Sudarshan Rodriguez and Aarthi Sridhar

2010

Dakshin Foundation

The Social and Environmental Upshot of Port Growth in India

Harbouring Trouble

Citation: Rodriguez, S. and A. Sridhar. 2010. *Harbouring Trouble: The Social and Environmental Upshot of Port Growth in India.* Dakshin Foundation, Bangalore, p 62.

Funding: The production of this report was made possible by a grant from the Duleep Mathai Nature Conservation Trust.

Sudarshan Rodriguez
Dakshin Foundation
Email: sudarshan.rodriguez@gmail.com
Website: www.dakshin.org
Phone: +91-80-65356130

Aarthi Sridhar
Dakshin Foundation
Email: aarthi77@gmail.com
Website: www.dakshin.org
Phone: +91-80-65356130

Cover photo: Photograph of Tuticorin Port taken from Ratchanyapuram Village, Tuticorin District, Tamil Nadu. Sudarshan Rodriguez. 2010.

Acknowledgements

The authors would like to thank the following people:

Commander John Jacob Puthur (Retd.) Naval Hydrographer, for spending time and providing his inputs, guidance and most importantly sharing his vast experience on ports, port planning and shoreline dynamics which made this report possible.

Rachel Pearline who assisted in the data collection despite her existing commitments.

Probir Banerjee, Ajit Reddy and Aurofilio Schiavina from Pondy Citizens' Action Network (CAN) who all helped with their support and invaluable inputs from their experience, documentation and insights from their struggle against the Pondicherry port and its impacts.

Vaishnavi from the Indian Institute of Technology, Chennai for assisting with the database on minor ports.

The Duleep Mathai Nature Conservation Trust for providing funding support for the research and production of this publication.

Abbreviations

CMZ	Coastal Management Zone
CRZ	Coastal Regulation Zone
EIA	Environment Impact Assessment
EMP	Environment Management Plan
GMB	Gujarat Maritime Board
ICMAM	Integrated Coastal and Marine Area Management
MoES	Ministry of Earth Sciences
MoEF	Ministry of Environment and Forests
MoF	Ministry of Finance
MoS	Ministry of Shipping
MoST	Ministry of Surface Transport
NEERI	National Environmental Engineering Research Institute
NFF	National Fishworkers' Forum
NITK	National Institute of Technology
PPP	Public Private Partnership
RPM	Respirable Particulate Matter
SEZ	Special Economic Zone
SMB	State Maritime Board
SPM	Suspended Particulate Matter

Boxes

Tables

Figures

Table of Contents

Ports in India – the concern

There are more than 2,000 active seaports throughout the world that cater to the requirements of seaborne cargo volume of around 5.3 billion tonnes (i-maritime 2003). The volume of international seaborne trade in 2008 was estimatated at 8.18 billion tonnes (UNCTAD 2008). Major technological changes especially the containerisation of cargo and the development of larger and deeper specialised vessels have revolutionised the seaport sector across the world leading to the fast renovation of existing facilities and development of new ones. The economies of scale, evident by the use of large specialised vessels at lower unit costs, have led to a significant rise in high capacity vessels.

In order to attend to the growing demand for modernisation, the seaport industry across the world has felt a strong need for capital investment and private participation that have been promoted as better alternatives to respond to these challenges. With the growing move for privatisation and public-private partnerships in seaports all over the world subsequent to reforms, private sector participation in operations and infrastructure activities of seaports has been increased substantially over the last few years. This has resulted in a radical change in the organisational models of ports, from the Service port model to a Landlord port model. In the latter the 'port authority' retains the port infrastructure and fulfils its regulatory functions, while the port services are provided by private operators who own the assets conforming to the port's superstructure and equipment required for service provision.

Ports along the 7,500-odd kilometre long peninsular coastline of India have suddenly become the cynosure of investor and public policy attention in India. This is barely surprising considering that cumulative pressure for widespread policy-related reforms in the port sector coupled with growing investor interest in taking up port projects has been building up ever since the country embarked on the path of economic liberalisation and opened its doors to forces of globalisation with the opening up of the domestic port sector to private operators. Entrusting private operators to manage certain terminals within the ports through **concession agreements**[1] has led to the gradual privatisation of major Indian ports. With the government ushering in private participation in the port development sector, concession agreements are popular features where state governments offer complete freedom to private entrepreneurs to develop and operate the numerous minor ports dotting the country's coastline.

However, the roadmap to port reforms in the country is littered with many complex and befuddling issues. There has been acute lacuna of well-researched information and case studies in port research in India. A few earlier attempts focused on the economic aspects of the Indian port sector, without examining the underlying environmental and social costs or planning issues that are an inalienable part of this sector.

Ports, the environment and coastal communities

The 7500-kilometer long and narrow coastal strip of the country is one of its most fragile eco-zones. Millions of people reside by the coast and are increasingly joined by a steady stream of migrants in search of livelihoods sustained by the abundant coastal natural resources. According to the Marine Fisheries Census 2005, commissioned by the Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, and conducted by the Central Marine Fisheries Research Institute (CMFRI), there are 3,202 marine fishing villages, 1,332 landing centres and 756,212 households

[1] An agreement in which a government (either central or local), provides preferential treatment to a private-sector company in return for specific services, Broadly, a concession agreement involves special tax considerations, and is designed to encourage a company to enter or remain in an area.

(a total of 3.52 million marine fisherfolk in all maritime States and Union Territories of India excluding the Union Territories of Andaman and Nicobar and the Lakshadweep).

Currently, there are about 213 notified ports along the coast of mainland India. This would translate to roughly a port every 28 kms of the Indian coastline. Of these atleast 69 are proposed for devleopment according to our study. Besides its own impact, port development is often accompanied by other activities such as the location of industries, power plants, railway lines, highways, hotels, Special Economic Zones, residential complexes and so on. These activities can exacerbate the negative influence of ports through the cumulative impacts on the environment and communities. With one fishing hamlet located along every 2 km of the coast and a port proposed every 28 km, the port development trend in India has serious implications and impacts on fishing communities and the environment.

In many cases, the laws themselves contain enough loopholes to allow for the degradation of natural resources. Furthermore, one sees poor environmental governance in the form of non-implementation of the existing legal framework. The policies of the State that relate to protection of the environment through legal measures, in several instances do not clearly address the issue of social equity through participatory decision-making.

Such a development model would not confer any economic advantage given that most major ports in India currently not only lack efficiency but also have the potential for significant improvements in terms of operations, expansion of capacity and modernisation. While the debate on the economic soundness in large-scale minor port development is not yet documented, an important fact is that several of these minor ports are situated in highly sensitive ecological regions.

In this context, the profile of stakeholders on the coast is undergoing a vast change. Rather than traditional coastal communities, the dominant force is the Market, which has made inroads here with a vision to control as much of this scarce and desired region as possible. The economic policies of the State such as the EXIM policies and privatisation policies in varied sectors have recently thrown open the fragile coast to port construction conglomerates. The impact of this development needs to be understood. Social costs and impact on coastal communities such as fisherfolk have seldom been reviewed and collated apart from the press coverage. There are hardly any reports research monographs or papers that portray a contemporary emerging picture of the Indian port sector in general as well as the their social and environmental impacts. This report attempts this by collating information that will give the reader a better understanding of the port sector till date and its environmental and social implications.

This report is a modest attempt to untangle some of the challenging issues of development planning from environmental and social angles. We present information collated from various sources to reflect the latest trends in port planning and the environmental regulatory framework, and conclude each section with our comments and analysis of the same.

Growth of ports – moving towards minor

Definition

The Indian port sector has been broadly divided into two broad categories - major ports and non-major. The latter is commonly referred to as 'minor' and 'intermediate' ports. The legal distinction between major ports and minor ports is made on the constitutional principle of sharing of resources and revenues between the central and state governments. This technical nomenclature is also based on the legal distinctions made under the two key source laws that govern the port sector in the country, viz. the Indian Ports Act, 1908 and the Major Port Trusts Act, 1963. More specifically, the definition of 'major' and 'minor' and 'intermediate' ports in India is based on the list of central, concurrent and state subjects, as listed under the Indian Constitution. Major ports are listed under serial 27 of the Constitution and are administered under the Major Port Trusts Act of 1963 and fall under the direct jurisdiction of the central government. The ministry in charge of ports is the Ministry of Shipping (earlier called the Ministry of Surface Transport-MoST). These ports are governed and managed by Ports Trusts which are administered by a Board of Trustees of wide representation comprising of elected members of the legislature and Parliament, government officials, labour representatives and industry representatives.

Administration of ports – the rise of State Maritime Boards

All ports, other than major ports are listed under the concurrent list (serial 31[2])[3] of the Constitution and administered jointly by central and state governments under the Indian Ports Act, 1908. Under this arrangement, the central government continues to have the powers under certain other centrally administered laws (such as the environment-related laws and enactments) with respect to sanctioning development of state ports or any other marine construction, along the coastline of individual states. In practice, the primary responsibility for their development and management rests with the state government

At the state level, there is an assigned department in charge of ports and in some states a special State Maritime Board (SMB) exists, which is created through state legislation. The SMBs are responsible for port planning and development, attracting private investment in the development of state ports, regulating and overseeing the management of non-major ports, enforcing environmental protection standards, formulating waterfront development policies, plans and so on.

The Gujarat Government was the first state to have enacted a legislation - the Gujarat Maritime Board Act of 1981 - to create the first ever State Maritime Board – the Gujarat Maritime Board (GMB) in 1982. Subsequently, the Maharashtra and Tamil Nadu Governments followed suit during the second half of the nineties and formed their own State Maritime Boards.

Though each State MaritimeBoard is set up via statute through the respective state legislative assembly, the objectives, functions and structure of these boards can vary from state to state. However, they do contain a mandate for environmental, ecological and social safeguards in port development and operations. For e.g. one of the objectives of the Gujarat Maritime Board is *'to ensure and protect ecological balance and safeguard social and environmental issues'*[4] and it also has an environment policy statement[5].

[2] Extract: *'Ports other than those declared by or under law made by Parliament or existing law to be major ports'*
[3] List - III of the Seventh Schedule of the Constitution of India, which form the joint domain of both the State Governments and the Union Territories of India as well as the Central Government of India under these subjects.
[4] See Gujarat Maritime Board website link, http://www.gmbports.org/showpage.aspx?contentid=1246
[5] See Gujarat Maritime Board website link, http://www.gmbports.org/showpage.aspx?contentid=1330

The Maharahstra Maritime Board lists *"Enforcement of maritime rules & regulations for administration and conservancy of ports, for regulating traffic and tariff structure and licensing of crafts etc."* as one of its functions[6]. This would also include general as well as specific maritime environment and pollution related laws.

Currently, other coastal states like Karnataka, Kerala, Andhra Pradesh, Orissa and West Bengal, which have department level organisations for port administration have announced steps to follow the setting up of maritime boards. The Orissa Government is proposing to set one up, modelled on the Tamil Nadu Maritime Board Act (Dash 2008; J.K. Rath[7] pers. comm.).

Thus the distinction between 'major', 'minor' and 'intermediate' ports assumes important implications in terms of the distribution of maritime jurisdiction between the central and state governments. Though there is very little literature and commentary on this distinction between major and non-major ports it is believed this was made with the assumption that the latter would be suitable for fishing (mostly as harbours and jetties), coastal trade and the like, and so remain under state charge with major ports being viewed as the principal gateways for international trade (Aiyar 2009; Anon 2009c).

Trends in port growth

At present in India, there are 13 major ports; six each on the west and the east coast, one in the Andaman and Nicobar Islands[8] and as of 2006 there were 61 operational non-major ports[9] contributing to the maritime trade.

