

SIR MOHAMED YUSUF SEAMEN WELFARE FOUNDATION



Project Report

**ECOLOGY CONSERVATION PROGRAMME IN NHAVA
THROUGH
MARINE MUSEUM, NHAVA**



PROJECT FINANCED BY MMR-EIS

CONTENTS

Topic	Page No.
Synopsis	
Background information: Sir Mohamed	
Yusuf Seamen Welfare Foundation	1-2
Objectives of the Project	3
Reed Bed Plant for Waste water treatment	4-7
Dry Dock Repairs & Boat Displays	8
Interactive Quiz Station	9
Remodeling of Eco Gallery	10-11
Workshop on World Wetland Day	12

Synopsis

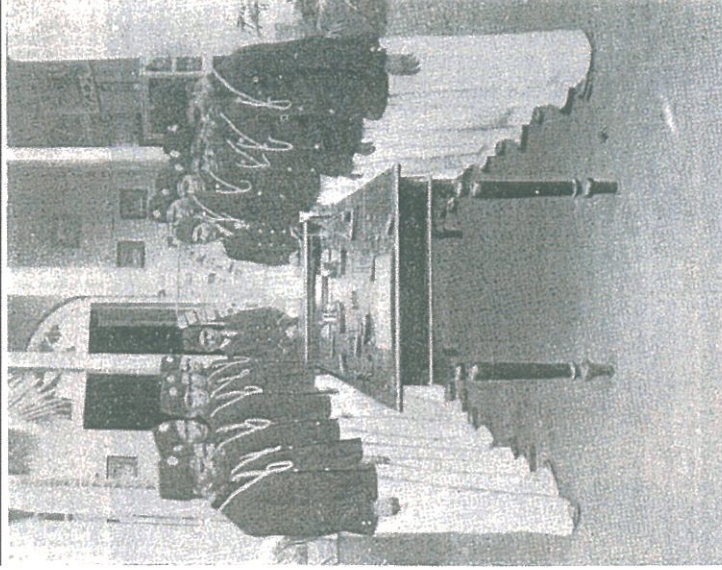
In December 2005, Sir Mohamed Yusuf Seamen Welfare Foundation applied to the MMR EIS in response to their advertisement seeking grant for a Project on ecology conservation in the environs of Nhava. This was driven in the wake of large scale degradation of the fragile mangrove eco system around Nhava. It was also proposed to raise awareness regarding the Country's rich maritime heritage. The Project was to be executed under the aegis of the Marine Museum of the Foundation at Nhava.

The said Project was subsequently sanctioned at a total cost of Rs. 20.20 lakhs. The major component of this Project was installation of a waste water treatment plant which had low maintenance cost, remodelling already established ecology gallery and a boat shed, installing computerised interactive stations for conduct of quiz shows and organising publicity through holding workshops and seminars.

ECOLOGY CONSERVATION PROGRAMME IN NHAVA THROUGH MARINE MUSEUM NHAVA

BACKGROUND INFORMATION: SIR MOHAMED YUSUF SEAMEN WELFARE FOUNDATION

A CLASS ON SEAMANSHIP IN 1933



1. Sir Mohamed Yusuf Seamen Welfare Foundation has its beginnings in the year 1910. The Late Haji Ismail Yusuf, Proprietor of Bombay Steam Navigation Company established a number of charitable Institutions as a debt of gratitude to the seafaring community who had served with loyalty on the Company's ships. The main purpose was to enable and encourage the orphans and sons of the Indian Seafarers irrespective of cast, creed or religion to follow the footsteps of their forefathers. These Institutes included - Marine Training School, later named 'Training Ship Rahaman'.

Training Ship Rahaman at Nhava

2. The orphanage established in Worli (Mumbai) subsequently shifted to the Island of Nhava in 1912 and nautical education for these students commenced in 1915. Training Ship Rahaman thus came to be established as the pioneering institution for Maritime Training in India. The Institution now conducts Pre Sea Training Courses that includes Maritime Catering Technology and Hotel Management for students and prepares them for a career in merchant marine. These courses recognised by the Directorate General of Shipping, Government



DR. LEO BARNES PRE SEA ACADEMY

of India. The Pre Sea Courses vary in duration from six months to three years. Approximately, 400 Pre sea trainees are thus undergoing training at any given time in Dr Leo Barnes Pre Sea Academy of the Institution.

