

#### GOVERNMENT OF CHHATTISGARH PUBLIC HEALTH ENGINEERING DEPARTMENT

# **PROJECT**

#### **FOR**

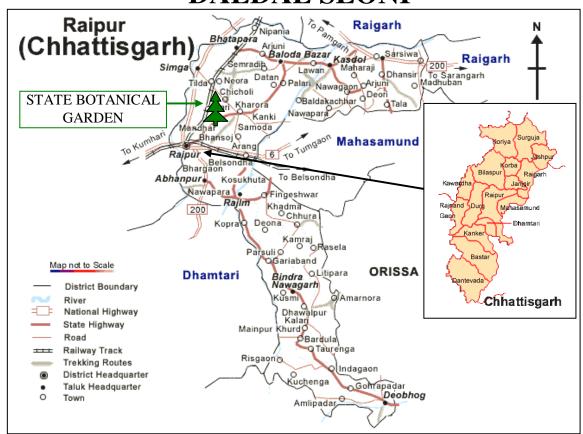
### RECYCLING OF "SEWAGE WATER" THROUGH INDION REED BED SYSTEM

TO DEVELOPE

# STATE BOTANICAL GARDEN

# AT

### **DALDAL SEONI**



PROJECT COST PHASE I: Rs. 189.15 Lacs

PROJECT COST PHASE II: Rs. 73.05 Lacs

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# **PROJECT**

# RECYCLING OF "SEWAGE WATER" THROUGH INDION REED BED SYSTEM TO DEVELOPE STATE BOTANICAL GARDEN

PERIOD – 2002 TO 2007
[BASED ON THE GUIDELINES ISSUED BY THE E..P.C.O.]

#### 1.1 INTRODUCTION

"A growing tree is the living symbol of a progressive nation"

( Pt. Jawahar Lal Nehru )

Biogeographically, India is situated at the trijunction of three realms namely Afro-tropical, Indo-Malayan and Paleo-Aretic realms, and therefore has characteristic elements from each of them. This assemblage of three distinct realms makes the country rich and unique in biological diversity. Based on the available data, India ranks tenth in the world and forth in Asia in plant diversity, and ranks tenth in the number of mammalian species and eleventh in the number of endemic species of higher vertebrates in the world.

There is much stress on preservation of bio-diversity in the Chhattisgarh State Forest Policy 2001. Chhattisgarh is very rich in the bio-diversity, which is scattered in the whole state including in the remotest area in sizable quantity. The general public must be aware of our state's wealth of flora and fauna. At present there are several species, which are on the verge of extinction, and many are still awaiting identification by the Scientist, Botanist, Taxonomist and by the Foresters.

After establishment of Raipur as the Capital there has been a popular demand to develop a Botanical Garden. Earlier the Ravishankar University Raipur had prepared a plan for development of Botanical Garden in the University area, which could not get through because of lack of funds. Since the Recycling of sewage water is already being done at Daldal Seoni, the treated water can be diverted to Botanical Garden and thus solve the watering problem. The area surrounding the Oxidiation Pond is 15.79 acre and would be ideal for the development of Botanical Garden. It would act as a conservation site of the Chhattisgarh flora in addition to protecting endangered species. The Proposed Botanical Garden will have among other feature like senior citizen park and recreation facilities for the people of surrounding area and also for the citizens of Raipur.

Concept of Botanical Garden in this project report envisages an expenditure of Rs. 2.62 crores (Annexure –1), which if approved may be sanctioned by the government.

This project is formulated with a view to collect almost all species of flora present naturally in the State including other parts of India at one place for the benefit of all FORESTERS, SCIENTISTS, BOTANISTS, TAXONOMISTS, STUDENTS, TOURISTS & GENERAL PUBLIC etc.

#### 1.2 INDION REED BED SYSTEM

#### AN ECOLOGICAL APPROACH TO WASTE WATER MANAGMENT

Adopting natures own zero waste, zero effluent ecosystem approach to provide an effective answer to the problems of pollution and water scarcity.

Reuse or recycle of wastewater is essential for water conservation as well as for economic use of water. The conventional methods of wastewater treatment require complex setups, energy and instrumentation. Besides, maintaining the system is also a costly affair requiring highly trained manpower and instruments.

It is a clean, economic and Eco-friendly method of domestic sewage treatment as an alternative to the conventional systems. It is used for removal of BOD,COD and suspended matter from sewage of domestic wastewater.

#### 1.2.1 SALIENT FEATURES OF THE SYSTEM ARE:

- No need of electricity for aeration
- No moving parts, hence very low maintenance and replacement cost
- The treated water coming out of the system can be reused or recycle for industrial use for agriculture, pisciculture or ground water recharge.
- There are no foul odours typical of the wastewater treatment sites
- The system gives picturesque garden like appearance.

#### 1.2.2 THE MODE OF ACTION:

INDION REED BED SYSTEM uses ecological principles, which simulate the natural processes for treatment of domestic sewage. The system involves specially selected aquatic plants in combination with proprietary media. The treated water can be recycle or reused with minimum treatment.

#### 1.2.3 HOW DOES THE INDION REED BED WORK?

Efficient simulation of processes occurring in the wetland is the key to the reed bed system. After analysis of the waste water (flow rate, nature and concentration of contaminants), a group of hardy indigenous wetland plant species are selected based on our extensive studies of wetland plants and soil. These plants, which have been acclimated to survive in a harsh polluted environment, are planted in the reed bed.

As the plants used are from various species their root system reach different levels in the bed medium. Further, they harbour different types of microbes, thus increasing the bio-diversity of the system. More than 3000 types of bacteria and ten of thousand of fungi are made to thrive in the reed bed.

The plants transport oxygen through their leaves & stems to the root hair which release oxygen in to their surrounding where the aerobic microbes survive. Away from this area, the oxygen level starts depleting and here the facultative microbes thrive. Still away from this is the region of no oxygen where the anaerobic bacteria thrive.

The proprietary media help acclimated plants to spread their roots easily in the soil. moreover it supports microbial arounds the roots.

The microbes oxidize impurities in the waste water. The different type of microbes exist side by side in this simulation of ecosystem, inducing different type of chemical reaction and balancing bacterial growth, thus decomposing the contaminants to their basic form.

Sulphur compounds and nitrogenous materials are converted to their elemental forms while BOD & COD are drastically reduced. Heavy metals precipitate and are fixed to the soil matrix. What comes out of this engineered ecosystem is treated wastage water which environmentally acceptable. It can then be disinfected for use for toilet flushing gardening and irrigation or to recharge ground water.

#### 1.2.4 PRINCIPLE OF OPERATION

After clarification in the sedimentation tank, the waste water passes through the reed bed treatment system. Here it comes in contact with the proprietary filling media and the microbes present around the roots of the acclimated plants. During this process suspended solids, BOD &COD are reduced to an acceptable level. Thus , the INDION reed bed system combines the functions of aeration tank secondary clarifier and sludge handing mechanism into a single , simple aesthetically designed unit.

