

Executive Summary of Draft Environmental Impact Assessment Report

Establishment of Fishing Harbour for Providing Fish landing Facilities to Fishermen

At Versova, Taluka Andheri, District Mumbai Suburban.

by

Maharashtra Fisheries Development Corporation Ltd., Government of Maharashtra Undertaking

Baseline Monitoring:
Winter (Dec 2019-Feb2020)



September - 2022

Environmental Consultant: Aditya Environmental Services Pvt. Ltd., Mumbai

QCI- NABET Accredited EIA Consultant

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NABET/EIA/1922/SA 0129



Introduction:

Versova is placed at mouth of the Malad creek in Andheri Tehsil of Mumbai Suburban district bordering the Arabian sea. It is a fishing village with a population of about 5,592 fisherfolk. The existing facilities at Versova fish landing centre consists of broken wharf, net mending shed, unpaved, open fish drying area, engineering workshop, fuel station and open space. The Government of Maharashtra had requested Central Government for Administrative Approval to develop the fishing harbour at Versova, vide letter no number MATSY A VI - 1119/CR-48/ ADF-14, Mantralaya, Mumbai dated 10th July 2019.

Development of fishing harbour is proposed by Maharashtra Fisheries Development Corporation Ltd. requires prior environmental and CRZ clearance under EIA and CRZ notifications. The **proposed activity** falls under **Schedule 7(e) category (B)** as per EIA notification of September 2006 with subsequent amendments and covered under clause 5.1.2(i)(a), 5.4(ii)(a) & 5.4(iii) as per CRZ Notification of January 2019. State Environmental Impact Assessment Authority has granted Terms of reference to the proposal vide letter No. SIAIMH/MIS/5 1074/2020 dated 26th June 2020.

MFDC is proposing to develop fishing harbour which will cater to 900 fishing boats

The proposed development of Versova fishing harbour is projected to handle about 41,060 tons of fish annually. The development of Versova fishing harbour will involve construction of a boat basin, 2 Breakwaters, a series of Quays, along with necessary infrastructure (such as Fish Auction hall, Net Mending Shed, Dormitory, Resting shed, Public Utility stores, Radio communication tower, Restaurant, Admin building, firefighting facilities, workshop, greenbelt, vehicle & boat parking), Ship repair yard and associated storages, Guard House approach roads and Utilities (power supply, water supply, sewage treatment, fuel dispensing for fishing boats). The purpose of the Environmental Impact Assessment report is to investigate & assess the principal environmental concerns associated with these activities.

Project Description:

The project is spread over area of 32.8 Ha. The fishery harbour complex accommodating the landside facilities is spread over in area of 19.27 Ha out of which reclaimed area will be of 19.19 Ha. The harbour basin area is provided for the safe berthing and manoeuvring of fishing vessels. The facilities at the harbour complex will includes:

➤ Waterside facilities:

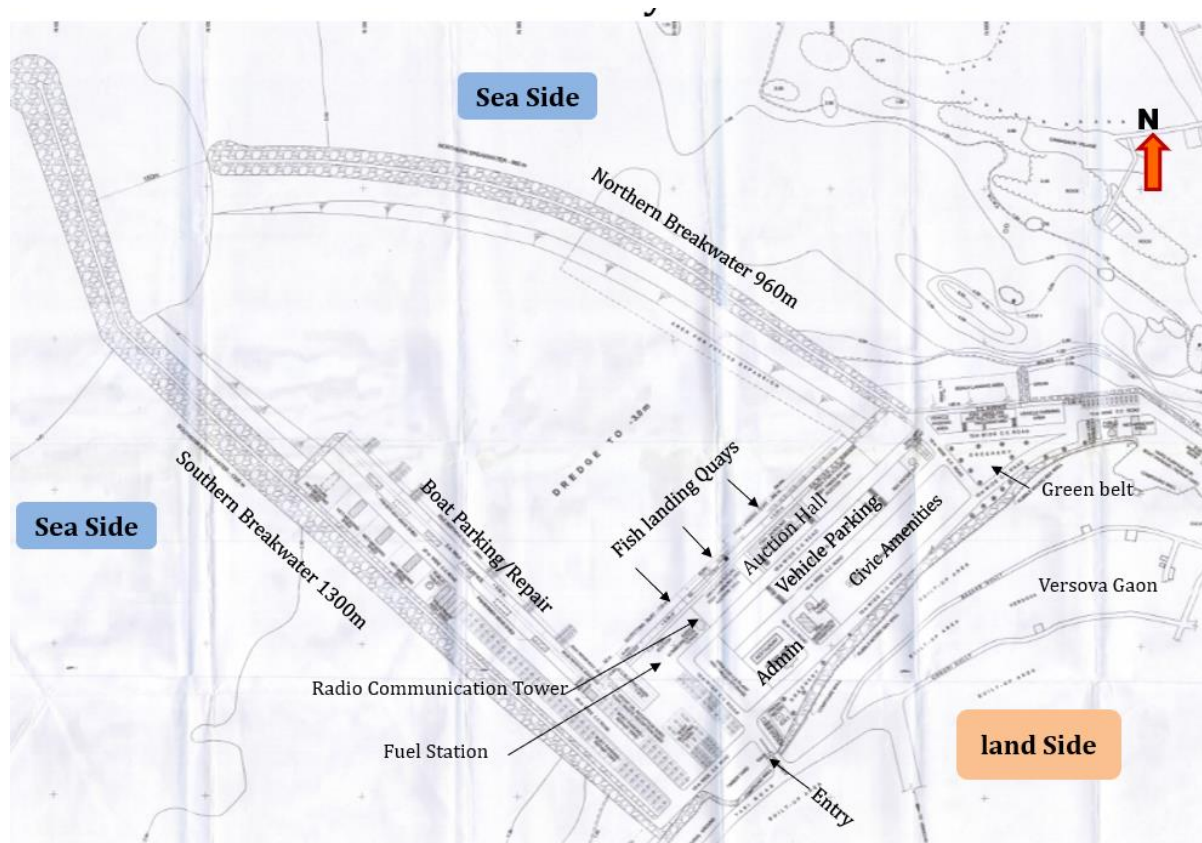
- Breakwaters (Northern Breakwater 960m, Southern Breakwater 1300m)
- Harbour basin (The basin up to -3 m to facilitate the fishery harbour to be used as an all-weather harbour)
- Quays
- RC sloping hard
- Reclamation bund
- Navigational aids

➤ Landside facilities:

• Auction Hall	• Fish Loading Area
• Fishery Administrative office	• Fishermen's gear storage sheds
• Net mending shed	• Boat repair shop
• Restaurant	• Fishermen rest sheds
• Dormitory	• Public toilet blocks
	•
• Radio Communication Tower	• Security/Guard house and compound wall

<ul style="list-style-type: none"> • Approach road and internal roads 	<ul style="list-style-type: none"> • Parking area for vehicles
<ul style="list-style-type: none"> • Boat Parking/Repair Yard 	<ul style="list-style-type: none"> • Ice plant
<ul style="list-style-type: none"> • Drainage and Sewerage System 	<ul style="list-style-type: none"> • Electric Power and Lighting System
<ul style="list-style-type: none"> • Civic amenities 	<ul style="list-style-type: none"> • Garden/ Landscaping

Fig. 1: Proposed Site Layout at Versova



➤ **Water Requirement:**

- The total water consumption for the Versova fishing harbour complex shall be 583 KLD (Sea water + Fresh water).

Sr. No.	Details	Water requirement	
		Sea water	Fresh water
1	Source	Arabian sea	MCGM
2	Quantity	291 CMD	292 CMD
3	Usage	<ul style="list-style-type: none"> • Fish washing • Cleaning of auction halls and fish boxes 	<ul style="list-style-type: none"> • Fishing vessels (for drinking) • Ice plant • Domestic need of the people working in the fishery harbour complex
4	Sewage Generation	100 CMD	
5	Effluent Generation	232 CMD	
6	Green Belt	96 CMD treated sewage from STP	
7	STP Capacity	120 CMD	
8	ETP capacity	250 CMD	

The treated sewage and effluent will be recycled for the maintenance of green belt area of 192700 Sq.m. Excess treated water will be disposed of to the existing sewer line.

Solid Waste Generation and Disposal:

Construction Phase:

The project is spread over area of 32.8 Ha. This involves reclaimed land 19.19Ha. Removal of substratum (approximately 5,29,548 cum) will be used for reclamation purposes within site.