3. This shore establishment also conducts (Post Sea) Professional Courses for seafarers from home and abroad. These include amongst others, Fire Fighting, First Aid, Navigation, Radars, Distress Signalling and Personal Survival, Safety and Social Responsibility. At any given time, around 200 Post sea trainees are undergoing courses of varying durations from one and a half days to four months.



FATMA BANU HOSPITAL

provides round the clock medical cover to the trainees, employees' family members and the School children.

5. Lady Khatun Marium Navik School on the Campus is an English medium School affiliated to the Central Board of Secondary Education (up to Class X) and to the State Board of Secondary and Higher Secondary Education, Maharashtra State up to Class XII in Science Stream. The School essentially caters for the educational needs of Nhava and its adjoining villages. The School has on its roll more than 650 children now.

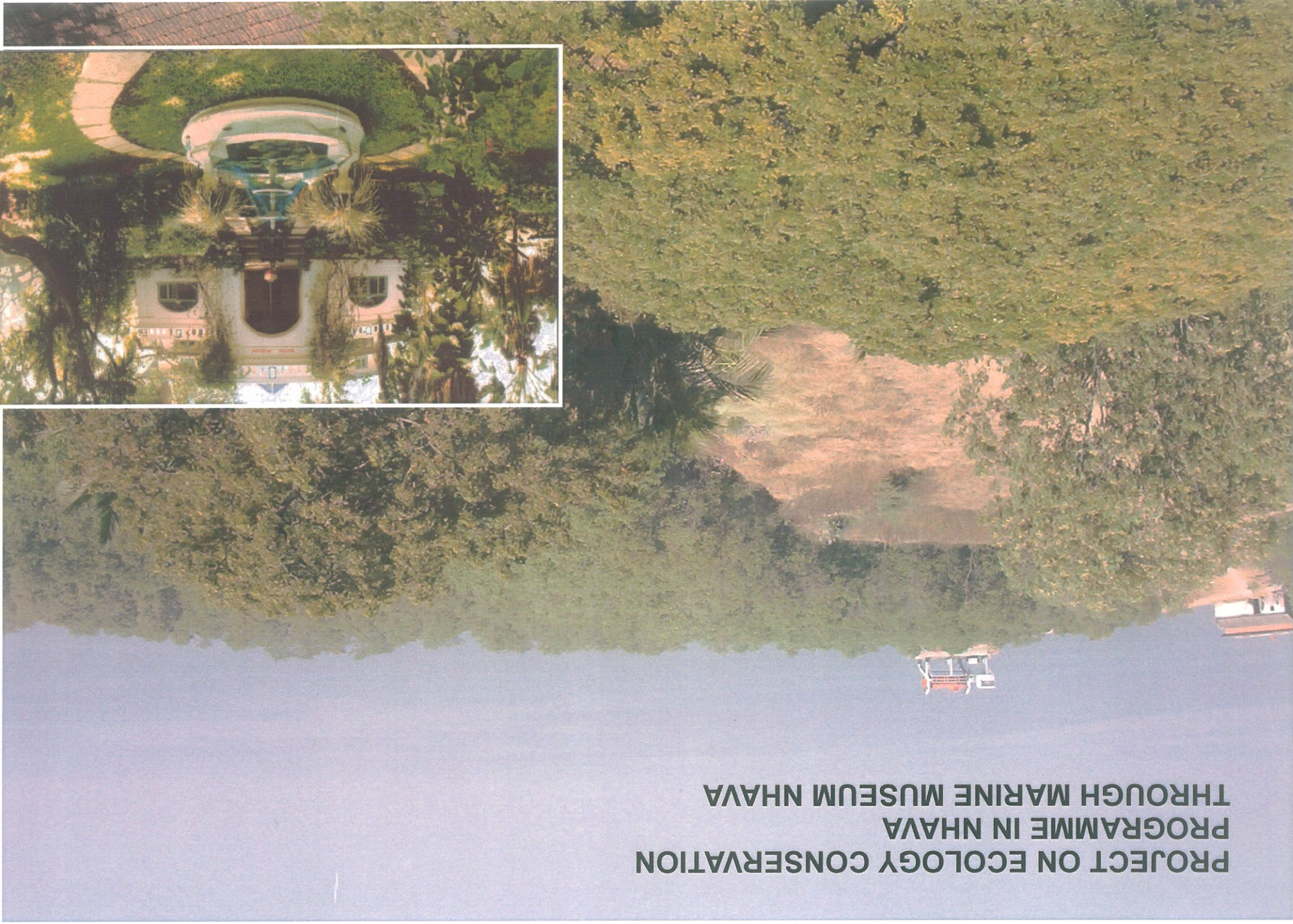
6. The Marine Museum that started off as an institutional Museum in 1912 is housed in a vintage building and is a tribute to the rich maritime heritage of the Country spanning more than 4000 years of history.