#### 1.2.5 FEATURES

**Aesthetic design.** Picturesque appearance.

**Virtually operation & maintenance free:** The system has no mechanical / moving parts. There is also wastage of energy since mechanical aeration is not needed.

**clean and efficient :** Since all chemical reactions occur underground , there are no strong odours or sludge formation , nor does it breed mosquitoes and files.

**Self – sustaining, long lasting :** Once installed and operational, the reed bed system can sustain itself more than 40 years.

**Adapatable:** The systems are suitable for concentrations from a few mg/l up to 20,000 mg/l of cod and 4000 mg/l of nitrogen; they cam be set up for capacities from about 1 m3/day to more than 10,000 m3/day.

Can handle difficult effluents: Due to the diversity of microbes and the wetland plants, the reed bed system can adapt itself to diverse types and varying shock loads of effluents, including difficult waste water containing, organic compounds like chlorinated hydrocarbons, sulphur containing aromatics and reactive dyes. Sulphur compounds such as sulphides and sulphates Nitrogen compounds such as ammonia and nitrates, heavy metals and pathogens

#### **1.2.6 DETAILS:**

The wastewater is collected via sewer lines and brought to a suitable site through sewage lifting pumps. On the site, a pit of requisite dimension is made. The length and breadth of the pit depends on the volume of the wastewater to be treated per day. The pit is lined by soling the LPD. If necessary, other type of civil structure can be made into the treatment tank. The tank is filled layer by layer with proprietary mixture of highly efficient sewage treating bacteria and supporting media.

The supporting medium is planted with special acclimatized plants, which form an association with the bacteria and the medium in such a way that the combination gives the effective sewage treatment system.

With in a few days the bacterial cultures and the plants establish themselves to cover the entire medium. This system becomes operative and remains functional for many years with almost zero maintenance. The treated sewage is filtered through multigrade sand filter and Activated Carbon Filter and chlorinated for disinfections.

#### 1.2.7 TECHNICAL BACKGROUND:

Indion Reed Bed System combines the functions done by aeration tank, secondary clarifier and sludge handing mechanism in a single, operationally simple and beautiful unit.

#### 1.2.8 The system consists of

- Properly designed treatment tank
- Proprietary filling material
- Acclimatized, aerobic, anaerobic, & facultative bacteria
- Acclimatized & selected indigenous plants

The clarified sewage is made to pass through the Reed Bed Tank. Here it interacts with the proprietary filling media and the bacteria present in the rhyzosphere of the acclimatized plants. This interaction results in removal of BOD, COD & suspended solids.

The aerobic and facultative introduces in the Indion Reed Bed System are supplied with oxygen by the network of root system of the acclimatized plants. While the anaerobic ones thrive away form the roots. Organic matter is converted to carbon dioxide & water. The sludge is mineralized and the suspended matter is filtered & sedimented insitu. As a result we get treated water out of the system.

#### 1.2.9 FEATURES & USES

REUSE OF TREATED WATER	SALIENT FEATURE OF THE SYSTEM
<ul><li>Gardening</li></ul>	<ul><li>Natural method</li></ul>
■ Fire fighting	<ul><li>Operationally simple</li></ul>

REUSE OF TREATED WATER	SALIENT FEATURE OF THE SYSTEM
<ul><li>Washing</li></ul>	Maintenance free
■ Toilet flushing	<ul> <li>No wastage of energy</li> </ul>
<ul><li>Construction</li></ul>	<ul><li>Improves habitat</li></ul>
<ul><li>Recreation</li></ul>	Aesthetically pleasing

# 1.2.10 COMPARISON WITH CONVENTIONAL SEWAGE TREATMENT PLANTS

Criteria	INDION Reed Bed System
Capital cost	Comparable or slightly lower
Moving parts	None
Energy requirement	None
Addition of chemicals	Not need except for final disinfection
Operation cost	Nill
Maintenance	Just like a garden

#### 1.2.11 DESIGN BASIS

On the basis of analysis following are the design basis:

Sr. no	Parameter	Raw sewage	Treated water
1.	Flow	125 m3/day	90m3/day
2.	BOD	200 ppm	< 30 ppm
3.	COD	350 ppm	< 100 ppm
4.	рН	6.0 - 8.0	6.0 – 8.0

The sewage water treated with Indion Reed Bed System would be utilized in irrigation of plants, Gardening, Toilet Flushing, Construction and recreation ( Fountains ) within the proposed State Botanical Garden.

#### 1.3 CLIMATE

Raipur falls within the temperate zone of Indian sub continent. The winter commences from December and last till the end of February. The Summer continues till the second week of June. Monsoon commences from middle of June and remains till the end of September. Excessive heat during summer, necessitates general public sleeping in open. This explains why it is difficult to provide higher residential density in planning proposal.

The maximum temperature in May is 460C and mean minimum temperature is 90c to 70c in December. May is the hottest month & December is the coldest.

The relative humidity is higher during the South West monsoon season, being generally over 75%. After Monsoon Season, humidity decreases and during the winter season, air is fairly dry.

Rainfall observations indicate that annual rainfall in the area is around 1400 mm. The rainfall recorded in 1884 was 2184.4 mm. Rains are predominant during July -August. South-West is the predominant wind direction during the period from May to September. Wind is generally calm and the city has around 90 calm days. The layer of soil is thin and the underground water is meager. Ground water is available at a Depth of 60 to 70 m.

#### 1.4 EDAPHIC FEATURES

Area mainly consists of black cotton soil .Soil is deep in depth ,1to 1.5 m. The underlying rock is deccan trap and intertrappeans. Lime Soft rock is found about 2 to 3.5 m. Deep from surface.

#### 2. PROJECT AREA

#### 2.1 STATE BOTANICAL GARDEN [SITE]

#### 2.1.1 LOCATION & BOUNDARY

The site is located at the distance of 8 km from Raipur at the Balodabazar road in the village Daldal Sewani. East boundary is marked by a nala acting as a division line between Saddu and Daldal Sewani village. In the south boundary of Mova village marks it's periphery. In the west a all weather road marks it's edge. North is marked by an artificial boundary of chain link fence as it is within the same Khasara NO. 828/1 of the Patwari Halka no. 109.

#### **2.1.2 LEGAL STATUS:**

The site is within the village DALDAL SEONI on the Khasara no828/1, having area of 24.28 ha. Out of this 8.49 ha is in the possession of the Public Health Engineering Department rest lies with the Revenue Department it self and reserved for government purpose only.