Economic liberalisation and the globalisation process had started in India since the early nineties. However, the first steps towards private sector participation in infrastructure services were taken up only in the mid nineties. Infrastructure-related economic policy reforms in India were initiated and catalysed following the release of the Rakesh Mohan Committee Report on Infrastructure Development in 1996, which sought a fresh policy framework for private sector involvement in the development of infrastructure-related services (i-martime 2003).

The trend initially took off in Gujarat with the state government offering a slew of captive port facilities to private sector participants for the development and operation of minor and intermediate ports. Subsequently, major ports also began a wide range of development and modernisation activities, often with private sector involvement in setting up and operating terminal facilities as well as the operation of port services.

In the changing scenario of the Indian port sector, it is a misnomer to treat India's minor ports as really 'minor'. They are really neither small in size nor in traffic volumes handled by them. With private sector ports like Mundra and Pipavav getting ready to compete with the major ports, India's so-called 'minor and intermediate ports' together now aggregate an estimated traffic turnover of nearly 213 million tonnes (29 percent) out of the total traffic of 743 million tonnes (for the year 2008-09)[10] .

[6] See Maharashtra Maritime Board website link, http://www.mahammb.com/functions-of-the-mmb.htm
[7] Director, Directorate of Ports and Inland Water Transport, Government of Orissa.
[8] See Press Information Bureau report http://www.pib.nic.in/release/release.asp?relid=62358,
[9] Presentation by Secretary, DG shipping at Conference of Chief Secretaries on PPP in Infrastructure Public Private Partnership in Ports, 20th May 2006 http://infrastructure.gov.in/ppt_ports.pdf
[10] Data from Ministry of Shipping website, See http://shipping.gov.in/writereaddata/mainlinkfile/File342.xls

This differentiation in nomenclature was without significant impact till liberalisation, when the government allowed private enterprise into the sector. Then, given that neither the Constitution nor the legislations defined ports by size or investment, opportunistic governments like the Government of Gujarat took full advantage to invite and attract private enterprise into the sector (Aiyar 2008).

As a result of greater flexibility in decision-making and the prospect of greater revenue for state governments the process of privatisation reached a more advanced stage in the case of minor ports (as opposed to Public Private Partnerships (PPP) in major port operation and expansion). Furthermore, state governments rather than pushing the central government for major ports in their respective states preferred to notify minor ports inviting private developers as port operators. The states of Gujarat, Maharashtra and Andhra Pradesh, for example, launched active campaigns to attract investors and real estate developers to their ports, often combining industrial site development projects with port investment and vice versa (Haralambides and Behrens 2000).

In general, there are four different port organisation and administration structures, which are representative of the orientation of ports defined in terms of the level of private sector involvement (i-maritime 2003).

These are outlined in the adjacent box:

Box 1: Port organisation and administration structures[11]

Services Port- This model conventionally followed in many countries of the world, mainly focuses on the realisation of public interests, by following a direct service provider role for the government, which also owns all the port assets and facilities.

Tool Port- Here the port authority owns, develops and maintains the port infrastructure as well as the superstructure, including cargo handling equipment and is a direct employer. However, the port authority does rent out its equipment and facilities to private parties, who are also allowed to set up specific facilities and services, which the port authority does not wish to operate on its own.

Landlord Port- In this model, several infrastructure facilities are leased to private operating companies. While each of the operators of services is free to further develop and add to the facilities operated by them, the basic ownership of the leased assets including land, waterfront and other fixed assets rest with the port authority, which acts as the landlord.

Fully Privatised Ports- In fully privatised ports, the port authority and developer is a private enterprise. A port concession agreement is a contract in which the government transfers specific operating rights to private enterprise in return for tax benefits and other financial considerations. It is the most common form adopted world over, including in India, for attracting private sector participation in port development and operation. Within this, BOT (Build-Operate-Transfer) is the mostly accepted form of financing.

BOT (Build-Operate-Transfer): In this a contractual arrangement is drawn up whereby the concessionaire undertakes the construction, including financing, of a given infrastructure facility, and the operation and maintenance thereof. The concessionaire operates the facility over a fixed term during which it is allowed to charge facility users appropriate tolls, fees, rentals, and charges not exceeding those proposed in its bid or as negotiated and incorporated in the contract to enable the concessionaire to recover its investment, and operating and maintenance expenses of the project. The concessionaire transfers the facility to the Government Agency or Local Government unit concerned at the end of the fixed term.

BOOT (Build-Operate-Own-Transfer): This is an alternate mode, where the operator is granted ownership of the assets during the concession period. Here the project is based on the granting of a concession by a Principal (the Union or Government or a local authority) to the concessionaire, who is responsible for the construction, financing, operation and maintenance of a facility over the period of the concession before finally transferring the facility, at no cost to the Principal, a fully operational facility. During the concession period the promoter owns and operates the facility and collects revenue in order to repay the financing and investment costs, maintain and operate the facility and make a margin of profit.

BOOST (Build-Own-Operate-Share-Transfer): This is a contractual arrangement whereby a concessionaire is authorised to finance, construct, own, operate and maintain or share a part of the revenue and transfer the infrastructure facility at the end of the period. The proponent is allowed to recover its total investment, operating and maintenance costs plus a reasonable return thereon by collecting tolls, fees, rentals or other charges from facility users.

BOST (Build Own Share Transfer): This is a contractual arrangement whereby a concessionaire is authorised to finance, construct, operate and maintain, share a part of the revenue and transfer the infrastructure facility at the end of the period. The proponent is allowed to recover its total investment, operating and maintenance costs plus a reasonable return thereon by collecting tolls, fees, rentals or other charges from facility users.

BOO (Build-Own-and-Operate): This is another model mostly followed for captive jetties and ports**.** This is a contractual arrangement whereby a concessionaire is authorised to finance, construct, own, operate and maintain an infrastructure or development facility from which the proponent is allowed to recover its total investment, operating and maintenance costs plus a reasonable return thereon by collecting tolls, fees, rentals or other charges from facility users.

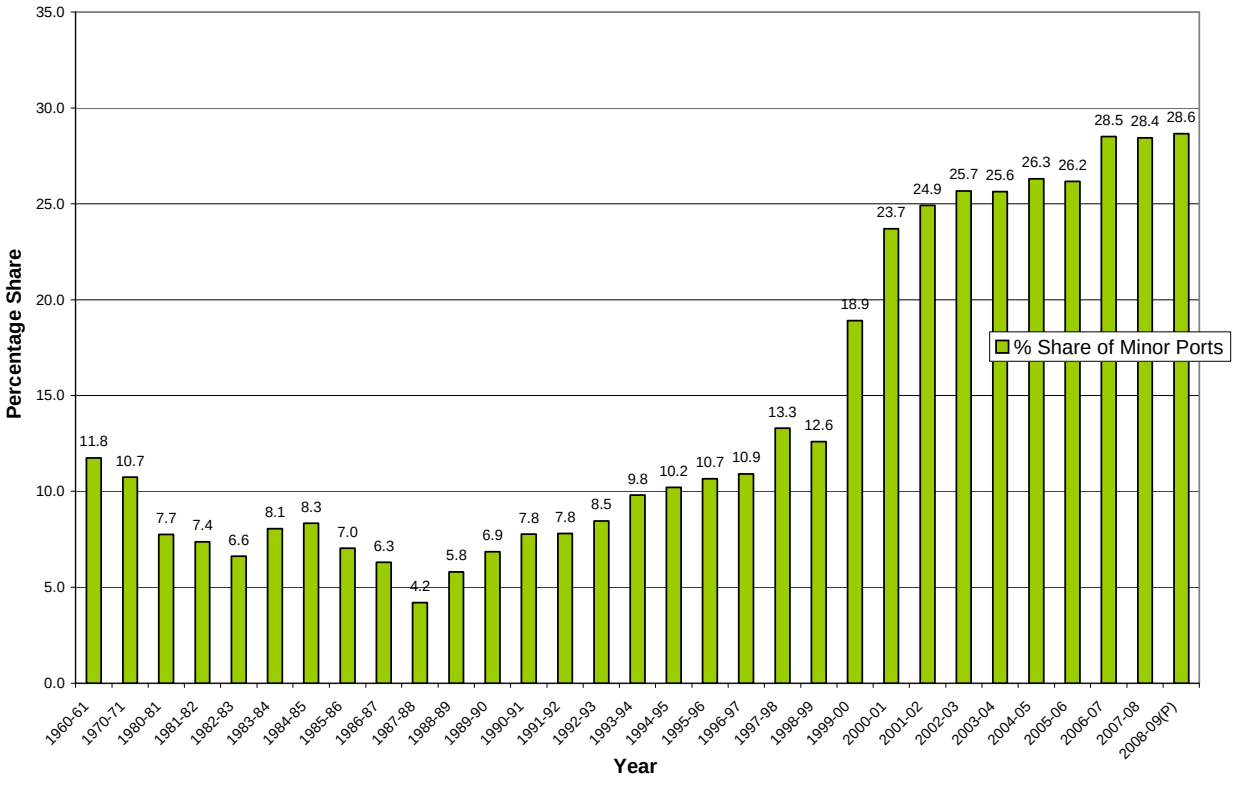
[11] Adapted from i-maritime 2003 and Govt. of Karnataka, Infrastructure and Development Department: PPP Models in Practice (See http://www.idd.kar.nic.in/ppp-models.html)

In the Indian context of minor ports, the port authority and developer is a private party while the respective state government acts as the landlord as the owner of the land. The government enters a lease agreement with the developer in addition to revenue sharing arrangements.

According to the Draft Approach Paper to the 11th Five Year Plan, it is estimated that Indian ports will have to handle cargo traffic of about 800 MT by 2012 as compared to 520 MT handled in 2004-2005 (Planning Commission 2006) and traffic is estimated to reach 960 MT by 2013-2014 (Simhan 2006). It envisages that this would require substantial capacity augmentation at major and minor ports including development of new ports.

The current focus of the central government is largely on the expansion and increase of capacity in the existing major ports under its jurisdiction. The importance of minor and intermediate ports, however, have not diminished as their development is being aggressively pursued by every maritime state. In fact, cargo handled by them recorded tremendous growth from nearly 25 million tonnes in 1996-1997 to nearly 213 million tonnes in 2008-2009[12]. In fact, cargo handling at all the ports is projected to grow at 7.7% p.a. till 2013-2014 with minor ports growing at a faster rate of 8.5% compared to 7.4% for the major ports (IL&FS nd). Traffic at non-major ports and private ports is growing at a Compounded Annual Growth Rate (CAGR) of 11.74%) in the years 2002-07 as against 8.54% for major ports (Planning Commission 2007). Over the last two decades, minor ports traffic has grown at a CAGR of 19.4%, almost triple the growth rate of major ports (Ramesh 2009). It should be pointed out here that the growth of traffic in non-major ports was skewed across coastal states, with Gujarat handling more than 60% in 2006-2007 (Planning Commission 2007). Data from the Ministry of Shipping showing trends in traffic (in million tonnes) is presented below.

Table 1: Percentage share of traffic at major ports over the last 48 years.



[12] Data from Ministry of Shipping website. See http://shipping.gov.in/writereaddata/mainlinkfile/File342.xls

During the Eleventh Plan, non-major ports are expected to increase more than double their capacity, from 228.31 million tonnes upwards to 575 million tonnes with its share expected to grow to 30% by 2011–12. The total value of the developmental schemes to be taken up during the Eleventh Plan amounts to around Rs 36,000 crores and three-fourth of this total projected investment in the Eleventh Plan in the ports sector is expected to come from the private sector (Das & Srinivasa-Raghavan 2009; Planning Commission 2007).

