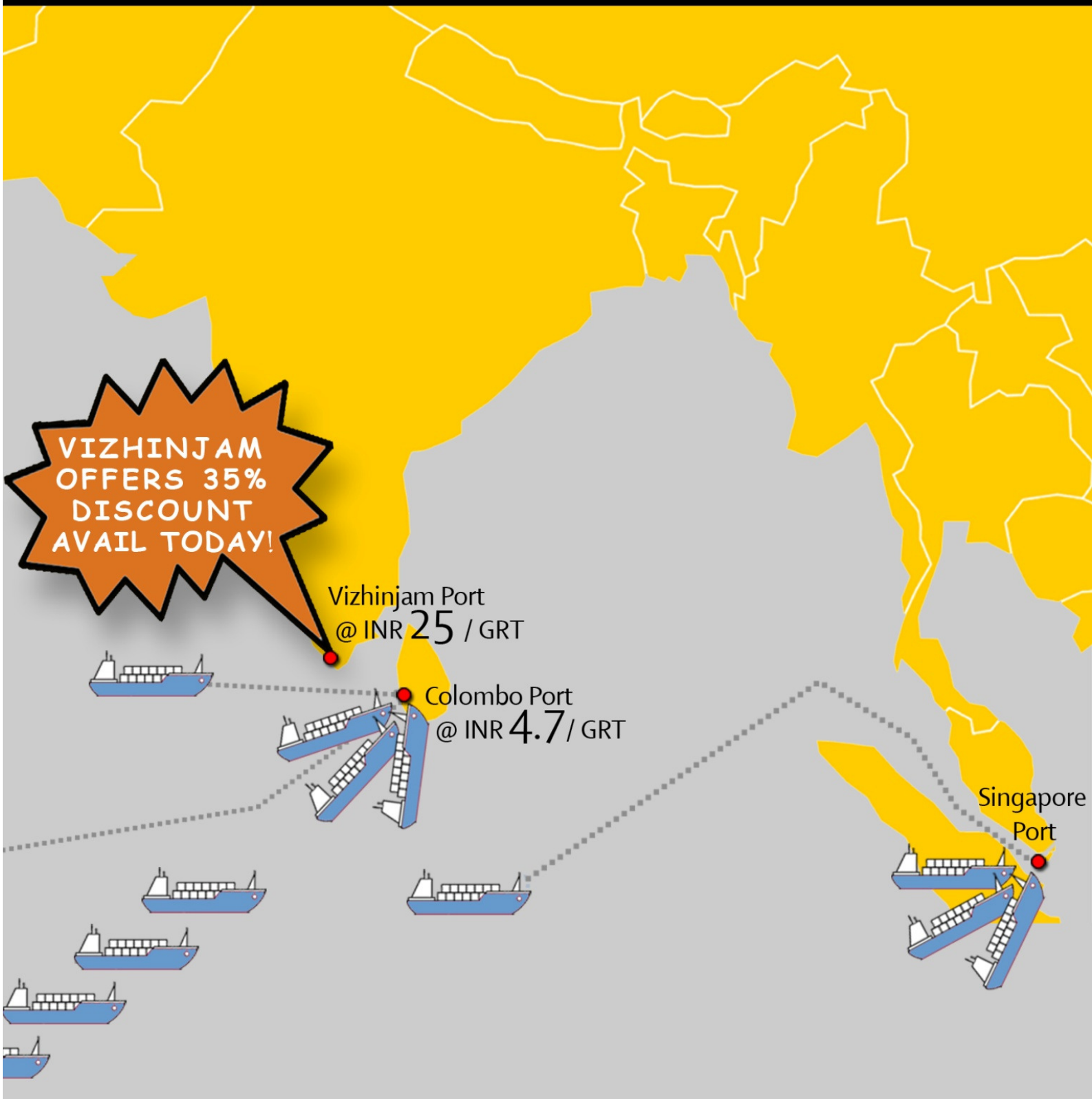
THE VIZHINJAM PORT: DREAM OR DISASTER



THE VIZHINJAM PORT: DREAM OR DISASTER

A Study of the Economic, Environmental & Social Impacts of the Port

November 2017

The Research Collective (PSA)

The Research Collective, a unit of the Programme for Social Action (PSA), facilitates research around the theoretical framework and practical aspects of development, industry, sustainable alternatives, equitable growth, natural resources, community & people's rights. Cutting across subjects of economics, law, politics, environment and social sciences, the work bases itself on peoples' experiences and community perspectives. Our work aims to reflect ground realities, challenge detrimental growth paradigms and generate informed discussions on social, economic, political, environmental and cultural problems.

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The Vizhinjam International Deepwater Multipurpose Port was awarded to the sole bidder Adani Ports & SEZ in 2015 by the previous Congress-led UDF (United Democratic Front) government in Kerala, almost half a century after the project was first mooted[1] and 20 years after the proceedings started in 1995. Touted by the government as a dream project and by many others as an economic disaster, the project has been mired in controversy and allegations of governmental misconduct. This report is an attempt to bring together the various issues surrounding the Vizhinjam port and critically evaluate the project for what it actually is, its true costs and benefits.

Supporters of the port see it as a "game changing" project that will alter the developmental fortunes of Kerala and cite Vizhinjam's proximity to the international East-West shipping route, deep natural draft and reduction in import/export cost as the main rationale behind the project. However, many stakeholders and experts claim that the reality is far from the rosy picture painted by the government. Apart from being an economically unviable project, the port can have very real adverse impacts on the region's marine and coastal ecology, livelihoods of local population and tourism. Further, related legal and regulatory issues including the lack of transparency in the contract award process has also been a subject of criticism from various quarters.

[1] Vizhinjam Port: a Grand Old Port Project. 07 December 2015. Hellenic Shipping News. http://www.hellenicshippingnews.com/vizhinjam-port-a-grand-old-port-project/

SECTION 1:
ECONOMIC VIABILITY

The Vizhinjam International Seaport Limited (VISL) was formed in 2004 as a fully owned company of the Government of Kerala (GoK) to be the implementing agency for the port. VISL is responsible for all obligations and responsibilities of the State Government. After three unsuccessful tenders in 2004, 2007 and 2011, in June 2015 the Kerala State Cabinet accepted Adani's bid for construction and operation of the Vizhinjam port. The Concession Agreement is for building port superstructure and operating the port for a period of 40 years including the four years of construction. The port assets are to be transferred back to GoK at the end of the concession period in 2054. The Concessionnaire, Adani Vizhinjam Port Private Ltd, began construction in December 2015 and according to the project schedule, Phase-1 is expected to be operational by December 2019. The project is proposed to be developed in three phases. The land requirement for the port is 351 acres[2]; of which 131 acres is reclaimed land. Thirty per cent of the total port land is to be used for real estate development in the form of hotels, commercial buildings and residential apartments.