#### **2.1.3 HISTORY**:

In the year 1984 an oxidation pond had been constructed under the Raipur Under Ground Drainage Scheme. It was made functional in the year 1993 and maintained by the P.H.E. department for 2 years, since then the system was not continued to be functional for want of budget. Three oxidation pond of the size 1 X 80.00 x 240 m. and 2x 80.00 x 340 m are there for the treatment of sewage water. At present it is treating about 172 cum sewerage water / day. Which will then be treated by laying Indion Reed Bed System in first oxidation pond for a size of 1250 sq. m. and then it would be available for the Botanical Garden.

#### 2.1.4: EXISTING FLORA & FAUNA:

The land is barren having no conspicuous Flora or Fauna.

#### 2.1.5: CRITERIA FOR THE SELECTION OF THE SITE:

The important features are as follows.

- Site is only 8 km. away from the main city and situated on Baloda Bazar road. This will attract FORESTERS, SCIENTIST, BOTANIST, TAXONOMIST, STUDENT, TOURIST, GENERAL PUBLIC etc
- 2. An opportunity for best utilization of treated sewage water.
- 3. An step towards the functional water conservation. This would act as a model for other projects.
- 4. Sufficient water in Govt. land is available beside the water treatment plant.
- 5. An alternate source of water a sami perennial Nallah makes the East boundary of the site.

### 3. OBJECTIVES OF THE PROJECT

#### 3.1 GENERAL OBJECTIVES

- 3.1.1: To upgrade the environment utilizing the best available resources.
- 3.1.2: To control the environment pollution specially water pollution by treating and best utilization of sewage water.
- 3.1.3: To increase in the green cover of the earth.
- 3.1.4: To develop the area to act as EDUCATION TREAK in future.
- 3.1.5: To reverse the trend of environmental degradation by re-establishing a productive vegetative cover.
- 3.1.6 To check soil erosion and improve ground water table of nearby villages.
- 3.1.7 To provide employment opportunities for the weaker sections of society.

#### **3.2 SPECIFIC OBJECTIVES:**

- **3.2.1:** As the name BOTANICAL GARDEN indicates, an effort would be done towards the formation of a garden along with information about the plant species.
- **3.2.2:** An attempt would be done towards the collection, and planting of all the plant species found in the Chhattisgarh.
- **3.3.3** The place would be developed in to an ideal, readily available area for the study of biodiversity at three different level. 1.Genetic diversity. 2. Species diversity. 3. Ecosystem diversity.
- **3.3.4** To share our knowledge effectively on as wide a front as possible.
- **3.3.5** To establish a state leader in the interpretation and teaching of systematic botany, conservation, biodiversity assessment and management, herbarium and botanic garden management, economic botany, and horticulture.
- **3.3.6** To assist actively in capacity-building in biodiversity and related sciences.
- **3.3.7** To network effectively with leading universities, colleges, schools and other botanical/horticultural institutions to develop relevant plant science education

# 4. PROJECT COMPONENTS

#### 4.1 FORMULATION OF MANAGEMENT ADVISORY COMMITTEE

The government of Chhattisgarh should constitute a committee as per the following to give advice on the species to be planted, preparation of work plan, approval of work plan, monitoring of work in progress, and effort to get necessary funds for the management and protection of the Botanical Garden.

- 4.1.1 District Collector: President
- 4.1.2 H.O.D. of Botany, of the college present at the district headquarter: Member.
- 4.1.3 H.O.D. of Zoology, of the college present at the district headquarter: Member.
- 4.1.4 H.O.D.of Bio Science of the Ravishankar University, Raipur
- 4.1.5 Divisional Forest Officer: Member.
- 4.1.6 District Ayurved Officer: Member.
- 4.1.7 Deputy director or Assistant director Horticulture: Member.
- 4.1.8 Deputy director or Assistant director Agriculture: Member.
- 4.1.9 Commissioner NN: Member
- 4.1.10An N.G.O.- Shri S.S.Pradhan, President Horticulture Society, Raipur.
- 4.1.11 A coordinator would be nominated by the District collector: Coordinator.
- 4.1.12 A consultant firm.
- 4.2 **ESTABLISHMENT OF A NURSERY**: A nursery would be developed within the Botanical Garden. The seeds collected from the near by forests and locality would be grown here and nourished before the planting at the site. Some exotic species would also be tried. A **GLASS HOUSE** would be formed to make suitable environment for the specific species.

- 4.3 **DEVELOPMENT OF THE SITE**: The site would be developed in to a Botanical Garden as the name suggests a garden having a brief information of the species planted. This would be done as per following.
- 4.3.1 **PROTECTION**: The area would be protected from the biotic factor mainly grazing animals by the chain link fence.
- 4.3.2 **PLANTATION**: Suitable species as per the site requirement and soil profile would be planted. Local Species would be planted and stress would be on the rare and on the verge of extinction. All type of plants ie. Tree Species, Shrubs, Bushy, Climber, Grass and medicinal plants etc. would be planted. Some exotic species also would be tried. **List of local species proposed for the planting is attached in the annexure no. II to IV**.
- 4.3.3 **IRRIGATION**: There is sufficient treated sewage water available for the irrigation. Irrigation would be done mainly by the gravitational method but the species, which needs sprinkling, and continuous water would be irrigated by the sprinkler system and drip irrigation system respectively. With the help of a lift pump and pipes the whole gravitational irrigation would be done. Sprinkler system and drip irrigation system would be required for about 1 ha. Each.
- 4.3.4 **GLASS HOUSE**: Within the botanical garden a glass house would be build in which exotic sophisticated species would be kept in their favorable environment.
- 4.4 **INFRASTRUCTURE DEVELOPMENT**: For the unhindered operation some facilities would be provided to the working staff and supervisory officers as per the following.

- 4.4.1 **SEED STORE**: A building for the storage of seed is proposed for the construction. This will increase the viability of seed and decrease the losses.
- 4.4.2 **LABOUR HUT**: For the relax of the working staff in the off time there is a great need of a hut. Thus a small 2 room building with attached latrine and bath rooms is proposed for the construction at the highest point from where a panoramic view of the botanical garden could be seen. This will also act as a watch tower.
- 4.4.3 **APPROACH ROAD AND INSPECTION PATH:** There is a approach road but in the need of up gradation. Total length of inner murum path would be around 1 km.
- 4.4.4 **DRINKING WATER**: Two tube well with power pump is proposed to be constructed. This will meet the requirement of thirst of the visitors.
- 4.4.5 **MOULDED GARDEN CHAIR AND BENCHES**: Moulded garden chair and benches would be placed at the suitable places and as per the requirement.
- 4.4.6 **LAWN, GARDEN & CHILDREN PARK**: Lawn, Garden and Children Park would be developed at suitable places as per the concept design including fountains and children play equipments to attract the children and provide a amusement place to adults and senior citizens.
- 4.4.7 **CONSTRUCTION OF CIVIL STRUCTURES**: Construction of a big & beautiful Entrance Gate would be done in first phase along with the **Chain Link Fence**, **Development of Parking**, **Internal Path** and **Tube Well**. In the second phase of the project **Sun Dial**, **Guard Room**, **Play Equipments**,

Office Building, Canteen, Watch Tower, Fountains, Glass House, Seed Store would be constructed and development of Picnic Spots would be done.