In the past eight years there has been no new major port development in India. The Ennore minor port which was completed in 2001 with full-fledged operations beginning in December 2002 was declared a major port under the Companies Act, 1956. Thus all the new ports and growth are a result of development of non-major ports by the private sector and state governments. The National Maritime Development Programme (NMDP) states 'All major ports are already facing congestions with containers clogging all over the ports and spiralling costs never relenting, it will be minor ports that can sustain the growth of coastal shipping' (Ministry of Shipping 2003). Under the NMDP, projects worth Rs 5,163 crore are to be taken up in the minor ports.

Investment in major ports

Under the National Maritime Development Program (NMDP) a investment need of $13.5 billion (Rs.60,750 crores) in major ports is envisaged mostly through the PPP model (Ministry of Shipping, Road Transport and Highways 2003)[13]. As of date, a total of 276 schemes and projects, involving investment of Rs 55,804 crore up to 2011-12 were identified under the NMDP (CAG 2010). The NMDP envisages an enhancement of the handling capacity of major ports from 385 MT in 2004-05 to 755 MT by 2011-2012 shown in the table below:

Table 2: Investments in major ports from 2005 onwards.

NMDP	No of schemes	Total investment (Rs in crore)	Private funding (Rs in crore)	Share of private funds (in % terms)	Expected capacity rise (in MT)
*Phase-I (05-09)	170	27075	14562	54	230.40
*Phase-II (07-12)	92	22263	14194	64	139.27
Total	262*	49338	28756	58	369.67

*Except 14 schemes planned for Ennore Port involving an investment of Rs 6,466 crore.
Source: CAG 2010.

[13] Also see www.pppinindia.com/sector-ports.php

Investment in minor ports

Data on the investment in various minor ports (both ongoing and proposed) is not readily available. We compiled information on the total investment in minor ports (proposed and ongoing). Data was collected from online sources from 2003 till date. There are several reports in the press providing different information on the levels of investment. We have shown here the highest value of investment proposed for these sites from all the reports available on the internet. According to our data the total investment estimated is at least Rs. 1,40,000 crores (See Table 3 for details).

Table 3: Ongoing and proposed investment in minor ports since 2003

State	Ongoing and proposed investment in minor ports since 2003 (in Crore Rs.)
Andaman & Nicobar Islands	Not available
Andhra Pradesh	19,976
Daman and Diu	Not available
Goa	Not available
Gujarat	27,280
Karanataka	6,238
Kerala	10,350
Lakshadweep	Not available
Maharashtra	13,770
Orissa	43,284
Pondicherry	4,216
Tamil Nadu	15,515
West Bengal	Not available
TOTAL	**1,40,629**

Ports without planning

The earlier section showed the shift in focus from major ports to the development of minor ports. Several government reviews highlight the importance of minor ports to the national growth rate. However, the Planning Commission's Reviews and the National Maritime Development Policy 2006 contain very little mention of the development and planning of minor ports. Most reports only mention the growth of traffic in minor ports and their importance to the Indian port sector. Given the jurisdictional set up and functioning of non-major ports, the central government has little role in the planning and development of minor ports.

Notified non-major ports in India

The Transport Research Wing at the Ministry of Shipping at the centre is supposed to maintain records on non-major ports as well as major ports. This is supposed to be released in the Annual Basic Ports Statistics. However, the Ministry denied possessing detailed information for minor ports, particularly on aspects such as the status of ports, developers, potential industries to occupy the hinterland and so on (Alok Nayak[14], pers. comm., 2010)[15].

The whole development, identification of sites and planning of minor ports rests with respective state governments. The only central coordination mechanism for coastal maritime activity established early this year, is a central committee under the Maritime States Development Council (MSDC) which coordinates coastal security issues with the respective state departments and maritime boards (Press Information Bureau 2009). Maritime States Development Council (MSDC) consists of ministers from each coastal state and this body does not deal with matters pertaining to minor port development or planning (S.N. Srikanth[16], pers comm., 2010)

Thus at a national level, there does not appear to be an accesible or detailed database on minor ports. In addition, most information regarding exact proposed port project details, investment amounts, infrastructure and terms of investment are all items that need to be compiled from various sources. For this report, we relied on the information available in the media and press releases along with information obtained through the Right to Information process.

The absence of a database on port infrastructure and investments at a central location poses various problems, particularly in assessing the social and environmental impacts of the sector. The absence of a single database is also reflected in the conflicting and inconsistent figures on the number of minor ports in various documents and literature. The documents reveal variations in the number of non-major ports and their operational and functional status and stage of development. This is illustrated in table 4 in the adjoining page.

[14] RTI Officer, Ministry of Shipping, Government of India.
[15] An application was filed by Sudarshan Rodriguez to which the officer , Mr. Alok Nayak responded via a telephone conversation stating that the Ministry of Shipping does not maintain such data.
[16] Senior Partner, Hauer Associates, Chennai and Consultant and co-author of the TCS Report on Coastal Shipping.

Table 4:Total number of notified non-major (minor) port sites from various sources

Source	Year	Number of Minor Ports	Functional Ports
Tenth Five Year Plan	2002	184	53
Economic Survey 2001-02	2002	148	NM**
TCS Report on Coastal Shipping	2003	185	61
National Maritime Development Programme (Ports)	2006		45
Economic Survey 2007-08	2007	185	60
MoST Annual Report 2007-08	2008	200	NM**
Economic Survey 2008-09	2009	200	60
MES/ICMAM study	2009	186	NM**
Ministry of Shipping Website	2010*	187	NM**
Economic Survey 2009-10	2010	200	66
Current Report	**2010**	**213**	

*no mention of date of preparation
**NM- Not Mentioned

A central database that contained information on the nature of traffic at minor ports throughout the country would be imperative to port planning. Logically, the development of ports in the country would have to be based on some prior information such as the trends in traffic movement across various ports, or the need to manage and distribute port traffic across different ports. For the year 1996-97, the Ninth Five Year Plan mentions 24.92 million tonnes of cargo handled by all non-major ports (Planning Commission 1997) but the Tenth Five Year Plan Report and the Economic Survey 2003-04 mention this figure as 27.83 million tonnes for the same period (Planning Commission 2002; Ministry of Finance 2004). A list of the all the notified minor ports compiled for the purpose of this report is provided in Annexure 1.

A state-wise list and disparity in the various sources is shown in table 5:

Table 5: State-wise number of non-major ports in India

State	MoS website	Dept. of Shipping 2007-8 Annual Report	MES/ICMAM to MoEF/2009	Current Study 2010
Gujarat	40	42	40	49
Daman and Diu	2	2	2	2
Goa	5	5	5	5
Maharashtra	53	48	53	48
Karnataka	10	10	10	10
Kerala	13	17	13	17
Lakshadweep Islands	10	10	10	10
Tamil Nadu	15	15	14	20
Pondicherry	1	2	1	2
Andhra Pradesh	12	12	12	13
Orissa	2	13	2	14
West Bengal	1	1	1	1
Andaman & Nicobar Islands	23	23	23	22
TOTAL	**187**	**200**	**186**	**213**

As per our analysis, the number of minor ports that have been put up for development is 69. The table below shows the number of investment proposals for each of the ports. Many minor ports were notified several decades ago but in some states old harbours or areas are declared as ports usually to attract development in this region. The information on investment pertains to those minor ports which have been mentioned in the press as attracting some investment interest. The information related to investment proposals have all been obtained from news reports as well as government press statements and right to information questions.

Table 6: Investment in major and minor ports in the country

Name of State	Number of major ports	No of major ports listed for development	No of minor ports (acc. to present study)	No of minor ports ongoing/ proposed to be developed
Gujarat	1	1	49	20
Daman and Diu	0	0	2	Not available
Maharashtra	2	2	48	6
Goa	1	1	5	Not available
Karnataka	1	1	10	4
Kerala	1	1	17	4
Tamil Nadu	3	3	20	16
Andhra Pradesh	1	1	13	5
Orissa	1	1	14	12
West Bengal	1	1	1	Not available
Pondicherry	0	0	2	2
Andaman & Nicobar Ils.	1	0	22	Not available
Lakshadweep Ils.			10	Not available
TOTAL	**13**	**12**	**213**	**69**

Density of ports on the Indian coast

With such a large number of ports competing for development, it is important to understand what this means in terms of the distribution of these facilities and their related activities along the coast. We show here the density of notified ports along the coastline. This is done by simply dividing the length of the coastline of each state by the number of notified ports to get the port density. The state-wise distribution of port density is given in the table below:

Table 7: State-wise distribution of port density

Name of State	Coastline (in km)[17]	Notified minor ports (present study data)	Major ports[18]	Port density (minor)	Port density (total)
Gujarat	1214.7	49	1	24.8	24.3
Diu and Daman	9.52[19]	2	0	4.8	4.8
Maharashtra	652.6	48	2	13.6	13.1
Goa	151	5	1	30.2	25.2
Karnataka	280	10	1	28.0	25.5
Kerala	569.7	17	1	33.5	31.7
Tamil Nadu	906.9	20	3	45.3	39.4
Andhra Pradesh	973.7	13	1	74.9	69.6
Orissa	476.4	14	1	34.0	31.8
West Bengal	157.5	1	1	157.5	78.8
Pondicherry	30.6	2		15.3	15.3
Andaman & Nicobar	1962	22	1	89.2	85.3
Lakshadweep	132	10		13.2	13.2
TOTAL		**213**	**13**		
Mainland coast plus islands	**7516.6**			**35.3**	**33.3**
Mainland coast	**5422.6**	**181**		**30.0**	**28.1**

From the table we see that the state with the greatest density of notified ports is Maharashtra, having a port every 13.6 km. However, many of the minor ports that are notified are not really operational and have only very basic and non-functional facilities such as a single wharf. For the mainland, the minor port density is one port every 30 km and for the whole country (including the islands) the minor port density is one port every 35.3 km.

Information on the number of non-major ports that are functional and details of their cargo is not available on the internet and often is not available even at the state departments of ports. However, some basic information has been compiled for the various states that mention non-functional ports (as of 2006): Maharashtra (46), Gujarat (23), Andaman and Nicobar Islands (17), Kerala (10), Tamil Nadu (9), Andhra Pradesh (9), Goa (4) and Karnataka (4) and Orissa (12) (Raja Simhan 2006).

[17] MoES 2009.
[18] Data compiled from National Maritime Development Programme, 2006.
[19] Sanil Kumar et al. 2006.

Captive ports and private jetties

There are a number of captive and private jetties located within some of minor port sites (falling within the port limits). Information in this regard is not with the central Ministry of Shipping and is with the respective state government departments and often times this information is not publicly accessible. In the state of Gujarat there are 23 captive jetties (falling within 8 minor limits) and 11 private jetties (within 6 minor port limits) in addition to the 16 operational minor ports (Gujarat Maritime Board response to RTI). In the case of captive ports in Tamil Nadu there are 4 which are operational, 3 under construction and 5 pending clearance (response to RTI, Letter of Tamil Nadu Maritime Board dated March 15, 2010).

For example, Magdalla port in Gujarat has about 5 captive jetties and Dharamtar port in Maharashtra has 3-4 operating private jetties (Manoj 2009). Dharamtar recently has developed container handling facilities and has an in-house automatic bagging plant and its rail line is expected to be operational soon. It has 2,40,000 sq. ft of warehousing space that can be scaled up to 2 million sq. ft. The port is also in a customs-notified port area (*ibid*). Such facilities are termed minor ports but actually function as captive ports falling within the common minor port limit. Thus it is possible to have more than one captive port facility within the port limits of a minor port.