The port is being developed as a Public Private Partnership (PPP) project on a design, build, finance, operate and transfer (DBFOT) basis. The PPP structure is based on the Landlord port model where land will be owned by GoK and VISL and the Concessionaire (Adani) willmanage the port development and operations. "In the landlord port model, the civil work facilities including construction of basic infrastructure like breakwater, quay wall, dredging, reclamation, rail and road access will be developed by VISL. Port operation will be through the PPP model for an agreed concession time period. Terminal operator(s) will be required to develop the container yard, terminal buildings, and purchase & operate the cargo handling equipments."[3]

Vizhinjam port is designed to cater primarily to transshipment[4] traffic, i.e. as an intermediate destination for international cargo en-route to a final destination. The port is expected to attract low volume of gateway traffic, i.e. traffic originating in or destined for Kerala, due to the lack of industry in the immediate hinterland of the port. According to VISL estimates, of the total vessels expected to call at the port, transshipment will account for 80%, with 60% being foreign ships. Gateway cargo is meant to contribute to only 20% of the traffic.

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[2] Status of Land as on 26.05.2015. Vizhinjam International Seaport Limited. http://documentsandmedia.s3.amazonaws.com/vizhinjamport/Status_of_land_%2020150528.pdf

[3] Integrated Master Plan for Vizhinjam Port. November 2012. AECOM. http://www.vizhinjamport.in/download/Final-Master-Plan-Report_Nov30-2012.pdf

[4] According to the Shipping and Freight Resource, transshipment is the act of off-loading a container from one ship (generally at a hub port) and loading it onto another ship to be further carried to the final port of discharge. https://shippingandfreightresource.com/transhipment-and-cargo-in-transit/

Analysis by Drewry[5] as part of a study commissioned by VISL shows that Colombo (Sri Lanka) handles 35% of transshipment traffic in the Indian Sub-Continent (ISC). Only around 4% of ISC transshipment is handled by other ports within the subcontinent. The remaining 61% is through ports outside of the subcontinent; important among them being Singapore, Salalah (Oman) and Jebel Ali (Dubai). Once completed, it is claimed that Vizhinjam will attract transshipment from these ports and increase India's share in the transshipment business of the region, thereby contributing significantly to the revenues of the region and reducing import/export costs. It is also claimed that the port would boost the gateway traffic from the hinterland (primary being Kerala) by opening up new supply-chain networks. All estimates of economic feasibility are made on the central assumption that Vizhinjam will be able to draw a substantial proportion of traffic away from its competing foreign transshipment hubs.

Closer examinations of the facts reveal that the claim of Vizhinjam attracting significant traffic away from other ports is unsubstantiated. First has to do with the market conditions and competition. Every study commissioned by VISL[6] has unambiguously stated that Vizhinjam will face intense competition from already established ports like Colombo and Singapore for transshipment traffic and from domestic ports like Cochin and Tuticorin for gateway traffic. Moreover, established foreign transshipment hubs like Colombo and Singapore have the presence of global players in port operations and they enjoy established relationships with shipping lines besides better logistical network. This clearly puts Vizhinjam at a disadvantage from the very start. According to these reports, one of the necessary but not sufficient conditions for Vizhinjam to attract traffic is by providing "world class services" to its users. However, a comparative analysis of Vizhinjam's competing ports, across 7 parameters of port and terminal performance, by Drewry as part of the 2010 IFC report[7], gives a score of 4.2, 4.8 and 5 on a 5 point scale to ports in Colombo, Dubai and Singapore respectively. No Indian port scores above 2.9 according to this study. Thus the main competing ports are already operating at a very high standard from the perspective of shipping operators. This then raises the question - what standard would Vizhinjam have to aspire for to become a preferred destination over the aforementioned foreign ports and is it realistically achievable?

The second aspect has to do with the tariff structure. Two types of tariffs are applicable to shipping traffic; the vessel (pilotage, port dues and berth hire) and the containers (handling and storage). Apart from geographical factors, these charges determine the choice of vessels to call upon a given port as opposed to another. According to the 2015 Ernst & Young

[5] Drewry provides maritime research and financial consulting services to the maritime and shipping industry.

[6] Strategic Option Report by IFC in 2010, Detailed Project Report by AECOM in 2013, Estimation of Economic Internal Rate of Return of the Vizhinjam Port Project – Draft Report by Deloitte Touche Tohmahatsu in 2013 and Feasibility Report by E&Y, AECOM and HSA Advocates in 2015.

[7] Strategic Options Report. September 2010. International Finance Corporation. http://www.vizhinjamport.in/downloads/Kerala_Port_SOR_FINAL.pdf

Feasibility Report, the tariffs at Vizhinjam are to be capped at Cochin rates for gateway traffic and Colombo rates for transshipment. It also calls for a further discount of up to 35% over Colombo rates to attract vessels. Let us look at how Vizhinjam fares without discount viz a viz Colombo on vessel charges for foreign flag ships.

Table 1: Comparative tariff for Vizhinjam and Colombo ports

Type of Ship	**Pilotage Charge (INR/GRT*)**		**Port Dues (INR/GRT)**		**Berth Hire (INR/GRT/Hour)**	
	Vizhinjam	**Colombo**	**Vizhinjam**	**Colombo**	**Vizhinjam**	**Colombo**
Upto 30,000 GRT	50	4.11	25	4.77	0.6	0.13
30,000 GRT& above	40	4.11				

*Gross Registered Tonnage

A cursory glance at the above numbers reveals that vessel charges at Vizhinjam are many times that of Colombo. Even after a 35% discount, the tariffs do not come close enough to pose a serious threat to Colombo, which is incidentally planning to expand its capacity. Also note that Vizhinjam does not have geographical advantage over Colombo to offset its steeply higher vessel charges. The prospects for Vizhinjam turns gloomier when one considers the fact that Malaysian ports of Kelang and Tanjung Pelepas, both among the largest ports in the world, offer fares even lower than Colombo. Question then remains, why would foreign flag vessels which constitute the bulk of global cargo choose Vizhinjam? Moreover, Indian flag transshipment vessels enjoy no benefit in terms of vessel charges in Vizhinjam compared to Colombo.

The third aspect is the growth potential of container traffic. The reports on Vizhinjam draw attention to the impact of the global economic downturn on the prospective growth of global container traffic. A projected CAGR (compound annual growth rate) of 8-10% in container traffic is assumed in the official economic viability studies for Vizhinjam but global and national estimates for the previous years reveal much lower figures. Simply put, the growth in shipping traffic that is expected by the government will not materialise and the projections are a deliberate overestimation.

As mentioned earlier, Vizhinjam will primarily be a transshipment port, a fact that adds to its risk and undesirability. The IFC report in no uncertain words states that *"large investments in greenfield ports are rarely planned based primarily on transshipment traffic, because transshipment traffic is very unpredictable and shipping lines are known to switch from one port to another at the slightest of reasons."* The same report also confesses that Vizhinjam will not contribute substantially to the development of Kerala, the primary justification given for the project. To quote the report: "*A port based primarily on transshipment traffic does*

not have significant linkages and synergies with the local economy. As a result one of the key priorities of the Government of Kerala, i.e. development of Kerala, is unlikely to be served optimally, if the port develops primarily as a transshipment port." It further states that the project runs the **"***risk of creating a white elephant with poorer economic and financial results in the medium to long term*."

Other necessary conditions needed to attract ships to Vizhinjam, as proposed by all the three reports commissioned by VISL, include exemption from Indian Cabotage Laws to allow foreign ships to handle domestic cargo traffic, relaxation or exemption from labour laws and constituting the port as an SEZ. These recommendations if implemented can have disastrous consequences.