5.**PEOPLE INVOLVEMENT**: One prerequisite for any successful project is the involvement of people for whom the project is made. Efforts will be made to involve the local population, academics, teachers, professors, N.C.C. and N.S.S. students in every aspect of project ie. from planting, protection & species identification to monitoring & evaluation.

#### 6. ADMINISTRATIVE ORGANIZATION

The project will be implemented by Public Health Engineering Department. Adequate number of technical and administrative staff is already available with the P.H.E but they would need Consultancy in the field of Forestry, Horticulture Planting Maintenance etc. as they have not any expert on these fields.

#### 7. MONITORING & EVALUATION

Monitoring of project will be done on regular basis by the MANAGEMENT ADVISORY COMMITTEE & CONSULTANT.

#### 8. PRACTICAL UTILITY:

- 8.1 Conservation of biodiversity.
- 8.2 Utility in academic and research work.
- 8.3 Development & protection of environment.

# 9. AGENCIES WHICH CAN UTILIZE THE RESULTS OF THE PROJECT:

- 9.1 STUDENTS: In their studies.
- 9.2 RESEARCH FELLOWS: In their research work.
- 9.3 ENVIRONMENTALISTS: In the development of environment.
- 9.4 GENERAL PUBLIC: In increasing the knowledge and general awareness on the environment and forests.

#### 10. EXISTING FACILITIES AVAILABLE:

- 10.1 Nursery and a source of water [tank] for the irrigation.
- 10.2 Approach road [upgradation is needed.]
- 11. PROJECT BUDGET & PHASING: Project has been divided in two phases.
- 11.1 Phase I: Primary land development, Fencing, construction of Indion Reed Bed System for the treatment of sewage, Plantation, Gardening and construction of Path are the main features included in the Phase I of the project. Estimated Phase I expenditure is Rs. 1,89,15,000.00 (Rs. One Crores Eighty Nine Lacs Fifteen Thousand only)
- 11.2 Phase II: Secondary development features such as Construction of Gate, Civic and official amenities are included in this phase along with the maintenance cost for second year. Rs. 73,05,000.00 (Rs. Seventy Three Lacs Five Thousand only ) is estimated for second year expenditure in Phase II.

# DETAILS OF EXPENDITURE IS GIVEN IN THE STAGE I ESTIMATE IN THE ANNEXURE NO. 1.

#### 12. PROJECT COST

Cost on various activities are tabulated in the annexure 1. Total project cost is Rs. **2,62,20,000.00 TWO CRORES SIXTY TWO LACS TWENTY THOUSAND ONLY.**, without considering increase in the rate of wages and material.

#### 13. PROJECT BENEFITS

The main objective of the project is to collect about all the species available in the CHHATTISGARH at a one convenient place, conserving and protecting them. It is expected that the treated area will satisfy the genuine needs of FORESTER'S, SCIENTIST'S, BOTANIST'S, TAXONOMIST'S,STUDENT'S, TOURIST'S,& GENERAL PUBLIC etc.

### Annexure 1.

	Estimate for the Botanical Garden development at Daldal Seoni ( Stage - I Estimate)						
S.No.	Particulars	Qty	Unit	Rate	Amount	Project cost in Phase I	Project cost in Phase II
1	Fencing	1900	R.M.	450	855000.00	855000.00	
2	Indion Reed Bed System			L.S.	2500000.00	2500000.00	
3	Labour Hut			L.S.	150000.00	150000.00	
4	Seed Store			L.S.	80000.00	80000.00	
5	Nursery Establishemnt cost			L.S.	2000000.00	2000000.00	
6	Glass House			L.S.	150000.00	150000.00	
7	Construction of Utility	1 No.		L.S.	80000.00	80000.00	
8	Procurement of Plants (family wise) including endangered species. (energy plants) for 7 ha.	10000	/ plant	75	750000.00	750000.00	
9	Garden Development cost on periphery of lawn etc.	3.5	На.	50000	175000.00	175000.00	
10	lawn development cost	3.5	На.	1500000	5250000.00	5250000.00	
11	Water Harvesting Structure measures cost			L.S.	1500000.00	1500000.00	
12	Development of Parking area (Black Topped)			L.S.	300000.00	300000.00	
13	Construction of path			L.S.	1000000.00	500000.00	500000.00
14	Construction of Gate			L.S.	175000.00	175000.00	
15	Display Boards			L.S.	150000.00	150000.00	
16	Tube Well with Pump House			L.S.	200000.00	200000.00	
17	Cactus House complete with plants				1000000.00	500000.00	500000.00

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S.No.	Particulars	Qty	Unit	Rate	Amount	Project cost in Phase I	Project cost in Phase II
18	Planting and maintenance for 2 year including supervision and expenditure on consultant				2500000.00	1000000.00	1500000.00
19	Underground Electric Cable and Garden light complete electricity work L.S. 10% of the Construction and Garden Development Work			L.S.	2230000.00	1000000.00	1230000.00
20	Irrigation, sprinklers, complete water management. 10 % of the cost			L.S.	2000000.00	1500000.00	500000.00
21	Expenditure on unforeseen items				200000.00	100000.00	100000.00
22	Construction of Guard room			L.S.	175000.00		175000.00
23	Development of children park & Senior Citizens Park including play equipment			L.S.	800000.00		800000.00
24	Construction of Sun Dial	1 No.		L.S.	50000.00		50000.00
25	construction of canteen	1 No.		L.S.	175000.00		175000.00
26	Construction of office building	1 No.		L.S.	300000.00		300000.00
27	Construction of Watch Tower	1 No.		L.S.	100000.00		100000.00
28	Equipment Cost for Amphitheater	1 No.		L.S.	500000.00		500000.00
29	Fountains	3 Nos.		L.S.	600000.00		600000.00
30	Development of Picnic Spots			L.S.	200000.00		200000.00
31	Moulded Garden Chair, Benches & Dust bins			L.S.	75000.00		75000.00
	Total Cost of Project				26220000.00	18915000.00	7305000.00

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Annexure II
LIST OF TREE SPECEIS PROPOSED FOR PLANTING

