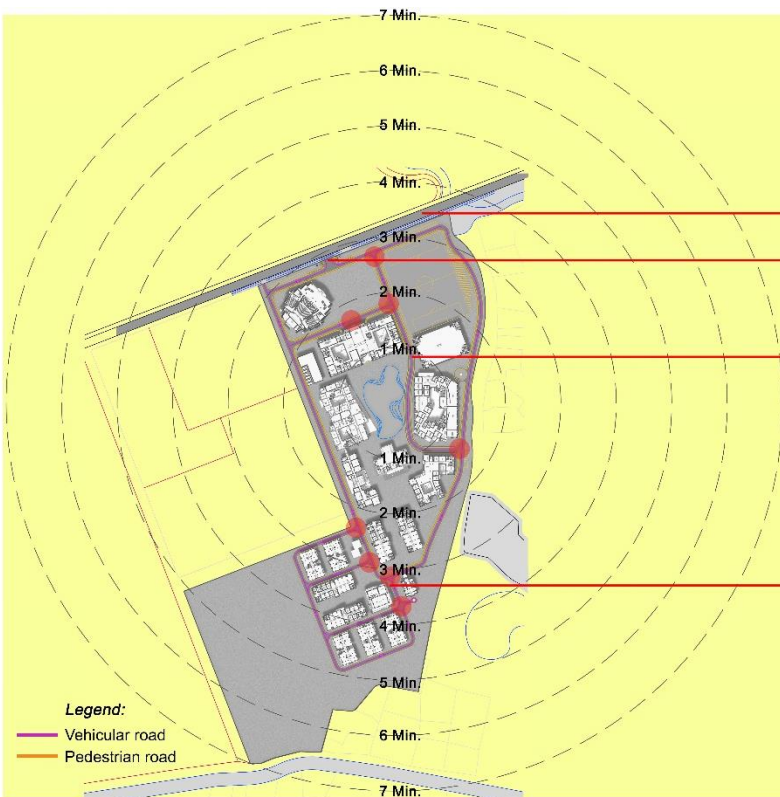
Library:

- Placed between academic blocks which offers ease of access from all buildings.

Residential Zone:

- No separate entry/ exit.
- Less option for recreational activity.
- Proper arrangement of residential zone & segregation of spaces is required.
- Kitchen-dining is placed in between Girl's & Boy's hostel for easy access and use.

4.2.3 Walkability-Pedestrian & Vehicular movement analysis:



Walkability:

- Travel distance: 1 min. = 70m
- Ideal: Within 10 min. walking distance from all space to campus core area.

Access road:

- From NH2B road

Main Entrance:

- Lay-by/ Entry plaza required.

Vehicular access:

- Inside core campus area.
- Not pedestrian friendly campus.
- Limitation to vehicular access is required to make pedestrian friendly campus.
- Hierarchy of access road or path is missing.

Conflict point:

- Vehicular pedestrian conflict points.

Bicycle:

- Bicycle parking and pathway is not incorporated in architect's scheme.

BUILD V/S OPEN SPACE ANALYSIS :



HIERARCHY OF OPEN SPACES:

1. PRIMARY:

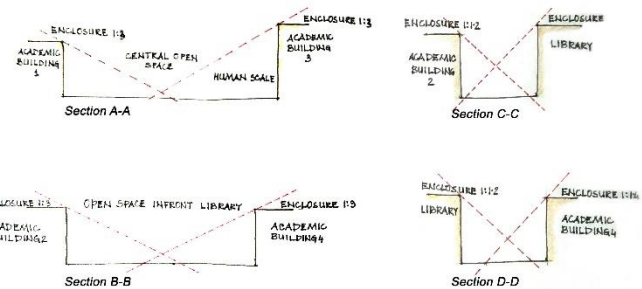
- Front open space to compliment the structure and used as recreation space.
- Redesign of residential zone incorporating the amenities.

2. SECONDARY:

- Central open space as major circulation space between all adjacent building.
- Water body to enhance aesthetics and create micro-climate inside the court.
- Congregation space for all user's of the adjacent buildings.
- **Enclosure:** of central open space is comfortable and secure feeling enclosure.
- Human Scale (H:W -1:2 to 1:3)

3. TERTIARY:

- Small open space adjacent to building used as circulation & congregation.
- Too small open area to hold out door activities.
- **Enclosure:** Uncomfortable and unsafe feeling enclosure.



OPEN SPACES STRUCTURE:

1. LANDSCAPE FOR INTENSIVE USE:

- Courtyard, Plaza, Building fore-ground.

2. LANDSCAPE FOR LEISURE ACTIVITIES:

- Lawn, canteen, Garden.

3. UNUSED LANDSCAPE:

- Backyard of buildings, road side plantation

4. LINKAGES:

- Connecting pathway, building entrances

5. WATER BODY:

- Congregation space

6. PARKING

4.2.2 Architecture & Structure:

RESPONSE TO ARCHITECTURE:

CONCEPT:

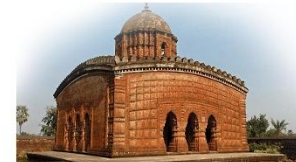
- All the building blocks has designed on Bengal architecture. Rural art form & its feature could be seen on building elevation to response its context.
- Height of all Building blocks is less the 14.5 M (G+3) to achieve *HUMAN SCALE*.



FRONT ELEVATION OF ADMINISTRATIVE BUILDING



Art work used on Building surface of Visva Bharti (Santiniketan)



Madan Mohan Temple- Bishnupur
(Source: www.googleimage.com)



Bengal huts (Source: www.googleimage.com)

Inference:

- Entry plaza with lay-by required.
- Encouragement to make pedestrian friendly campus.
- Promotion for bicycle use to internal access.
- Avoid conflict point for vehicular & pedestrian movement and offer a special path for internal access.
- Min. 6m width required for internal access road.
- Buildings are placed so closely that air circulation will be an issue for that climate (Hot-humid).
- Orientation of building is dominated by site shape so mitigation will be required from summer sun.
- Properly ditribution of open space as per use.
- Ecological enhancement.
- Integration of built-open space and respone to its context.

CHAPTER 5. LITERATURE REVIEWS

5.1 BRIEF HISTORY- TRANSFORMATION & IDEOLOGIES OF 'VISVA BHARTI

5.1.1 Brief History:

Once Debendranath Tagore, the poet's father while passing from Bolpur to Raipur to attend an invitation which was came from the Zamindar of Raipur, he took rest under two small trees and discover immense tranquillity of nature that gave him comfort, pleasure and peace of mind and soul.

Then he decided to make a sanctuary for his religious polarisation. In 1863, the lord of Raipur had leased him 7 acres of land from his own territory at a cost of a token price. Consequently Debendranath made a wisdom sanatorium in the following year and named it Santiketan. He occasionally used to stay there with his followers and spent time for religious discussion. In 1888, Debendranath formed a trustees and open it for all.

After inauguration of 'Upasana Griha or Temple' in 1892, the temple provide the access for people from any cast and any believe.

Rabindranath Tagore came at an age of 11 at Santiniketan with his father and stayed few days with him. In 1901 Rabindranath Tagore came to Santiniketan permanently with his family. Rabindranath had been worried about the education of his children and he decided to start an experimental school but not like the school that had been nightmare of his own childhood named Brahmacharyasram. The school was started with five students (Ghosh 2016).

To develop a congenial and friendly relation between teacher and students, a class room with vast space was created with sky as roof and bushes and trees as surrounding walls. Students and teachers were very close to nature and through continuing question and answer session students used to learn from teachers. The curriculum had music, painting, dramatic performances and some other performativity practices. The little plants started to grow and bloom gradually and converted to big trees and open air class rooms started functioning under the serene and tranquil shades of the greenery. Slowly it became Tagore's Santiniketan, "*an Abode of learning unlike any in the world*" (Pal 2016).

5.1.2 Growth and transformation of Visva-Bharti to a central university:

After Rabindranath was awarded Nobel Prize for his Geetanjali in 1913, he was invited from different corner of the world. He travelled to Japan (1916), Argentina (1924), Russia (1930) and he came close to a large part of world and its culture.

At a certain time at his world he felt the immense urge to cop up the Indian thoughts to the Global spectrum. To materialise the thought in 1918 Tagore declared Santiniketan's Brahma ashram as Visva Bharti.

