

EXECUTIVE SUMMARY

1. Project Background

The applicant has proposed a Sand quarry in Government (River Poramboke) land in S.F.Nos. 782/1 (part) over an extent of 20.0.0 Ha of Mathrivellur Village, Sirkazhi Taluk, Nagapattinam District, Tamil Nadu State for a period of three years only. The category of project falls under B1, it is a fresh Sand quarry in Mathrivellur Village. The lease applied area exhibits plain topography covered with sand.

The quarry operation is proposed to carry out with conventional opencast semi mechanized method of mining without drilling and blasting to a bench height of 1.0m vertical bench and a width of 500m (Avg), judicial number of Excavator/Poclains is involved. Mining activities is being carried out in a manner so that there is no obstruction to the movement of water flow.

The quarry operation is proposed up to depth of 1m (Avg) below theoretical river bed level. The reserves of Sand including Shoals available as Geological is about 10,53,991 m³, Mineable Reserves and Proposed Year wise production is calculated to be 4,53,991 m³ for three years (Thirty six months) only. Mining Plan and Progressive Mine Closure Plan of this proposed mining lease area is approved by Assistant Director, Department of Geology and Mining, Nagapattinam, vide Lr.no.Rc.No.392/Mines/2017, dated 06.08.2018 with production capacity of 4,53,991 m³ from the date of execution of lease deed. The project area does not fall in Hill Area Conservation Authority region. There is no interstate boundary, CRZ zone, Western Ghats, notified Bird sanctuaries, wild life sanctuaries as per Wild life protection Act 1972, within the radius of 15Km.

2. Nature & Size of the Project

The proposed sand quarry is over an extent of 20.0.0 Ha land which is located Mathrivellur Village of Sirkazhi Taluk, Nagapattinam District. The lease granted area for mining lease is a plain topography covered with sand which is formed by continuous mechanical action of river (River Coleroon) erosion of weathered particles transported and deposited.

Mineral intends to quarry : Sand
District : Nagapattinam
Taluk : Sirkazhi
Village : Mathrivellur
S. F. Nos. : 782/1 (P)
Area : 20.00.0 Hectares

Table1: Brief Description of the Project

S. No	Particulars	Details
1.	Latitude	11°18'12"N to 11°18'25"N
2.	Longitude	79°39'17"E to 79°39'44"E
3.	Site Elevation above MSL	6 m from MSL
4.	Topography	Slightly undulated topography
5.	Land use of the site	Government (River Poramboke) land
6.	Extent of lease area	20.00.0 Ha
7.	Nearest highway	(SH-49) Chidambaram - Sirkazhi which is about 5.8 Km on Eastern side of the area. (NH-227) Chidambaram - Kattumannar kovil which is about 5.8Km on the Western side of the area
8.	Nearest railway station	Kollidam Railway station - 7.0 km - NE
9.	Nearest airport	Trichy Airport - 120 km - SW
10.	Nearest town / city	Nearest Town : Sirkazhi - 11.0 km - SE Nearest City : Nagapattinam - 63.0 km - SE Nearest District : Nagapattinam - 63.0 km - SE
11.	Rivers / Canal	Coleroon River (Project Site) Uppanaru - 10.55 km, NE Vellar - 14.15 km, N
12.	Water bodies	Sengalmedu Lake -7.20 km NW Veeranam Lake - 11.60 km W Thilai Pond - 8.47 km , SW

		Perumal Kovil Kulam – 10.69 km, SE Temple Pond – 10.95 km, SE Mudhalaimedu Pond – 13.40 km, NE Saavadi Kulam – 14.85 km, NE
13.	Archaeologically places	Nil in 10 km radius
14.	National parks / Wildlife Sanctuaries	Vakkaramari Corcodile Park -6.0 km N
15.	Reserved / Protected Forests	Nil in 10 km radius
16.	Seismicity	Proposed Lease area come under Seismic zone-
17.	Defense Installations	Nil in 10 km radius

3. Need for the Project

The Sand quarrying project falls in the area of Nagapattinam District, Tamil Nadu, where agricultural activities are been carried out and the new industries are springing up in the district. Sand is an important commercial product, with a number of applications. The applicant intends to use this Sand specifically used for construction purpose in and around the district.