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
1	Alaua	Aal	Morinda tinctoria, Roxb.	Rubiacaceae
2	Aam	Aam	Mangifera indica, Linn.	Anacardiaceae
3	chironji	Achar	Buchannania Lanzan,	Anacardiaceae
			spreng	
4	Akasnim	Akasnim	Millingtonia hortensis, Linn	Pedaliaceae
5	Akol	Akol	Ailangium salvifolium	Cornaceae
			Linn.	
6	Girmala	Amaitas	Cassia fistula, Linn	Leguminoseae
7	Amta	Amta	Bauhinia malabarica	Leguminosae
8	Anjan	Anjan	Hardwickia binata,Roxb	Leguminoseas
9	Aonla	Anola	Eebeliea officinalis Gaertn	Euphorbiaceae
10	Asok	Asok	Polyalthia longi folia	Anonaceae
			sonnerat Thw.	
11	Senta	Asta	Bauhinia racemosa,Lamk	Leguminosae
			and Hk	
12	Babul	Babul	Acacia nilotica	Leguminosae
13	Bahera	Bahera	Terminalia belerica,Roxb.	Combretaceae
14	Bakani	Bakain	Melia azedarach,Linn.	Meliaceae
15	Bargad	Bar	Ficus benghalensis, Linn.	Moraceae
16	Lasora	Bara lasora.	Cordia latifolia ,Roxb.	Boraginaceae
17	Baranga	Baranga	Kydia calycina, Roxb.	Malvaceae
18	Khajur	Barichhind	Phoenix humilis, Royle	Palmae
19	Barna	Barna	Cretaeva unilocularis Ham	Capparidaceae
20	Bel	Bel	Aegle marmelos, correa	Rutaceae
21	Ber	Ber	Zizyphus mauratiana,	Rhanmnaceae
			Lamk.	
22	Bhak tendu	Bhaktendu	Diospyros cordifolia, Roxb.	Ebenaceae

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
23	Bhilawa	Bhilawa	Semecarpus anacardium, Linn	Anacardiaceae
24	bhirra	Bhirra	Chloromylon swietenia D.	Meliaceae
25	Bhorsal	Bhonrsal	Hymenodictyon excelsym,wall	Rubiaceae
26	Bija	Bija	Prerocarpus Marsupium, Rexb.	Leguminoseae
27	Binnas	Bilsena	Limonoia crenulata, Linn.	Rutaceae
28	Bottle brush	Bottle brush	Callistemon ctrinus, Skeels	Myrtaceae
29	Chandan	Chandani	Santalum album, Linn.	Santalceae
30	Chonkar	Chenkur	Prosopis cineraria, Linn Druce	Leguminoseae
31	Airwan	Chichwa	Albizzia odoratissima, Benth	Leguminosae
32	Chirol	Chirol	Holotelea integrfoia,Planch.	Ulmaceae
33	Gondi	Dahipalalas	Cordia macleodii,H.F.andth.	Boraginaceae
34	Tamoe	Datronga	Enretialaevis, Roxb	Boraginaceae
35	Dikamali	Dekamali	Gardenia lucida, Roxb.	Rubiaceae
36	Dhaman	Dhaman	Grewia tiliaefolia, vahi	Tiliaceae
37	Dho	Dhaora	Anogeissus Latifolia, wall	Combretaceae
38	Phansi	Dhoblin	Dalbergia paniculata Roxb.	Leguminoseae
39	Domsal	Domsal	Miliusavelutina, H . F . and Thoms.	Anonaceae
40	Dudhi	Dudhi	Wrighia tinctoria A . br .	Apocynaceae
41	Gadha palas	Gadha palas	Erythrina suberosa, Roxb.	Leguminoseae
42	Ganer	Galgal	Cochlospermum reliosum Linn	Bixaceae
43	Sewan or Gmher	Gamari	Gmelin arborea,Roxb	Verbenaceae
44	Ghont	Ghont	Ziyphus syloprya, Willd.	Rhamnaceae

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
45	Gilchi	Gilchi	Caseria graveolens, Dalz	Samydaceae
46	Gular	Gular	Ficus glomerata, Roxb.	Moraceae
47	Gulmohar	Gulmohar	Delonix regia, Bojer Raf.	Leguminoseae
48	Haldu	Haldu	Adina cordifolia, Hook f.	Rubiaceae
49	Hingot	Hingot	Balanites aegyptica, Delile	zygophyllaceae
50	Imli	Imli	Tamarindus indica, Linn	Leguminoseae
51	Dona orJacaranda	Jacaranda	Jacaranda actifolia ,homb.	Pedaliaceae
			And bonpl	
52	Jamrasi	Jamras I	Elaeodendron glaucum, pers	Celastraceae
53	Jamum	Jamun	Syzygium cumini, Linn.	Myrtaceae
			Skeels	
54	Jangal jalebi	Jangal jalebi	Pithecclobium dulce, Benth.	Leguminoseae
55	Jhau	Jhau	Tamarix dioica, Boxb.	Toomariaceae
56	Jhingan or Moyen	Jhingan	Lannea	Anacardiaceae
			cormandelica,(Hout) Merr.	
57	Kacnhar	Kachnar	Bauhinia variegata, Linn.	Leguminosae
58	kadam	Kadam	Anthocephalus cadamba	Rubiaceae
59	Kahua	Kahua	Terminalia arjuna, Bedd.	Combretaceae
60	Kaitha	Kaitha	Feronia limonia, swingia.	Rubiaceae
61	Kankee	Kakai	Flacourtia indica Burm F.	Bixaceae
			Merr	
62	Siris	kala Siris	Albizzia lebbeck, Benth	Leguminosae
63	Kalaphetra	Kalaphetra	Randia uliginosa, D. C.	Rubiaceae
64	Bankela	Kalla	Dillenia pentagyna, Roxb.	Dilleniaceae
65	Kanji	Karanj	Pongamin pinnata, Linn.	Leguminoseae
			Pierre	
66	Kardhai	Kardhai	Anogeissus pendula	Combretaceae
67	Kari	Kari	Miliusa tomentosa, Roxb .	Anonaceae
			□inclair	
68	Akaj	Kasai	Bridelia retusa, Spreng	Euphorbiaceae

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
69	Katdumar	Katgular	Ficus hispida, Linn	Moraceae
70	Kathal	Kathal	Artocarpus heterophylus	Salicaceae
71	Kekad	Kekad	Garugapinnta, Roxb.	Burseraceae
72	Keolar	Keolar	bauhinia purpurea, Linn	Leguminosae
73	khir	Khair	Acacia catechu, willd	Leguminosae
74	Vilayati Babul	Khejra	Prosopis juliffora, D. C.	Leguminoseae
75	khrini	Khrini	Manilkara hexendra (roxb)	Sapotaceae
			Dub.	
76	Kulu	Kulu	Sterulia urens, Roxb.	Sterculiaceae
77	Kumbhi	Kumbhi	Careya arborea, Roxb.	Myrtaceae
78	Kusum	Kusum	Schleichera oleosa, oken	Sapinndaceae
79	Lasora	Lasora	Cordia dichotoma, Frost	Boraginaceae
80	Lendia	Lendia seja.	Lagertroemia parvifflora	Lythraceae
			Roxb	
81	Lokhandi	Lokhandi	Ixora arborea ,Roxb	Rubiaceae
82	Arul orMaharukh	Maharukh	Ailathus excelsa, Roxb	Simarubaceae.
83	Mahura	Mahura	madhuca indica, Gmel	Sapotacene
84	Maidalakri	Maidalakri	Litsea Glutinosa ,(lour)	Lauraceae
			C.B. and Robin	
85	Mainphal	Mainphai	Randia dumetorum Lamk.	Rubiaceae
86	Amjni	Majni	Streblus asper, Linn	Moraceae
87	Medh	Medhsing	Dolichandrone □alcate,	Bignoniaceae
			seem	
88	Mithinim	Mithinim	Murraya koenigii,Spreg.	Rutaceae
89	Mokha	Mokha	Schrebera swietenioides,	Oleaceae
			Roxb	
90	Morpai	Morpai	Vitex peduncularis, Wall.	Verbenaceae
91	Molasari	Mulsari	Mimusops elangi, Roxb.	Sapotaceae
92	Kaim or Kalam	Mundi	Mitragyana parvifolia,	Rubiaceae
			Korth	
93	Senjhra	Mung	Moringa oleifera, Lamk	Moringaceae