In 1921 he formed a council for Visva Bharti and handed over his all own asset including the Nobel Prize money and open the access to all the students from all over the world. After formation of Visva Bharti Tagore concentrated to develop the infrastructure of the locality in 1929 and set up Sriniketan in a village close to Santiniketan.

Visva Bharti started to gets shape gradually. University section was named **Vidya Bhavana**, College section- **Siksha Bhavana** and school section was named **Patha Bhavana**. Girl's Hostel was named **Srisadan** and boy's hostel named as **Tarekh. Cheena & Hindi Bhavana** were built in 1937. **Hindi Bhavana** was the last building was constructed in Visva Bharti before Tagore died.

Mahatma Gandhi visited in 1940 and Tagore urge him to take charge of Visva Bharti in his absence. After 10 years of Tagore's death in the year 1951, Indian Parliament declared Visva Bharti as a full-fledged university and from that time Indian government took responsibility and built rest of the structure.

Music, dance, painting, sculpture is so popular in Visva Bharti that students from several countries and culture are still coming with the passion and pursuit of learning.

Earlier Santiniketan compound was built in a 7 acres of land but now Visva Bharti has extended its area to 1200acres and become the only university in India where the opportunity to learn from Kinder garden to Ph.D. degree.

The Brahma Vidhyalaya started with 5 students in 1901 and in the long course 100 years of time the Visva Bharti now have more than 5000 students from home and abroad. The concept of open air class room is still successfully running with the motto of "Yatra visvam bhavatyekanidam (where the whole world makes a home in a single nest) after a 100 years of time of history.

5.1.3 Tagore's Ideologies of learning

Tagore's idea of education was to incorporate the presence of nature to the fresh minds as we are an integral part of nature. Fresh minds conceive the ongoing circumstances around him. This circumstance does not only include the physical connections but also mental attachments. They consciously or subconsciously leaves an impact on the overall growth.

Rabindranath Tagore visited different countries during his entire lifetime. This does not include only some mere places but different areas of locations. He was somehow involved with different projects from different fields.

These experiences expanded his perspective thus creating a garden of wisdom. Nature forms the society by introducing itself to us, and the society again gives this back to nature.

According to Tagore this understanding between nature and society should always remain in harmony. Nature is forming the society and getting affected vice e versa.

The overall teaching process and the procedure to form the society generated due to his lifetime experience and later his tour to different parts of the world with the consistent addition of input from nature. He critically examined every situation.

His continuous involvement with the evolving process led to the outcomes that not only reflected at the time of planning the Santiniketan Campus but also in some of the major works undertaken by him.

So accumulating my continuous immersion to the field of Tagore's philosophical approach can be point wise delineated as-

- 1) Assimilation of outdoor and indoor space through the involvement of nature.
- 2) Taking the human activity more close to nature for better grasping of knowledge.
- 3) Major importance was given to the vernacular and in-context requirement of the project.
- 4) Climatic condition and its respective treatment holds in a prime location for designing
- 5) Continuous influx and proportionate mixing of spaces within to form a better way of living.
- 6) Involvement of local knowledge to form an improvised design.

5.1.4 Past and Present Image of 'Visva Bharti' – Santiniketan

5.1.4.1 Present Image of 'Visva Bharti' – Santiniketan



Students in Brahmacharvasram Vidhvalava



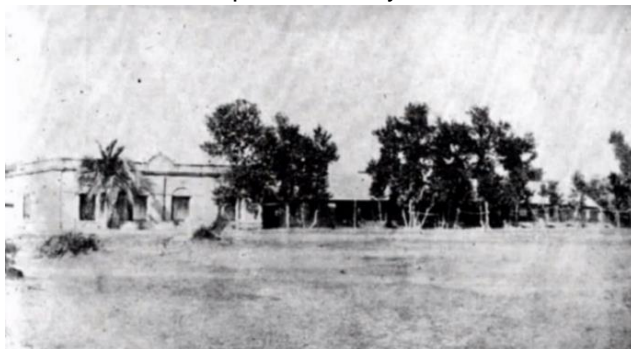
Prof. Levi with Tagore in open air class



Santiniketan Temple, Sketch by Selim Munshi



Students in open air class



Early Sriniketan



Santiniketan Temple, Sketch by Selim Munshi



Santiniketan sketch by Kanai Samanta



Tagore in Visva Bharti Campus

5.1.4.2 Present Image of 'Visva Bharti' – Santiniketan



Road towards Visva Bharti- Urban Setting



Santiniketan Griha



Building dominance both side of the road



Temple (Upasana Griha)- green on both side enhancing the building



Transition of urban area & Visva Bharti boundary



Open air class room



Vegetation along two side of the road towards Visva Bharti



Khoai's character is still intact- covered with densely vegetated eucalyptus tree

5.2 CAMPUS PLANNING

5.2.1 Campus planning history in India

History of campus with Indian context can be traced to down Indus valley civilization time. In previous times there were enormous nos of campus in India which enlightened the whole world. Nalanda, Bikramshila, Takshilla were among them. These are the universities that are used to attract huge nos. of students across the whole world. There was properly planned campus at that time. Many times sun brunt bricks were used for construction. Regarding their technology availability, history tells that in Nalanda there was a hall for the gathering of students in 5000 capacity. The whole campus consisted different areas for the hostel, academic sections etc. Local landscape materials and items were used for better perfection.

5.2.2 Importance & Goals of campus landscape/ outdoor spaces:

5.2.2.1 *Campus landscape as learning spaces*

The landscape on campus is provided only for greens but also it creates the feeling of being energetic. Different landscape nodes provide learning spaces in nature's laps. Apart from this green landscape campus helps to create memories too for life.

5.2.2.2 *Pedestrian friendly campus: ecological benefit*

Campus design should deliberately focus on differentiating the vehicular and pedestrian pathways. It helps to maintain ecological balance, creates different shades of transformation during entire campus life and most importantly delivers a perfect level of safety for every user's.

5.2.2.3 *Community participation*

It is the idea where every direct user will directly or indirectly get involved with the users surrounding the campus and its ancillary activity. There are certain stages of this design approach where community ultimately decides the final design. This activity includes not only tertiary service providers but also the service providers like campus placement, social responsibilities, and free education gainers etc.

5.2.2.4 *Healing landscape in campus: Kaplan & Kaplan*

Study (Kaplan & Kaplan) shows that spending time in nature such as gazing at the ocean or mountainous view, watching the sunset, sitting in a park, flying to the countryside, has provided people with the opportunity to rest, reflect and resolve problems.

From the study, it is understood that nature's valuable role to overcome mental fatigue and to improve our ability to solve problems.

In campus life, students mostly spend their time within confined boundary with assignment almost every time which can lead to mental fatigue, frustration, insomnia etc and to overcome from such fatigues is to nature. 10-15 minutes of nature work or exposure in nature can help to rejuvenate the mind of users.

5.2.3 Principles of campus planning

Campus should be ideal for growing new ideas apart from conventional study. A campus should be such that it will help to grow non-conventional thinking which in future will help to configure society.

Each and every location have its own specialties and uniqueness. It might consist some old buildings or may contain some previous architectural features. The new campus design should always be made to keep harmony with the existing conditions.

Campus design should respect its surrounding and nature. Respecting surrounding does not mean that design should look alike the previous situation. It may or may not be similar, but it must be complementary to the surrounding. Its existence should fulfil the surrounding.

The campus should create a feeling of being safe. It should be designed in such a way that it generates a sense of being comfortable which helps them to work freely in both workplace and other locations. The vehicular and pedestrian pathway should be properly delineated to create minimum nos. of conflicting points.

It should generate a sense of being part mix and part separated where needed. From the zoning perspective, it would consist of the private, public and semi-private area. Apart from this, it would also contain separate flow line for pedestrian and vehicular road. All of these may remain single or may be combined according to the need of design.

Campus planning as any other development project should encourage the employment and development in surround community. By this way, it harnesses the feeling of harmony and being contextual with the existing condition more.

5.2.4 Component of campus landscape

Campus landscape should include these major components

1) Main campus area this is the main place where the major activity of any campus continues. Whenever any stakeholder came into action, maybe he/she was previously aware or not aware of the campus, he/she comes at that location.

