



DREDGING CORPORATION OF INDIA LIMITED

WELCOME

To
A Presentation on
SETHUSAMUDRAM SHIP CHANNEL PROJECT

By
NEERAV KUMAR GUPTA
CMD, DCI Ltd.



SSCP PROJECT:

SETHUSAMUDRAM SHIP CHANNEL PROJECT (SSCP) AIMS AT CREATION OF A 12 MTR DEEP AND 300 MTR WIDE NAVIGATION CHANNEL WITHIN INDIAN WATERS LINKING GULF OF MANNAR TO BAY OF BENGAL THROUGH ADAM'S BRIDGE, PALK BAY AND PALK STRAIT FOR OPERATION OF SHIPPING TRAFFIC.



HISTORY OF SETHUSAMUDRAM SHIP CHANNEL:

The following were the various proposals for linking the Canal Pre-Independence:

- 1) Commander Taylor's Proposal – 1860
- 2) Mr. Townshend's Proposal – 1861
- 3) Parliamentary Committee's Proposal – 1862
- 4) His Excellency Sir William Dennison's Proposal
(Governor of Madras) – 1863
- 5) Mr. Robertson's (Harbour Engineer to the Govt. of India) Proposal – 1872
- 6) Sir John Code's Proposal – 1884
- 7) S.I. Railway Engineers Proposal – 1903
- 8) Sir Robert Bristo's (Harbour Engineer to the Govt. of India) Proposal - 1922



HISTORY OF SETHUSAMUDRAM SHIP CHANNEL:

Subsequently the following reports considered after Independence:

- 1) Sethusamudram Project Committee – 1956
- 2) Nagendra Singh Committee Report – 1967
- 3) Lakshminarayan Committee Report – 1981
- 4) Pallavan Transport Consultancy Services Report – 1996
- 5) Tuticorin Port Trust as Nodal Agency – 1997
- 6) DPR prepared by L&T-Ramboll – 2004



DPR by L&T-Ramboll:

Detailed Project Report prepared by L&T-Ramboll in 2004 establishing financial viability for the Project and has also prescribed a stringent Environmental Management Plan for preserving and conserving the rich bio-diversity in the project region.



INDIA – SRILANKA COAST LINE





CHANNEL ALIGNMENT





AERIAL VIEW OF SETHUSAMUDRAM





PROJECT RATIONALE:

- Navigational channel within India waters linking East and West coasts of India.
- Savings in distances.
- Savings in time.
- Opening up of Tamilnadu coast between Tuticorin and Chennai for international trade.
- Indian fishing boats can transit freely through Adam's Bridge. This is not possible today.
- The project will contribute to the national economy, develop the coastal districts of Tamilnadu, and improve the International competitiveness of India's exports.
- The project will facilitate coast movement of domestic cargo, leading to greater employment generation in the Ports and the industries in the vicinity.
- Maritime trade in Tamilnadu, both coastal and international, will flourish with rapid development of existing minor port in Ramanathapuram.



ESTIMATED SAVINGS IN TIME AND DISTANCE

FROM	TO	EXISTING ROUTE	SSC ROUTE	SAVINGS IN DISTANCE (NM)	SAVING TIME
		DISTANCE (NM)	DISTANCE (NM)		
CAPE COMORIN	CHENNAI	755	407	348	25.6
	VIZAG	1014	724	290	20.8
	KOLKATA	1357	1103	254	17.8
TUTICORIN	CHENNAI	769	345	424	31.9
	VIZAG	1028	662	366	27.1
	KOLKATA	1371	1041	330	24.1
			AVERAGE	335.3	24.5



TRAFFIC FORECAST AND VESSEL SIZE ANALYSIS

A detailed vessels size analysis has been carried out and typical dimensions of the design vessel sizes are given below.

Vessel Size	LOA (m)	Beam (m)	Draft (m)
30,000	190	30	10.50 *
40,000	215	33	11.00 *
50,000	267	33	12.50 *

* draft restricted to 10 m

From the vessel size analysis, all vessels up to 20,000 DWT, about 75% of 30,000 DWT, 10% of vessels up to 40,000 DWT and 5% of vessels upto 50,000 DWT, and all empty vessels will fall in this category and can pass through SSCP. This traffic is further adjusted to account for downtime predicted by the model studies and is considered for planning and financial analysis. Total traffic through SSCP is presented in the table below:

YEAR	PESSIMISTIC	OPTIMISTIC	MODERATE
2008	2858	3055	3249
2010	3140	3417	3683
2015	3900	4432	4895
2020	4784	5621	6343
2025	5883	7141	8234



TIME, COST AND METHODOLOGY FOR DREDGING THE CHANNEL



TIME, COST & ESTIMATE:

A summary of the capital cost estimate for the Sethusamudram project are presented in the table below.

