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Green Practices

Seminar and Site Visits
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Eco-Restoration

Adyar Creek Eco Park

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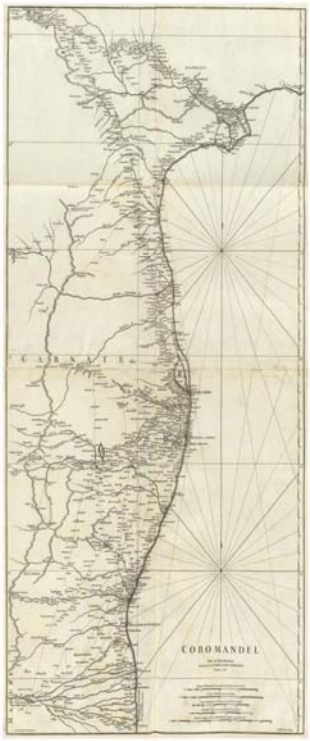
THE COROMANDEL COASTAL REGION



French Map of the Coromandel Coast, 1753AD (Ref: wikipedia.org)

COROMANDEL COASTAL REGION

The Coromandel Coast refers to the stretch between Point Calimere, near the delta of the Kaveri River in the south, to the mouths of the Krishna River in the north along the Bay of Bengal.

The coast is home to the East Deccan dry evergreen forests, which run in a narrow strip along the coast. It also has extensive mangrove forests along the low-lying coast and river deltas, and several important wetlands that provide habitat to thousands of migrating and resident birds.


Mangrove swamps in Pichavaram


Tropical Dry Evergreen Forest in Oorani


Pulicat Lake (Ref: wikimapia.org)


Kortalaiyar River Mouth (Ref: wikimapia.org)


Adyar Estuary (Ref: wikimapia.org)


Pallaar River Mouth (Ref: wikimapia.org)

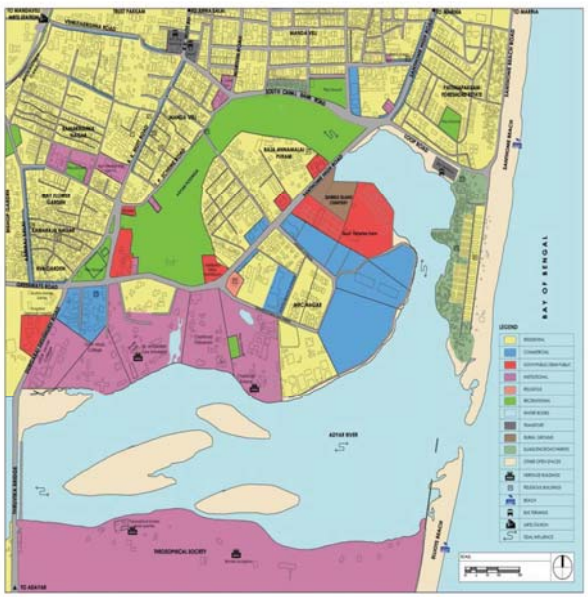

Kaliveli Estuary (Ref: wikimapia.org)


Chunambar Estuary (Ref: wikimapia.org)


Coleroon River Mouth (Ref: wikimapia.org)


Point Calimere (Ref: wikimapia.org)

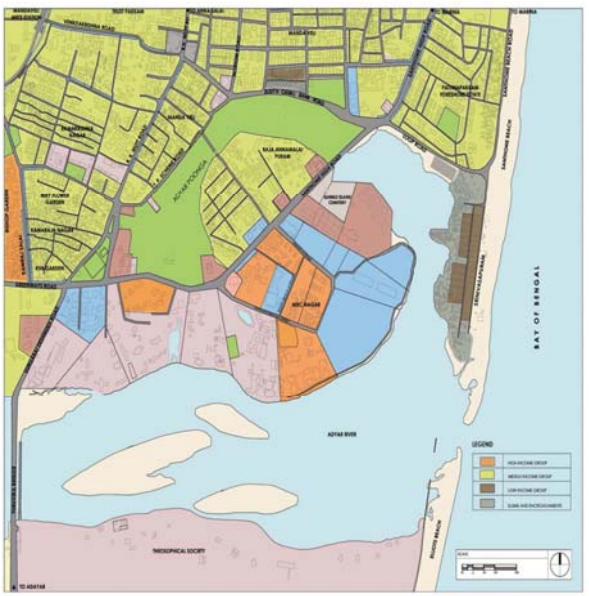
Land use



LAND USE

This part of Adyar predominantly has mixed use residential and institutional zones. A concentrated city-level commercial development is coming up on the Quibble Island facing Srinivasapuram.