River channels and their flood plains are important sources of construction grade aggregate materials like Boulder, Gravel and sand. The durability of river-borne coarser classics and their sorting by fluvial action make them best suitable raw materials/ingredients for building constructions. The market demands of such construction raw materials are high throughout the country for the construction and infrastructure development projects.

Apart from this the project will also serve the following:

- Generate various employment opportunities especially to the local people hosting the mining project.
- Economic development of the state by contributing to state exchequer.

Figure1: Location Map of the Project Site

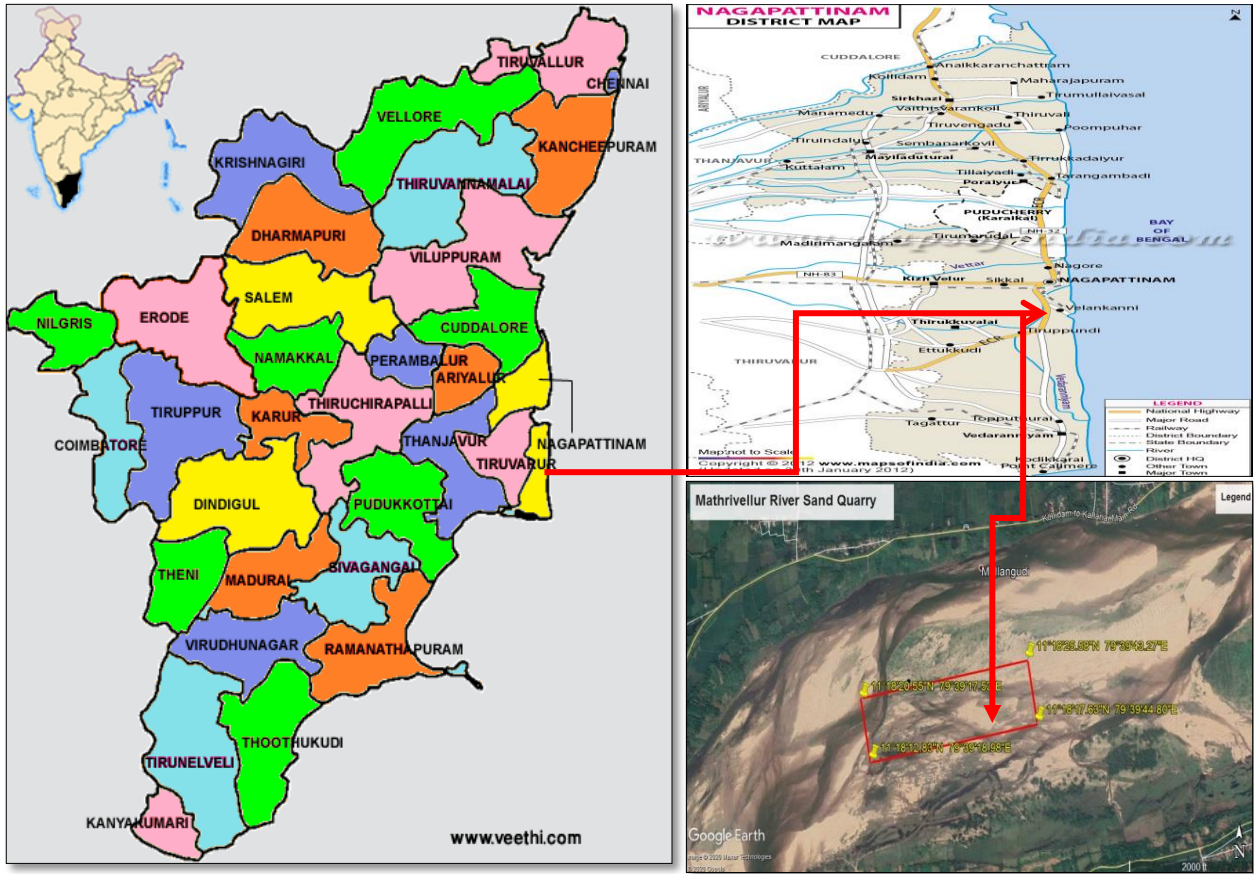


Figure2: Google Image of the Project Site

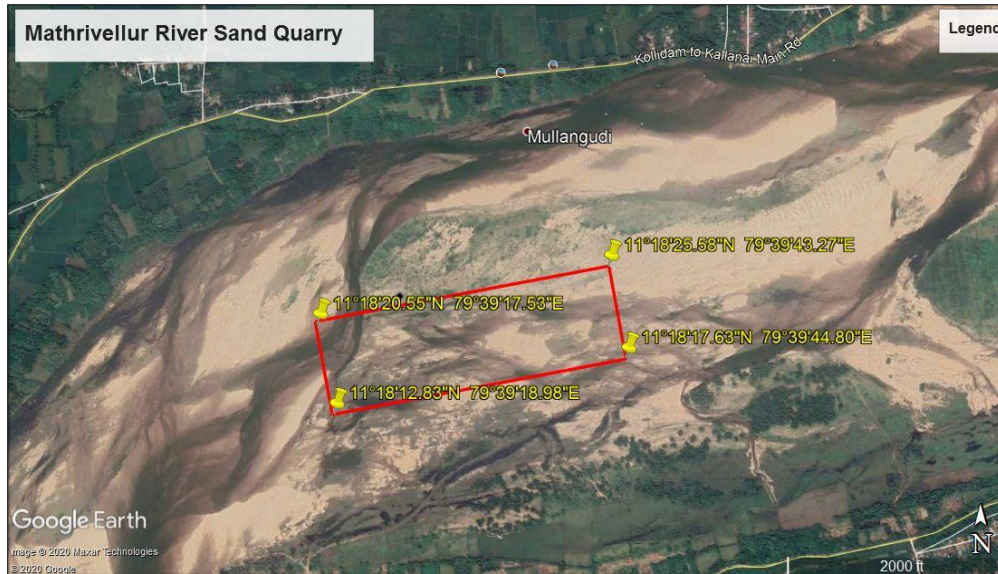


Figure2: Google image of the Project Site

4. Geological Resources

Geological Resources of shoals

Geological Resources of shoals = 2,53,991m³
Average height of shoals = 2,53,991 m³/2,00,000 m²
= 1.269m
Geological Resources of sand below the theoretical river bed = 8,00,000 m³
Total Geological Resources of sand including shoals = 10,53,991 m³

Table 2: Geological Reserves of Shoals

RESERVE ESTIMATION OF SHOALS					
S.No	CS@	Area (m ²)	Mean Area(m ²)	Distance (m)	Quantity in m ³
1	0m	48.35			
2	50m	61.75	55.050	50	2752.5
3	100m	143.45	102.600	50	5130.00
4	150m	206.15	174.800	50	8740.00
5	200m	286.75	246.450	50	12322.50
6	250m	318.60	302.675	50	15133.75