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
94	Neem	Neem	Azadirachta indica	Meliaceae
95	Padal	Padari	Stereospermum	Bignoniaceae
			personatum, Hassk Chatt.	
96	Pakar	Pakar	Ficus lacor, Buch Ham	Moraceae
97	Chhola	palas	Butea monosperma, Lank,	Leguminosae
			Taub	
98	pangara	pangara	Erythina variegata Linn.	Leguminoseae
99	Papri	Papra	Gardinia lutifolia, Ait.	Rubiaceae
100	Paras Pipal	Paras Pipal	Ficus microcarpa, Linn. F.	Moraceae
101	Chamar Karari	Phetra	Gardenia turgida, Roxb.	Rubiaceae
102	Gadela	Pilu	Savador oleoides, Dene	Salvadoraceae
103	Pipal	Pipal	Ficus religiosa. Linn.	Moraceae
104	Ratanjot	Ratanjot	Jatropha curcas ,Linn.	Euphorbiaceae
105	Reunjha	Reunjha	Acacia leucophloea, willd	Leeguminosae
106	Ritha	Rith	Sapindus laurifolius, Vaht.	Sapindaceae
107	Hadron	Rohan	Soymida febrifuga, A. Juss.	Meliaceae
108	Safed khair	Safed khair	Acacia ferruginea Dc.	Leguminosae
109	Malkarari or Gurar	Safed Siris	Albizzia procera, Benth	Leguminosae
110	Sagwan	Sagon	Tectona grandis, Linn. F	Verbenaceae
111	Saja	saja	Terminalia tomentosa, W.	Combretaceae
			A.	
112	Salar	Salai	Bcswellia serrata, Roxb	Burseraceae
113	Shhra	Sehra	Bauhinia retusa, Ham.	Leguminosae
114	Sehund	Sehund	Euphorbia nivuha, Ham	Euphorbiaceae
115	Semal	Semal	Salmalia malabarica, D . C .	Salmaliaceae
116	Shahtoot	Shahtoot	Morus laevlgate wall	Urticaceae
117	Shisham	Shisham	Dalbergia latifolia, Roxb.`	Leguminoseae
118	Rori or Rohan	Sinduri	Mallotus	Euphorbiaceae
			philipinensis,Muell	

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
119	Siran	Siran	Albizzia stiputa. Boiv	Leguminosae
120	Sissoo	Sissoo	Dalbergia sisso, Roxb.	Leguminoseae
121	Sitaphal	Sitaphal	Anona squamosa	Anonaceae
122	Sonpadar	Sonpodar	Radermachera xylocarpum, Roxb.	Bignoniaceae
123	Tendu	Tendu	Dispyros melanoxylon, Roxb.	Ebenaceae
124	Thuar	Thuar	Euphorbia neriifolia, Linn.	Euphorbiaceae
125	Tilwan	Tilai	Wendlandia exserta, D. C.	Rubiaceae
126	Tinsa	Tinan	Ougeinia oojeinensis, Roxb.	Leguminoseae.
127		Tondri Chilla	Casearia elliptica, willd	Samydaceae

# Annexure III LIST OF SHRUB SPECIES PROPOSED FOR PLANTING

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
1	Adhajhara	Chirchira	Achyranthes aspera, Linn.	Amarantaceae
2	Adhajhara	Adusa	Adhatoda vasica, Nees	Amarantaceae
3	Phanjo	Ajaganda	Agaratum conyzoides, Linn	Compositeae
4	Akol	Akol	Alanguium salvifolium Linn. f Wans.	Compositeae
5	Jhondharli	Jhondharli	Antidesma ghaesembilla, Gaertn.	Euphorbiaceae
6	Siarkanta	Siarkanta	Argemone mexicana, Linn.	Berberidaceae
7	Bankapas	Bankapas	Azanzalampas, Cav, Alef.	Malvaceae
8	Madar	Aak	Calotrophis gigantea, Br.	Ascelepiadaceae
9	Madar	Madar	Calotropis procera, Roth.	Ascelepiadaceae
10	Karil	Karil	Capparis aphylla, Roth.	Capparidaceae
11	Hins	Ulatkanta	Capparis zelanica, Linn	Capparidaceae
12	Karonda	Karonda	Carissa opaca, Staff	Apocynaceae
13	Tarwar	Tarwar	Cassia auriculata, Linn	Leguminoseae
14	Pawmar	Tarota	Cassia tora, Linn	Leguminoseae
15	Gilchi	Gilchi	Casearia gravcolens, Dalz.	Samydaceae
16	Tondri	Tondri	Casoria ellipttca, Willd	Samydaceae
17	Chillari	Ari	Caesalpia sepiaria, Roxb.	Caesalpiniaceae
18	Safed musli	Safedmusli	Chlorphytum tuberosum, Roxb	Liliaceae

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
19	Inni	Inni	Clerodendrum phlomidis,	Verbenaceae
			Linn	
20	Bhant	Bhant	ClerodendruViscosum,	Verbenaceae
			Vent.	
21	Rattanjot	Rattanjot	Clausena lansiun, skeela	Rutaceae
22	Kalabansa	Bhandra	Colebrookea oppositifolia	Labiate.
			Sinith.	
23	Datura	Datura	Daturs stramoniu, Linn.	Solanaceae
24	Chipti	Chipti	Desmodium cephalotes,	Leguminoseae
			Well.	
25	Bhirbhira	Yealati	Dichrostachys cinerea,	do
			W&A	
26	Kharenta	Kharenta	Dodonoea viscoas, Linn.	Sapindaceae
27	Janglituar.	Janglituar	Dolichos lablab, Linn.	Papilionaceae
28	Baibarang	Baibarang	Embelia tsjeriamcottam	Myrsinaceae
			R&S	
29	Naibarang	Thuar	Euphorbia tirucalli, Linn.	Euphorbiaceae.
30	Thuar	Thuar	Euphorbia nerifolia, Linn.	do
31	Gursukri	Gursukri	Grewia hirsuta, Vani.	Tiliaceae
32	Bendi	Bendi	Grewia scabrophlla, Roxb.	Tiliaceae
33	Khursi	Khursi	Grewia elastica, Royle	Tiliaceae
34	Bekal	Baikal	Gymnosporia Spinosa Forsk	Celastraceae
35	Marorphli	Maorphal	Helicteres isora, Linn.	Sterculiaceae.
36	Sheeflower	Jasond	Hibiscus rosasinensis, Linn.	Malvaceae