Drivers of investment in ports

Many of the ports today are not mere standalone ports as earlier..A port attracts a number of industries. It is extremely cost effective for an industry that needs to move large quantities of raw material or final products through a sea route, to be located close to port areas. In port areas where there is a very large movement of goods and where ships berth for a long period of time, there are even facilities such as shopping malls. In at least two instances in the country, there have been proposals for the development of golf courses within port areas. These are all not necessarily activities that require the waterfront or the foreshore region. A good example is the power sector, particularly thermal power. A growing number of thermal power plants are being located in coastal areas of the country. In the district of Nagapattinam in Tamil Nadu alone, there are over 6 coastal thermal power plants. The district has been witnessing sporadic protests from fisherfolk spread across 53 fishing habitations over proposals to set up over six thermal power plants. Each TPP comes wth a proposed captive jetties or ports to dock ships with imported coal (Srividya 2010).

In Andhra Pradesh, north coastal Andhra and coastal Nellore are slated to become power generation hubs. Coastal Andhra has 17 power projects (power-generation capacity of 8,000 MW) and Nellow has 4 power projects (power-generation capacity of 8,000 MW) (Bhaskar 2007; Anon 2010).

Many experts feel that a lot of power projects will be set up at ports, making them power-generation hubs (with the plants being) run on imported coal or gas[20]. In fact it is expected that the proposed development of a large number of coastal power projects in many states will be a major driver of construction and development jetties (Bhaskar 2009). Already five Ultra Mega Power Plants[21] or UMPP are planned in coastal locations by the Ministry of Power[22]. Some analysts see the development of these jetties as a cost-effective alternative to ports (*ibid*). However, jetties have their own impacts in terms of shoreline and pollution during operation, much of which unfortunately has not been documented in India (B.R. Subramaniam, pers. comm., 2010). The cumulative social and environmental impacts of a large number of jetties mushrooming on the coast is bound to be significant and cannot be ignored in the planning of port sites.

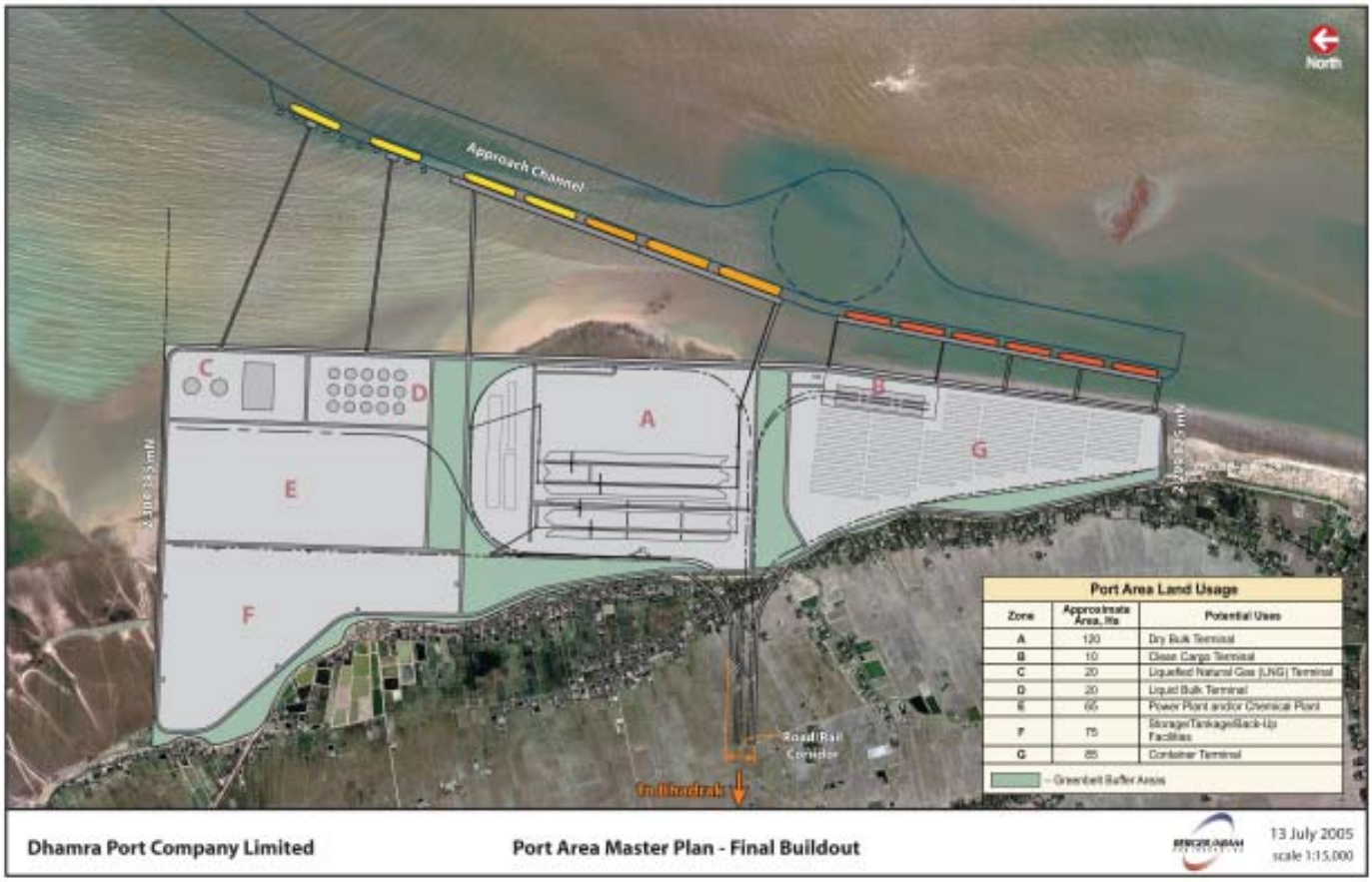
[20] Stated by Arvin Mahajan, Executive Director, KPMG in Bhaskar 2007.
[21] UMPP are large-sized power projects of 4000 MW and above requiring investment between Rs 16,000 and Rs 20,000 crore.
[22] See http://www.powermin.nic.in/whats_new/pdf/ultra%20mega%20project.pdf

Land acquisition and ports

Another phenomenon marking the investment in ports is the rush by investors to develop port-based SEZs. Consultants associated with such projects opine that several investors are interested in developing SEZs around 'greenfield' ports in different maritime states such as Kochi, Mundra, Karaikal, and Krishnapatnam. Investors including infrastructure companies like construction majors and investment banks have been scouting for potential projects. Experts point out that that this rush is despite the fact that there is no market study made on the requirements of port-based SEZs (Anon 2008a). The reason for this interest is that coastal land is cheaper, with hardly any clear ownership or land rights of individual communities especially fisherfolk, and is therefore easier to acquire. Hence port proponents acquire large land holdings within the port area for non-port based activities. Information on this aspect is very difficult to access and there have been no studies or literature in this regard.

The Dhamra port proposed a power plant /chemical plant or fertilizer plan within its port limits (marked Area 'E' in the figure below):

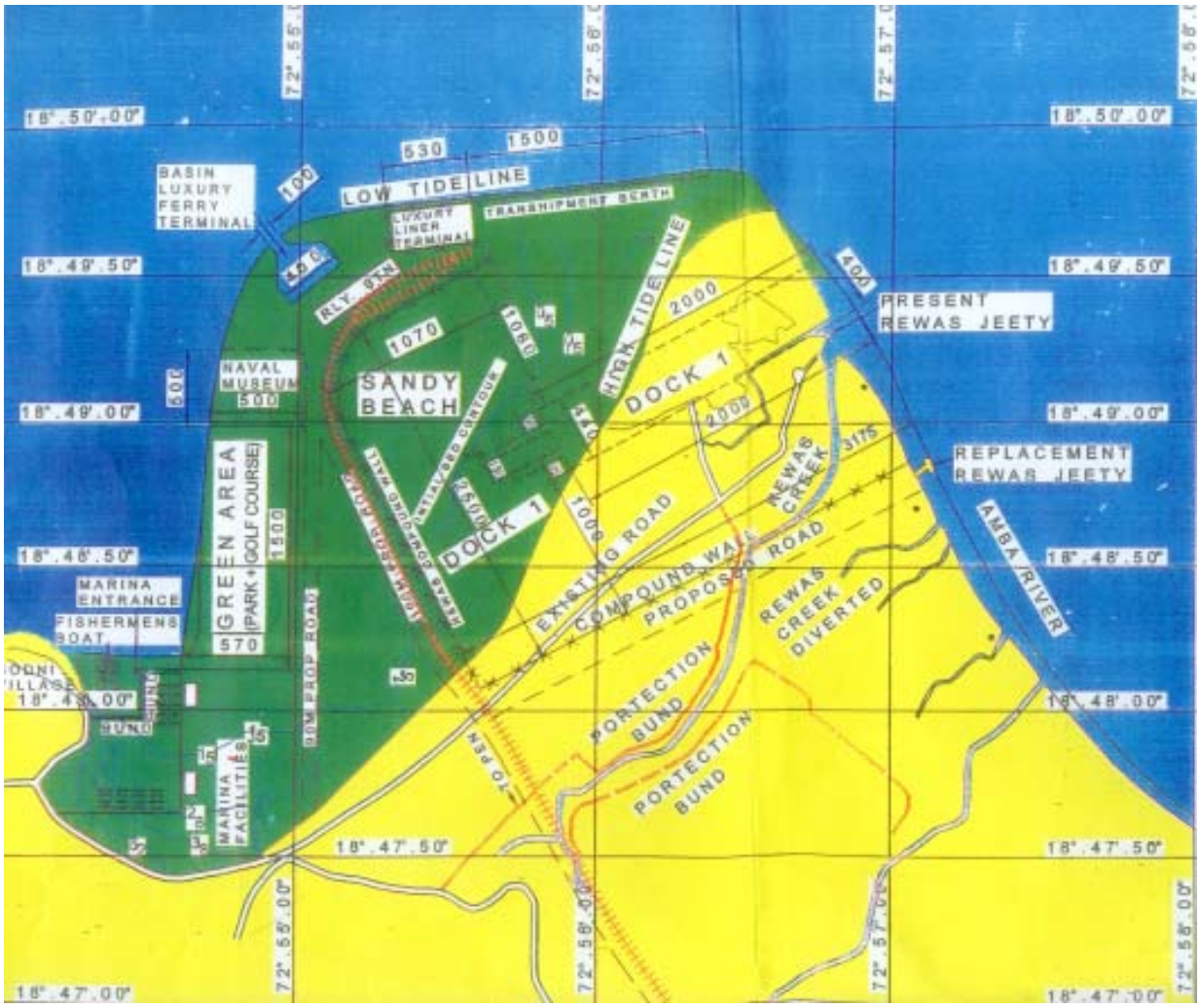
Figure 1: Schematic plan and layout of Dhamra port, Orissa



Source: Dhamra Port Company Limited website www.dhamraport.com

Another example is of the proposed Rewas port in Mumbai which has a golf course within the port area (green shaded area).

Figure 2: Schematic plan and layout of Rewas port, Maharashtra



Source: Navroz Modi

Too close for comfort...

Distance between ports

Not only is there a high density of notified minor ports along the coast (one every 33.3 km on the coast), but the distance between many of these ports is fairly small. The table[23] below shows the distance between select minor ports that are proposed for development and their adjacent port. Gangavaram & Vishakapattinam are operational with a distance of only 14 km between them!