7	300m	285.20	301.900	50	15095.00
8	350m	342.80	314.000	50	15700.00
9	400m	358.00	350.400	50	17520.00
10	450m	316.10	337.050	50	16852.50
11	500m	379.75	347.925	50	17396.25
12	550m	405.80	392.775	50	19638.75
13	600m	404.05	404.925	50	20246.25
14	650m	383.85	393.950	50	19697.50
15	700m	486.05	434.950	50	21747.50
16	750m	498.55	492.300	50	24615.00
17	800m	357.60	428.075	50	21403.75

GRAND TOTAL	253991.30
GRAND TOTAL (Round off)	2,53,991

Table 3: Geological Reserves of Sand

Area in (Ha)	Depth in (m)	Volume in m ³	Geological Resources of Sand in m ³
20.00.0	4.0	8,00,000	8,00,000
Total			8,00,000

5. Mineable Reserves

Mineable Resources of shoals = 2,53,991 m³

Mineable Resources of sand below the theoretical river bed level = 2,00,000 m³

Total Mineable Reserves of sand including shoals = 4,53,991 m³

Table 4: Mineable Reserves of Sand Shoals

RESERVE ESTIMATION OF SHOALS					
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GRAND TOTAL					253991.30
GRAND TOTAL (Round off)					2,53,991

Table 5: Mineable Reserves of Sand

Area in (Ha)	Depth in (m)	Volume in m ³	Geological Resources of Sand in m ³
20.00.0	1.0	2,00,000	2,00,000
Total			2,00,000

Table 6: Three Years Proposed

Production from Riverbed	
Year	m ³
I	151330.3
II	151330.3
III	151330.3

6. Mining

6.1 Size and Magnitude of Operation

The mining lease area is only 20.00.0 Hectare area, available for mining of sand. Due to significant role in the domestic as well as infrastructural market, mining of sand makes it economically viable.