Settlement Pattern



SETTLEMENT PATTERN

Housing areas mostly consist of lower and upper MIG residential districts, with a considerable share of HIG housing. LIG, EWS & slum areas are found in Srinivasapuram & Raja Grammni Thottam.

PLANNING CONCEPTS

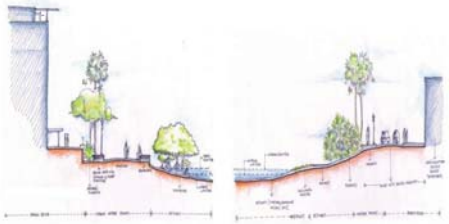
Ecological Restoration of the Creek & Estuary

The first step towards ecological restoration is to define and secure the edges of the creek and estuary from the surrounding urban development activities. The best method to secure the edges is to bring public watch and ward by providing public access to these edges. Once the edges are protected, restoration of these edges with mudflats, mangroves and other appropriate habitats would follow.

An Urban Walkway on the Waterfront

An Urban walkway is proposed along the edges of the creek abutting the Quibble Island. The walkway will provide an opportunity for people to enjoy the spectacular view of the creek and estuary.

On the other side of the creek, the walkway will follow the edges of Foreshore Estate Loop Road, Srinivasapuram Housing Colony as well as the beach, connecting public spaces and institutions such as ecological interpretation centers, marine aquarium etc.



ADYAR ESTUARY

ESTUARINE ECOSYSTEM

An estuary is a transition zone between freshwater and seawater. As such it is perpetually in a state of flux as it is influenced both by the tides and floodwater. Due to this unique characteristic it is the place that is the most affected by anthropogenic factors - for example, all sewage and pollutants upstream settle on the substrate and cannot be flushed into the sea due to the incoming tidal action (except during the monsoons) and due to the formation of sand bars. The state of an estuary is a valuable indicator to the state of a waterway, and the biodiversity it contains is crucial in determining the health of this ecosysstem.

The Adyar Estuary is a shadow of its former self. Surveys have revealed only a limited number of species. Some are shown below.


Avicennia marina


Little Cormorant


Intermediate Egret


Common Sandpiper


Kentish Plover


Black-winged Stilt


Catfish


Halavi's Guitarfish

There is still life in Adyar Estuary and because of this there is still hope


Rhizophora mucronata


Aegiceras corniculatum


Salicornia brachiata


Suaeda maritima


Gracilaria sp.

All these indicators of environmental health would return if only we work together to clean up the ecosystem

Many of the species shown below are of economic value.Sustainable harvesting of these bioresources is the ultimate indicator of ecorestoration success


Golden Plover


Green Mussel


Grey Eel Catfish


Prawn


Fiddler Crab


Ghost Crab


Mud Crab


Sea Bass


Mangrove Snapper


Dory Snapper


Greasy Grouper

Research & Studies

Pied Cuckoo
Clamator jacobinus

Asian Koel - Male
Eudynamys scolopaceus

Asian Koel - Female
Eudynamys scolopaceus

Rose - ringed Parakeet
Psittacula Krameri

Barn Owl
Tyto alba

Spotted Owlet
Athene brahma

In the master plan it was proposed that focused research would be carried on in the **Adyar Watershed Restoration & Research Institute (AWRI)**, which would be situated in the Green Centre, adjacent to the Poonga.

A Vertebrate diversity survey report of the Adyar wetland complex from Chembarampakkam till the estuary, was conducted.