	Port	Adjacent port	Distance between the two (in km)
1	Gangavaram	Vishakapattinam	14
2	Jatadhar (POSCO port)	Paradip	14
3	Karaikal	Nagapattinam	14
4	Karaikal	Cuddalore	80
5	Kattupali	Ennore	15
6	Pondicherry	Cuddalore	24
7	Thirukkadaiyur	Karaikal	15
8	Thirukkadaiyur	Cuddalore	70
9	Thirukkadaiyur	Nagapattinam	29
10	Honnavar	Tadri	27
11	Tadri	Belekeri	23
12	Belekeri	Karwar	26
13	Karwar	Mormugao	71
14	Okha	Positra	14
15	Posita	Salaya	45
16	Salaya	Sikka	24

In addition to the drivers of port development mentioned earlier (cheap land, possibility to conduct non-port activities and projects within port limits) the table above suggests that there is no market saturation and the business of port development continues. Additional ports are cropping up in the vicinity of existing ports (including major ports). The expansion of and improvement in the efficiency of the Vishakapattinam Port would have been an optimal approach to maximise economic benefit while minimising the social and environmental costs of developing adjacent ports like Gangavaram. The same can be said of Belikere port or Karwar in Karnataka, rather than the development of new minor ports like Tadri (renowned for its ecological sensitivity).

[23] This was arrived at by plotting locations and measuring approximate distances on Google Earth.

Public monopoly vs private monopoly

Ports are referred to as 'natural monopolies'. Their geographical location, favourable environment, access to sea or river and hinterland connectivity are advantages that cannot be easily duplicated and hence lends them their monopolistic character. Wilder and Pender have defined the market structure of port services as `differentiated oligopoly' with spatial considerations of particular importance, suggesting that ports, in general, exhibit the characteristics of a `partial monopoly' (Paul 2005).

This has made competition between ports a subject of intense discussion. The government has guidelines in place restricting an existing terminal operator from bidding for the next immediate project. Within the port, these guidelines take care of ensuring 'intra-port' competition but do not have powers to ensure inter-port competition. Nothing prevents a private operator of a competing, non-major port located close to the major port from bidding for the terminal or a private operator setting up a non-major port nearby (Das & Srinivasa-Raghavan 2009). In the port sector, the economies of scale are extensively relative to the size of the market, such that a few ports can provide the necessary infrastructure and service required by the entire industry. Increase in number of competing ports would lead to duplication and raise the cost structures (i-maritime 2003).

There are others who argue that technology and finance can, eventually, neutralise these locational advantages and even the best of natural monopolies can face competition; also arguing that as the market size increases, the problem of natural monopoly falls (*ibid*). Given the expected growth rate in economy and trade, some believe that the natural monopolistic situation would not remain in the Indian ports sector in future (i-maritime 2003). Some experts believe that with the current policy and planning trend, from a purely commercial point of view, competition and markets will eventually stabilise the market and some ports will eventually die out and some could be merged (S.N. Srikanth, pers. comm., 2010). However, this does not appear to make environmental or social sense since the stabilisation as many of these 'dead' ports will have permanent and irreversible negative social and environmental impacts. Instead, an alternative approach could be a steady and phased development of ports and hinterland connectivity. Thus, one needs to look at optimal planning at a macro level keeping current and future trends in view, with a goal towards minimising the total number and cumulative impacts of ports.

Implications for planning

This raises questions about the manner in which the government maintains checks and balances for port development and planning as well as of the extent of private sector involvement. The debate on the behaviour and the nature of port services (monopolistic behaviour and free competition), the public policy on ports and planning, should encompass an optimum balance of the following aspects - social and environment considerations, macro-economic development objectives and considerations of business and enterprise-level efficiency (public, private and PPP). This poses formidable challenges for policy makers and planners in terms of reconciling the seemingly conflicting demands especially in the absence of a meaningful resolution of many key issues of concern.

How many ports and who decides?

Some experts are of the view that another 10 ports are required in addition to the existing 12 major ports considering the growth prospects of the economy and the projected growth of foreign trade (Paul 2005). A more appropriate approach in the context of international shipping is not the number of ports, but how much handling capacity is needed (S.N. Srikanth, pers. comm., 2010). This approach recommends developing big ports that can handle large quantities and operations. This would automatically ensure deeper draught, faster turn-around and connectivity making these ports much more profitable than non-major ports.

Given the social and environmental impacts of ports, many of which are permanent and irreversible (such as impacts on shoreline and subsequently livelihoods) the optimal number of ports must be centrally planned and not left to state governments to decide. An approach that permits unfettered free competition, will result in some ports dying out while their impacts on the environment and communities continue[24].

Considering the above, it appears that minimising the number of ports and jetties and optimally utilising and operating these facilities through the existing larger ports in the region can reduce the pressure on the coast and its communities. Continuing in the present vein will only result in a mushrooming of such facilities all along the coastline with cumulative and continuous social and environmental implications.

Thus from a combined environmental and economic point of view, there is generally a unanimous view among experts on the need for rationalising port planning at a central level, particularly on the question of the location of ports (Lakshminarainan Ramachandran[25], pers. comm., 2009; Sudhir Rangnekar[26], pers. comm., 2009; S.N. Srikanth, pers. comm., 2010; Santosh Kumar Mohapatra[27], pers. comm., 2010).

[24] Shoreline impacts will continue irrespective of halt of operation. Even the decommissioning of a port, an extremely costly proposition, will not restore the original shoreline.
[25] Consultant, KPMG, Chennai.
[26] CEO, Indian Ship Owners Association, Mumbai.
[27] CEO, Dhamra Port Company Limited, Bhubaneshwar.

Coastal shipping

Planning for coastal shipping requires another set of needs to be addressed as the sector differs vastly from foreign trade. This involves coast-to-coast domestic shipping as well as intra-coast (along one coast) domestic shipping. India's coastal traffic is estimated to increase from 116 MT in 2002 - 03 to 220 MT by the end of the Eleventh Plan period (Planning Commission 2007). The value of coastal shipping as a supplement and substitute to other modes of transport is highlighted by its advocates (marginal external costs are less compared to road or rail transport). Though coastal shipping can use an existing port that handles international cargo, the approach to promote coastal shipping is through the development of minor ports or fresh new ports catering to small vessels. Experts feel that a shallow draught of 8m would be enough as this sector would consist of small vessels (S.N. Srikanth, pers. comm., 2010).

The Ministry of Shipping commissioned a study on coastal shipping, executed and released by the Tata Consultancy Services (TCS) in 2003[28]. Like several other reports earlier, this report also considers coastal shipping to be a comparatively environmentally benign mode of transport. However, in the absence of any peer-reviewed studies showing comparative data between rail, road and shipping data in the country, the 'green' nature of coastal shipping in India remains an unverified assumption.

Based on the recommendations of the TCS report, the Ministry of Shipping has taken steps to set up a Special Cell on coastal shipping to focus on the development of minor ports that can promote such activity[29]. The TCS report does not make any mention of the land requirements or the environmental impacts from coastal shipping or the building of ports for the same. The report recommends a total of nine ports for both coast s (Gopalpur, Cuddalore, Vizhinjam, Azzhikal, Malpe, Karwar, Ratnagiri, Dharamtar, Magdalla) (TCS 2003). The NMDP has introduced a Centrally Sponsored Scheme (CSS) for the promotion of coastal shipping by assisting the Maritime States in undertaking requisite infrastructure projects in minor ports. However it extends CSS support to the following ports: Gopalpur(Orissa), Azhikkal (Kerala), Malpe (Karnataka), Dharamtar (Maharashtra), Magdalla (Gujarat), Cuddalore (Tamil Nadu) and Gangavaram (Andhra Pradesh). It is not clear what the basis of this planning is.

The development or promotion of coastal shipping is not without controversy. The Sethusamudram Ship Canal Project (SSCP)[30] was touted as an important undertaking to promote coastal shipping. The environmental and social impacts of this project are well-recorded (Rodriguez et al. 2007). Even a project that is considered ancillary to port development has grave environmental implications. Coastal shipping in other countries where it is far more developed and intense, has shown environmental impacts such as increased emissions, pollution in coastal waters and impacts on local biodiversity.

An important fact to consider is the density of coastal communities occupying the Indian coastline, which is far greater than other countries. The implications of coastal erosion exacerbated by port construction can easily be the result of over-enthusiastic promotion of minor port development for the promotion of coastal shipping. The social and environmental concerns raised about each of the port projects for coastal shipping as well as international maritime trade, needs to be factored into any planning effort. It is conspicuously absent at present.

[28] Tata Consultancy Services, 2003. *Study on Development of Coastal Shipping & Minor Ports*. Mumbai.

[29] See http://www.dgshipping.com/dgship/final/tcsrep/commentary.htm Director General of Shipping Commentary on the TCS Report.

[30] The Sethusamudram Ship Canal Project (SSCP) is a 167 km long shipping canal, which is to pass through the globally renowned, ecologically sensitive Gulf of Mannar (GoM), the Palk Strait and the Palk Bay in India. It involves dredging of a 89 km stretch for a width of 300 m for a depth of 12 m to accommodate commercial shipping along this route.

How are minor ports declared?

The respective maritime boards and departments of ports in each state appear to retain only the bare minimum information like lists of notified minor ports and their functional status, but their websites (if any) do not show information on the total area of each port, the total cargo it handles per year, proposals for growth, investors and so on. The basis for declaring many minor port sites as such does not appear to be a scientific exercise. In most cases the studies that identify potential port sites are not really comprehensive and almost always do not consider environmental or social issues. Orissa's efforts in declaring minor ports is a case in point. The Indian Institute of Technology (IIT) Chennai undertook a study in 1996 (Ocean Engineering Centre 1996) which recommended 2 minor and 2 major ports (mostly referring to scale and size and not the legal definition) and assessed seven other sites as being potential port sites.

Table 9: Comparison of Orissa's non-major port sites and IIT study recommendations

Port site notified by Government of Orissa	IIT Study	Environmental concerns
Astarang /Nuagaon	Identified as minor or feeder port	Close to the Devi turtle mass nesting site. River mouth – CRZ- I (fish breeding areas in the CRZ Notification)
Bahabalpur	One of the evaluated sites	-
Bahuda Muhan (Sonepur)	One of the evaluated sites	River mouth – CRZ- I (fish breeding areas in the CRZ Notification)
Baliharchandi	One of the evaluated sites	-
Barunei Muhan	Not in list of evaluated sites	River mouth – CRZ- I (fish breeding areas in the CRZ Notification)
Bichitrapur (Talsari)	Not in list of evaluated sites	-
Chandipur	One of the evaluated sites	Mud flats and horshoe crab breeding site
Chudamani/ Chandabali	Identified as minor or feeder port Dhamra	River mouth – CRZ- I (fish breeding areas in the CRZ Notification)
Dhamara	Identified as Major Port Also as minor or feeder port	Close to the Gahirmatha sea turtle mass nesting site
Gopalpur	One of the evaluated sites	Close to the Rushikulya sea turtle mass nesting site
Inchuri	Identified as Major Port	-
Jatadhar Muhan	Not in list of evaluated sites	Close to the Devi sea turtle mass nesting site
Palur	One of the evaluated sites	Close to the Rushikulya sea turtle mass nesting site
Subarnarekha Muhan (Kirtania)	One of the evaluated sites	River mouth – CRZ- I (fish breeding areas in the CRZ Notification)

There are three core problems with port planning in this instance. Firstly, the Orissa state government has notified and promoted all of the sites mentioned in the first column of the above table although only 4 were recommended for development by the IIT study. Three sites - Jatadhar, Barunei Muhan, Bichitrapur (Talsari), find no mention in the IIT Report and were promoted by the state government as minor ports for development. The basis for this is unclear.