Let us now examine the project structure and its economic viability as estimated by the government. The project is structured in a fashion that has no precedent the country. The total cost of the project awarded to Adani is Rs. 4089 Cr, out of which 40% or Rs. 1635 Cr will be funded by the government's Viability Gap Funding (VGF) scheme. Twenty per cent (Rs. 817 Cr) of the VGF amount has to be raised by GoK and the rest (Rs. 817 Cr) will be contributed by the Government of India (GoI). Vizhinjam is the first port in the country to receive VGF support. Apart from this, construction of a 3 km breakwater and a fishing harbour will also be funded by GoK under the Funded Works concept. The construction of infrastructure under Funded Works will be done by Adani with GoK paying a lump sum amount of Rs. 1463 Cr, in a move that did not involve any competitive bidding. The cost of funded work increased 53% from Rs. 952 Cr in December 2014 to Rs. 1463 Cr in May 2015 at the time of final award. At the same time, the total project cost increased from Rs. 3930 Cr to Rs. 4089 Cr, just about 4%. This indicates that Adani may be making undue benefits from the funded works portion of the project which is being paid for by GoK.

Further, land acquisition, supply of drinking water and electricity and rail connectivity is also the responsibility of GoK at a cost of Rs. 1973 Cr. Thus the total investment on the port works out to be Rs. 7524 Cr. As a proportion of the total investment, GoK funds 57%, GoI 11% and Adani 32%.

Returns to GoK are nonexistent for the first 15 years after which Adani will share a paltry 1% of the revenue, increasing 1% annually, with the government. Such a preposterous cost and revenue sharing model is indeed shocking and justifiably raises concerns about the real motives behind the project and who its real beneficiaries are. Compare this with the nearby Vallarpadam port where in 2004 DP World and Punj Lloyd had offered 33.3% and 10.1% premium respectively to the government. Moreover, in 2014, Adani had offered 37% premium in its winning bid for the Ennore port in Tamil Nadu.

All studies commissioned by the government, without exception, have concluded that Vizhinjam as a standalone port project is economically unviable, even after such generous financing arrangements. According to the Feasibility Report submitted to VISL in 2015, the *"project is not financially viable because of long gestation periods and limited financial returns".* It is only after allowing Adani to develop the real estate project on 30% of the allotted land and providing (maximum possible) VGF support of 40% that the project could barely cross the viability threshold even on paper. Additionally, VGF norms were amended specifically to allow commercial real estate components for the Vizhinjam project. It is also of interest to note that the addition of the real estate component in the project happened only after the then Chief Minister of Kerala, Oomen Chandy, met with Gautam Adani, Chairman of Adani Group, in Delhi. The minutes of this meeting were not officially released. Thus, it is only the port estate development that delivers any profit (to which the government has no claim), rendering the entire project as a glorified real estate project with no real contribution to the state exchequer.

It is precisely for this reason that the Comptroller Auditor General (CAG) of India in its 2016 report concluded that the Vizhinjam project is against the interests of the Kerala State and that only the Adani Group will benefit from the agreement. The report points to widespread discrepancies in the Concession Agreement as well as grave irregularities in breakwater construction and land acquisition resulting in a substantial loss to the government.

Even as the government has bent over backwards to claim that the project is economically feasible, the economic loss inflicted upon the existing communities and the local economy has not been considered. Vizhinjam is located close to one of the most important tourism and fishing centers of the state. According to government's own estimates, the port will provide only 550 direct jobs including managerial staff and engineers; whereas the livelihoods of about 50,000 fisher people and 10,000 tourism-related jobs stand to be adversely affected by the project.

To conclude, it is evident that the success of the port to even realise its immediate economic returns hinges on many ifs and buts, which in themselves are unrealistic. All claims of economic viability are contingent upon the rosy traffic projections which as shown earlier are deeply suspect to begin with. The lopsided revenue sharing model will push the already strained state economy into further debt trap. Additionally, massive loss of livelihood in the tourism and fishing sector will be brought about by the port and the purported gains are far outstripped by these losses. Many have also alleged corruption at the highest levels of the government machinery to award the project to Adani. Add to this, the absolute lack of transparency in the bidding process and the dubious contract structure, Vizhinjam can only be seen as a massive hoax perpetrated on the people of Kerala for the benefit of Adani and unscrupulous politicians.

SECTION 2:
EFFECTS ON ENVIRONMENT AND BIODIVERSITY

2.1 Coastal Geology

One of the most crucial aspects of the project is related to the status of the coast along which the project is located and the effects that the construction will have on the local coastal geomorphology, specifically the shoreline changes. Shoreline changes of a coast are primarily determined by two current systems that operate in the sea: tidal and wave generated currents. Interplay of these currents along with the wind systems shape the natural evolution of coasts. Shorelines change seasonally by tending to accrete slowly during summer months when sediments are deposited by relatively low energy currents. Dramatic erosion occurs during monsoons and winter when sediments are removed offshore by high energy storm waves. Interference in this natural cycle by construction of seawalls and other hard structures results in the shifting of the erosionary tendencies to downdrift areas.

Kerala coast is subject to mild northerly long shore drift leading to sediment transport during the non-monsoon months. During monsoon, the direction of the drift reverses southerly and its energy also increases considerably[8]. Hence, most natural coasts witness high erosion during the monsoon season. An important study regarding shoreline change trends in Kerala, conducted by the National Centre for Sustainable Coastal Management (NCSCM)[9], attributed most of the drastic shoreline changes in Kerala to the structures built along its coast. The NCSCM study was conducted looking at the shoreline changes of Kerala for a period of 38 years from 1972 to 2010. According to this study, almost 63% of the Kerala coasts, including artificial coasts, are eroding and careful precautions need to be taken before constructing any further structures along its "eroding and vulnerable" coasts. Furthermore, this study also concluded that among all the coastal districts of Kerala, the Thiruvananthapuram coast has the highest percentage of erosion, at 23.33%, without including artificial coasts. If artificial coasts are included, this figure rises to 52.4%.

Multiple studies, including those authorised by the government, have categorised the Thiruvananthapuram coast as critically eroded. For instance, an Office Memorandum of the Ministry of Environment and Forests (MoEF) dated 03 November 2009 pertaining to the new policy on expansion of existing ports and initiation of new projects along the coastline categorises Thiruvananthapuram as a site of "critical erosion"[10]. The same memorandum

[8] Sajeev, P., Chandramohan, P., Josanto, V., & Sankaranarayanan, V. (1997). Studies on sediment transport along Kerala coast, south west coast of India. Indian Journal of Marine Sciences, pp.11-15.

[9] Shoreline Change Assessment for Kerala Coast. http://www.ncscm.res.in/cms/geo/pdf/research/kerala_fact_sheet.pdf

[10] Office Memorandum No.15-3/2009-IA-III. 03 November 2009. Ministry of Environment & Forests. http://www.moef.nic.in/downloads/public-information/Coastline_OM.pdf

also recommended that such high erosion sites should not be considered for locating ports and harbours. The exact words of the memorandum are reproduced below:

"With regard to the hotspot stretches viz. those areas which are prone to high erosion above 1 meter per year (identified by the concerned Central/ State Government agencies), locations identified within 10 km on either side of the eco-sensitive areas categorized as Coastal Regulation Zone-I(i) and water bodies with high bio-diversity, shall not be considered for locating ports and harbours."