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
37	Inderjo	Kurchi	Holarrhena antidy -senterica Wall.	Apocynaceae
38	Bareni	Neel	Indigofera cassioides, Rottleex. D. C.	Leguminoseae
39	Besharam	Besharam	Ipomia battatas, Forsk	Convoloulaceae
40	Jhunjru	Jhunjru	Indigofera g landulosa, Willd.	Papilionaceae
41	Lantana	Raimunia	Lantana camara, Linn.	Verbenaceae
42	Kand	Hathi .pan	Leea macrophylla, Roxb.	Vitaceae
43	Bharati	Bharati	Maytenus emarginata willd Ding. H.	Celastraceae
44	Ailly	Ar.	Mimosa rubicaulis, Lamk.	Leguminoseae
45	Kenher	Kaner	Nerium indicum Mill.	Ascelepiadaceae
46	Siari	Harsinghar	Nyctanthes arbortristis, Linn	Verbenaceae
47	Nagphani	Nagphani	Opuntia dillenii, Haw.	Cactaceae
48	Chhind	Chhind	Phoenix acaulis, Roxb.	Palmaceae
49	Kora	Kora	Pogostemon benghlensis O . Ktz	Labiate.
50	Sural	Sural	Pueraria tuberosa, Roxb.	Papilionaceae
51	Mainphal	Mainphal	Lamk.	Rubiaceae
52	Bainsa.	Bed	Salixtetra sperma, Roxb.	Salicaceae
53	Dengala	Dengala	Securinega leucophyrus M. Arg.	Euphorbiaceae
54	Khareta	Khareti	Sida acuta, Burm f.	Malvaceae
55	Ringini	Bhat - katari	Solanum indicum Linn	Solanaceae
56	Makoi	Junglibaigan	Solanum nigrum, Linn	Solanaceae

S.N.	LOCAL NAME	STANDRISED NAME	BOTANICAL NAME	FAMILY
57	Maruadona	Nees	Strobilanthes auriculatus	Acanthaceae
			Nees.	
58	Kat-Jamun	Kat-Jamun	Syzygium heyneanum,	Myrtaceae
			Wall.	
59	Jhan	Jhau	Tamarix dioica, Roxb.	Tamaricaceae
60	Junglikapas.	Vankapal	Thespesia lampas Dal . et.	Malvaceae
			Gils.	
61	Gokhru	Gokhru	Tribulus terrestris. Linn.	Zygophylaceae
62	Nirgud	Nirguri	Vitex negundu, Linn	Verbenaceae
63	Rasna Epiphyle	Rasna	Vanda roxburghil, Roxb.	orchidaceae
64	Dhawi	Dhawai	Wood fordiafruticosa, Linn.	Lythraceae
65	Ardhasisi	Gokhru	Xanthiumstr umarium,Roxb.	Compositae
66	Jharberi	Jharberi	Zizyphus nummularia,	Rhamnaceae
			W&A	

### **Annexure IV**

# LIST OF CLIMBERS AND PARASITES SPECIES PROPOSED FOR PLANTING

S.N.	BOTANICAL NAME	STANDRISED NAME	LOCAL NAME	FAMILY
1	Abrus precatorius, Linn.	Gunj	Gunj or Rati.	Papilionaceae
2	Acacia caesia, w & t.	Ari	Ari	Leguminosae
3	Acaciatora Roxb Craib	Gurar	Chillari	Mimosaceae
4	Acacia pinnata, Willd	Raodi	Raoni	Mimosaceae
5	Asparagus racemosus, Willd.	Shatawar	Shatawar	Lilliaceae
6	Bauhinia vahli w& A	Mahulbel	Mahulbel	Leguminosae
7	Butea superba, Roxb.	Palasbel	Palasbel	Papilionaceae
8	Celestrus peniculata, Willd.	Malkangani	Malkangani	Celestraceae
9	Cissus repanda, Vanl.	Panibel	Panibel	Ampelidaceae
10	Cryptolepis buchanani, Roem & Scb.	Nagbel	Nagbel	Asclipiadaceae
11	Cuscuta feflexa, Roxb.	Amarbel	Amarbel	Convolvnlaceae
12	Dendrophthoe falcata Linn. f Etting.	Bandha	Vanda	Loranthaceae
13	Gymnema sylvestris R. Br.	Gudmar	Gudmar	Apocynaceae
14	Ichnocarpus frutescens R . Br .	Dhimarble	Dudhikali	Apocynaceae
15	Millettia auriculata , Baker	Gurar	Gurar	Papilionaceae
16	Momordica dioica, Roxb.	Kakodable	Kakodabel	Cucrbitaceae
17	Mucuna pruriens, D. C.	Kenwanch	Kenwanch	Papilionaceae
18	Smilax zylanica ,Linn	Ramdaton	Ramdton	Lilliaceae

S.N.	BOTANICAL NAME	STANDRISED NAME	LOCAL NAME	FAMILY
19	Tinospora cordifolia	Geloy	Geloy	Monispermaceace
	,Miers			
20	Vallaris solanacea (Roth)	Dudibel	Dudibel	Apocynacaece
	O.Ktze			
21	Ventilagecalyculate, Tul.	Keoti	Lalbel	Rhamnaceae
22	Viscum nepalense ,	Banda	Banda	Loranthaceae
	Spreng.			
23	Vitis quadrahqularis, Wall	Harjuri	Harjuri	Amphelidaceae
24	Zizyphus oenoplia, Mill	Makor	Makor	Rhamnaceae