Secondly, there are absolutely no environmental and social considerations at all in the IIT study. An example to illustrate this argument is that almost all of the above sites are close to or located within river mouths/estuaries with significant ecological value in terms of biodiversity, fish spawning and breeding grounds. The CRZ Notification, 1991 considers fish breeding grounds (estuaries and river mouths are known fish breeding sites) as CRZ – I (ecologically sensitive areas). Five of the sites - Astarang /Nuagaon, Dhamra, Gopalpur, Jatadhar Muhan, and Palur are close to the three world renowned mass nesting beaches of the olive ridley sea turtles (declared as a Schedule I animal under the WLPA). However, officials in the Port Department of Orissa do not consider these sites as being environmentally sensitive as they are not declared protected areas under the Wild Life Protection Act, 1972 (Guru Ray, [31] pers. comm. 2010).

Some port developers argue that state governments should shoulder the responsibility of carrying out environmental due diligence exercises in locating port sites before inviting port developers[32] (Anon 2009b). On its part, the Orissa Orissa government belatedly confesses an interest in conducting such a study in future (Guru Ray, pers. comm. 2010).

Thirdly, the validity of basing current development plans on a dated study is in question. To begin with, the IIT study was only a preliminary study and furthermore it was prepared 13 years ago in 1996 (Ocean Engineering Centre 1996). The IIT report itself mentions that further detailed studies are required. Officials of the state government have also admitted that a detailed pre-feasibility study of sites including a due diligence exercise should have been undertaken (absent in the IIT study).

In the case of Andhra Pradesh, in a response to an RTI application, in their letter dated March 23, 2010 the AP port department mentions that 9 of the 13 minor ports were identified prior to 1980. This is the case with many ports, suggesting that the mere possession of land in port areas presents state governments with something to offer developers and project proponents who are interested in more than just port development.

The case of planning minor ports for coastal shipping (mentioned in the earlier section) also illustrates this point, where the NMDP suggests the development of ports that were not mentioned in the TCS technical report.

It is evident from the above that there is no macro or national perspective in the planning of non-major ports which will dominate future growth in terms of numbers as well as handling capacity. Even at the state level, planning and due diligence is inadequate and appears ad-hoc. This would result in the mushrooming of jetties and ports all along the coast when the same current and anticipated cargo could have been handled with fewer, more efficient and more profitable ports thus also reducing the environmental and social cost.

[31] Mr. Guru Ray is the Special Secretary, Commerce and Transport Department, Government of Orissa

[32] Statement by Santosh Kumar Mohapatra, Chief Executive Officer of Dhamra Port Company Ltd in the *Financial Express* dated 10th December 2009.

Ports and their impacts

Port development can create a wide range of impacts on the environment through dredging, construction work, landfills, discharges from ships and waterfront industries, cargo operations, and other port related activities. The potential adverse effects of port development include water pollution, contamination of bottom sediments, loss of bottom habitat, damage to marine ecology and fisheries, beach erosion, current pattern changes, waste disposal, oil leakage and spillage, hazardous material emissions, air pollution, noise, vibration, light and visual pollution.

Aside from the environmental impacts on communities, ports are responsible for several direct and indirect social impacts as well. The most significant and direct impact is the displacement of communities through land acquisition (where community land rights exist) or simply displacement of settlements without any compensation either. There are numerous indirect environmental and social costs of port development which we examine in further sections.

The three major sources of these adverse effects are:

(a) Site location: The location of the port site will determine the nature and severity of impacts. This could be both environmental (near high erosion areas or turtle nesting areas) as well as social (proximity to fishing settlements or near fishing grounds).

(b) Construction activities: Construction activities for ports take place both in the offshore waters and on land. The most significant of this is construction of breakwaters or groynes, dredging, disposal of dredged materials, and transport of construction materials.

(c) Port operation: This includes ship traffic and discharges, cargo handling and storage, and land transport. Port operation consists of ship-related factors such as vessel traffic, ship discharges and emissions, spills and leakage from ships; and cargo-related factors such as cargo handling and storage, handling equipment, hazardous materials, waterfront industry discharges, and land transport to and from the port.

Environmental impacts

There is very limited literature, documentation or case studies of environmental impacts of port operations in India (other than shoreline impacts). However, there does exist a fair amount of information on campaigns against various ports that highlight these issues.

Relations between impact sources and various aspects of the environment are summarised in the table below:

Table 10: Relationship between impact sources and environmental parameters[33]

Source	Port Location	Construction	Port Operation		
Environmental Parameter			**Ship traffic & discharges**	**Cargo, berth & terminal operations**	**Maintenance dredging**
Water quality	Yes	Yes	Yes	Yes	Yes
Coastal hydrology	Yes	Yes	-	-	Yes
Bottom contamination	Yes	Yes	-	Yes	Yes
Marine/coastal ecology	Yes	Yes	Yes	Yes	Yes
Air quality	-	Yes	Yes	Yes	
Noise and vibration	-	Yes	-	Yes	Yes
Waste management	-	Yes	Yes	Yes	Yes
Illumination impacts	Yes	-	-	Yes	
Shoreline impacts	Yes	Yes		Yes	Yes
Direct socio-cultural impact	Yes	-	Yes	Yes	

Based on the compiled information available on the internet as well as personal experience we examined the extent of known environmental and social concerns in minor port development. Upon an analysis, it is clear that of the 181 notified minor ports on the mainland coast, at least 41 (23%) have reported environmental concerns and at least 32 (18%) report protests on social grounds. See Enclosure with this report.

[33] Adapted from UNESCAP, 1992. Assessment of the Environmental Impact of Port Development. A Guidebook for EIA of Port Development. See www.unescap.org/ttdw/Publications/TFS_pubs/Pub_1234/pub_1234_fulltext.pdf

Highlighted below are the main ecological concerns with port development:

Port pollution and impacts of ancillary industrial development in the region

During the operation of ports, spillage or leakages from the loading and unloading of cargo and pollution from oil spills are common due to poor adherence to environmental laws and standards. This along with ancillary industries in and around the port also can contribute to pollution thus affecting fisheries (Anon 2010; Bhaskar 2007; Bhaskar 2009; NFF 2008).

Bilge and ballast water

The water discharged during the cleaning of a ship and the discharge of ballast water is a well-known threat to marine ecosystems. In fact the introduction of invasive marine species into new environments (from ballast water, or from organisms attached to ships' hulls and via other vectors) has been identified as one of the four greatest threats to the world's oceans[34]. In India, black stripped mussel *Mytilopsis sallei* has been reported from Mumbai and Visakhapatnam. This species is native to tropical and sub-tropical Atlantic waters and is reported to have invaded Indian waters sometime during 1960's. The east asian green lipped mussel (*Perna viridis*) has been reported in the navy dock at JNPT, Mumbai. Green crab - *Carcinus meanas*, a native of Europe is also reported from the Indian Ocean (Sri Lanka). The molluscs and crustacean population on which this crab preys upon can be affected (Anil *et al*. 2004)

Dredging

Both the capital dredging (dredging for the construction of a port) and maintenance dredging during the lifespan of a port causes environmental problems affecting local productivity of the local waters and its fisheries. One of the fallouts of this is the marked increase in fine sediment suspension in the waters which results in increasing sediment deposits in marine habitats, and a lowering of light conditions. It is likely that the spread of these sediments is dependent on a combination of particle size, local current patterns and weather conditions. The penumbra of influence of the dredging operations is likely to extend far beyond the dredging zone itself, and may increase the sediment and nutrient loads in nearby marine systems (see section 4 in Rodriguez *et al*. 2007; UNESCAP 1992).

Shoreline impacts

We devote primary attention to the shoreline impacts from ports and illustrate this with examples from various sites.

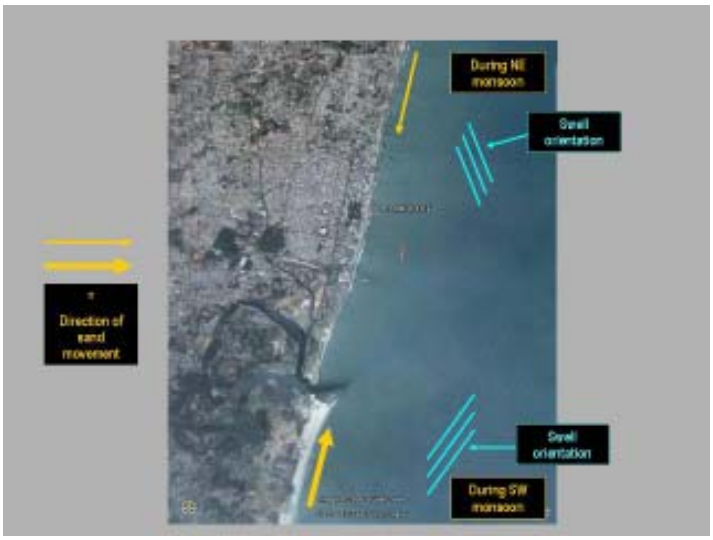
The primary source of the sediments deposited on the beaches is the weathering of land; the sediments are then transported through rivers to the ocean. The striking feature of the east coast of India is its large littoral drift, said to be one of the highest among the world's coastlines (Komar in Sanil Kumar et al. 2002. pp1382). Shorelines are generally more or less in dynamic equilibrium and their evolution due to changes in winds, waves, currents, and sediment transport, is rather seasonal, characterised by alternate erosion and accretion. Changes and impacts occur by introduction of anthropogenic factors or activities such as the construction of structures along coastal shorelines, or river mouths (Bhalla 2007; Schiavina 2007; Puthur 2007 and MoES 2009).

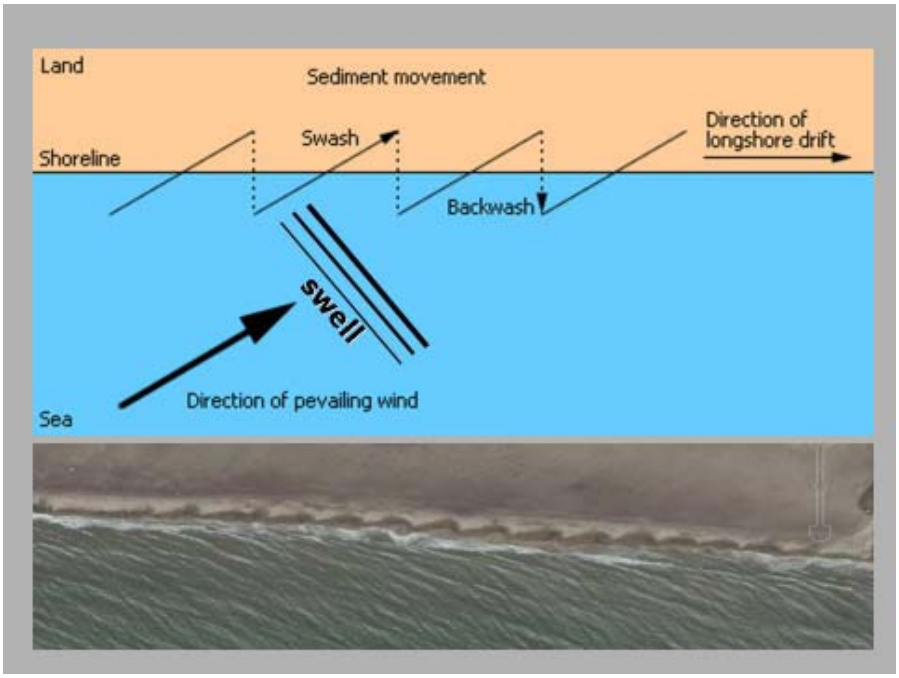
For 9 months of the year, during the south west monsoon period, sand moves from the south to the north with the total amount of transported material being 600,000 cubic metres. During the remaining 3 months of the year (the north east monsoon) the littoral drift occurs in the opposite direction and nearly 100,000 cubic metres of sand is transported from the north to the south. Thus the annual net littoral drift is from south to north with net quantum of sand/sediment movement of 500,000 cubic metres (Puthur 2007; Schiavina 2007; Schiavina 2009).