2) Secondary campus area: This is such a location where the previously aware peoples of the campus visit here. This can be some academic portion or some hostel agglomeration area or just simple gossiping location.

3) Entrance area: All types of stakeholders enter the campus through this point. It needs to be attracting enough for all type of target groups.

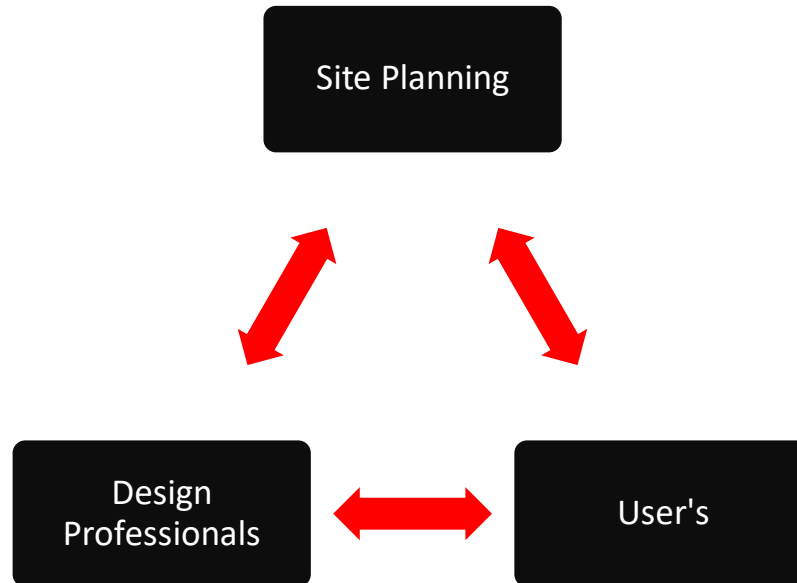
4) Residential greens: Every residential portion should be surrounded by enough amount of green, which will not only boost their mind but also will make them comfortable and amusing to stay on campus.

5) Attracting pathways: Pathways are such locations which will be used for every type of users every day. So its appearance should fascinate the users so that he/she feels energetic to go through that.

6) Courtyard nodes and plazas: Nodes and plazas at various points not only helps to gather and enhance knowledge but also helps to create the memory which might remain with them forever.

5.2.5 User's role in campus design: a new concept

The new concept of user's involvement in design process is termed as QFD (Quality Function Development). It was introduced in 170-80s in both Japan and USA. The main concept of this process is, the users are termed as designers. Users will design according to their requirement so that it will need the least modification for betterment. Professionals will only help them to get over if they feel any objection, and professional will involve themselves at the time of execution. It differs from community - based approach to some certain principles. The community-based approach is depending on some theories or assumption but it lacks in terms of finalizing a conceptual plan. On other hand QFD is not rigid to any assumption, various paths can be adopted for its operation, and finally, it depends on the satisfaction of users. QFD process is more frequently used in product design.



5.2.6 Conclusion

Campus designing is a job of blending residential architecture with the commercial and institutional framework considering in mind the essence landscape and urban of users activity in different areas. Campus design is not only to incorporate the space for regular residential spaces but also creating space where purely professional academic activity will take place. After schooling, it is the place where young minds are prepared to face situations which may happen in their life. It prepares students for their daily job along with ups and downs. At this crucial point of life, campus imparts some various important mental and physical through its design. With all these theoretical approaches it must proceed with some important design considerations. i.e. safety, security, advancement, proper landscape. Differentiating in the circulation in the form of pedestrian and vehicular pathway should be properly distinguished. The campus will not only show a proper place for study and know bookish materials but also will help to explore new thinking, fruitful gossiping and wonderful memories.

LIST OF BOOKS & PAPERS AND THE FINDINGS

SL NO.	TITLE	AUTHOR	YEAR	FINDINGS
1	Campus Design in India- Experience of a developing nation	A.P. Kanvinde & H. James Millers	1969	<ol style="list-style-type: none"> 1. History of campus planning in India 2. Definition of campus planning 3. Component of campus planning 4. Issues & the ideal campus 5. Case study of different campuses
2	Campus Landscape Space Planning and Design using QFD	Huan Yang	2009	<ol style="list-style-type: none"> 1. The importance of campus Landscape 2. Community-based design process 3. User's role in campus design process 4. Campus Landscape: Functions, Forms, Features 5. Traditional approach of campus planning
3	Main Campus Planning Framework- University of Regina (Part c)	University of Regina	2011	<ol style="list-style-type: none"> 1. Open space approach 2. Open space character & structure 3. Movement framework inside campus 4. Road hierarchy and character
4	University of Washington Master Plan -- Seattle Campus: Goals and Objectives	University of Washington Faculty Handbook	2003	<ol style="list-style-type: none"> 1. Goals of campus planning 2. Objectives of open spaces, Transports & circulation
5	"A campus is the mirror of a college or university's soul....."	University of Colorado		<ol style="list-style-type: none"> 1. The spirit of campus design 2. Campus design guidelines- whole process of a campus planning through case study
6	University of California Riverside- Campus Design Guidelines	Walker Macy (Landscape architect & Thomas Hacker (architect)	2007	<ol style="list-style-type: none"> 1. Goals of campus planning 2. Campus design guidelines- whole process of a campus planning through case study
7	Recognizing Campus Landscapes as Learning Spaces	Kathleen G. Scholl & Gowri Betrabet Gulwadi	2015	<ol style="list-style-type: none"> 1. How beneficial learning within nature can be and how much greenery affects the nervous system in a soothing, calming environment 2. Open-air spaces can also increase overall health and can lead to better cognition and retention.
8	Campus Landscape Vision & Site Standards	Carol R Johnson Associates	2012	<ol style="list-style-type: none"> 1. 5 Principle of campus planning 2. Campus design guidelines

LIST OF BOOKS & PAPERS AND THE FINDINGS

SL NO.	TITLE	AUTHOR	YEAR	FINDINGS
9	Campus--Community Partnerships: The Terms of Engagement	Robert G. Bringle & Julie A. Hatcher	2002	1. Campus--Community Partnerships conceptualized as relationship 1. Office workers with a view of nature were happier and healthier at work. 2. Too much focused attention on anything can lead to mental fatigue and such fatigue's remedy is found in exposure to nature. 3. Exposure to natural environments of the most mundane sort has proven to lift people's moods and enhance their ability to mentally focus. 4. Natural environments can improve attention, connection and focus or nature has the capacity to renew attention after exerting mental energy such as; feeling tired after studying for exams, working tirelessly.
10	The Experience of Nature: A Psychological Perspective _ Attention Restoration Theory	Rachel & Stephen Kaplan	1989	
11	The Architectural style of Santiniketan	Prathita Biswas & Prof. Dr. Jayanta Mete	2014	1. Brief history of Santiniketan 2. Architectural style of Santiniketan 3. Different building and construction analysis
12	From Bharmacharyashrama to Visva-Bharati: A Chronicle of Metamorphosis of a Tiny School into an Internationally-Acclaimed Centre of Learning	Annul report of Visva Bharti	2013-14	1. Elaborate discussion from Debendranath Tagore to Rabindranath's Visva Bharti
13	Rabir Aloy Santiniketan	Sharmishta Ghosh		1. Santiniketan in different phase 2. Importance of all Building in Santiniketan
14	Rabindranath Tagore & Patrick Geddes, The ecological cultural visionaries	Arunendu Banerjee	2005	

CHAPTER 6. CASE-STUDY

CASE-STUDY: 1

6.1 Tagore's Visva-Bharti: Language of landscape

5.6.1 Introduction:

Visva Bharti is located in between two rivers Kopai & Ajay of Birbhum district, WB which is 3.2km away from Bolpur railway station.