6.2 Process Description

Opencast method of shallow mining is proposed, heavy earth moving machineries like excavator are proposed for quarrying the sand up to a depth of 1m from below the theoretical

river bed level. No drilling and blasting is proposed, it is a conventional eco-friendly quarrying operation. The quarried sand will be loaded directly into the tippers/trucks for transportation to the stockyard.

7. Water Requirement

Total water requirement for this mining project is 6 kLD. The 90% water will be required for the suspension of dust, the rest of the water will use for domestic purpose as well as for plantation.

Table 7. Water Balance

S.No.	Description	Water in kLD	Source
1.	Domestic water	0.30 kLD	Drinking water available in Mathrivellur Village which is 1.5 km on SE
2.	Green Belt	0.70 kLD	From road tankers supply
3.	Dust suppression	5.00 kLD	From road tankers supply
Total		6.0 kLD	

8. Man Power

Total estimate Man power would be about 34 persons as per the details given below. The local people will be given as an opportunity to earn their living.

Table 8. Man Power

Skilled			
S.No	Designation		Nos
1.	PWD Assistant Engineer		1
2.	Technical Assistant		1
3.	Excavator/Poclaim Operator		4
4.	Excavator/Poclaim Co-Operator		4
Total			10
Un-Skilled			
5.	Permit Slip Issuer		3
6.	Traffic Regulator	Entrance	2
		Exit	2

		Quarrying site	2
7.	Bucket Watcher		2
8.	Office Helper		1
9.	Track Maintainer		6
10.	Watchman (Three Shifts)		6
Total			24
Grand Total			34

9. Solid Waste Management

Waste management is an important facet of environment management. Thus, solid waste management is important from both aesthetics and environment viewpoints.

Solid waste (sand and silt) that will be generated during mining activities as spillage will be utilized for filling of the mine voids. Apart from this, no other solid wastes will be generated from the said mining operations.

Generated food waste or any other domestic waste will be collected in dustbins and will be properly disposed off.

There are no toxic elements present in the mineral which may contaminate the soil or river water.

Total municipal solid waste comes upto 15.13 kg/day generated by the man power provided.

(As per CPCB guidelines: MSW per capita/day=0.45 kg/day)

Table 9. Solid Waste Management

S. No	Type	Quantity	Disposal Method
1.	Organic	9.18 kg/day	Municipal Bin (including food waste)
2.	Inorganic	6.12 kg/day	TNPCB authorized recycle
Total		15.13	

10. Energy and Fuel

- 16 Litre diesel per hour for quarrying machineries

- Quantity of diesel consumption - 1,21,072 Liters of HSD will be utilized for one excavator.
- No Electricity is required for quarry operation; the quarry working is restricted on day time only

11. Land Requirement

The total extent area of the proposed project is 20.00.0 Ha, Government (River Poramboke) land in S.F.Nos.782/1 (P) over an extent of 16.08.0 Ha of Mathrivellur Village, Sirkazhi Taluk, Nagapattinam District, Tamil Nadu State

12. Human Settlement

There are no habitations within 500m radius. There are villages located in this area within 5km radius of the quarry.

Table 10. Population Density

S.No	Direction	Village	Population	Distance
1	SE	Mathrivellur	250	1.2km
2	NW	Keezhaparuthikudi	300	1.2 km
3	NE	Nalamputhur	300	1.5km
4	SW	Pattiyamedu	100	1.7 km