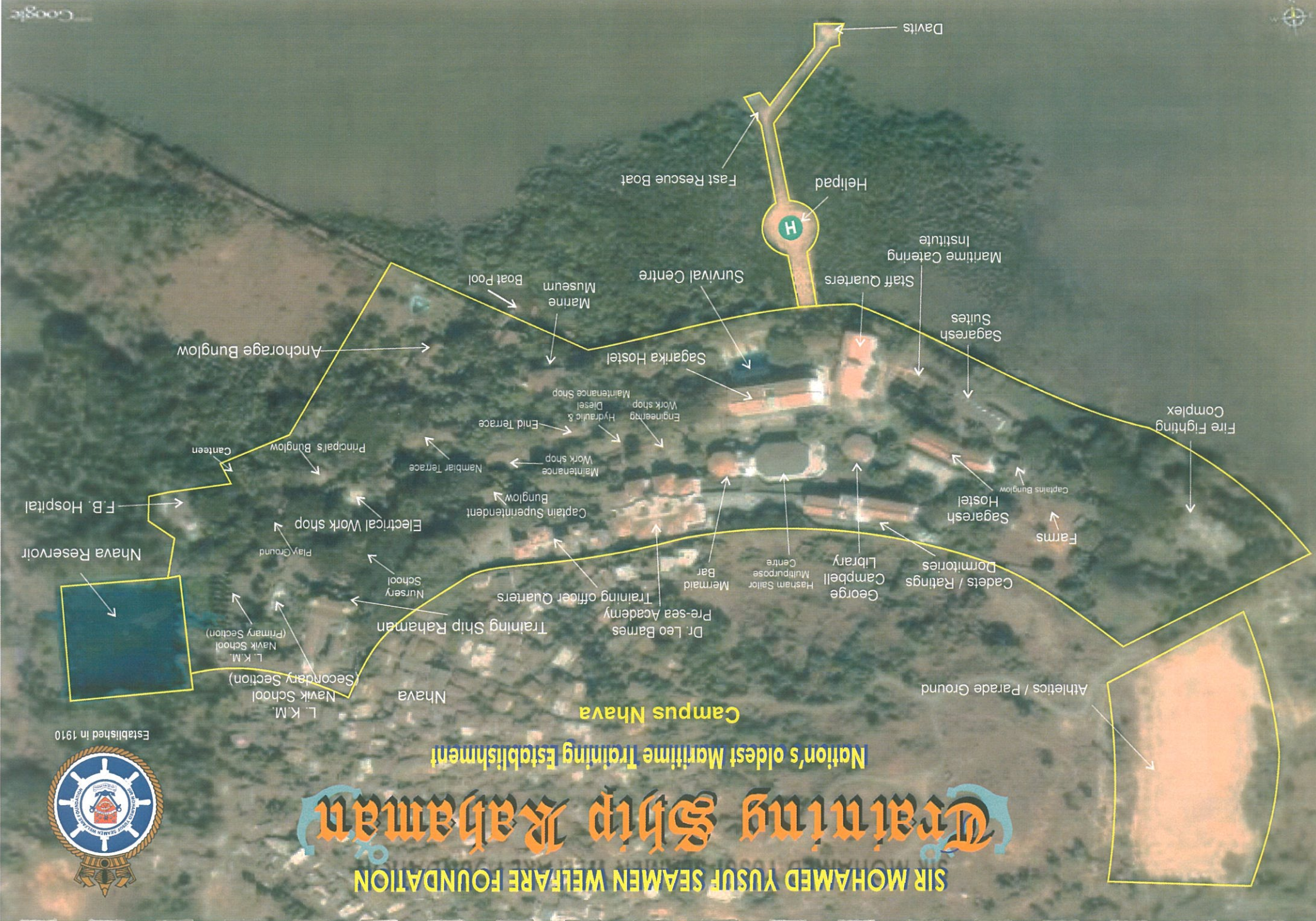
4. The 22 acre self contained Campus has modern training and administrative infrastructure at Nhava with around 270 employees and their family members having been provided with residential accommodation in the Campus besides the trainees. A full fledged 15 bed Fatma Banu Hospital with an Operation Theatre, X Ray Section, an ICU, Dental Section, a Pathology Laboratory and a dispensary