SL. NO.	DESCRIPTION OF WORK	AMOUNT (Rs. Crores)
1	Preliminary Expenses	10.00
2	Cost of land acquisition / administrative costs	5.00
3	Dredging	1719.60
4	Navigational Aids	10.90
5	Supply and Commission of Tugs & Crafts	157.60
6	VTMS & Equipment	65.90
7	Civil works	144.00
8	Consultancy and Supervision	20.00
9	Contingency	100.00
10	Grand Total:	2233.00
11	Financing Cost:	194.40
12	Total:	2427.40



OPERATING AND MAINTENANCE COSTS:

A summary of Operation and Maintenance costs is presented below

SL. NO.	DESCRIPTION	YEAR						
		1	2	3	4	5	6	7
1	Maintenance Cost	3700	3700	3400	3400	3100	3100	3100
2	Operation Cost	1465	1465	1465	1465	1465	1465	1465
3	Subtotal of O & M Cost	5165	5165	4865	4865	4565	4565	4565
4	Contingencies and Project Management	258	258	243	243	228	228	228
5	Total O & M Cost	5423	5423	5108	5108	4793	4793	4793



CHANNEL DESIGN:

- **DESIGN VESSEL SIZE: LOA-215M, B-33M, D-10M**
- **VESSEL SPEED: 8 KNOTS**
- **TWO WAY CHANNEL**
- **CHANNEL WIDTH: 300 Mtrs**
- **UNDER KEEL CLEARANCE: 2 Mtrs**
- **SAFE DRAFT: 10 Mtrs**
- **SIGHT DISTANCE: 2.5 KM**



SALIENT FEATURES OF CHANNEL

SECTION	LENGTH IN KM	AREA
G-A	04.37	Adam's Bridge
A-B	17.30	Adam's Bridge
B-C	13.38	Adam's Bridge
C-D	37.44	Palk Bay
D-E	40.48	Palk Bay
E-E₄	54.25	Palk Strait
TOTAL:	167.22	



DREDGING REQUIREMENT:

The dredging quantity estimation is done taking sections at every 100m interval and integrating over the length of segment. The details of channel and dredging quantities computed for each segment are as below.

SEGMENT	LENGTH (KM)	DREDGE QUANTITY (Million Cu.M.)	AVERAGE DISTANCE (ONE WAY) NM
ADAM'S BRIDGE	35.00	48.05	18.90
PALK BAY	78.00	No Dredging	
SOUTHERN PART OF PALK BAY & PALK STRAIT AREAS (E – E3)	40.68	20.95	32.40
SOUTHERN PART OF PALK BAY & PALK STRAIT AREAS (E3 – E4)	13.56	13.50	16.20
TOTAL:	167.24	82.50	

Based on the model studies report, it is estimated the maintenance dredging to be 2 Million Cu.M in the first year reduction to 1.4 Million Cu.M in 5 years and remaining constant thereafter.



METHODOLOGY FOR DREDGING:

For dredging in Adam's Bridge upto a level of (-) level, it is proposed to deploy CSD. Dredging below the level of -8, upto -12, will be by TSHD, except in region where dense / hard material is encountered where again CSD will be used.

The Palk Strait area is divided into two sections depending on the distance to the dumping spot in Bay of Bengal (one with average lead of 60 km and the other with average lead of 40 km) where dredging will be carried out using TSHD.

The dredged materials from Adam's Bridge area is proposed to be dumped offshore into sea in the Gulf of Mannar at location of 20-30 m natural depth within Indian territorial waters. The dumping location is assessed to be 25-30 km away from Adam's Bridge . The entire quantity of dredged material from Adam's Bridge can be dumped at this site.

The dredged material from Palk Strait is proposed to be dumped offshore in Bay of Bengal area at about 25-30 m depth.



**SETTING UP OF SPV i.e.
SETHUSAMUDRAM
CORPORATION LIMITED**



SSCP – COMPANY & PROMOTERS:

- Sethusamudram Corporation Ltd. (SCL) incorporated on December 6, 2004, to develop and operate the Sethusamudram Channel.
- As per DPR, the project cost is Rs.2427.40 Crores and in a debt equity ratio of 1.5 : 1 and debt component of Rs.1456.40 Crores and equity of Rs.971.0 Crores.
- Promoted by Govt. of India along with other major Ports on the East Coast of India viz. Tuticorin, Chennai, Ennore, Visakhapatnam and Paradip along with Shipping Corporation of India Ltd. and Dredging Corporation of India Ltd.
- Tuticorin Port Trust is the nodal agency for the development of channel.