Operation Phase:

Solid waste generation and disposal from the operation will be as follows:

Table 1 non-Hazardous waste generation & disposal

Sr. No.	Particulars	Quantity in Kg/Annum	Method of Disposal
1	Discarded fish by-catch	90670	Given it for manuring/composting/ 'Fish Meal'
2	Iron scrap	360	Sale to scrap dealers
3	Wooden planks	2700	Reuse in Koliwada
4	Reinforced fibre panels	900	Reuse in Koliwada
5	Resin foam pieces (damaged fibre boats)	360	Reuse in Koliwada
6	Torn pieces of fishing nets	180	Sale to scrap dealers

Table 2 Hazardous waste generation & disposal

No	Description	Category as per HW rules 2016	Total Quantity (per year)	Method of Disposal
1	Used oil from boats and DG sets	5.1	5 Ton	Sale to authorized recyclers
2	Used batteries	-	50 Nos.	Will be exchanged with the dealer on purchase of new batteries

Solid waste generated during construction will be used for reclamation activity or sold to authorised dealers as appropriate. Non-hazardous solid waste generated during the operation phase will be either reused, given for composting, or sold to scrap dealers. Hazardous waste generated during the construction and operation phases will be sold to authorized recyclers/ scrap dealers.

Description of the Environment

➤ Study period and area:

Baseline environmental study/monitoring is carried out during Winter 2019-2020 (December, January, February) within 10 km radius of the site to understand ambient air, ground water, surface water, soil, sediment quality, noise level, biological, marine study and socioeconomic status of study area.

Environmental baseline data of site and surrounding region prior to development of fishing harbour at Versova was done by undertaking primary surveys through field visits, sampling/monitoring, laboratory analysis, questionnaire surveys and discussions with fishermen co-operative societies. Secondary data was collected from relevant agencies, such as Primary Health Centres, Forest Department and Directorate of Census Operations.

➤ **land use Land Cover:**

Study area consists of the total area 314.15 Km², built-up land covers 104.83 Km², forest covers 13.18Km², barren area covers 6.07 Km², Mangroves covers 15.70 Km², Airport is 5.16 Km² whereas water bodies covers 169.21Km². Classes like, wildlife sanctuaries, mining area do not exist in the study area. Sanjay Gandhi National Park is approx. 9.4 km to the east side of the project site.

➤ **Soil:**

Soil quality has been checked in Versova village Soil in Versova is neutral, has sufficient humus, low phosphorus, potash, good concentration of micronutrients, moderate fertility.

➤ **Meteorology:**

In the study area, the wind flows predominantly from NNE direction to NNW direction during winter season. The weather in study area remains warm & humid throughout the year as it is in a coastal region. The area receives rainfall for about four months of the year (June to September), which provides main climatic variations. Even though the region experiences heavy rains, no flood-like situations are observed since the surface water runoff goes into the surrounding creek, which has a wide cross-sectional area that drains towards the Arabian Sea.

➤ **Air Quality:**

Baseline air quality was established by monitoring primary air pollutants viz PM₁₀, PM_{2.5}, SO₂, NO_x & CO for 24 hours. Results of AAQM survey indicate that the levels of primary air pollutants are well within the NAAQS standards. Levels are high due to predominant urban development and high levels of traffic of the area.

➤ **Noise:**

Noise level monitoring has been conducted in the study area at four locations. It was observed that the Noise levels during daytime and night-time were within the limits given by Ambient Noise Quality standards. Sources of noise in study area include operations at the fish landing centre and noise due to road near site having medium to heavy traffic. Furthermore, the proposed site is under a regular flight path because of which there is noise generation.

➤ **Water Quality:**

The study area shows a distinct sub-dendritic drainage pattern wherein majority of the streams flow towards south and contribute to Arabian Sea. Water samples were collected from 4 locations and analysed for physico-chemical and biological parameters to describe the baseline status of the ground water environment. The results of analysis show that the ground water quality meets the IS 10500:2012 standards except microbial parameters which shows presence of coliforms and E. coli . Ground water does not show presence of heavy metals, toxicity. Thus, the water cannot be used for drinking purposes. Surface water quality was also analysed using samples collected from 3 locations. The results do not show presence of any heavy metals or toxicity, but coliforms were found to be present.