FOUNDER: Rabindranath Tagore

AREA: Approx. 1200 Acres

The core campus consists of:

a. Academic Buildings

- Bhasha Bhavana (Institute of Languages, Literature and Culture)
- Vidya Bhavana (Institute of Humanities & Social Sciences)
- Vinaya Bhavana (Institute of Education)
- Siksha Bhavana (Institute of Science)
- Sangit Bhavana (Institute of Music, Dance & Drama)
- Kala Bhavana (Institute of Fine Arts)
- Palli Samgathana Vibhaga (Institute of Rural Reconstruction)
- Rabindra Bhavana (Institute of Tagore Studies, Museum & Archives)

b. ANCILLARY FACILITIES

- Computing and Learning
- Exhibition space
- Workshop
- Museums

d. Recreational FACILITIES

- Heritage Area/ Buildings
- Auditorium & O.A.T
- Outdoor Sports
- Swimming Pool
- Natya Ghar
- Deer Park
- Water bodies

c. SERVICES

- Hostel (Girl's & Boy's Hostel)
- Guest Houses
- Canteen/Dining
- Cafeteria
- Workshop
- Parking facilities
- Post office
- Creche
- Hospital
- Bank
- Community Hall
- Railway Booking Counter

5.6.2 Approach:

Bolpur railway station is the nearest railway station which is 2.7 km from Visva Bharti University.

5.6.3 Climate:

Warm & humid with well distributed rainfall. Avg. Max. temp. 40°C. and avg. Min. temp. 26°C. Average rainfall is 1303 mm. Prevailing wind direction: In Summer: East/South-East wind and in winter– North-West wind.

5.6.4 Master Plan:

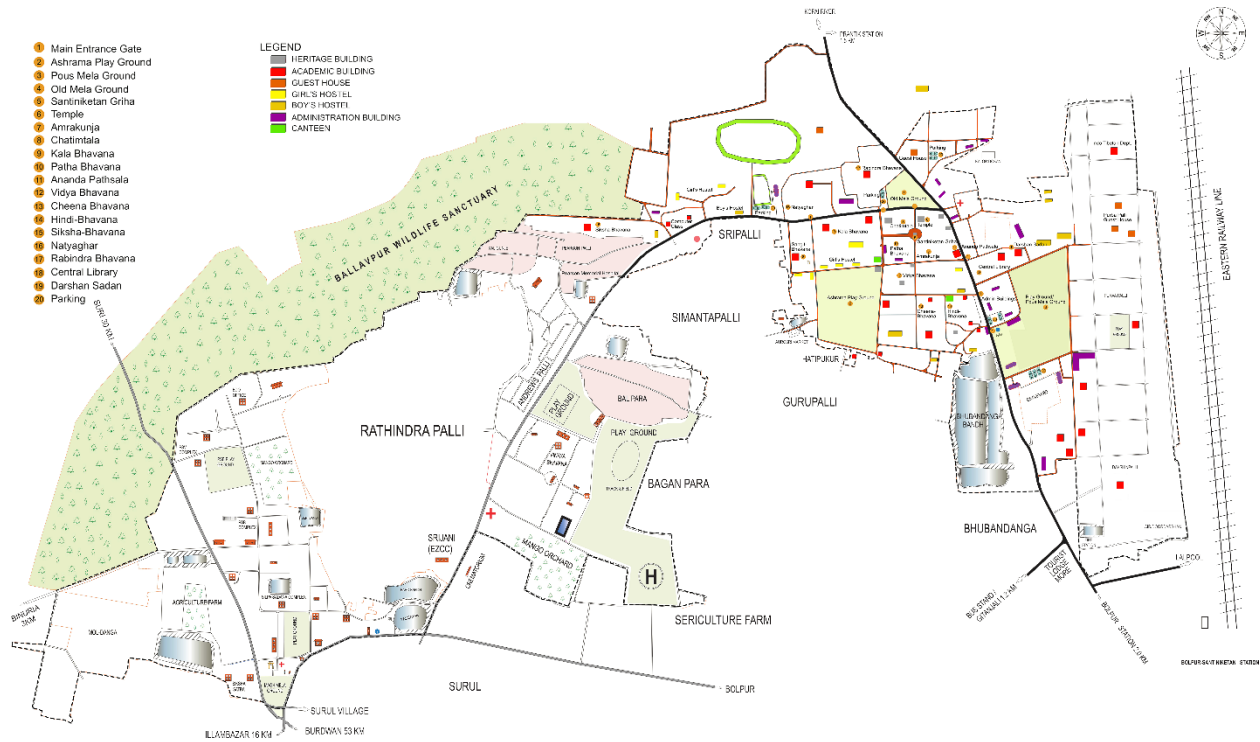


Figure 15 Master Plan (Visva Bharti University campus map)

5.6.5 Observations/ Landscape Characteristics:

5.6.5.1 Zoning:

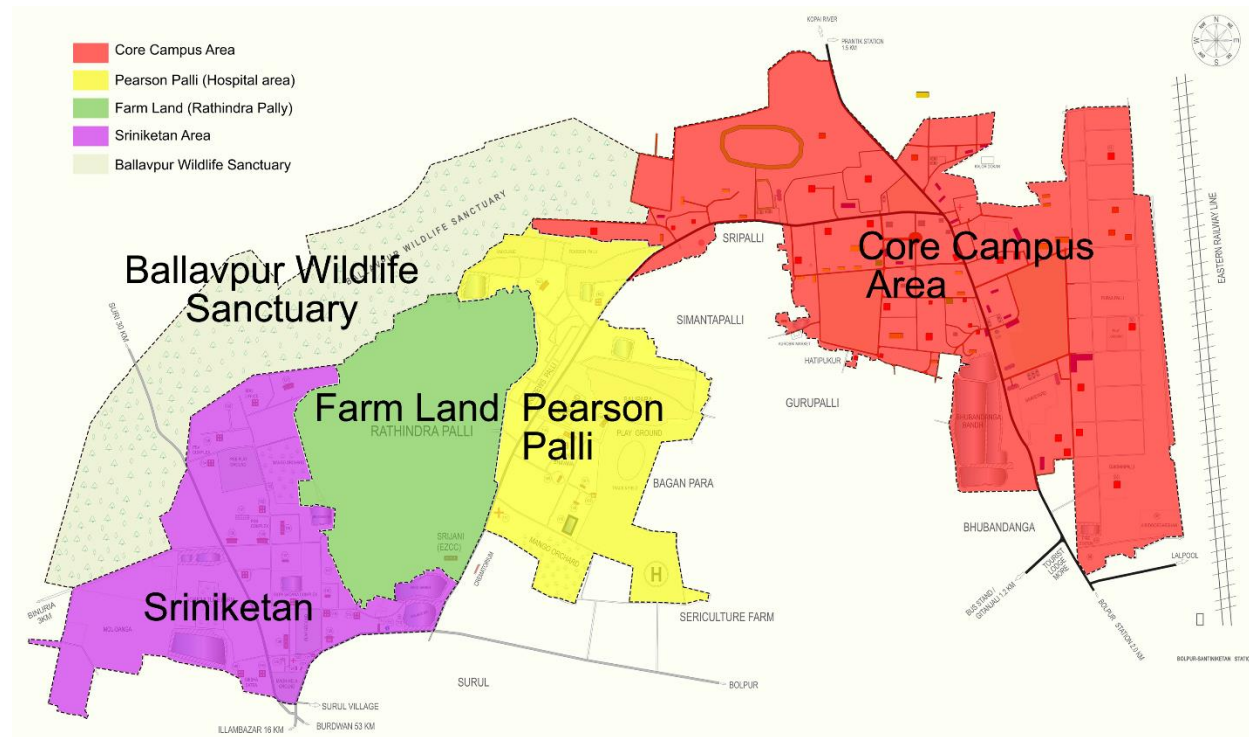


Fig: Various Zone of Visva Bharti

- **Core Campus area-** This area is mixed of Heritage and Academic Buildings.
- **Pearson Palli:** was named on the educator and social reformer Charles Freer Andrews who had served the poor's for Visva Bharti for more than 25 years. A hospital for Visva Bharti was constructed and named it as Andrew's Hospital. This area consist of various 'pallis' or clusters of homes, developed mainly for staff quarters which reflects as primary sense of township.
- **Sriniketan-** came later after foundation of Visva Bharti. Tagore wated to uplift poor locals lifes. So he came up with some development goal e.g. Mass Literacy programme, adult education, rural library services, craft extension & training, Anti-Proverty programmes in Rural Areas, Agricultural Production and Agricultural Marketing.
- **Academic Buildings in Sriniketan area:**
 - a) Palli Samgathana Vibhaga (Institute of Rural Reconstruction)
 - b) Palli Siksha Bhavana (Institute of Agricultural Science)
 - c) Siksha Satra (Institute of Primary, Secondary & Higher Secondary Education)

5.6.5.2 Approach Road:

The approach road towards main entry is 15m wide road and both side vegetation offers shade & provide vertical containment from summer sun.