The fact that Thiruvananthapuram has the highest rate of erosion among the coastal districts of Kerala was also pointed out by the Expert Appraisal Committee of the MoEF in its 95th meeting on 20 January 2011 while considering the final Terms of References for the Vizhinjam project[11]. This was further reiterated during the 101st meeting of the Expert Appraisal Committee on 31 May 2011 and VISL was asked to do a careful study of the shoreline conditions of the area and submit its report. MoEF in its remarks cited the Integrated Coastal and Marine Area Management (ICMAM) project of the Ministry of Earth Sciences that characterised Thiruvananthapuram district as a high erosion zone.

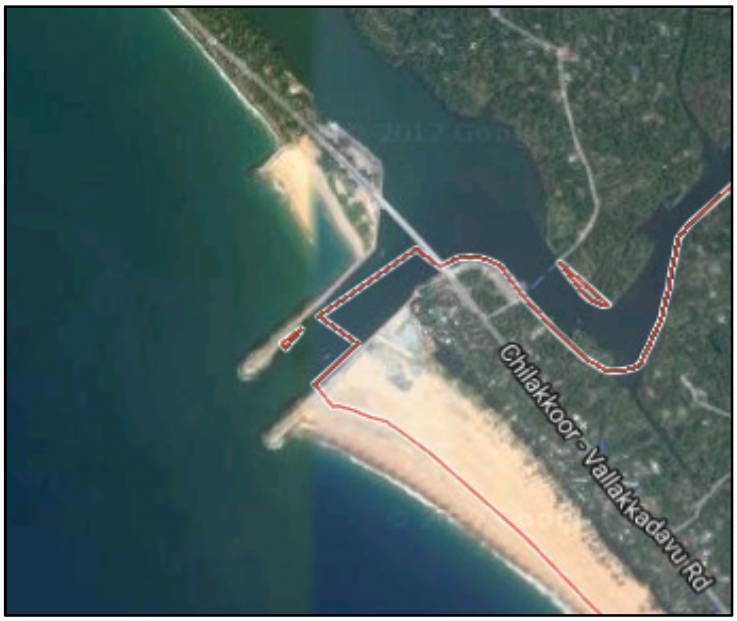
According to the Coastal Regulation Zone (CRZ) Notification 2011, if a site falls in a high erosion zone, no port project is permissible in that area. Of the two high erosion zones along Kerala coast as determined by NCSCM, one falls within 10 km radius of the project. This indicates that the port should not have received environmental clearance in accordance with the CRZ regulations.

Two key aspects of port construction are expected to have critical repercussions on the shoreline and marine ecosystem: construction of breakwater and dredging. Phase-1 of the project is proposed to have a breakwater of 3180 meters in length; the works for which are already underway. The breakwater will be extended to 4000 meters in Phase-3. It is common knowledge as well as a scientifically proven fact that construction of breakwaters as part of ports and artificial seawalls to check erosion has further complicated an already intractable problem of erosion throughout Kerala's coast. Seawalls only help to push the erosion problem further downdrift. The coastline of the state is dotted with 17 ports, 11 harbours, 90 fish landing centers, 106 groynes and 25 breakwaters[12]. Most of these harbours and fish landing centers are not operational today due to erosion and siltation. Breakwaters have exacerbated the drastic shoreline changes in and around its proximity. In almost all these areas, the coast to the north of the breakwaters are heavily eroded while the southern areas

[11] Minutes of the 95th Meeting of the Expert Appraisal Committee for Building/ Construction of Projects/ Township and Area Development Projects, Coastal Regulation Zone, Infrastructure Development and Miscellaneous projects. 18th-20th January 2011. http://www.vizhinjamport.in/download/ExtracofMoEFMinutes18_20Jan10.pdf

[12] Shoreline Change Assessment for Kerala Coast. http://www.ncscm.res.in/cms/geo/pdf/research/kerala_fact_sheet.pdf

witness significant accretion. This phenomenon is ubiquitous across the state and in Tamilnadu's shores lying south of Thiruvananthapuram. A classic case to illustrate this phenomenon is the present state of the Muthalapozhi fishing harbour after the construction of breakwater (shown in the image below).



As can be observed in the aerial view, the area to the north of the breakwater shows heavy erosion while the south area shows accretion. There is almost a 150-200 meter difference between the relative levels of north and south shorelines.

Besides erosion and accretion on either side of breakwaters, most of the harbours and ports are also plagued by heavy siltation leading to many of them being rendered unusable. The situation is not just restricted to minor ports and harbours but even the Vallarpadam container terminal, the largest port currently in operation in the state, has been heavily silted on one side. Annual dredging costs required to address siltation has pushed the terminal, once touted as the dream project of the state, into deep financial troubles. The port is still running in loss after years of operation.

2.2 Environmental Clearance and Impact Assessment

As mentioned earlier, in the first two sittings to deliberate the ToR for the project, the MoEF had directed VISL to search for other possible sites on account of the high erosion nature of the coast around Vizhinjam. VISL replied to the MoEF that no other site was feasible. Based on the goverment's claim that there was popular support for the project, MoEF conditionally allowed VISL to move ahead provided no erosion is caused during the development phase. However, some activists and local residents moved the National Green Tribunal (NGT) seeking a stay on the project on the grounds that port construction was prohibited on high erosion coastlines as per the 2011 CRZ notifications. The NGT stayed all proceedings related

to the project in 2015. In response, the Kerala Government moved the Supreme Court which ordered all other legal processes to be halted till it gave a final verdict. However, during the proceedings in the NGT, the government counsel had agreed that no process related to the port project would be undertaken till a judgment is given on the matter. Soon after the SC verdict, the Kerala Government, in contradiction to its assurance to the NGT, went ahead with the tendering process and finalised the project with Adani.

During the public hearings, local residents and experts on the issue had categorically stated that Vizhinjam is a high erosion coast and that the constant upkeep of seawall is the only reason the shore is not receding further. However, the study agency removed all references to these points in its final draft of the Environment Assessment Impact (EIA) report.

The EIA report for VISL shows many more instances of the government colluding with its study agency, indulging in a deliberate attempt at misinformation, arriving at out rightly flawed conclusions divorced from the actual reality of the area and contradicting earlier scientific studies. The EIA report of the project, released in May 2013, was prepared jointly by various agencies such as International Finance Corporation (IFC), Royal Haskoning, Asian Consulting Engineers, L&T Ramboll, Indian National Centre for Ocean Information Systems (INCOIS) and Central Marine Fisheries Research Institute (CMFRI). The shoreline change study conducted by INCOIS in particular has come under heavy criticism from various quarters for its gross errors. One of key aspects of the study that was questioned is the conclusion on morphology and shoreline changes. The INCOIS report states that *"this part of the coast is experiencing high wave energy with long-shore drift is northerly during monsoons and southerly for the remaining periods"*[13]. Previous studies by others and the ground reality is in fact contrary to the above conclusion. The longshore drift is southerly during monsoon and northerly during the remaining periods. Such a grievous error regarding a fundamental aspect of shoreline change throws the credibility of the study out of the window and it can only be concluded that it was a deliberate attempt at misinformation.