➤ **Biological Environment:**

Most of study area is urbanized and has some Industrial areas, deciduous forest ecosystems of SGNP, Aarey Colony, and mangrove vegetation. In the study area, the vegetation diversity can be divided into mostly urban and forest based. Common plants such as jamun and Indian Copper pod tree can be observed near residential complexes and industrial areas. In the forested landscapes, the floristic diversity is composed of wild flora. Creeks such as Malad Creek and Manori Creek, which possess mangroves and other associated plant species are present in the study area. Study area covers stretch creek lets, wetlands with mangrove vegetation in it, with

human habitation viz. Jogeshwari, Vile Parle, Malad etc. The industrial area observed under study area are MIDC Andheri and MIDC Chakala etc.

In the study area, the vegetation diversity can be divided into mostly urban and forest based. Common plants such as *Ficus* sp., *Syzygium cumini* and *Peltophorum* species can be observed near the residential complexes and industrial areas. In the forested landscapes, the floristic diversity is composed of wild flora *Tectona grandis*, *Terminalia tomentosa*, *Acacia catechu*, *Adina cordifolia*, *Mitragyna parviflora*, *Pterocarpus marsupium*, *Holarrhena antidysentrica*, *Butea monosperma*, and *Diospyros melanoxylon* etc.

The Arabian Sea towards the west side of the project area is the major water body within the study area. Apart from this, there are creeks (Manori, Malad), rivers (Poisar and Mithi), and lakes (Lokhandwala Lake, Godzilla Lake) present in the study area. Malad Creek once sustained vast mangrove areas (~1000 ha) in the past, but these have been gradually reduced due to urban pressures and at present estimated to be around 400 acres.

➤ **Marine Environment:**

Analysis of water quality of marine environment revealed overall low physico-chem values that indicate that the water quality is under much stress, with low pH and DO and high nutrient levels in the upper creek due to sewage release. The sediment was mainly composed of sandy-silt. The shore water, creek water, and sediments had significantly high microbial counts suggesting widespread contamination by sewage. The phytoplankton standing stock in terms of chlorophyll and cell counts, was in the lower range except for generic diversity. Similar to phytoplankton, the zooplankton standing stock in terms of biomass and population density was also found low except for faunal group diversity. The faunal diversity of benthos observed is low suggesting that the environmental conditions at the creek sediment were not favourable for benthic organisms. Mumbai is an important metropolis that sustains rich fishery diversity despite being highly urbanized. However, over the years, due to anthropogenic causes like widespread industrialization, developmental activities, population pressure, etc. the marine ecosystem off Mumbai has been getting polluted, threatening the sustainability of its biota.

➤ **Socio Economic Environment**

As per the socio-economic survey of the project area, it was observed that locals/fishing communities have a positive opinion about proposed development of Fishing Harbour at Versova. They are favourably disposed towards the establishment of a fishing harbour with all essential post harvesting infrastructural facilities for improved fishing activities and linkages. To boost the incomes from fisheries, people reflected that this proposed fishery harbour development project should be started as soon as possible.

This baseline data, together with the relevant project activities will be considered for identifying the likely impacts of the project on the environment.

1.2 Anticipated Environmental Impacts & Mitigation Measures

The proposed development of fishing harbour by Maharashtra Fisheries Development Corporation Ltd., GoM undertaking at Versova fishing harbour will have various impacts on environmental parameters like marine sediment, marine water quality, air quality of surrounding area due to various operations.