[34] See IMO Ballast Water Management website and the Globallast website.

These are shown in the figures below:

Figure 3 & 4: Mechanism of sand transportation along the east coast of India





(Source: Schiavina 2009)

The primary purpose of a port is to provide safe mooring and navigation for calling vessels but when built on the shoreline or a river mouth, it interferes with the littoral drift budget and the results are sedimentation and impact on the shoreline.

The port berths, terminals and other related coastal engineering structures such as groynes and breakwaters end up obstructing this littoral drift of sand and sediment. The port acts as a blockage of the littoral transport, as it causes trapping of sand on the upstream side in the form of an accumulating sand fillet, and the possible bypass causes sedimentation at the entrance. The sedimentation requires maintenance dredging and deposition of the dredged sand. The result is a deficit in the littoral drift budget, which causes lee side erosion along the adjacent shoreline (Bhalla 2007; Schiavina 2007; Puthur 2007 and MoES 2009). Thus on the east coast they cause erosion on the northern side and accretion on the southern side of the structure.

An illustration is given in the figure below:

Figure 5: Illustration of shoreline impacts of breakwaters

(Source: Puthur 2007)

(Source: Google Earth accesed on July 2010)

In fact the Integrated Costal and Marine Area Management (ICMAM) report mentions coastal structures constructed for port operations as the major anthropogenic cause of shoreline erosion (MoES 2009). There has been some documentation and scientific study of the impact of a few Indian ports on shorelines. A snapshot of this is provided in this section.

Pondicherry harbour

Coastal erosion is a serious problem in Pondicherry. The problem began in 1989, when a harbour was built at the southern tip of the union territory. Two breakwaters were constructed as a part of the harbour which stopped the littoral drift, the natural south to north movement of sand. The breakwaters in southern Pondicherry meant that sand from the beaches of the state moved north but there was no sand to replenish this loss. Therefore the area north of the breakwater lost all beaches (see photo below).

The harbour did have a sand bypass system installed in the harbour's design to obviate sea erosion: silt from the harbour would be dredged and artificially pumped to the other side, restoring the movement of sediments along the coast. Though put in place, it was seldom used except for a brief period between 2000 and 2001, when small stretches of beach began to reappear. But the system was discarded in 2002, and the beaches disappeared once again (Dutta 2008)

By 2002, Northern Pondicherry had lost all sand with structures along the coast crumbling as sea water intruded into their foundation. In 2002-2003, the state government decided to build a seven km long seawall consisting of boulders along the coast at a cost of Rs 40 crore. The problem of erosion has now transferred to villages in Tamil Nadu to the north of Pondicherry (*ibid*).

Figure 6: Photograph of shoreline impact of breakwater at Pondicherry Harbour

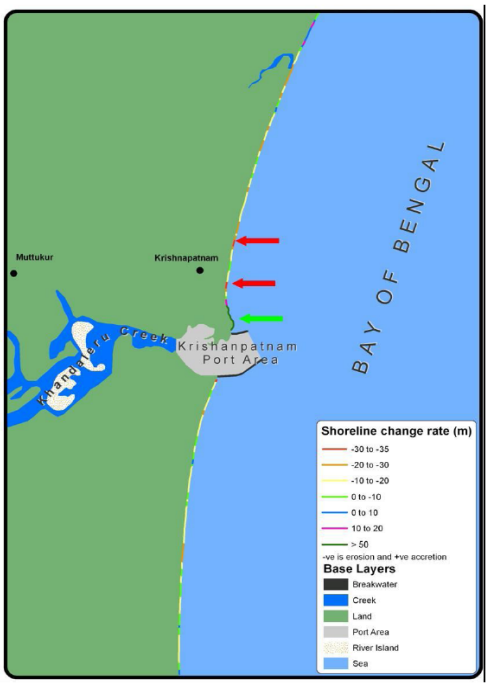
A photo of the Pondicherry harbour is shown below with original shoreline as a dotted line.

(Source: Schiavina 2007)

Andhra: Krishnapatnam Port

The Krishnapatnam Port is located in Nellore District of Andhra Pradesh. Studies show that there is erosion in the northern part of the port, up to 2 km from the port and a slight accretion in the southern parts with the shoreline change rates indicating severe erosion at a rate of about 30- 35 metres/year (MoES 2009).

Figure 7: Shoreline change rate due to Krishnapatnam Port



(+ ve: accretion and – ve: erosion, Red/Green arrows indicate areas of severe erosion/accretion)
(Source: MoES 2009)

Ennore Port - impact despite mitigation measures

The port was constructed in the year 2000 and became operational from 2001. It is has two breakwaters measuring 1.1 km in length in the south and 3.2 km long to the northern side of the port. The construction of the breakwater has arrested the movement of long-shore sediment transport thus resulting in accretion in the south side and erosion on the north side.

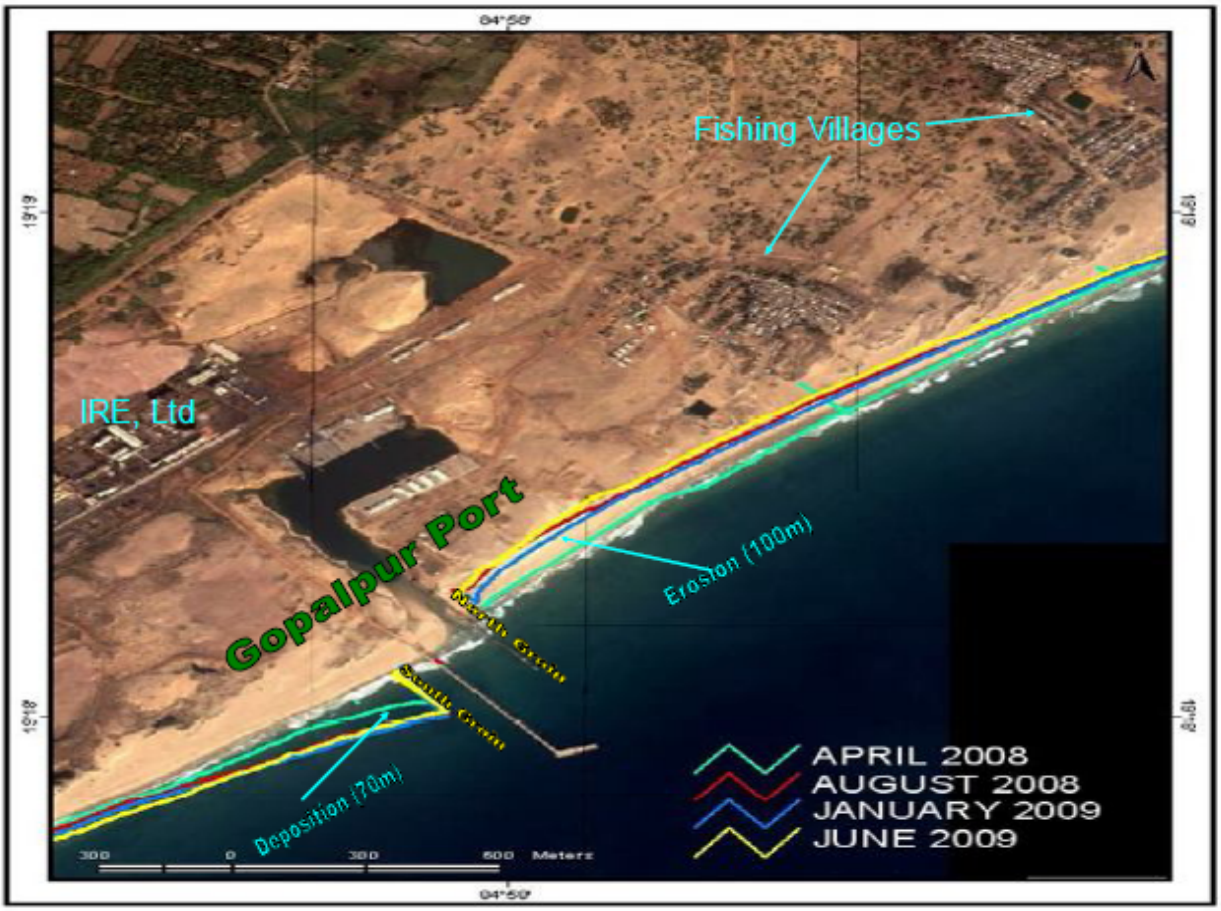
Anticipating the erosion on the north side, the port authorities have artificially nourished the northern part of the shoreline at the time of port construction in the year 2000 by placing 3.5 x 106 m3 of sand dredged from the harbour basin and the approach channel, through capital dredging, to prevent down drift erosion. Studies have revealed that severe erosion took place in a 1.5km stretch, to the coast north of the Ennore port and the erosion rate was measured at 50m/yr (ICMAM, 2006).

Further, the impact of coastal erosion due to breakwaters was seen up to Kattupalli village 3 km north of the port, where the shoreline underwent readjustment over the period of time, experiencing moderate erosion of 50 m/yr (*ibid*). The zone of accretion extended south up to 2.6 km alongshore where a 90 m wide beach has developed that eventually led to the rapid silting of Ennore Creek – a source for cooling water for the power plants in the vicinity (*ibid*). The port is also nearly 18 km south of the Pulicat lake which is the second largest brackish – water lake or lagoon in India.

Gopalpur Port, Orissa

Studies indicate that due to the construction of two groynes at the entrance channel near the Gopalpur port, the northern beaches are continually eroding and there is a loss of about 120m of the beach at present. The major changes are restricted to an area measuring 1.5 - 2 km along the shore on each side of the groynes.

Figure 8: Satellite showing erosion due to Gopalpur captive port, Orissa



(Source: MoES 2009)

The MoES/ICMAM report to the MoEF clearly warns - *"the proposed expansion of the port with breakwaters on the southern side will aggravate erosion. Unless remedial measures are taken the beaches of the fishing villages located 2 to 3 km from the port, will face erosion depriving facilities for landing crafts to fishermen."*

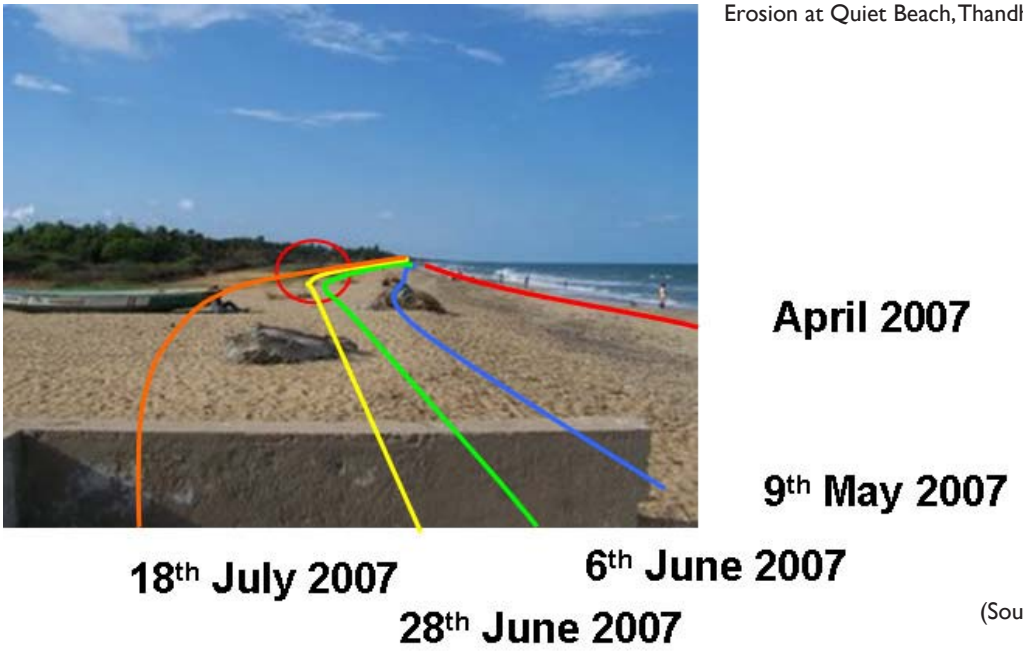
Impact of jetties

Jetties have the same types of impacts as groynes but have not been studied or documented in India though it is likely that their impacts are slightly lesser (B. R. Subramaniam, pers. comm., 2010). An example to illustrate the likely impact of a jetty is shown below. Thandhirayankuppam, Tamil Nadu, has seen the severe impacts of erosion of almost 60m beach width as a result of a groyne measuring 150m. The erosion is on the northern side of the groyne and is seen in the image below.