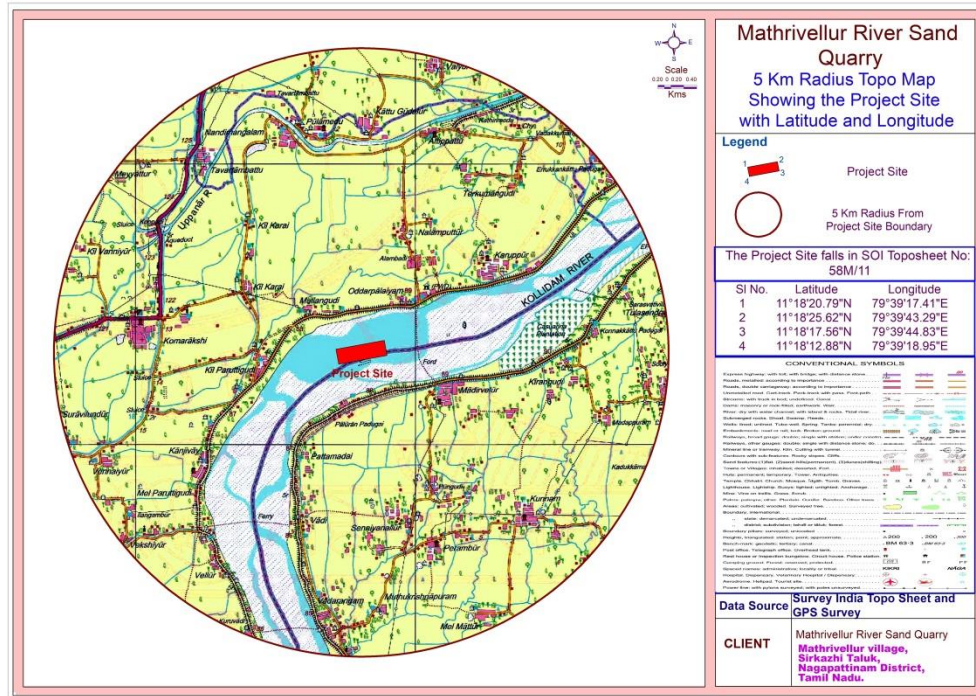
13. Scope of the Baseline Study

The chapter contains information on existing environmental scenario on the following parameters.

1. Micro – Meteorology
2. Water Environment
3. Air Environment
4. Noise Environment
5. Soil/ Land Environment
6. Biological Environment

7. Socio-economic Environment

Figure.3: Topo Map of the 5 km radius



13.1 Micro - Meteorology

Meteorology plays a vital role in affecting the dispersion of pollutants, once discharged into the atmosphere. Since meteorological factors show wide fluctuations with time, meaningful interpretation can be drawn only from long-term reliable data.

- i) Average Minimum Temperature : 27°C
- ii) Average Maximum Temperature. : 34°C
- iii) Average Relative Humidity(%) : 67 %
- iv) Average Annual Rainfall of the area : 969.2mm

13.2 Air Environment

Ambient air monitoring was carried out on monthly basis in the surrounding areas of the Mine Lease area to assess the ambient air quality at the source. To know the ambient air quality at a larger distance i.e. in the study area of 5 km radius, air quality survey has been conducted at 5

locations over a period of Pre Monsoon Season. Major air pollutants like, Particulate Matter (PM₁₀), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) were monitored and the results are summarized below.

The baseline levels of PM₁₀ (30-58 µg/m³), PM_{2.5} (15 -29 µg/m³), SO₂ (5-17 µg/m³), NO₂ (10-36 µg/m³), all the parameters are well within the standards prescribed by National Ambient Air Quality during the study period from January 2020 to March 2020.

13.3 Noise Environment

Ambient noise levels were measured at 5 locations around the proposed project site. Maximum & minimum noise levels recorded during the day time were from 46 Leq dB and 54 Leq dB respectively and maximum & minimum level of noise during nighttime were 39 Leq dB and 49 Leq dB respectively.

13.4 Water Environment

Ground water was tested and the results were as follows.

- The average pH ranges from 7.4 -8.13.
- TDS value varied from 78.4 mg/l to 1019 mg/l
- Chloride ranges 288 mg/L to 2622 mg/L
- Total Hardness as calcium carbonate values ranges from 78.4 mg/l – 1019 mg/l
- Sulphates range between 18 mg/l and 350 mg/l.

Surface water was tested and the results were as follows.

- pH varies from 7.66 to 8.08
- Total Hardness varies from 143 to 157 mg/L
- Total Dissolved Solids varies from 261 to 282 mg/L.

13.5 Land Environment

The analysis results show that soil is neutral in nature as pH value ranges from 7.1 to 7.31 with organic matter 0.20 % to 0.31 %. The concentration of Nitrogen, Phosphorus & Potassium has been found to be good amount in the soil samples.

13.6 Biological Environment

The proposed Mining lease area is mostly dry barren ground with sand having small shrubs and bushes. No specific endangered flora & fauna exist within the mining lease area.

13.7 Socio Economic Environment

Population as per 2011 census was 16.16 lakhs.

- Rural population : 2.71 lakhs
- Urban population : 71.7 thousands
- The literacy rate is 83.59%.