Table 3: Environmental Impacts and Mitigation Measures

Cause	Impact	Mitigation measure
Improper disposal of solid waste and hazardous waste produced	Unhygienic conditions and hazards to nearby populace and marine life	Construction team will be trained for collection of solid/ hazardous waste, safe storage, and recycling/reuse of these wastes
Construction vehicle activity	Traffic congestion on Versova Marg/ JP road in Andheri	Segregation of heavy and light vehicles on different roads as well as scheduling construction vehicle movement such that it will not coincide with market and school timings
Operation of concrete mixer, D.G. set, use of excavators, trucks	Localized temporary air emissions	Wherever possible, ready-mix concrete shall be used instead of concrete mixers. In addition, construction machineries will have a valid PUC certificate, and will be well maintained, lubricated and cleaned periodically
Transportation and actual construction activities (like cutting, D.G. set, excavators)	Temporary increase in noise levels	Adequate PPE (earmuffs/ ear plugs) will be provided for construction workers and their duty hours will be scheduled such that recipients will not be exposed to noise for continuous durations
Excavation, filling, concreting during piling, construction of quays, dredging activity	Temporary increase in turbidity and suspended matter	The entire construction activity in intertidal and subtidal areas will be carried out in non-monsoon season during low tide period. Dredging activity will be carried out by 'Trailing Suction' technique by a trained, experienced agency. This method provides control over loose sediment as it gets pumped immediately into the system
Dredging activity and construction activity	Benthic organisms will be permanently lost. Benthic loss was calculated to be 604 kg @3.1 gm/m ²	The entire construction activity in intertidal and subtidal areas (including dredging activity) will be carried out in non-monsoon season during low tide period. Dredging activity/ creation of basin area will be done with periodic halts.
	Increase turbidity in water column which results in less penetration of light and a decrease in primary productivity which overall hampers the marine ecosystem	

Cause	Impact	Mitigation measure
Improper disposal of solid waste generated during operation phase	Unhygienic conditions and hazards to nearby populace and marine life	Ensuring appropriate disposal, recycling, or reuse of solid and hazardous wastes
Operation of fossil fuel-powered fishing vessels	Air and noise pollution	Fishermen will be encouraged to ensure regular preventive maintenance of their boats taking advantage of the various Government schemes available for refurbishment and modernization of fishing vessels
Indiscriminate disposal of bycatch and other solid waste; pumping out bilge water into marine environment; onboard use of toilet, washing, cleaning while boat is docked in harbour; as well as accidental release/ spillage or surface run-off of fuel/ oil	Water pollution and impact on marine ecosystem	Fishermen will be trained for proper disposal of solid waste generated during voyage. Bilge water shall be collected and treated instead of being pumped out to the sea. Fishermen will be encouraged to use harbour toilets and other facilities while docked. Outfitting/ berthing and repair quays will be outfitted with systems to prevent accidental spillage of oil or contaminated surface runoff into the marine area.
Versova beach will be occupied during the construction	Loss of scenic beauty at Versova beach during the construction phase	In the operation phase, this facility will be very beneficial to the fisherfolk because it will accommodate more vessels, allow for safe berthing of vessels, and boost the livelihood of fishermen at Versova.

No private land will be acquired for this project. During the construction phase, local workforce will be engaged (skilled, semi-skilled, unskilled). Furthermore, local and regional communities and stakeholders will be engaged in planning decisions relating to the fishery harbour.

A corporate environmental responsibility (CER) plan has also been drawn up for this project and funds have been allocated for specific activities under this program. They are as follows:

Table 4: Proposed CER Activities

Sr. No.	Activities under CER as per specific needs	Rs. In lakhs	Rs. In lakhs	Rs. In lakhs	Rs. In lakhs	Rs. In lakhs	Total
		1st year	2nd year	3rd year	4th year	5th year	
1	Community Health & sanitation Improvement. Health camps and health awareness programs in Versova koliwada for child and mother care, health and hygiene practices Donation of medical equipment in hospitals	30	10	10	10	10	70

2	Community Education Facilities Award scholarship to meritorious students & Education Vocational training & job placement for unemployed youth Distribution of educational books, stationary, uniforms and aids etc. Providing desktop computers to schools Awareness programme in nearby schools on clean beach/coastal areas	25	25	20	20	20	110
3	Activities for fishermen community Subsidy for fishing related equipment's/financial assistance to small scale fishermen	25	25	25	25	25	125
4	Solid waste disposal and associated activities Dustbin facility at (beaches/coastal belt, residential area), for garbage removal on beaches mini truck/tipper provision on daily basis (1 tipper price=7.5 lakhs- 5 tipper in first year)	40	10	10	10	10	80
5	Infrastructure development Water supply Maintenance of street lights/installation of solar light Maintenance of street taps Maintenance of internal roads in Versova fishery harbour	15	15	15	15	10	70
6	Plantation/landscape	10	10	10	10	10	50
Total Amount (Rupees in lakhs)						505	

Additional Studies:

➤ Risk Assessment, Hazard identification:

The principal objective of the risk assessment study is to identify and quantify the major hazards and the risk associated with various activities of the project, which may lead to emergency consequences (disasters) affecting the public safety and health.