ENVIRONMENTAL MONITORING DURING DREDGING OPERATIONS



ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION PHASE:

- **No Dredging in Gulf of Mannar except in Adam's Bridge Area**
- **Alignment in Gulf of Mannar at least 20 Km away from the marine National Park**
- **Land acquired for mobilisation and monitoring to be returned to users on completion of dredging activity**
- **Safe distance of 4 Kms from International Medial line**
- **Disposal in sea at depths of 30-40M, 20-25 Km away from GOM Islands and 25-40M, 30-60 Km away from the dredging area in Palk Strait**
- **Strict enforcement of Environmental Monitoring Plan**
- **No interference with Fishing activities**
- **Augmentation of existing Jetties, Roads etc.**



ENVIRONMENTAL MONITORING PLAN

Monitoring of environmental components especially marine water, sediment, marine ecology is vital owing to the sensitiveness of the project region. Keeping in view the ecological sensitivity of the region, a 3 level monitoring plan is being implemented to mitigate the impacts during the implementation phase of SSCP. The details of the monitoring levels are as follows:



Environmental Monitoring of SSCP

DCI monitoring the Environmental parameters with the assistance of the following:

- 1) **ALAGAPPA UNIVERSITY, KARAIKUDI** initially for the Environmental impact monitoring at SSCP from July, 2005 to October, 2005
- 2) Subsequently, basing on tenders, the EMP being carried out by **CENTER FOR ADVANCED STUDIES IN MARINE BIOLOGY , PARANGIPETTAI** from October, 2005 till completion.



Environmental Monitoring of SSCP

The monitoring program for the implementation :-

Marine Water Quality :-

Parameters being monitored :

- Physical Properties : pH, EC, Salinity, Temperature, Turbidity, TSS.
- Chemical Properties : DO, BOD, COD, Oil & Grease, Nutrients, Sulphates, Chlorides.
- Heavy Metals : Fe, Zn, Mg, Mn, Cd, Cr, Hg.
- Bacteriological Parameters: Coliform count.
- Marine Biology : Phytoplankton and zooplankton .



Environmental Monitoring of SSCP

Locations / Frequency of Measurements :-

First Level :-

Locations :- 2 Locations covering the Dredging Zone & Disposal Location.

Frequency :- At an interval of 4 hours.

Second Level :-

Locations :- 2 Locations at Point Calimere wild life sanctuary and Muthupet mangroves.

Frequency :- At an interval of 8 hours.

Third level :-

Locations :- 1 Locations at Point Calimere wild life sanctuary / Muthupet mangroves.

Frequency :- 1 sample /day.



Environmental Monitoring of SSCP

Sediment Quality Monitoring :-

Parameters monitored :-

- Physio-Chemical Properties : pH, Organic matter, Nutrients, Oil and Grease
- Heavy Metals : Fe, Mn, Cd, Ni, Cr, Hg, Zn and Pb
- Benthic Communities : Macro & Micro Benthic Flora and Fauna.



Environmental Monitoring of SSCP

Ambient Air Quality Monitoring :-

Parameters monitored :

Suspended Particulate Matter (SPM)
Respirable Particulate Matter (RPM)
Sulphur Dioxide (SO₂)
Oxides of Nitrogen (Nox)
Carbon Monoxide (CO)
Hydrocarbons .

Locations/Frequency of Measurements :

Locations :- 2 Locations at Point Calimere wild life sanctuary and Muthupet mangroves.

Frequency :- Once in a month for two days.



Environmental Monitoring of SSCP

Noise Level Monitoring :-

Parameters monitored :

Hourly noise levels for 24 hours

Locations/Frequency of Measurements :

Locations :- 2 Locations at Point Calimere
wild life sanctuary and Muthupet
mangroves.

Frequency :- Once in a fortnight.



Environmental Monitoring of SSCP

SAMPLES COLLECTED PER DAY

	<u>WATER</u>	<u>SEDIMENT</u>	<u>TOTAL</u>
<u>FIRST LEVEL</u>			
➤ Dredging Ground -	6	6	12
➤ Dumping Ground -	6	6	12
<u>SECOND LEVEL</u>			
➤ Point Calimere -	3	3	6
➤ Muthupet -	3	3	6
<u>THIRD LEVEL</u>			
➤ Point / Muthupet -	1	1	2
Total -	19	19	38

Above samples results in to 741 nos TESTS PER DAY.



INAUGURATION OF SETHUSAMUDRAM PROJECT BY HON'BLE PRIME MINISTER





**INAUGURAL DREDGING AT
SETHUSAMUDRAM SHIP CHANNEL PROJECT
BY DCI DREDGE-XII ON 02-07-2005**



DREDGING CORPORATION OF INDIA LIMITED

THANK YOU