Before transformation: Edges of the creek piled with debris and accumulated waste, sewage flowing into the creek polluting the water.

Before transformation: Edges of the estuary taken over by Prosopis and floating garbage, heritage structures hidden.

After transformation: Edges of the creek restored with mangroves and mudflats, sewage inflows stopped, encrochments removed and water front walkway established.

After transformation: Boardwalk experiencing edges reestablished with mangroves and visible heritage buildings.

IDEAS FOR TRANSFORMATION

Being a disaster prone area, the proposed waterfront walkway is to be constructed with durable natural materials capable of mitigating flood, storm etc. Accessibility and safety for children, old aged and disabled shall become the fundamental aspects of its design.

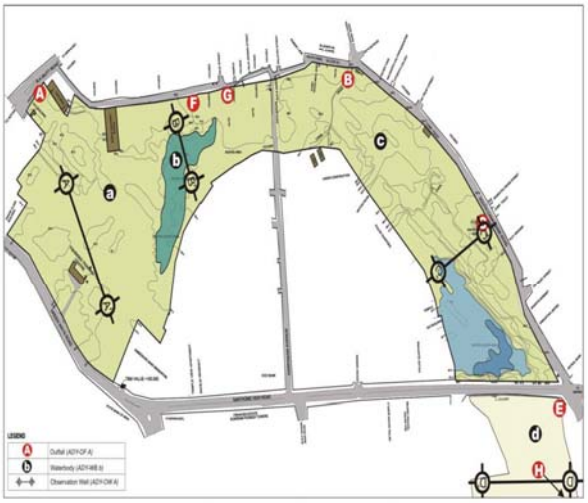
Various heritage structures such as Chettinad Palace, Brodie's Castle, and the ones in Theosophical Society would become visible from these walkways, which would improve the image of this heritage City. Boardwalks crossing over delicate natural edges would bring people closer to life in nature.

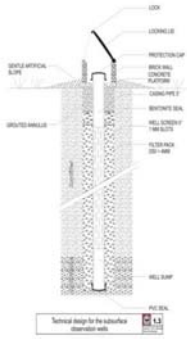
OBSERVATION WELLS

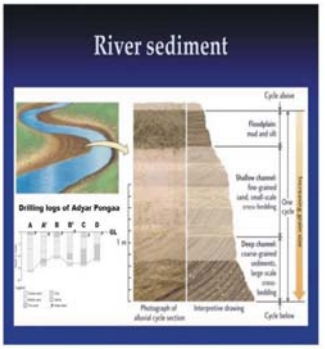
(Baseline Data Assessment by Centre for Environmental Studies, Anna University)

Six boreholes were sunk at Adyar Creek area to assess the geological conditions and to develop observation wells for ground water monitoring. The drillings were conducted to a depth of 20m approximately till the impermeable layer of the first water bearing aquifer.The observation wells were provided with screen pipe throughout the length of the aquifer to allow a continuous monitoring of the vertical differences in salinity.

Besides the physico-chemical analysis of the ground water, the water table and vertical salinity (EC) profiles were measured. The results will help to understand the ground water quality and its suitability for many purposes. Furthermore, it will support to identify the recharge of freshwater due to rainfall events by observing changes in the fresh-salt water interface.

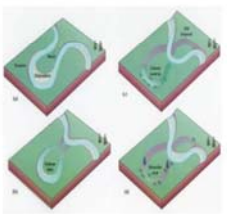






Fossilized fauna of Adyar Pongaa

Historical formation of an Oxbow-lake



BASELINE DATA COLLECTION WAS COORDINATED BY CES, ANNA UNIVERSITY. STRUCTURES WERE ERECTED TO MEASURE THE INFLOW OF THE GREY WATER AND SEWAGE.

ECOLOGICAL RESTORATION PLAN

Zone 1 - This is essentially a stormwater retention and infiltration zone. The periphery of this area is composed of earth berms covered with TDEF vegetation. The zone also includes a few freshwater ponds.