- Mature avenue of trees leading towards main entry reduce heat gain.
- Diversity in vegetation & huge canopy cover offers shade to pedestrian
- Brick edge with wire mesh boundary wall for visual connection
- Asphalt road is for vehicular movement.

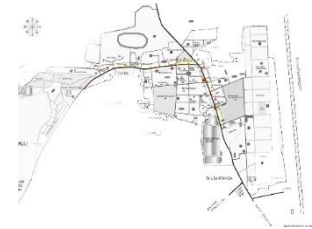


Fig: Key Plan

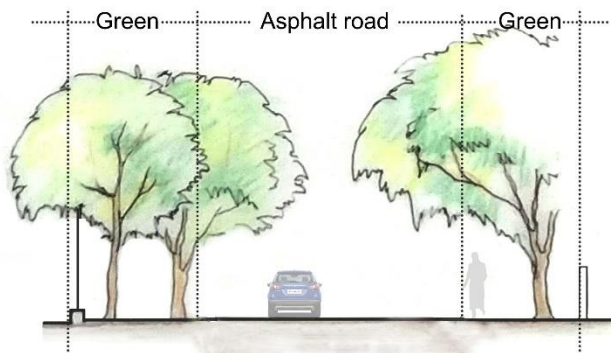


Fig: Schematic section



Fig: Internal Service Road (Asphalt Road)

Observations:

- Surface Material: Asphalt
- Pathway: No dedicated pathway
- Road edge: Wide murrum pathway (Multipurpose use)
- Vegetation: Both side vegetation offers shade (Avenue)
- Threshold: Porous boundary wall (Visually connected)

5.6.5.3 Pathways:



- Shaded walkways
- Gate to new zone (Transition/ Homogeneous/ Human scale)
- Threshold: Porous wall
- No drainage facility
- Edge protection: Kerb stone
- Murrum pathway offers ground water recharge

Fig: From canteen to Kalo bari



Fig: Murrum path with wire mess railing offers directions



Fig: Wide murrum path. No edging & huge canopy cover.



Fig: Murrum path with wire mess railing offers directions

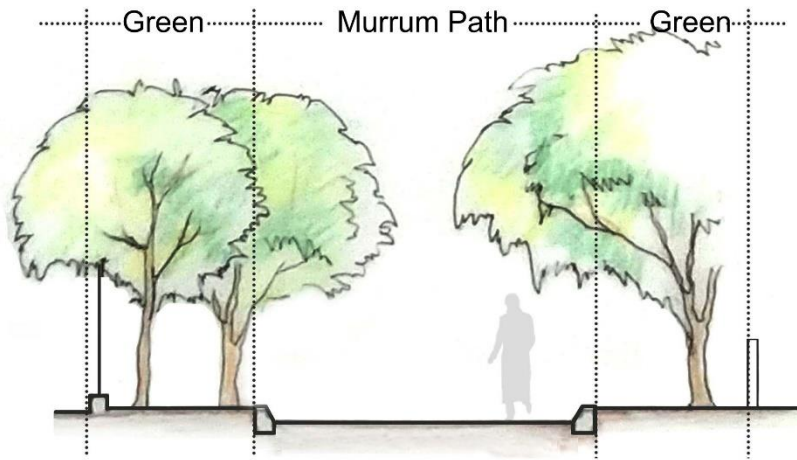


Fig: Schematic pathway section



Fig: Schematic kerb section



Fig: Pathway defined by building boundary wall



Fig: Pathway defined by building boundary wall

Observations:

- Surface Material: Murrum and virgin soil
- Drainage: No surface drain provided along pathway

- Edge: Kerb stone/ Designed concrete kerb/ absent
- Vegetation: Both side vegetation offers shade (Avenue)
- Threshold: Porous boundary wall

5.6.5.4 Entrance Gate Complex:



Fig: Old Banyan tree creates Landmark, provide shelter & shade

- Porous canopy act as ceiling for users
- Human scale Entry Gate act as frame for Santiniketan building
- Wire mess fencing offers enclosure & sense of a space
- Edge: Plastered low wall
- Murrum road maintain the rural character

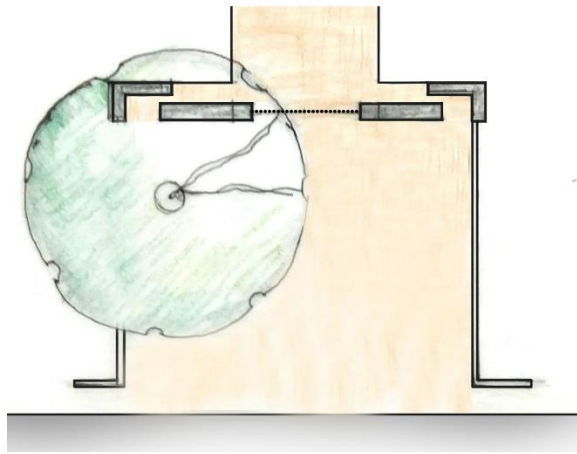


Fig: Plan showing schematic layout of main entrance

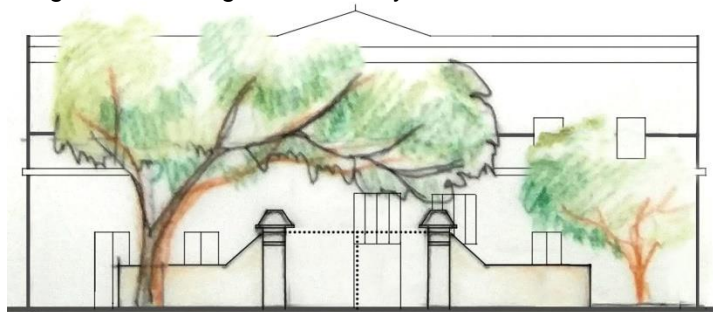


Fig: Schematic section showing the scale of the Gate



Fig: Secondary Entry Gate (Human scale, homogeneous architecture & landscape character)



Fig: Kala Bhavana Entry Gate (Human scale, homogeneous architecture & landscape character)

Observations:

- Maintain Homogeneous character of the campus
- **Surface Material:** Murrum and virgin soil
- **Drainage:** No surface drain provided

- **Edge:** Colour on plastered brick work
- **Vegetation:** Shade & shelter providing tree
- **Threshold:** Porous boundary wall to visually connect
- The scale and form of the gate creates identity for the space.

5.6.5.5 Boundary wall/ Fencing



Fig: Boundary wall type-I



Fig: Boundary wall type-II



Fig: Internal Gate & Boundary



Fig: Internal Gate & Boundary wall



Fig: Fencing type-I



Fig: Fencing type-II

Observations:

- Material: Boundary wall- RCC & Brick work & Iron fencing and internal gate.
- Nonporous boundary wall respect the architectural form.
- Porous fencing obstructs movement but allow vision.

5.6.5.6 Heritage zone



Fig: Conceptual part plan

LEGEND:

1. Front Garden
2. Main Entry Gate
3. Upasana Griha
4. Santiniketan Griha
5. Garden
6. Nursery
7. Chatimtala
8. Convocation Ground
9. Patha Bhavana- Open air class room
10. Patha Bhavana- Admin Building



Fig: Key plan



Fig: Upasana Griha



Fig: Santiniketan Griha



- Winter sun penetrate through mature canopy cover
- Commemorative stage of Tagore's father
- Pathway divided the lawn to break down the vast scale
- Vegetation to soften the edge
- Red coloured murrum path

5.6.5.7 Patha Bhavana (Institute of Secondary & H.S. Education)



- Trees act as enclosure
- Green backdrop
- Elevated seat for teacher
- Brick edge define the class room boundary
- Dapple shadow cast on surface through large canopy cover

Experience: Close to nature, various birds & their dulcet sound will ameliorate mind.



Character of open air class rooms- Large open space for class rooms. To bring large trees bring down the vast scale to human scale.

Observations:

- Surface Material: Murrum
- Drainage: Natural slope
- Edge: Coloured brick Kerb define boundary wall
- Vegetation: The class rooms are held under large canopy tree to protect from sun.
- Raised platform: For guru's (Teacher's)
- Close to nature, various birds & their dulcet sound will ameliorate mind.