In a detailed review of the INCOIS report, Dr. K.V. Thomas from Centre for Earth System Studies (CESS) has enumerated various critical shortcomings in the methodology, quality of data and imagery used in the study, the lack of ground understanding and the negligent manner in which the report was prepared. In his analysis, Dr. Thomas cites the lack of any study on the impact of breakwaters on the long term shoreline changes along the project area as one of its major flaws. This is very crucial because as mentioned earlier breakwaters have been known to create heavy erosion/ accretion in the areas around it. Further, the INCOIS report also does not mention whether the shoreline taken from satellite imagery

[13] Assessment of Long Term Shoreline Changes in and around Proposed Vizhinjam Port, Kerala. December 2012. L&T Ramboll Consulting Engineers and Indian National Centre for Ocean Information Services (INCOIS) http://www.vizhinjamport.in/downloads/Report-long-term-SLC.pdf

depicts the High Water Line, the Low Water Line or the Vegetation Line which is important in making any conclusion on the trend of shoreline changes. It has also been argued that since the INCOIS study only uses 20 years' data, other studies like those conducted by NCSCM (which uses 38 years' data) need to be used for assessment.

One of the crucial claims that the government agencies have put across in favour of selecting Vizhinjam for the proposed port is the purported lack of annual maintenance dredging that would be required to sustain the operational draft. So strong was this claim that in calculating the financial viability, no funds have been earmarked for maintenance dredging as part of the projected operational expenses of the port. VISL in its Detailed Project Report (DPR) and EIA concluded that *"siltation that would be expected in the channel entrance and harbour basin is negligible".*

Commander John Jacob Puthur, the retired Charge Hydrographer of Indian Navy has emphatically rebutted this claim of Vizhinjam being a "non-silting deepwater port" citing the unique characteristics of the Vizhinjam coast that were neglected by the EIA studies. Commander Puthur's argument is based on the established fact that the seabed gradient generally follows the trend of the hinterland. In the case of Vizhinjam, the hinterland is hilly with a steep seaward gradient. The modelers who prepared the technical report ignored the fact that tidal and wave currents are not the only source of sediment transport leading to siltation. The heavy monsoons that last for almost four months in the South Western Coast of India bring almost 3000 mm of rain, making it one of the wettest regions in the country. The heavy rain coupled with the steep hinterland gradient of the coast near Vizhinjam is expected to result in colossal sediment laden runoff, originating in land, to be finally deposited in sea through rivers, streams and groundwater aquifers. This process will go on unabated through the entire length of monsoons with no foreseeable mechanism to arrest the runoff from being deposited in the harbour basin. To further complicate matters, the construction of the North breakwater will trap the sediments that would otherwise have travelled further seaward. According to Commander Puthur, this process would be rapid and within a few weeks of the onset of monsoons the port will silt and become unusable for the entire monsoon season. It will be a few weeks after the end of the monsoon season, once the post-monsoon dredging is completed, before the port can restart its operations. Considering that the port is envisaged to operate 365 days a year without maintenance dredging and the business model is conceptualised under this assumption, a shutdown of almost 5 months a year and additional expense for annual dredging would affect the port's financial viability from the very start, quite possibly never to break even.

Besides the technical deficiencies in the EIA report, allegations have also been leveled against the procedural aspects of its preparation and the public hearing that followed. It has been alleged that one of the chapters of the draft EIA report pertaining to shoreline changes which referred to erosion in the north of Vizhinjam was deleted in the final version of the

EIA report. VISL conveniently included those sections that spoke of accretion in the south but deliberately deleted any reference to the erosion observed to the north. The report also has remained silent on the effects of the existing breakwater at Vizhinjam harbour on the shoreline of areas to the south and north. Ever since its construction almost 40 years ago, the shoreline to the north has manifested strong erosionary tendencies. This is also the experience of other areas in the state such as Kovalam, Panathura, Poonthura, Beemapally, Cheriathura, Kochuthope, Kannanthura, Vettucaud, Kochuveli, and Valiaveli.

Another significant shortcoming of the EIA report is that the evaluation has been done only for Phase-1. Clearances and approvals have been received based on this partial EIA and it fails to show the true and full extent of the impacts of the project. Considering that the project plan and economic viability is conducted for all three phases, it is a blatant flouting of norms that the EIA was done only for Phase-1. There is also no mention in the EIA of the ecological consequences of the near total dismantling of two hills in the Western Ghats to provide rocks for the construction of the project.

The way in which the public hearing for the project was conducted has also been called into question by many critics of the project who allege that the entire process was manipulated by officials to drown out opposing voices. During the public hearing, the supporters of the project encouraged by the government officials tried to intimidate and heckle those who tried to raise concerns about the project. It has also been reported that when some local fisher people and activists tried to raise genuine environmental and livelihood concerns, their microphone was turned off by the district administration.

2.3 Marine Biodiversity and Ecosystem

All studies conducted by the authorities on the Vizhinjam project are marked by its almost total absence of any serious exploration into the status of the marine ecosystem and biodiversity and the possible effects of the port. The entire discussion on aquatic flora and fauna (including lakes, backwaters, etc) is less than two pages in the final EIA report! This shows the flippant nature in which the authorities view the marine ecosystem of the area.

The South Western coast of India adjoining Kerala and more precisely its southern section is thought to be the most productive marine ecosystem in India. This has been attributed to the presence of a broad continental shelf between 7 to 8 degree north latitudes and 76.3 to 78 degree east longitudes called the 'Wadge Bank'. Studies by the International Ocean Expedition Team (1962-67) determined the area of this region to be 12,000 square km with a depth of 75-100 meters. Due to limited wave action and richness in nutrients and fish food, Wadge Banks are rich habitations and breeding grounds for a large number of fish and other aquatic organisms. Thus, Wadge Banks can be seen as being analogous to biodiversity hotspots in a terrestrial ecosystem. The Wadge Bank off the Vizhinjam coast is only one of 20 such regions in the world. The richness of its biodiversity and its contribution to the

fisheries sector is corroborated by the fact that though Thiruvananthapuram district accounts for only 13% of the state's coastline, it is home to close to 25% of its fisher people. Coastal villages in the district are characterised by very high densities of population and the highest per capita fish catch in the state. Any destruction of the Wadge Bank will in all possibility have a disastrous effect on the fisheries sector of Southern Kerala. Recent studies have identified the Vizhinjam-Poovar stretch as a biodiversity hotspot and recommended that the region be recognised as a Marine Protected Area (MPA). Increased turbidity from rock blasting for construction activities would have an adverse effect on the Wadge Bank ecosystem. Moreover, increase in shipping traffic and possible discharge of effluents (oil, bilge, sewage, ballast, etc) from ships and port operation could have a disastrous effect on the Wadge Bank. The critical importance of the Wadge Bank to the marine wealth of the region and the possible effects of the port on this ecosystem has scarcely been considered in a serious manner in the EIA study. There was no effort to gauge the possible long term effects of the project on the marine ecosystem. This gross neglect of the marine biodiversity has compelled many scientists and activists to call for a fresh comprehensive EIA study for Vizhinjam, and a study of the Wadge Bank, by competent experts in marine biology, ecology, and oceanography from national research institutions.