LKM JUNIOR COLLEGE

**PROJECT ON ECOLOGY CONSERVATION
PROGRAMME IN NHAVA
THROUGH MARINE MUSEUM NHAVA**





SIR MOHAMED YUSUF SEAMEN WELFARE FOUNDATION Training Ship Rahaman

Nation's oldest Maritime Training Establishment

Campus Nhava

Nhava

Established in 1910



- Davits
- Fast Rescue Boat
- Hellipad
- Maritime Catering Institute
- Staff Quarters
- Sagarsh Suites
- Fire Fighting Complex
- Farms
- Cadets / Ratings
- Dormitories
- George Campbell Library
- Hasham Sailor Multipurpose Centre
- Mermald Bar
- Dr. Leo Bames Pre-sea Academy
- Training officer Quarters
- Nursery School
- Play Ground
- Electrical Work shop
- F.B. Hospital
- Nhava Reservoir
- Secondary School (Secondary Section)
- Navik School (Primary Section)
- L. K.M.
- Training Ship Rahaman
- Captain Superintendent
- Maintenance Shop
- Nambiar Terrace
- End Terrace
- Hydraulic & Diesel Work shop
- Engineering Work shop
- Sagarsh Hostel
- Sagarsh Hostel
- Survival Centre
- Marine Museum
- Boat Pool
- Principal's Bungalow
- Canteen
- Anchorage Bungalow
- Captains Bungalow
- Sagarsh Hostel
- Athletics / Parade Ground

OBJECTIVES OF THE ECOLOGY CONSERVATION PROJECT

1. The main Objectives of the Project were as follows:-
 - 1.1 Conservation of fragile ecology of the environs Nhava
 - 1.2 Preservation of precious Mangrove cover of Nhava
 - 1.3 Promote awareness regarding marine ecology and the Country's rich maritime heritage.
 - 1.4 Promote tourism and develop sustained economy of this backward region.

REVISION OF THE SCOPE AND COST OF THE PROJECT

2. The Project was initially conceived in late March 2006 at a total cost of Rs. 20.20 lakhs (MMR EIS Letter No MMR-EIS/SOC/8-2005/252/2006 dated 27 March 2006 refers). However, due to our underestimation of the total cost of waste water treatment Plant and consequent representation by us, the MMR EIS consented to revise the Scope of Project to include re-appropriation of funds and sanctioned additional grant amounting to Rs. 1.10 lakhs thereby raising the total allocation to Rs. 21.30 lakhs.
3. Revised allocation of grant including own contribution as indicated in the Table below was conveyed to us vide MMR EIS letter No. MMR-ENV/SOC/8 - 2005/19/2007 dated 12th April 2007 refers):-

S. No	Component	Total Cost	Own Commitment	Approved cost
1	Reed Bed System	18,64,048.00	6,58,188.00	12,05,860.00
2	Dry Dock Repair and Boat Display	8,00,000.00	0	8,00,000.00
3	Computer/Server	41,200.00	0	41,200.00
4	Panels	72,940.00	0	72,940.00
5	Workshops	10,000.00	0	10,000.00
	Total	27,88,188.00	6,58,188.00	21,30,000.00

DURATION

The Project was to be completed in 12 months from the time of sanction.

REED BED SYSTEM OF WASTE WATER MANAGEMENT AT NHAVA .



REED BED SYSTEM OF WASTE WATER MANAGEMENT

Introduction

1. The system employs natural methods of passing the domestic waste water through layers of filtering media resulting into clear water that could be recycled thus conserving this precious source.
2. The septic tanks are connected to this Reed Bed through an inlet chamber. The reed bed medium has plants with deeper roots at the deeper layer and shallow ground cover in several centimetres of top layer. The roots in deeper region form an association with aerobic and facultative bacteria which consume the complex organic matter into molecules. The aerobic bacteria prevalent in the upper region convert this simple organic matter into CO₂ and water thus completing the digestion process and treating the waste water. The maximum digestion process happens in the first 25 to 30% of the bed area and volume, and the remaining area functions as the 'polishing' area. The excess bacteria are consumed by the earth worm introduced in the system. Thus the sludge management does not remain problematic issue in this type of system. Trimming of any excess or unwanted growth of plants is required to be regularly carried out.
3. Please see the attached Schematic representation of the system.