Zone 2 - This is a stormwater discharge area. Clear passage for stormwater is proposed by rebuilding the Karpagam Bridge. It is proposed to reuse the large amount of debris dumped in this area to create hillocks on either side of this zone. TDEF vegetation would cover the banks of the stormwater channel.

Zone 3 - This is a brackish water wetland zone connected directly to the creek and estuary. Mudflats naturally occur in this zone. Mangroves and mangrove associates will be planted here. The water quality of the creek and estuary need to be greatly improved for successful intervention in this area.

BIODIVERSITY RESTORATION

Although it is impossible to restore the Poonga, Creek and Estuary to its former pristine state, bio intervention can convert the poonga space into an ecologically significant and sustainable one, and also mitigate many of the problems in the larger creek and estuarine region. The process has to start with the phased eradication of Prosopis juliflora, implementation of a water management plan and the deepening of existing water-logged areas to create a stormwater reservoir and finally the introduction of appropriate floral biodiversity.

TROPICAL DRY EVERGREEN FOREST (TDEF)

This is a forest type found along the Coromandel Coast from Vishakapatanam to Point Calimere. Historically it existed only as a narrow belt approximately 40km along the coast. In the Poonga Master Plan, TDEF planting is mostly concentrated around storm water retention pond, in the dry areas.


Aglaia elaeagnoidea


Atlantia monophylla


Crateva adansonii


Capparis brevispina


Bauhinia recemosa


Salvadora persica


Diospyros chloroxylon


Benkara malabarica


Bauhinia recemosa - fruits


Capparis brevispina - fruit


Cassia fistula - flower


Chloroxylon swietenia - flowers

HILLOCKS

Within the geographic region granite hillocks occur on bedrocks of charnockite. The variation of species on these hillocks vary distinctly from the apron around their base. The species on the hillocks are akin to the species of the Eastern Ghats.


Gyrocarpus americanus


Sterculia foetida


Butea monosperma


Euphorbia antiquorum - flowers

PONDS

These are in fact small standing bodies of water. Along the Coromandel Coast such ponds are found near the paddy fields separated from the larger water systems. In the poonga 3 small fresh water ponds are proposed.


Eleocharis actunagula


Elodea canadensis


Marsilea quadrifolia


Typha latifolia


Vallisneria americana


Ruellia sp.


Pistia


Lemna minor

GRASSLANDS

Along the Coromandel Coast, grasslands are found interspersed with wetlands and tropical dry evergreen forests, forming a distinct ecotone. In the poonga, the grasslands are areas that add biodiversity to the wetlands and TDEF systems.


Aristida adscensionis


Cymbopogon citriatus


Cyperus rotundus


Vetiveria zizanioides


Aristida hystrix


Cymbopogon citriatus


Cynodon dactylon


Saccharum spontaneum

REEDS & MARSHES

Reeds and marshes are essential to maintain the ecological balance of the storm water retention area. They provide protective edge habitat supporting a large number of species.


Aponogeton natans


Arystida sp.


Scirpus grossus


Typha angustata

INTEGRATING THE POONGA TO THE COASTAL WETLAND

Wetlands are the fundamental component of a coastal landscape. The marshlands, mudflats, mangroves and associated flora & fauna are its components. These are dynamic water systems, which encounter constant interaction of freshwater and saltwater supporting a variety of species in various stages of their life cycle. Adyar creek is one such system, which the master plan proposes to revive and restore into a healthy example of a coastal wetland.

MANGROVES & ASSOCIATES

Mangroves and mangrove associates are considered to be globally endangered and hence their introduction to the park has high conservation value. Mangroves and mangrove associates that are tolerant to inundation and salt, are proposed to be planted in the eastern reaches of the park.


Aegiceros


Avicennia sp.


Rhizophora sp.


Thespesia populneoides


Sarcolobus carinatus


Suaeda maritima


Derris trifoliata


Salicornia sp.


Suaeda maritima

EDUCATION CENTER

PLAYING A SUPPORTIVE, EMPOWERING ROLE TO THE RESTORATION WORK

The Poonga Education Center will offer a series of nature programs designed to create awareness about the basic principles of Ecology and Biology while nurturing an appreciation for and understanding of the natural world. Participants will become familiar with plants and animals native to Chennai and learn about their interrelationships and how human activities affect the environment.