One of the challenges currently is the lack of any comprehensive empirical data on the marine biodiversity of the Vizhinjam area. No underwater exploration of the sea was conducted till 2015. Things started to change in February 2015 when Friends of Marine Life (FML) – a collective of fisher people, citizen scientists and technical experts – conducted the first near inshore underwater exploration of the sea from Kovalam to Chowara as part of the creation of Marine Biodiversity Register of Trivandrum Coast. This study also served to create a baseline to ascertain the effects of dredging that started in December 2015. Being rocky, the seabed here serves as sub strata that are conducive for a large variety of flora, and consequently marine fauna, to thrive. According to FML, initial exploration revealed the presence of an extremely species-rich seabed ecosystem and many species were found for the first time in the state, or even the country in some cases. The process of detailed study of the collected specimens and their identification and categorisation is still underway with the assistance of the Kerala State Biodiversity Board (KSBB). Underwater exploration also revealed that the area is home to 33 rocky reefs.

Twenty two types of sea slugs were collected from the area, of which 15 have been observed for the first time in Kerala. Two of them were found for the first time in India. Two species of crabs that were found are believed to be sited for the first time in the state. Many collected specimens are yet to be identified, and it is believed that the number of indigenous species will go up once the process of cataloguing is completed. Many argue that these findings, which point to the species richness of the area, are compelling enough reason for the region to be declared an eco-sensitive area and protected from further encroachment.

Table 2: List of marine fauna identified by the FML study

Phylum	**No. of documented species**
Cyanophyta, Phaeophyta, Rhodophyta (Algae)	40
Porifera (Sea sponges)	70
Cnidaria (Sea anemones, jellyfishes)	70
Platyhelminthes, Nematodes, Annelida (Flatworms, roundworms, ringed worms)	230
Mollusca (snails, slugs, clams, mussels, octopuses, etc)	500
Bryozoa (moss animals)	30
Anthropoda (Shrimps, prawns, lobsters, crabs etc)	550
Echinoderm (star fish, sea urchins etc)	360
Chordata (Ascidians, fishes, turtles etc)	225
Yet to be classified	48

The second round of underwater exploration was conducted in December 2015 after the dredging works for the port commenced and revealed a catastrophic effect on the reefs and organisms dependent on them. Study area was the 56 km coast from Kappil to Puthukurichi and Valiathura to Pozhiyoor. Of the 33 reefs, 15 were completely destroyed as a result of sand deposition from dredging. Of the remaining 18 reefs, 17 have been heavily damaged, showing very low biological growth. Reefs are also a habitat for great many sedentary organisms that live in a symbiotic relationship which have been affected by dredging. This includes mussels, barnacles, ascidians, hydrozoans, bryozonas and sponges. The FML team reports that the rocky outcrops and sea bed is littered with shells of molluscs that perished as a result of the ingress of sand particles into their system due to the increased turbidity.

Additionally, there are reported sightings of other marine species. Leatherback turtles, Olive Ridley turtles, Risso dolphins, Devil rays, Green turtles, and Hawksbill turtles were accidentally caught in the nets (usually gill nets/ seines) during fishing[14 15 16]. Presence of nesting grounds for Olive Ridley turtles have also been reported in the beach near Mulloor village, which falls in the terminal area of the port.

[14] Thiagarajan, R and Pillai, S Krishna and Balasubramanian, T S and Chellam, A (2000) Accidental catch of three Risso's dolphin at Beemapally, near Vizhinjam. Marine Fisheries Information Service, Technical and Extension Series, 163. p. 10.

[15] Thiagarajan, R & Lipton, A P & Gopakumar, G & Pillai, S Krishna & Raju, B & Joseph, Selvin & Rajan, A N (1999) Stranding of a rare marine dolphin at Vizhinjam. Marine Fisheries Information Service, Technical and Extension Series, 159. p. 18.

[16] Thiagarajan, R and Pillai, S Krishna and Jasmine, S and Lipton, A P (1998) Capture of a live South African cape locust lobster at Vizhinjam. Marine Fisheries Information Service, Technical and Extension Series, 158. p. 18-19.

SECTION 3:
IMPACT ON LIVELIHOODS

3.1 Fisheries

The project area and its surroundings are predominantly fishing villages and as a result impact on fisheries is the biggest livelihood threat resulting from the project. The villages in and around Vizhinjam are also some of the most densely populated villages in the whole of Kerala. Poverty rates are higher than the state average in these villages, reflecting the general socio-economic marginalisation of the fisher people in the state. Construction activities of the port and its operation will adversely affect the local fisher people in multiple ways and these effects are grossly under reported in official reports. To begin with, the Environmental and Social Impact Assessment Report (ESIA) identifies beaches of four fishing villages that lie in the shadow area of the breakwater – Nellikkunnu, Mulloor, Pulinkudi and Azhimala – access to which will be lost to the local fisher people due to the reclamation of sea. These beaches will be permanently lost. The ESIA report identifies 549 shore seiners active in this stretch of the sea whose livelihood will be directly affected by the construction. Movement of vessels along this coastal stretch (Nellikkunnu – Adimalathura) will be hampered. The affected fish workers will now have to shift to other beaches to pursue shore seining thereby increasing the pressure on other beaches and the competition among fish workers.

Besides the permanent loss of beaches, there will also be a loss of fishing ground in the marine area due to the breakwater, approach channel and exclusion zone. Fisher people who use the area between the existing shoreline and up to the breakwater and also the exclusion zone and approach channel are poised to lose access to their traditional fishing grounds. The survey conducted as a part of the ESIA identified 597 fishworkers from southern villages who were involved in fishing in this area. The number has been criticised as being grossly underestimated. They will be forced to give up fishing activities like lobster, mussels and crab collection, shore seining and open sea in this area and move to other areas for sustaining their livelihoods.

Apart from the loss of beaches and fishing ground due to port operations, fisher people from at least eight villages to the south – Adimalathura, Chowara, Pulluvila, Pallam, Kochuthura, Karamkulam, Poovar and Puthiyathura – will be forced to take a longer route to the existing fishing harbour at Vizhinjam. Fisher people from these villages depend on Vizhinjam harbour particularly during the monsoon and post-monsoon months and the current route of their fishing path passes through the dredging and reclaimed area. It is expected that these fisher people will have to now use a longer channel that is at least 1.5 km off the shoreline to enter the harbour, thereby driving up the fuel expenses and reducing profitability. Another aspect that has rarely been discussed is the strict regulations that would be imposed on fishing

operations around the port area. Fishing in an area 15 km around the port will require permission from the port authorities. This is applicable not only for marine fishing but also for water bodies inland, including lakes and backwaters. Moreover, as pointed out in the official ESIA report itself, there is the possibility that the entire active port area and approach channel would be declared as a no fishing zone for security reasons.