Contract

4. The contract was awarded to M/S Jal Rasayan Corporation, Kalyan, Maharashtra on 29th January at a total cost of Rs. 18, 64, 048.00 after competitive bidding and with permission from MMR EIS (MMR EIS Letter NO MMR-ENV/SOC/8-2005/211/2007 dated 29th January 2007 refers).

Scope of Work

5. The scope of work included inter connecting septic tanks to an inlet chamber, laying out a reed bed of the dimension 55 m x 10m x 1.8 m system with required sand and filter media, saplings, required culture and constructions of a skirting wall around the bed to prevent water run off, provision of a treated water collection chamber and, chemical dosing as and when required.

Schedule of Inclusion & Exclusions

6. The inclusion schedule stipulated undertaking required excavation, Plastic liner to cover the bed, filtering media, saplings and culture, Inlet and outlet chambers and a skirting wall 2 ft high along the Reed bed to prevent water run off.

The schedule of exclusion (own responsibility) stipulated the disposal of excavated soil, internal piping, provision of a Pump for pumping out water and laying distribution pipeline network for reutilisation of the cleared water.

Schedule of Execution

7. The entire installation was to be completed in 160 days from the time of placing of firm order.

8. Payment Schedule

- Rs. 8, 38, 820.00 representing 45% of the Project cost to be paid in advance along with placing of firm order.
- Payment of Rs. 3, 90,000.00 on the 75th Day or on completion of the filling Reed Bed with stipulated media and the erection of skirting wall.
- Rs. 3, 75,000.00 to be paid on the 93rd Day after filling the bed with water.
- Balance payment of Rs. 2, 60, 228.00 on the 160th day or on completion of plantation, de-weeding, installation of plumbing and commissioning of the Plant whichever is later.

PROGRESS OF WORK

Excavations

9. The excavations commenced on 8th March and carried on till 25th March.

Due to excessive rains in the months of July and August, work of filling up the media was held up.

Media Filling

10. First Layer of Sea sand – 75 mm height – 26th and 27th March.

Second Layer of Grain Husk across the bed to protect the HDPE Lining – 28 to 30th March

Third Layer of HDPE sheet – 30th and 31st March

Fourth Layer of Sea sand – 75 mm height 2nd and 3rd April

Fifth Layer of supporting media size 40 cm to 25 cm, 200 mm height – 3rd April to 28th April

Sixth Layer of supporting media size 25 cm to 15 cm, 200 mm height – 29th April to 12th May

Seventh Layer of Filter media size 12 cm to 6 cm, 250 mm height – 13th May to 22nd May

Eighth Layer of Filter media, size 6 cm to 3 cm, 250 mm height – 23rd May to 30th May

Ninth Layer of Top sand soil media, 100 mm height – 30th May to 10th June

11.1. Civil Works

- This included construction of
- An inlet water collection chamber 1m x 1m x 1m
- An Outlet water collection chamber – 1m x 3m x 1m
- intermediate chambers from septic tanks to the reed bed system
- Construction of skirting wall across the root zone

Piping Work

12. Piping work undertaken to connect septic tanks to the reed bed for inlet (raw water) and additional pipelines (outlet) for treated water.

Preparation of the Reed Bed

13. The upper layer was inoculated with bacterial culture and assorted species of acclimatised plants to include Travellers' Palm, Cycus, Fan Palm, Pisonia Alba, Spider Lilly, Golden Aralia, Adathoda Vasica, Canna and Acorus Calamaus, were planted.

14. These plants after planting were supplied fresh water for allowing them to adapt to the new culture. Septic tank was connected to the inlet chamber of reed bed system and pumping out of approximate equivalent quantity of water was commenced from treated water compartment to establish continuum of water movement from inlet end to outlet end.

15. The Plants grew to cover considerable part of reed bed system. Some weeds also appeared and had to be removed by carrying out de-weeding three times within a span of two months. This permitted spread of ground cover plants on the entire surface of the reed bed.

16. Weeding was carried out in accordance with the following schedule:-

First weeding and training of local operators – 3rd week of July 2007

Second weeding – 1st week of August

Third weeding – 4th week of August

17. The treated water collection sump has been planted with water Lilies and populated with 'Guppi' fish to prevent mosquito menace.

Water Analysis

18. It may also be appreciated that the Reed Bed was completed in the face of the monsoons and thus collection of water samples for analysis had to be restricted to a comparatively longer dry spell.

19. Water samples were independently tested and the results are attached. These are within the acceptable limits for the water to be utilised for gardening purposes. The comparison statement of the pollutants at the inlet and outlet end is attached. A total of 55 CuM of water is thus being conserved everyday.