14. Rehabilitation/ Resettlement

This eco-friendly quarrying for a depth of 1.0m (Avg) below theoretical river bed level does not require any backfill, Reclamation & Rehabilitation.

Leveling the floor will be leveled naturally.

The overall land of the mine is Government (River Poramboke) land. There are no displacement of the population within the project area and adjacent nearby area. Social development of nearby villages will be considered in this project.

15. Greenbelt Development

1. The development of greenbelt will be carried out on the river bund, nearby villages and village roads after the consultation with the Panchayat authorities.
2. Green belt has been recommended as one of the major component of environmental Management Plan, which will improve ecology, environment and quality of the surrounding area.
3. Local trees like, Neem, Pungam, Magizham, Causirina etc. will be planted along the river bund, nearby villages and village roads at a rate of 500 trees and their rate of survival is expected to be 80% in this area.

16. Anticipated Environmental Impacts

16.1 Air Environment and Mitigation Measures

- Water sprinkling be done before loading by making it moist

- Water sprinklers along the sides of haul road will be fixed to control fly of dust while transporting minerals and waste.
- Overloading will be prevented.
- Trucks/Dumpers covered by tarpaulin covers
- Avenue trees along roads will be planted as per the norms of MoEF to control fly of dust.
- Labour's engaged in such dust prone areas will be provided with safety devices like ear muff, mask, goggles as per the MMR, 1961 amendments and circulars of DGMS.
- Regular health check-up of workers and nearby villagers in the impacted area will be carried out and also regular occupational health assessment of employees should be carried out as per the Factories Act.0
- Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air.

16.2 Noise Environment and Mitigation Measures

- Proper and regular maintenance of vehicles, machinery and other equipment.
- The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipments.
- Speed of trucks entering or leaving the mine will be limited to moderate speed to prevent undue noise from empty vehicles.
- Adequate silencers will be provided in all the diesel engines of vehicles.
- Minimum use of horns and speed limit of 10 km/hr in the village area.It will be ensured that all transportation vehicles carry a valid PUC Certificates.
- Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas
- Provision of quiet areas, where employees can get relief from workplace noise.
- The development of green belts around the periphery of the mine to attenuate noise.

- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.

17. Responsibilities for Environmental Management Cell (EMC)

The responsibilities of the EMC include the following:

1. Environmental Monitoring of the surrounding area.
2. Developing the green belt/Plantation.
3. Ensuring minimal use of water.
4. Proper implementation of pollution control measures.

18. Environmental Monitoring Program

A monitoring schedule with respect to Ambient Air Quality, Water & Wastewater Quality, Noise Quality as per Tamil Nadu State Pollution Control Board (TNPCB), shall be maintained.

19 .Project Cost

The total project cost is Rs.1,13,82,040 for deployment of machinery and creation of infrastructural facilities like approach road, Mine office / Workers Shed, First Aid Room etc., including electrifications and water supply.

Table 11. Project Cost details

S.No.	Description	Cost
1.	Estimated operational Cost	1,09,25,040
2.	EMP Cost	4,57,000
	Total	1,13,82,040

20. Corporate Environmental Responsibility

The Corporate Environment Responsibility (CER) fund will be provided to the below activity.

Table.12 CER Cost

S.No.	CER Activity	CER (Rs in lakhs)
1.	Providing Hygienic Toilets, RO facilities, Solar Facilities and Furniture's to Government school in Mathrivellur Village	1,36,35,700
Total		1,36,35,700

21. Benefits of the Project

- Consequence of the change in river regime and reduction in carrying capacity of the River Coleroon, the shoals in the rivers, diverting the flow of water results in bund erosion and consequent breaches, which lead to loss of property and lives.
- Solution to the above said problem is to de-silt the shoals in the River Coleroon by expending huge amount.
- Alternatively, the economical solution to this problem is to mine the sand to remove the shoals. This option would yield the net revenue to the State exchequer apart from making available the important construction material for infrastructure development at a reasonable price to the common people.
- There is positive impact on socio-economics of people living in the villages. Mining operations in the subject area has positive impact by providing direct and indirect jobs opportunities.
- The project is environmentally compatible, financially viable and would be in the interest of construction industry thereby indirectly benefiting the masses.
- Quarrying in this area is not going to have any negative impact on the social or cultural life of the villagers in the near vicinity.