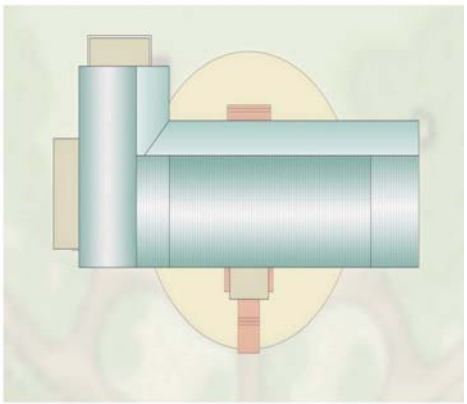
THE EDUCATION CENTER WILL FOCUS ON THE FOLLOWING GROUPS:

- SCHOOLS - KINDERGARTEN, PRIMARY, INTERMEDIATE AND HIGHER SECONDARY.
- ADULT EDUCATION- TERTIARY, TRAINING FOR TEACHERS, ENVIRONMENTAL EDUCATORS, NGO AND COMMUNITY WORKERS.
- VOCATIONAL EDUCATION - LOCAL COMMUNITY MEMBERS, TRADE, HEALTH PROFESSIONALS.
- GENERAL VISITORS - LOCAL COMMUNITY MEMBERS, CHENNAI RESIDENTS, NATIONAL AND INTERNATIONAL VISITORS.
- PROFESSIONAL / RELATED NETWORKS - ECOLOGISTS, SCIENTISTS, TRADITIONAL HEALERS, RELATED ORGANIZATIONS, TEACHER ASSOCIATIONS.

VIEW

GROUND FLOOR PLAN

NORTH ELEVATION



ROOF PLAN

EAST ELEVTATION

LONGITUDINAL SECTION

ENVIRONMENTAL EDUCATION PROGRAM

A centre for excellence in environmental and sustainability education

Education : Conducting on-site and outreach educational experiences for schools and community

Researches : Contributing to and researching the latest innovations in environmental education pedagogy.

Awareness and Advocacy : Promote sustainable practices in energy and water use, afforestation and land use in the urban ecology context.

The education program will provide pathways for the local community to be actively involved in the restoration of the Adyar Ecosystem through certified vocational training and outreach programs. Long term volunteer programs will allow interested Chennai citizens, national and international visitors to participate in research, ecosystem restoration and maintenance.

Programs will centre on the following areas:
Bioregional Studies
Watersheds
Land and Water
Biodiversity
Energy
Waste recycling
Organic Agriculture
Water Ecosystem Exploration
Energy Initiatives

During field visits participants will explore, examine and compare the fresh & marine water ecosystem. This highly hands-on experience will have activities like measuring pH, water temperature, dissolved oxygen and flow rate. Participants will also take an inventory of invertebrate species living in both fresh & marine waters.

School Programs

The programs are developed around a planned interface with the environment in the Poonga and an off site program in the schools for class work and de-briefing. The Adyar Poonga will serve as an open air classroom