Reduction in fish catch is also a certain outcome of the port both during construction and operation phases. The increased turbidity of water as a result of reclamation and dredging will reduce the fish catch by destroying fish spawning and habitat sites. Its effect on the mussel population has already been documented. The consequent loss of income would be a severe blow to a community that is already impoverished. The rocky nearshore waters adjacent to Vizhinjam are one of the few observed habitats of brown mussels (*Perna Indica*). It is also home to Green Mussels (*Perna Viridis*). Dredging operations have already had a devastating effect on its population. It is pertinent here to note that majority of the traditional mussel, oyster and lobster collectors belong to the Dalit community (Pulayar and Vedar) who live close to the hill slopes near the seashore. The dwindling mussel population has had a disastrous effect on these communities who constitute only 0.5% of the total fisher people of the district and are also the most marginalised. As reefs were destroyed the mussel collectors from the area have had to shift their operation to other areas leading to increased competition and conflict with other collectors. Increased competition has also led to over-exploitation of mussel colonies with collectors resorting to picking young mussels that used to be left untouched earlier.

Moreover, with the addition of shipping routes and vessel traffic, accidents involving fishing vessels and container ships are certain to increase. Conflicts between fishworkers and coastal vessels are a regular occurrence in and around the Southern Coast of Kerala and Tamilnadu, with the latest incident being the death of three fishworkers 12 nautical miles off Cochin port after their fishing boat collided against a Panama based bulk carrier cargo ship[17]. It is only logical conclusion that with the construction of a port the size of Vizhinjam, in an area as densely populated by fishing community as in the case of the Thiruvananthapuram coast, accidents would go up drastically.

The methodology adopted by VISL to identify affected population is deeply flawed. With regards to the fishing community, impact assessment claims that 549 shore seiners, 597 fishworkers and 158 mussel collectors only will be directly affected by construction and operation of the port. This is a gross underestimation. Moreover, impact assessment only covered Phase-1 of the project. A close look at the available data (Marine Fisheries Census)

[17] Panama-based cargo ship collides with fishing boat near Kochi port, three fishermen killed. 11 June 2017. The Indian Express. http://indianexpress.com/article/india/panama-registered-cargo-ship-collides-with-fishing-boat-three-fishermen-killed-4698444/

shows that villages in the project affected area, from Vizhinjam North to Kollengode, are home to more than 14,000 traditional fishing families.

Table 3: Demographic data of villages in the project affected area[18]

S. No	Village	Fisher Families	Traditional Fisher Families	Below Poverty Line Families	Fisher people Population
1	Vizhinjam North	1050	1050	403	5849
2	Vizhinjam South	3060	3058	1724	11606
3	Chowara	238	238	236	871
4	Adimalathura	1307	1307	1304	4885
5	Pulluvila	2078	2027	683	7800
6	Pallom	353	353	71	1206
7	Puthiyathura	1587	1587	1169	6544
8	Kochuthura	262	259	248	1040
9	Karumkulam	375	375	193	1330
10	Poovar	963	963	961	3721
11	Kollengode	2385	2384	1591	9552
12	Paruthiyur	1169	1169	661	4860
	Total	**14827**	**14770**	**9244**	**59264**

These villages are home to almost 60,000 fisher people. It is also important to note that 62% of the fishing families fall below the poverty line. Any disruption in the livelihood activities of such a vulnerable community would plunge them into further deprivation and marginalisation. Examining the detailed livelihood patterns of the residents of these villages gives a clearer picture of the dependency of this community on fishing and the magnitude of the errors in the official impact estimation.

[18] Marine Fisheries Census, 2010.

Table 4: Livelihood pattern in the project affected villages[19]

S. No	Village	Active Fishworkers	Marketing	Making/ Repairing Net	Curing/ Processing	Peeling	Labour	Others	Non-fishing Activities	Total Occupied
1	Vizhinjam North	1308	4	0	0	0	144	0	0	1456
2	Vizhinjam South	3137	465	3	0	0	16	15	20	3656
3	Chowara	234	116	121	0	0	0	3	51	525
4	Adimalathura	1390	541	270	155	0	1	38	53	2448
5	Pulluvila	1938	565	3	253	8	38	9	292	3106
6	Pallom	352	156	3	35	1	3	4	31	585
7	Puthiyathura	1800	386	29	65	8	22	17	217	2544
8	Kochuthura	297	84	1	12	0	1	3	16	414
9	Karumkulam	350	112	2	41	0	6	0	17	528
10	Poovar	1094	501	27	2	0	3	9	22	1658
11	Kollengode	2716	316	347	4	6	21	0	22	3432
12	Paruthiyur	1440	232	0	0	0	0	0	0	1672
	Total	**16056**	**3478**	**806**	**567**	**23**	**255**	**98**	**741**	**22024**

The government's own account show that virtually all (99.96%) residents in the project affected villages are involved in fishing or allied activities for their livelihood. Active fishworkers account for 73% of the population of the villages. Given the fundamental nature of fishing in these villages, to identify just 1000 fisher people as project affected is clearly a devious move on the part of the authorities to understate the socio-economic impacts of the port on the local population and push through the project for its vested interests.

3.2 Tourism

Thiruvananthapuram district accounts for 15% of tourists who visited Kerala in 2011 and 31% of foreign tourists[20]. The focal point of tourism in the district is Kovalam (2 kms from port site) and the beaches from Nellikkunnu to Adimalalathura which are in the core area of the port. Details of the hotels and resorts in the project affected area obtained from Kerala Hotel and Restaurant Association (KHRA) is given below.

[19] Marine Fisheries Census, 2010.

[20] Comprehensive EIA for Vizhinjam Deepwater Port.

Table 5: Details of hotels and resorts in the project affected area

Hotel/ Resort	No. of Rooms	No. of Staff
Nellikunnu Beach		
Thapovan Heritage Home	31	75
Medicos Ayur Bay	18	16
Kadaltheeram	6	4
Sea Park	25	18
Padme Beach Resort	10	6
Vayalkara Beach Resort	14	16
Merlin Villa	2	2
Lotus Beach	2	3
Park House	20	12
Gods Light	1	1
Mulloor Beach		
Nandikulam Beach House	4	4
Coconut Bay Beach Resort	27	125
Pulinkudy Beach		
Surya Samudra	30	90
Bethsaida	90	165
Karikathi Beach House	4	4
Paradise Garden Resort	8	6
Azhimala Beach		
Agastya Beach Resort	32	60
Nikkis Nest	47	85
Sea and Sand Beach Resort	9	6
Azhimala Beach Resort	20	25
Sun Tara Beach Resort	13	19
Chowara Beach		
Shin Siva Ayurveda Ashraram	23	60
Dr Franklins Panchkarma Institute	42	125
Visaya House	4	7

Somatheeram Health Resort	66	255
Somatheeram Beach Resort	80	400
Manaltheeram Beach Resort	60	300
Travancore Heritage	90	235
Ideal Resort	22	35
God's Own Country Resort	20	20
Sandal Resort	12	10
Total	**832**	**2189**

Considering the established hotels and resorts in the project affected area, more than 2100 workers and about 30 resorts with a market value of Rs. 1500 Cr stand to be directly affected. This is not considering the smaller businesses and workers in the extended tourism value chain that depend on the tourists visiting these beaches. Official studies have not looked into this aspect. Once the knock-off effects on tourism is quantified, the affected population would most certainly rise drastically. As mentioned in the earlier section, construction of breakwater is expected to erode the coast north of Vizhinjam. Kovalam beach, which is 2 kms to the northwest, will take the maximum brunt of erosion. Historically, Kovalam beach has witnessed heavy erosion, and a large part of the beach has been taken away by the sea in the last couple of decades. Today seawalls cover more than half the length of the original beach. Erosion of the magnitude that would be wrought by the 4 kms breakwater, many experts and locals claim, will destroy what is left of Kovalam and the associated tourism industry.