5.6.5.8 Front Garden/ Garden



Naturalistic open spaces



Front garden- manicured landscape

5.6.5.9 Amrakunja and Convocation Ground



Convocation stage

Mango trees is habitat for many bird species and provide shade & shelter

Use: Lawn used as congregation space, Meeting place, Space for music & dance performance

Symbolic value (Amrakunja): Tagore used to stroll around- r ecreational cum open air class room



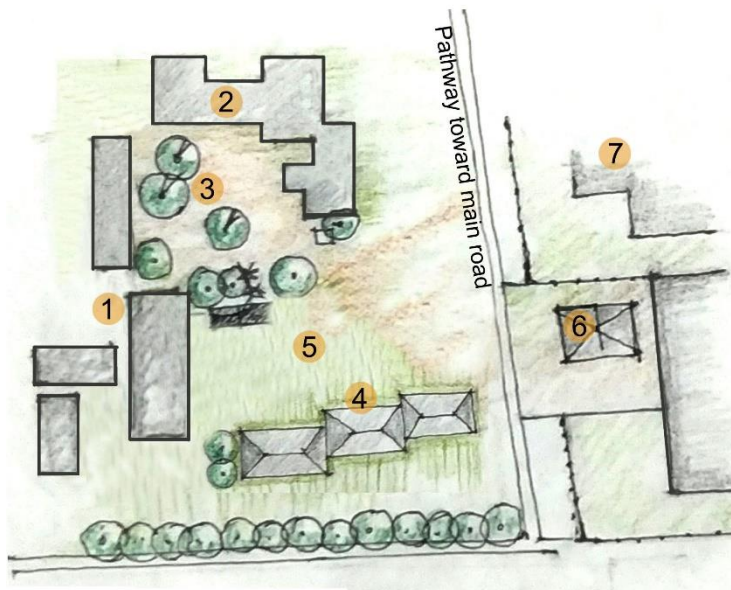
The linear feature mark the historic alley and provide focal points.

Threshold: Porous fencing obstructs movement but allow vision

Artwork by students involved in various activities

Cultural value (Convocation ground): The linear convocation alley lined by Mango tree which is decorated with local artwork by students is bearing its cultural value.

5.6.5.10 Sangit Bhavana (Institute of Music, Dance & Drama)



Conceptual Part Plan



Key Plan

1. Sangit Bhavana
2. Hostel
3. Open air class for Kala Bhavana Dept.
4. Kalo Bari
5. Congregation space
6. Buddha statue
7. kala Bhavana



1. Kalo Bari: Constructed by the students of Kala Bhavana.



5. Infront Kalo Bari: Space for exhibition and congregation.
- Used as Art installation space.



Large canopy tree provide shade & shelter.

Scale: Vast scale is reduce by trees.

Use: Work place for Kala Bhavana Students.

Edge: Defined by brick & Threshold: Building wall

3. In front Hostel area/ Court: Space Defined by human scale buildings which provide sense of enclosure.



Seating: Informal seating, Brick & RCC slab on top placed there.

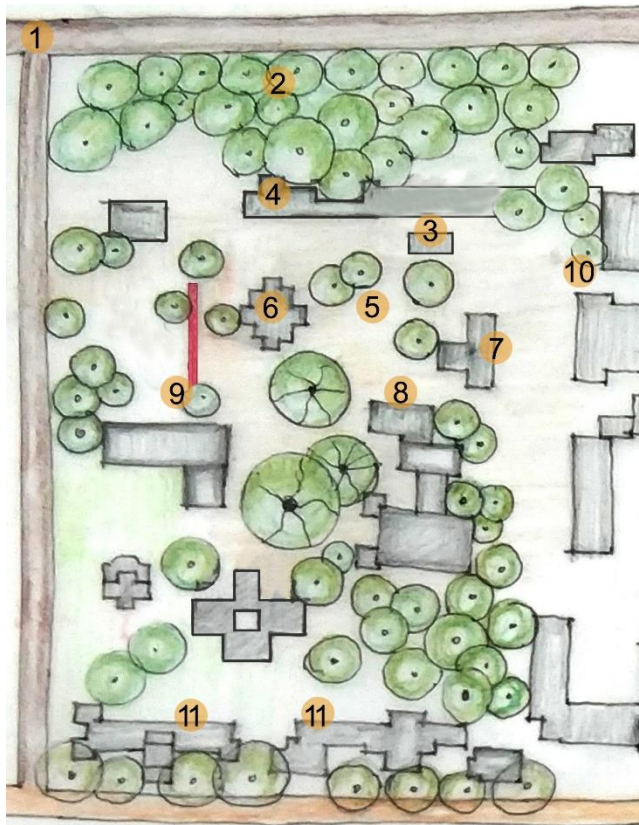


Pathway: No defined pathway. Desire path bearing rural character.

Observations:

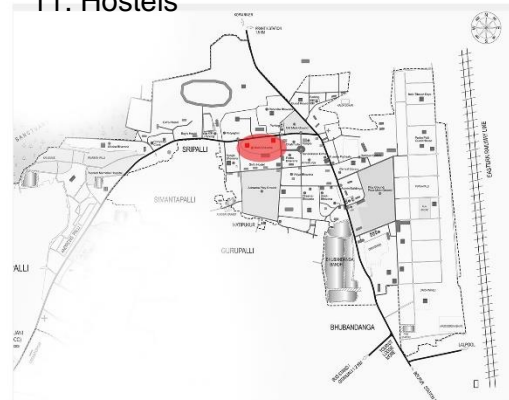
- Open space: For exhibition, art installation, and congregation
- Pathway: Desire path
- Edge: Defined by buildings and lined trees
- Enclosure: Full enclosure

5.6.5.11 Kala Bhavana (Institute of Fine Arts)

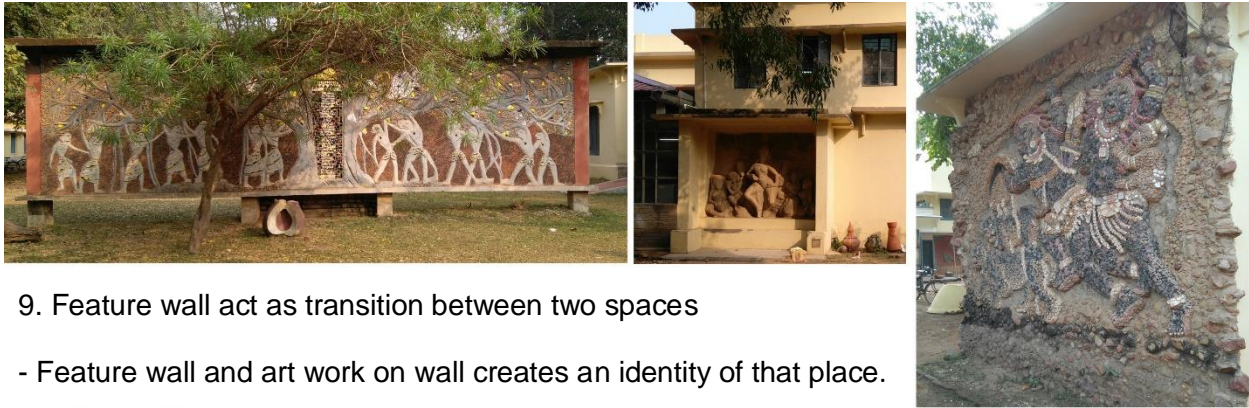


Conceptual Part Plan

1. Entry Gate
2. Front Garden
3. Kala Bhavana
4. Admin & Class rooms
5. Central court
6. Nandan
7. Ceramic & Glass Dept.
8. Wall painting
9. Feature wall
10. Workshop
11. Hostels



Conceptual Part Plan



9. Feature wall act as transition between two spaces

- Feature wall and art work on wall creates an identity of that place.



5. Central court held many activities as Exhibition space, stage for performance, working place for large sculpture & art, large installation and space for mass gathering as recreational space.

Observations:

- Space requirement: Large open area required for art work (wood, ceramic, earth etc.)
- Character: Naturalistic open space confined to buildings which requires less maintenance.
- Stage: For performance & could use as seating space.