➤ Coastal Regulation Zone (CRZ) Mapping:

As per CRZ notification (2011), The High Tide Line marking of the study area must be demarcated by the institutions authorized by the Central Government in accordance with the guidelines issued in this regard.

Institute of Remote Sensing (IRS), Anna University, Chennai (MoEF&CC authorized agency) demarcated the High Tide Line (HTL) and Low Tide Line (LTL) as the CRZ Notification, 2011 approved CZMP.

All project activities are in CRZ IB, CRZ IVA, & CRZ II.

The CRZ map as per CRZ notification 2019 is under preparation.

➤ **Public consultation**

Public hearing will be conducted as per terms of reference issued.

Environmental Monitoring Program

Based on the identified & assessed impacts as well as the baseline environmental status of the study area, an environmental monitoring program is suggested for implementation during various stages of the project.

Major objectives of the Environmental Monitoring Program are as under:

- To comply with the statutory requirements of monitoring conditions of Environmental and CRZ Clearance, Consent to operate and provisions under Environmental Protection Act, 1986
- Assessment of the changes in environmental conditions, if any, during the construction, operation phases of project activities.
- Monitoring & tracking the effectiveness of Environment Management Plan & implementation of mitigation measures planned.
- Identification of any significant adverse transformation in environmental condition to plan additional mitigation measures; if & as required.

Maharashtra Fisheries Development Corporation Ltd., GoM undertaking will implement the environment monitoring programs in line with the planned schedule. It will be ensured that the necessary requisite facilities are made available and budgetary provision is made as & when required to ensure regular efficient environmental monitoring activities.

The records of the monitoring program viz marine water, sediment, air, noise shall be prepared and preserved properly. Monitoring reports will be reviewed regularly by the Dy. Engineer along with Environmental Consultant for necessary improvement of the monitoring plan/ mitigation measures/ environmental technologies as well as for necessary actions of environmental management cell.

The proposed project of Maharashtra Fisheries Development Corporation Ltd., GoM undertaking will have low adverse impact with due implementation of control measures as suggested. Continued vigilance with budgetary support is required from the industry in order to implement the Environment Management Plan.

Maharashtra Fisheries Development Corporation Ltd., GoM undertaking will implement the environment monitoring programs in line with the planned schedule. It will be ensured that the necessary requisite facilities are made available and budgetary provision is made as & when required to ensure regular efficient environmental monitoring activities. The capital cost of activities for the proposed Environmental Management Plan is estimated as Rs. 1.22 Crores.

Table 5: Budgetary Provisions for Environmental Management Plan

Environmental Controlling Measure	Capital Investment (Rs. In Lakhs)	O & M Cost/ Annum (Rs. In Lakhs)
Solar lighting	2	1
Waste management (solid, liquid including membership, annual fee)	20	2

Environmental Controlling Measure	Capital Investment (Rs. In Lakhs)	O & M Cost/ Annum (Rs. In Lakhs)
Public awareness especially of fishermen and those working in fishing harbour about environmental safeguards implemented, proper use of facilities provided	10	2
Social welfare & upliftment	The project is based on social welfare of fishermen in Versova	
Green belt development	20	5
Appointing Project Management Consultant for ensuring statutory compliances for the project activities, vendors, contractors, proper implementation of mitigation measures, obtain feedback on effectiveness of measures implemented, suggestion on modification/upgradation in measures (if required) to make them more effective during construction and operation phase	60	10
Environment Monitoring Program	0	10
Total	122	32

Project Benefits:

➤ **Improvement in Infrastructures:**

Due to this project, fish landing infrastructure will be upgraded which gives ease in operations, fish landing, post-harvest processing and dispersal of catch.

➤ **Employment Potential**

The proposed peak manpower requirement during commissioning will be 192 Persons. The project will also offer benefit to society as it would create temporary employment and business opportunities in construction phase while, in operation phase too it will offer another kind of employment and business opportunities.

Most of the recruitments will be done from local area which will be the considerable benefit to the local area considering the demography of the region.

➤ **Other Tangible & Intangible Benefits**

Demand of sea food is increasing in India as well as foreign country day by day. Thus, the proposed project will help in reduction in time required for distribution of perishable sea food till end user. This will benefit the community in earning appropriate revenue against their efforts.