CONCLUSION

Three unsuccessful tenders for the Vizhinjam port and receiving only one bid in the fourth tender process was not sufficient to deter the State Government and save Kerala from the impending disaster of the Vizhinjam port. The adamant state carved out 30% of the port land and served it as real estate land to lure Adani to come onboard.

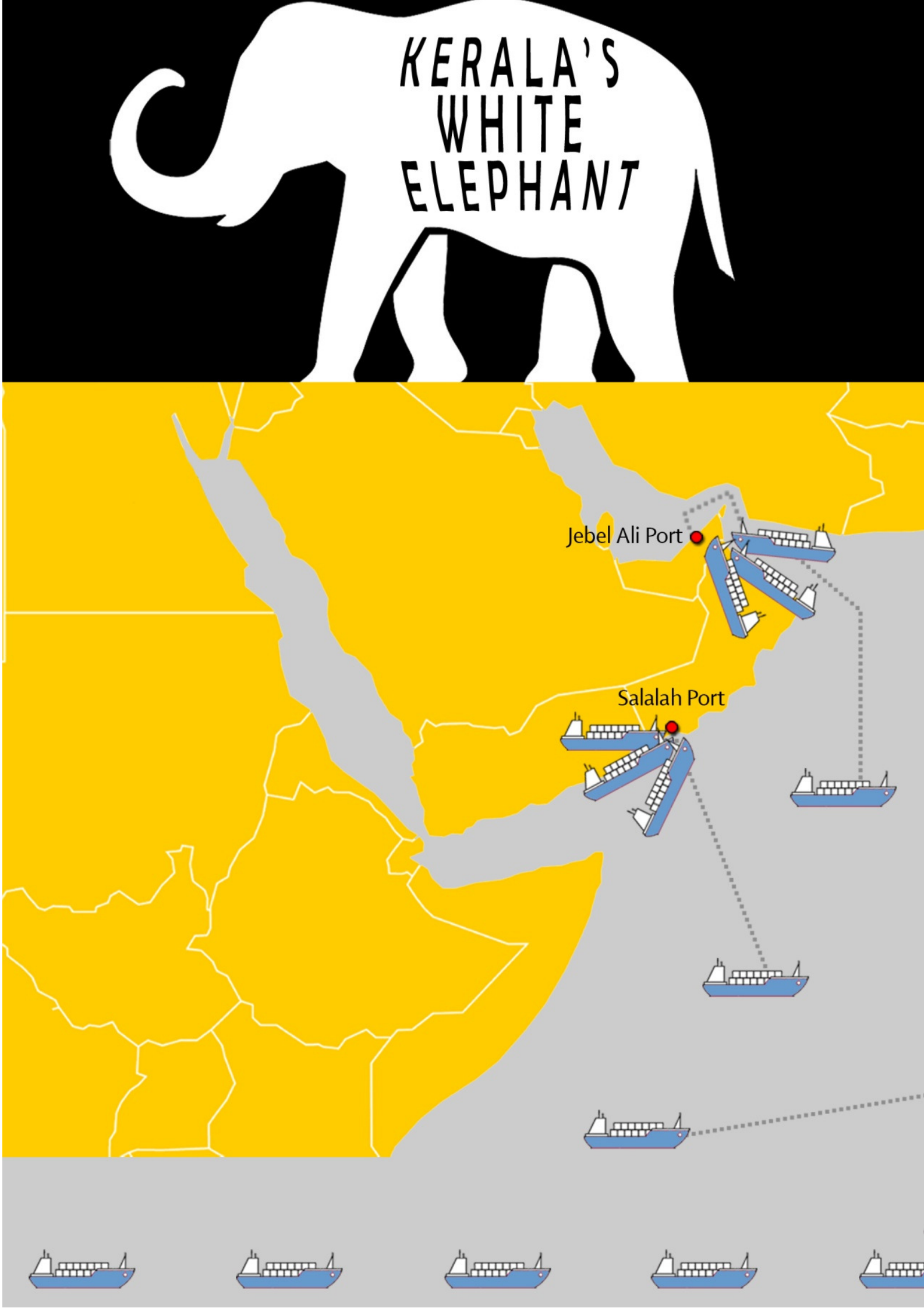
It is evident that the success of the port hinges on many ifs and buts, which in themselves are unrealistic. More than Rs. 7500 Cr is being poured into the Vizhinjam transshipment port project whose economic rationale is to attract international shipping vessels away from its competitors who have much better standards and ratings (than any Indian port) and more importantly much, much lower rates. There is no explanation to why international shipping vessels are going to choose Vizhinjam over nearby Colombo whose rates (for port dues) are

nearly 80% lesser than Vizhinjam's estimated rates. All claims of economic viability are contingent upon the rosy traffic projections in global shipping which are deeply suspect.

The International Finance Corporation, the vanguard of the private sector, stated unabashedly that the port project is unviable and, even if implemented, will not contribute to the local economy or the development of Kerala. The lopsided revenue sharing model will push the already strained state economy into further debt trap. The State is set to receive nothing from the port for the first 15 years and an abysmal 1% from the 15th year onwards. The State has also forfeited claim to any revenue from the real estate development, probably the only profitable component of the project. Without due benefits, why are the State Government of Kerala and the Government of India bearing 57% and 11% of the project cost? Moreover, allowing real estate development on 30% of the port land is a disturbing precedent. By this logic, any preposterous project can be made to appear viable.

Neither the environmental nor livelihood impacts of the project have been assessed sufficiently or accurately. The port is irresponsibly sited in the erosion prone coast of Thiruvananthapuram. Studies indicate that the coastline is not braced to subsume the potential impacts from construction and operation of the Vizhinjam port, begging the question of how this project was granted the environmental clearance by the Ministry of Environment and Forests. The exploration of the Friends of Marine Life (FML) have also revealed shocking impacts of the dredging works for the port on the marine biodiversity and ecosystem in the area surrounding the port. Of the 33 reefs, 15 were found to be completely destroyed and 17 were heavily damaged as a result of sand deposition from dredging. The Wadge Bank off the coast of Thiruvananthapuram has a rich marine biodiversity and needs to be protected for its ecological and livelihood implications.

Additionally, massive loss of livelihoods in the fishing and tourism sector will be brought about by the port and the purported gains are far outstripped by these losses. Over 50,000 fish workers in the area will be affected owing to destruction of breeding grounds, reduction in fish catch, loss of beaches, loss of access to fishing grounds and increased conflict with shipping vessels. Add to this, the absolute lack of transparency in the bidding process and the dubious contract structure, Vizhinjam can only be seen as a massive scam perpetrated on the people of Kerala for the benefit of Adani and unscrupulous politicians.


KERALA'S
WHITE
ELEPHANT
Jebel Ali Port
Salalah Port