5.6.5.12 Siksha Bhavana (Institute of Sciences)





8. Typologies of courtyard of various Department

Hostel courtyard



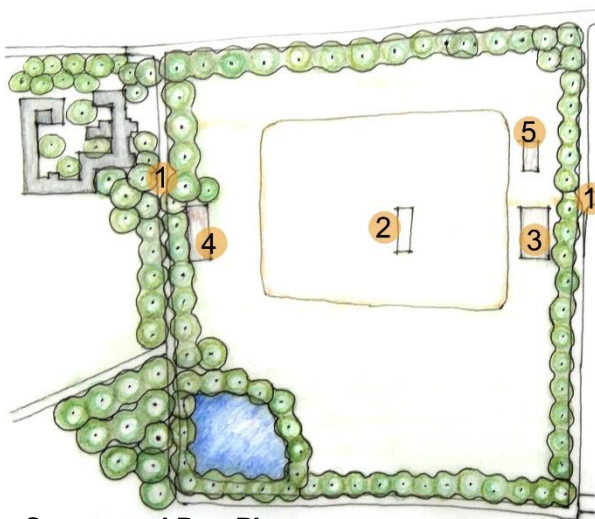
Fig: Concrete paver Pathway

Fig: Mammoth arrival court

Observations:

- Pathway: Concrete Kerb stone
- Vegetation soften edge
- Mammoth arrival space
- Less maintained open spaces
- Huge window provide visual connection

5.6.5.13 Recreational Facilities



Conceptual Part Plan



Visva Bharati Play Ground

1. Entry Gate
2. Cricket cum Football Ground
3. Basketball Court
4. Tennis Court
5. Volleyball court



Basketball court



Volleyball court

Kitchen-Dinning & Library Facilities

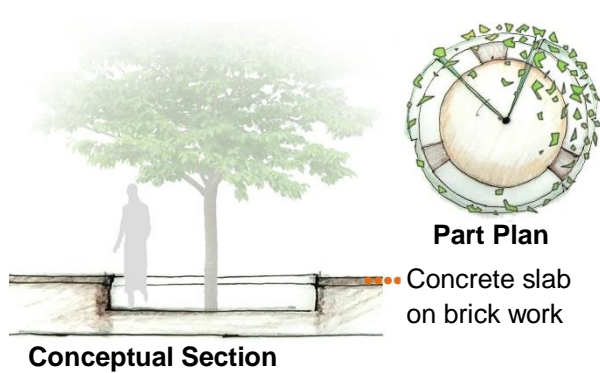


Visva Bharti main Kitchen-dinning



Central library is near to main access road

Types of Seating



Concrete slab on brick work



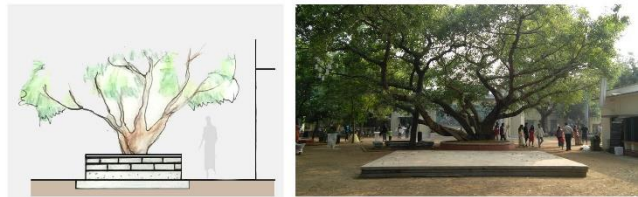
Seating arrangement below tree



Seating along pathway



Various seating layout



Exhibition area

- Stage for live performance and demonstration

Observations:

- Interactive seating layout, facing to each other.
- Local art work, carvings done to decorate seats and stage.
- Materials: Durable and low maintenance material used e.g. coloured Brick, brick work, concrete slab, sand stone on top.
- Seating area define by brick edge.

Parking Facilities



- Dense tree provide shade and reduce heat gain

- No edge protection, space defined by buildings & boundary wall

- Material: virgin soil used as parking

- No segregation between 2 & 4-wheeler parking space.

- Vehicular access restricted near main entrance of the campus.



Observations:

- The campus is accessed by bicycle and by foot.
- No dedicated bicycle parking.
- Natural earth is used for parking.

CASE-STUDY: 2

6.2 Planning- Design & contextual response: Case study of CEPT, University- Ahmedabad

6.2.1 Introduction:

LOCATION: CEPT is located on the Kasturbhai- Lalbhai campus in Navrangpura a western suburb of Ahmedabad Gujarat, India.

ARCHITECT: Ar. B.V. Doshi

AREA: Approx. 17.7 Acres

THE SITE CONSISTS OF:

- a. Academic Building
 - Faculty of Architecture
 - Faculty of Planning
 - Faculty of Technology
 - Faculty of Design
 - Faculty of Management
- b. Ancillary Facilities
 - GIDC Bhavan
 - Workshops
 - University office
 - Exhibition Center
 - Laboratory
 - Library
- c. Services
 - Canteen
 - Stationeries shop
 - Printing Shop
 - Crèche Facilities
 - Parking Facilities
- d. Recreational Facilities
 - O. A. T.
 - Basket Ball Court
 - North Lawn
 - Forest Area (Stroll)
 - Central & S.I.D Plaza
 - Gufa (Art Exhibition)



Fig: Showing location & surrounding of CEPT, University

6.2.2 Climate:

Hot & dry with moderate rainfall and dusty atmosphere avg. Maximum temperature 43c. and avg. Min. temp. 24c. Average rainfall is 750mm.

6.2.3 Master Plan:

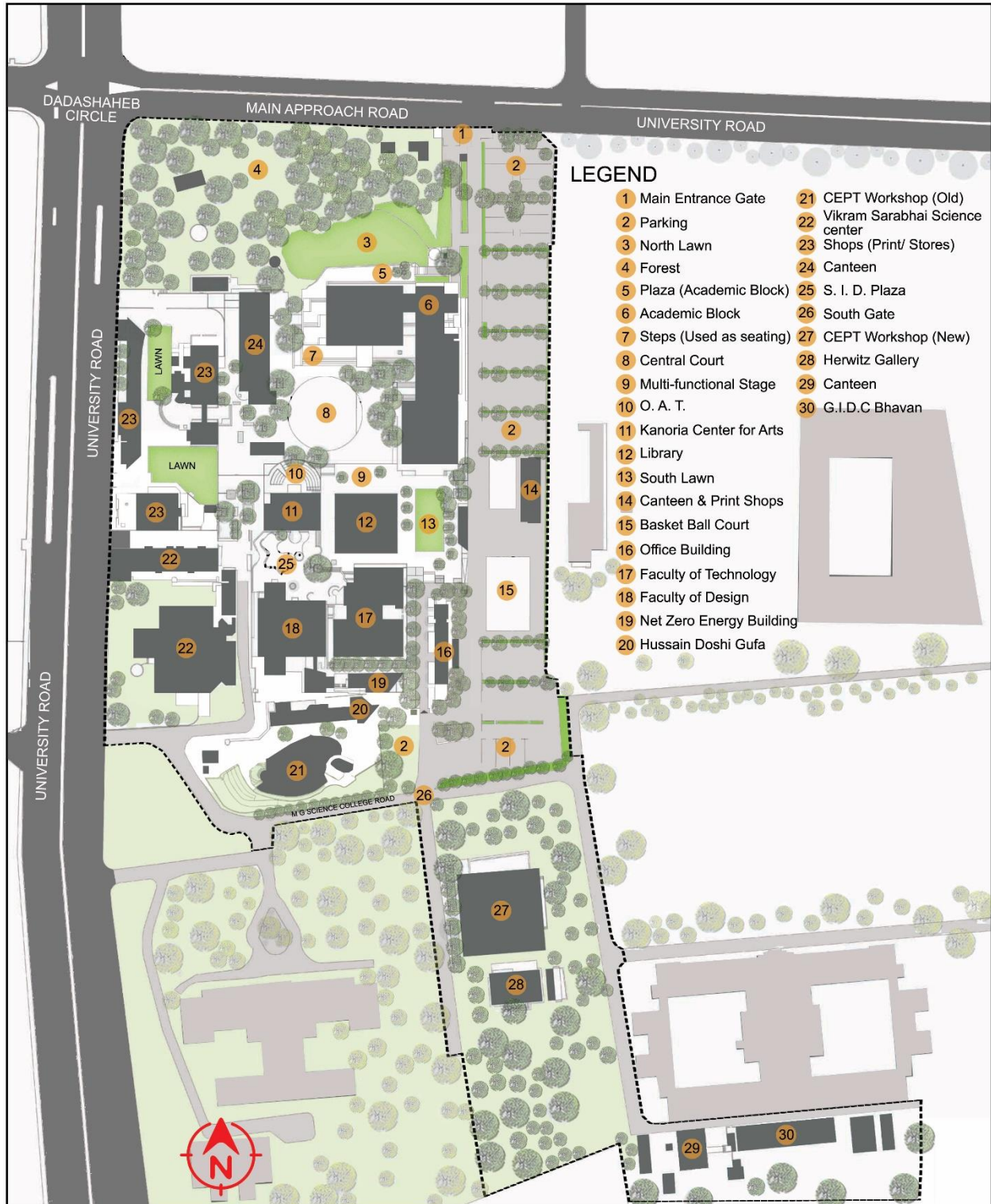


Figure 16 CEPT University Campus Map

6.2.4 Observations:

6.2.4.1 Open v/s Built Space Analysis



Source: CEPT University Campus Map (<http://cept.ac.in/campus-maps>)

- The campus was established in 1962. The zoning of the campus had been changed in different time due to space requirement.