### **Annexure V**

# LIST OF GRASSES AND BAMBOO SPECIES PROPOSED FOR PLANTING

S.N.	BOTANICAL NAME	STANDRISED NAME	LOCAL NAME	FAMILY
1	Apluda varia, Hdk. subsp. mutica Halck.	Phuli	Phulera	Gramiinae
2	Cymbopogon martinii, Wats	Rusa	Rosha	Gramiinae
3	Cynodon dactylon, Pers.	Doop	Doop	Gramiinae
4	Desmostachya bipinnata, Linn Stapf.	Kush	Kush	Gramiinae
5	Dendrocal amus strictus, Nees	Bans	Bans	Gramiinae
6	Dichanthium annulatum Forsk Staph	Chhoti Marvel	Chhoti Marvel	Gramiinae
7	Digitaria longiflora Reez Pers	Ghatka	Ghatka	Gramiinae
8	Digitaria griffithii Ard Henr.	Rai	Rai	Gramiinae
9	Echinochloa frumentaceaLink	Sama	Sama	Gramiinae
10	Echinochloa colonum Linn Link	Same	Same	Gramiinae
11	Eragrostis diarrhena, Steud	Ghadela	Ghadela	Gramiinae
12	Eragrostis tenella Linn Bevauv	Bhurbhusi	Bhurbhusi	Gramiinae
13	Heteropogon confortus Linn Beauv, ex R & S.	Kusul	Kusul	Gramiinae
14	Hemarthria compressa linn R. Br.	Torghans	Torghans	Gramiinae
15	Ischaemum Laxum. Hack.	Mushan	Mushan	Gramiinae
16	Ischaemum pilosum Hack.	Kunda	Kunda	Gramiinae

S.N.	BOTANICAL NAME	STANDRISED NAME	LOCAL NAME	FAMILY
17	Ischaemum Prostratum	Ukri	Ukri	Gramiinae
	Linn.			
18	Imporata cylindrica Linn	Chhir	Chhir	Gramiinae
	Beauv			
19	Paspalum scrobiculatum	Kondon	Kondon	Gramiinae
	Linn			
20	Paspalidum flavidum, Rets	Chichwi	Chichwi	Gramiinae
	A. Camus			
21	Phragmiteskarka Retz Trin.	Nal	Nal	Gramiinae
	Ex. Steud			
		•		
22	Paspalidium punctatum	Ghatka	Ghatka	Gramiinae
	Burm F. A Camus			
23	Saccharum spontaneum	Kans	Kans	Gramiinae
	Linn.			
24	Schima nervosum, Rottle	Sheda	Sheda	Gramiinae
	stafi			
25	Schima sulcatumHakc	Paonia	Paonia	Gramiinae
	Camus			
26		kolia	kolia	Gramiinae
27	Sorghum halepense Linn	Barru	Barru	Gramiinae
	pers			
28	Themeda quadrivalvis linn	Gunher	Gunher	Gramiinae

#### CAPABILITY OF LNC.

LNC is a multi-disciplinary group of, experienced Foresters, Horticulturists, Landscapist, Architects, Engineers, Managers, Software Developers and Web Applicators, who are well versed in providing specialised services such as.

# A Micro-Management Plan and Landscape Development Plan Covering following aspects can be prepared.

- (i) An inventory of natural, cultural and historical resources existing flora and fauna would be prepared.
- (ii) Marking of the areas available for the green cover on the map.
- (iii) Derive, site quality of an area on the basis of soil composition and natural surroundings.
- (iv) Testing of soil for identification of pH and availability- non-availability of, macro and micro-nutrients.
- (v) Study of climatic conditions.
- (vi) Park, Open Water Channel and other maintenance activities like pruning shaping of trees and shrubs and removal of dead, dying diseased trees.
- (vii) Selection of Species on the basis of soil pH, micro-macro nutrients, type and depth of soil & site quality, from the computerized data base of more than 4100 forestry, horticulture and floriculture species.
- (viii) Computer Aided, Object Oriented, Aesthetic Design and layout of the green cover on the basis of height, Diameter of

# Crown, Shape of Crown, flower and foliage colour and flowering season.

- (ix) Development of educational programs for creating awareness among the people.
- (x) Advice on the regulation of entry & user privileges.
- (xi) Advice for the management committee.
- (xii) NATURE BALANCE CONCEPTION, a model formulation and development.
- (xiii) Estimating and Costing for Calculation of budget needed in phased manner. {capital and recurring expenditure}.
- (xiv) Advice on method and procedures of Revenue Generation.

#### WE HAVE KEY PERSONNEL IN:

	EX	KPERIENCED PLANNERS
S.N.	DISCIPLINES	SPECIALIST
1.	FORESTRY	1. SHRI S.K. DATTA I.F.S. ( Retd.)
		2. SHRI L.B. OKHADE I.F.S. (Retd.)
		3. SHRI O.P. KAUSHAL D.C.F. ( Retd.)
2.	HORTICULTURE	1. Dr. B.L. TIWARI
		M.Sc. (Agr.), M.S., Ph.D. (U.S.A.), Retd.
		PROFESSOR & HEAD, DEPARTMENT OF
		HORTICULTURE, IGKU, RAIPUR.
3.	LANDSCAPIST	1. SHRI D.K. SHARMA
		B.Sc., DIPLOMA IN MECHANICAL
		ENGINEERING, JAVA & ADVANCE JAVA,
		HTML, DHTML, JAVA SRIPT, C++, TRAINED
		LANDSCAPIST & HORTICULTURIST.
3.	MANAGEMENT	1. Mrs. NOOPUR RAI
		M.B.A. (FINANCE)

	YOUNG DINAMIC EXECUTERS			
4.	ENGINEERS	1. ROSHAN TIWARI		
	&	ARCHITECTURAL & ENGINEERING		
	COMPUTER	SERVICES		
	PROFESSIONALS	2. RAKESH SHARMA		
		B.Com., D.C.A, E- BUSSINESS		
		DEVELOPMENT PROFESSIONAL		

3. SHRI SUNIL E. TAKLE
B.E., JAVA, JAVA SCRIPT, VB SCRIPT,
HTML, DHTML, ASP, DATA BASE, HANDLING,
XML.
4. KU. SEEMA PADMAKER
M. Com, M.A., DIPLOMA IN
COMPUTERS FROM CONCOURSE
INTERNATIONAL ( POONA), JAVA, SERVLETS,
C++.
5. SHRI RISHI KUMAR
B.Sc., M.A. {ECONOMICS}, P.G.D.C.A.,
WEB PROGRAMMING USING JAVA, WEB
DEVELOPER.

#### In addition to above:

- a. We have 8 highly qualified young persons responsible for the field and office works.
- b. We have increasing **Data Base of more than 4100 plant species** and a growing library of more than 1000 books related to environment, forestry, wild life, computer, management etc.
- c. We have experts in data analysis. Our Computer division have two computers of Pentium III series and One of Pentium I series along with 2 latest printers for the quality documentation work.

We can prepare detailed Computer Aided Landscaping Plan along with the Estimates, Design & Layout of the Civil Structures, Green Area Development, Micro management Plan of the garden and evolve Revenue Generating Procedures. In addition to it we are capable of developing special software for the Computerized Garden Management

We are looking forward to serve the nation in the field of Natural recreation, Amusement and attract the children towards Natural Environment & Green Cover, **applying the latest techniques including Information Technology**. The children will learn with fun, pleasure and delight, about the nature. Any inquiry or help is always welcome.

(D.K. SHARMA) LEARN NATURE COMPUTECH