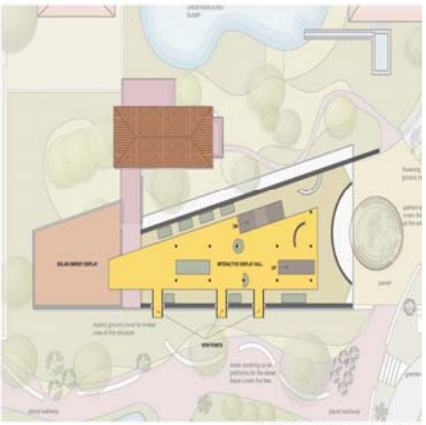
INSPIRING PEOPLE TO CARE ABOUT THE ENVIRONMENT

SITE INTEGRITY.
THE CENTER IS DESIGNED WITH AN UNDERSTANDING OF ALL ASPECTS OF THE BUILDINGS' SETTING.
• IT HAS BEEN DESIGNED AS SEPARATE SPACES THAT FORM A WHOLE BY MERGING IN THE NATURAL ENVIRONMENT, THE OPEN AND SEMI OPEN PATHWAYS FORMING THE GREEN CONNECTIONS BETWEEN THE VARIOUS BUILDINGS. THIS HAS BEEN DONE WITH A VIEW TO PRESERVE ALL THE TREES ON SITE.
• THE BUILDINGS OF THE CENTER ARE USED AS A SOUND BARRIER BETWEEN THE NOISY VEHICULAR ROAD AND THE POONGA ECO PARK.
• RETAINING AND ENHANCING EXISTING SITE FEATURES SUCH AS THE UNDERGROUND SUMP AND EXISTING CONTOURS.

LOW ENERGY / HIGH PERFORMANCE.
BUILDINGS IN THE CENTER COMBINE ELEGANTLY SIMPLE ELECTRICAL SYSTEMS WITH CLIMATIC COMMON SENSE TO ALLOW A WORKING WITH - RATHER THAN AGAINST - THE SUN, WIND AND TEMPERATURE IN THE AREA. ARTIFICIAL LIGHTING AND COOLING WOULD ONLY BE USED TO SUPPLEMENT WHAT NATURE ALREADY OFFERS.
• PV PANELS ON ROOF USE RENEWABLE ENERGY TO MEET A SUBSTANTIAL FRACTION OF THE BUILDINGS ENERGY NEEDS.
• A DOUBLE WALL FAÇADE WITH AIR CAVITY REDUCES HEAT GAIN WITHIN THE BUILDING.
• WINDOW OPENINGS ON OPPOSITE SIDES OF THE BUILDING ENHANCE CROSS VENTILATION DRIVEN BY BREEZES. WITH OPENINGS AT THE TOP SO WARM AIR CAN ESCAPE, WHILE COOLER AIR ENTERS THE BUILDING FROM OPENINGS NEAR THE GROUND.
• REDUCED DEPTH OF INTERNAL SPACES FOR OPTIMAL USE OF DAYLIGHT TO ILLUMINATE INTERIORS.

MATERIAL EFFICIENCY.
THE CENTER UTILIZES MATERIALS THAT MEET BASIC RESOURCE EFFICIENCY.
• USING RECYCLED CONTENT.
• USING LOCALLY AVAILABLE FINISHING MATERIALS TO REDUCE ENERGY USED IN TRANSPORTING MATERIALS
• USING MATERIALS THAT MELLOWED WITH AGE AND WEATHERING WITHOUT LOOSING CHARACTER OR STRENGTH.

THE GREEN CENTER



GREEN CENTER FIRST FLOOR PLAI

GREEN CENTER - ENTRANCE PLAZA

KEY PLAN

GREEN CENTER - TRANSVERSE SECTION

GREEN CENTER GROUND FLOOR PLAI

GREEN CENTER - LONGITUDINAL SECTION

Ground Reality
June 2008

June 2008

December 2008

June 2008

December 2008


90 thousand seedlings of 172 Indigenous species have been planted.

Signs of Regeneration in spite of many adverse conditions

Mangroves

Mangrove associated fauna has migrated upto 500mts into the poonga

Uca spp.

Sesarma spp.

The crab population associated with mangroves has considerably increased.

Wetland Habitat Support

Ecological Monitoring

- The benchmark survey at the master plan stage recorded only 13 species. With the improvement in water quality the count has gone up to 34.

Children's Play Area

Arrival and Orientation Zone

Artworks

Artworks

Artworks

Artworks

Interpretative Exhibits

Interpretative Exhibits

Visit by Deputy CM

Planning solid waste management strategies with the residents of the surrounding area

Education

Poonga Visit

Organic Gardening

Students' Fauna Survey

Education

Art from Waste

Puppetry Workshop

Workshop on traditional medicine with folk-healers

Education

Summer Workshop

CAMPAIGNS

Green Corner

Eco-Restoration

Adyar Creek Eco Park

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Auroville
Green Practices

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