- The site occupies 35% of ground coverage.
- Integration between building & out door space offers multi-functional spaces for the students as well for the staff.

- From functional aspect, the buildings are developed random.

- Separate entry for pedestrian and vehicular.

- Parking has limited till the edge of the boundary of the campus. No vehicular access inside the core campus area.

- During monsoon natural water body formed near north-west corner which acts as a natural sponge & it helps to increase ground water. The area is also a habitat for peacock.



Fig: North Lawn- congregation space



Fig: Entry to Academic Building through brick paving

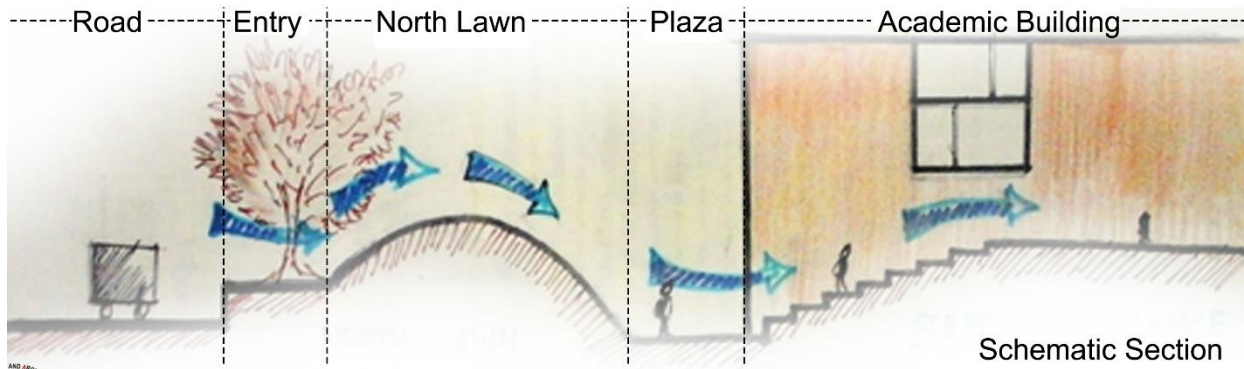


Fig: Built v/s Open Space



Fig: Open v/s Built Space



- Hierarchy of open spaces:

- 35% of **Ground coverage**. Good quality of open spaces can observe in the campus.

- Hierarchy of open spaces:

- **Large:** Front open space or North lawn used as a space for congregation and habitat for peacock.
- **Medium:** Central court used as multi-functional activity.
- **Small:** Adjacent to building act as interactive space and a linkage between other spaces.

- Multi-functional use of spaces:

- **Basement** is used as exhibition space which has a visual connection with outside.
- **Decorative wall:** Workshop walls are used for paintings work.
- **Steps:** Staircases acts as one of the interesting landscape element at the entrance of the building. It is used as seating purpose.



Fig: Exhibition in Basement



Fig: Decorative wall



Fig: Entry steps as sitting place

- Visual connection through Building Design:

- **Double height studios** are connected with outside through huge door & glass window opening.
- **Massing of building** placed next to each other which provide shade in the passages and maintain the heat gain.

- Observation:

- Courtyard based design.
- Huge hardscape apart from the central circular court and north & south lawn.
- Central court is exposed to sun all the time though there is temporary shade but not much green cover.
- Front open area or the north lawn act as sound buffer from the adjacent road but no measure has been taken for west side road.
- All the buildings have their own open area to serve adjacent public activity.
- Lay by is provided near the main entrance court with separate public & vehicular access.

- Inference:

- Uninterrupted Functional flow.
- Building are inter connected with plaza for ease of access.
- Library has been placed centrally for easy & short time access.
- All the open areas have multi-functional use.
- Depending upon function the whole site is divided into 3 major space:
 - a) Parking zone at east & south side
 - b) Centrally the Academic zone &
 - c) Service buildings at west side.

6.2.4.2 Circulation Analysis



Circulation: Types of movement pattern

- Pedestrian movement
- Vehicular movement

- Pedestrian movement:

- Separate pedestrian entry from main gate.
- Pedestrian oriented campus. Through plazas all the places are connected.
- Ramps are provided to make it barrier free.
- Individual building entry is provided from the central court which acts as multi-functional court & as well as major circulation for pedestrian movement.
- To avoid conflict in front Basketball court with vehicular movement, there is provided traffic barrier.

- Vehicular movement:

- Vehicular entry is separate from pedestrian entry from main gate.
- Vehicles are restricted to the parking space provided at the south-east side of the site while the campus is pedestrianized.
- Vehicular access is from both the adjacent road.

6.2.5 Landscape Elements

- The front lawn & forest area offers a foreground to the buildings.
- Front & parking area have large trees but in central portion due to hard surface there is less no of vegetation which cause direct sun.
- North lawn is used by many students as major congregation space.
- The campus is not residential campus so there is less outdoor sports facilities.
- Canteen area is one of frequent gathering space in the campus.

- Outdoor Materials:

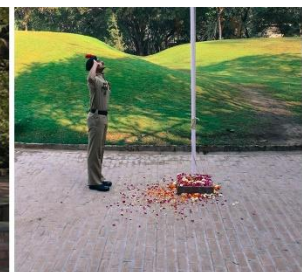
- **Material used on surface:** Brick, concrete paver, terracotta tiles, construction aggregate (Parking)
- **Seating Material:** Brick wall & sand stone in top, concrete block, terracotta tiles (tree pit)- used as seating elements, concrete wall (tree pit), steel benches,
- **Vertical wall Material:** Concrete wall (Feature wall)
- **Shading Material:** Tensile structure (temporary shade)



Brick paving has used as Surface materials



Concrete paver for surface & brick has used for seating with sand stone in top near canteen area



Brick has used as surface material & also for edge treatment.

Rain Garden/ Water body:

During monsoon natural water body formed near north-west corner which acts as a natural sponge & it helps to increase ground water.

Vegetation:

The campus is full of Neem tree which were planted over the years. Neem trees helps to reduce heat. There are also small plant within the buildings and plotted plants in many different places.

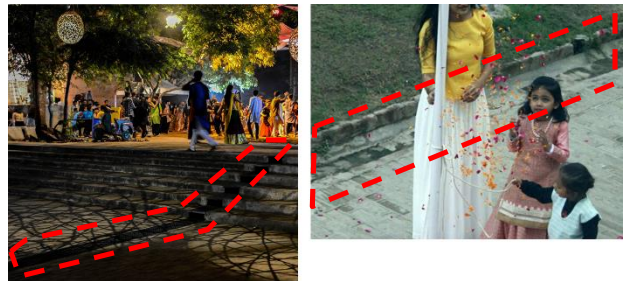


Fauna: North-west corner is a habitat for Peacock family.



Drainage:

- Channel & open surface drain is provided along the building periphery.
- Rain water come down through concrete gutter and flow with natural slope.



6.2.6 Outdoor activities through photograph:



Fig1: Hang-out/ open air reading



Fig2: Flag hoisting



Fig3: Indoor- outdoor Connection



Fig4: Multi functional use of lawn



Fig5: Open Air Class



Fig6:Exhibition Space



Fig7:Plaza as Class room

CHAPTER 7. CONCEPT AND DESIGN APPROACH

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