Figures 9 &10: Example of shoreline impact due to groynes - Thandirayankuppam, Tamil Nadu

Groyne built North of Thandirayankuppam Village in Tamil Nadu May 2007

(Source: Schiavina 2007)



Erosion at Quiet Beach, Thandhirayankuppam, TN

(Source: Schiavina 2007)

Dr. B. R. Subramaniam, Director, ICMAM Project Directorate states that the shoreline impacts from port construction on the west coast are site specific and difficult to predict to the nature and geomorphology of the west coast being more complex.

Construction of jetties involves some amount of disturbance to local ecosystems and species. In addition, jetties cut off access to stretches of coastaline often dividing up a continuous stretch of coast. However the social and environmental impacts of a series of constructions of jetties along a coastal stretch needs further study.

Social impacts of port development

There is very little documentation of social impacts of port construction and operation other than from media reports. In most states, there have been conflicts recorded over port development plans between the state government and local fishing communities (Sridhar & Parthasarathy 2003). Given below are some of the impacts and implications of ports for coastal communities:

Displacement and poor rehabilitation

Given that the Indian coastline is dotted with **one fishing hamlet every 2 km,** most port projects and development results in displacement (such as Gangavaram Port in Andhra and Mundra in Gujarat). The rehabilitation packages often locate the new settlement away from the shore which affects the livelihood of fishing communities who need shoreline access as in the case of Gangavaram. The lack of land and housing rights of fisherfolk in almost all states, despite having lived there for centuries make them more vulnerable to displacement by development projects such as ports (Anon 2009a; NFF 2008; Anon 2006a; Anon 2006b; Anon 2006c).

Restrictions of access

Besides displacement, the other important concern expressed by fishing communities is the restriction of access to fishing grounds around a port. The extent of such restrictions vary but this usually involves denying access to the near-shore waters, area of the main port channel and parts of shipping routes around the port (Simhan, 2009; Anon 2006b).

Ship traffic

Ship traffic near the port is a source of danger to fishing vessels and fishing nets. Due to the risk of destruction and loss of nets by ship traffic, fishermen often don't fish near port waters. Many also claim fish keep away and avoid the areas of vessel traffic and movement (NFF 2008).

Impact of loss of beaches due to shoreline impact of ports

This is perhaps the most long-term, permanent and perhaps irreversible impact of ports. This threatens not only fisherfolk and coastal community housing (xamples exist in Chennai, Pondicherry, Kakinada, and Gopalpur) but also fishing livelihoods as the beach space is integral to the fishing occupation (Anon. 2006b; NFF 2008; Anon 2008a).

Harbour development

Usually ports promise the development of a fishing harbour/ landing centre adjacent to the port site as part of rehabilitation plan for fishing communities. Communities also demand them in many cases. However, this changes the nature of the fishery, leading to the domination of mechanised trawlers and fish traders (Kocherry in Bakshi 2001). The traditional fishermen, whose small vessels are unable to compete with trawlers, then get pushed into the sidelines and their owners into penury. Women who would normally be central to the fish trade get marginalised due to the shift to dominance and entry of traders in harbour-based fishery.

In addition to the above, in some cases since ports are close to river mouths they destroy and reclaim ecologically sensitive areas which in turn decreases fish catch e.g. Mundra Port. (NFF 2008; Asher & Oskarsson 2009). There have been very few detailed documented struggles against port projects. A few cases with the issues are compiled in the table 11 - page 33.

With one fishing hamlet every 2 km and a port proposed every 28 km; port development in India has serious implications and impacts on fishing communities and the environment. An important fact is that several of these minor ports are situated in highly sensitive ecological regions that have highly productive fisheries, supporting the livelihoods of a large number of communities. The environmental and social costs of port project cannot be ignored and port planning needs to factor in these serious concerns.

The latest CAG report of 2009-2010[35] on major ports performance pointed many environment pollution related issues in major ports:

- At Mumbai port - one of the highest POL cargo handlers in India, marine pollution equipment procured at Rs. 2.63 crore between 1991 and 1995 was not being utilised properly due to the absence of trained staff and proper maintenance. Non-removal of old pipelines also constituted safety hazards.

- At Tuticorin, there was no oil spill response equipment.

- No scuppers[36] structures were found installed at Kolkata, although significant oil handling was occurring at jetties outside the dock systems. In the absence of these, the oil jetties and installations at Kolkata remained greasy.

- There was no ballast[37] facility at the berths at Cochin.

- At Mumbai, the Pollution Control Cell was inadequately manned, there was poor maintenance of pollution control equipment and the air quality was not being adequately monitored.

- New Mangalore indicated high levels of pollution at bulk handling berths like ore and coal berths.

- Although the port put in place all the requisite measures, the NITK reports revealed high dust pollution within the port premises in two out of the three months surveyed by them. Critical parameters like SPM and RPM were beyond tolerance limits.

[35] See CAG Report No. 3 of 2009-10 on Performance Audit of Functioning of Major Port Trust in India - Ministry of Shipping, Available at http://www.cag.gov.in/html/reports/civil/2010_3AB_PA/contents.htm

[36] Openings in side walls allowing draining out of liquids.

[37] Water filled devices used on ships for stability. To avoid marine pollution by introduction of invasive species during ballast discharge from tankers, specific facilities need to be created.

Table 11: Minor ports, Major struggles: protests and struggles against ports

Port	Issues and concerns
Mundra (Gujarat)[a]	• Reclamation and destruction of mangroves -560 ha. • 500 families dependent on fishing face the threat of losing their livelihoods as the port and jetties expand into their traditional fishing harbours. • Dredging activities at the port and movement of barges and large shipping vessels affect fish catch. • Destruction of nets. • Obstruction of access. • Eviction. • Impact ancillary development and industry.
Gangavaram (Andhra Pradesh)[b]	• Displacement of about 3,600 families of Gangavaram. • People are unsatisfied with the compensation and rehabilitation package. • Many protests take place leading to firing on 27th March 2007 where one fisherman was killed and 12 others were injured. • Obstruction of access; people demanded that the jetty distance be reduced by 15 km. • New settlement homes are now much farther away from the sea. • Concerns over dredging, siltation and the construction of breakwaters. • Gangavaram fishers are denied access to their traditional fishing grounds, which is compelling them to move towards poor fishing grounds. The port was inaugurated on 12th July 2009 despite ongoing protests and demands of the fishing community.
POSCO Jatadhar (Orissa)[c]	• Impacts on Jatadhari estuary - a fragile estuarine stretch, the spawning and breeding grounds of several fish species. • The construction at the mouth might cause water logging along the length of the creek and eventually destroy it, resulting in loss of livelihoods. • While the official figure of the number of families affected is quoted as 'up to 400', according to the local leaders of the movement against the POSCO project, the entire population of 22,000 will be affected by the project, due to displacement of livelihoods based on a thriving agricultural economy. • Problem with land records - lack of recognition of land titles and use of land by communities. • Direct displacement of several fishing communities. • Dredging in areas which are currently fishing grounds for the people of the area, and will therefore impact the entire coastal ecosystem of the region. • Opposition at the plant and port site from the very time the news about the project first spread in 2005. • POSCO Pratirodh Sangarsh Samiti formed at the local level and has been leading the struggle against POSCO till date. • The actions taken by local communities include the picketing of the POSCO local office, rallies and demonstrations and blocking off access to the village to all government and POSCO officials by setting up check posts.

[a] Asher & Oskarsson 2009; NFF 2009
[b] Anon 2006a; Anon 2006b; Anon 2006c; Anon 2009a.
[c] Asher & Kohli 2007; Bijulal et al. 2007; NFF 2008.

Port	Issues and concerns
Umargaon (Gujarat)[d]	• Wide scale protests-fisherfolk from Kinara Bachao Sangharsh Samiti (save coastline movement), or KBSS in early 2000. • Displacement of fishing communities. • Impact of harbour based fisheries on traditional fisherfolk. • Destructions of highly profitable traditional fishing and agriculture of area. • Port-protester and activist Lt. Col. (Retd.) Pratap Save (55) dies. Save was allegedly beaten up by the police in custody on 7th April 2000 following a protest by villagers of the area against the survey work being carried out for the port in Umargaon. • Protests led to the withdrawal of UNOCAL- the promoter.
Puducherry[e]	• In the year 2007, five thousand protestors had marched to the Puducherry bus stand demanding the cancellation of the deep water port. • Fishers see this as an excuse to usurp prime coastal land for low prices. • All Puducherry fishworkers are anticipated to be affected and over two lakh people have been constantly agitating against the construction of ports and harbours. • Construction of breakwaters and dredging for the port has already resulted in the accretion and erosion along different parts of the beach. • In Veerampatnam, four hundred families out of a total of 1800 would lose their land. 75% of the villagers are below the poverty line. Fishers fear that their boats will be damaged and livelihoods would get jeopardised by the project. The government is continuing to build the deep water port and upgrading the existing fair weather port.

[d] Bakshi 2001; Anon 2001; NFF 2008; Anon 2009a.
[e] NFF 2008; Anon 2008a.

Environmental regulation framework

The International Association of Ports and Harbours 'Guidelines for Port Planning and Design, 2001' makes the following observation: *'Ports are areas where several modes of transport come together and where industrial activities take place. This means that in port areas, the environmental components such as water, air, soil are at risk of being contaminated as a result of a large number of activities occurring within a relatively small area. In the decision making process, the environmental must be considered alongside economic aspects.'*
India uses a combination of laws to make decisions on permitting, monitoring and regulating industrial and infrastructure related activities. The influence of these laws ranges from decisions regarding the location of a port up to its daily operation aspects.
Environmental clearance for a port project also attracts provisions of other environment-related laws such as the Water and Air Acts[38], which seek to offer special protection to particular components of the ecosystem. .

Other legislations that govern port operations are:

- Manufacture, Storage and import of Hazardous Chemical Rules, 1989
- Hazardous Wastes (Management and Handling) Rules, 1989
- Rules for the Manufacture, Use, Import, Export and Storage of Hazardous Micro Organisms, Genetically Engineered Organisms or Cells, 1989
- The Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act, 1976
- Merchant Shipping Act, 1958

Other specific legislation that depend on the site and location of the port are:

- Ancient Monuments and Archaeological Sites and Remains Act, 1958
- Offshore Minerals (Development and Regulation) Act, 2002
- Forest (Conservation) Act, 1988
- Wild Life (Protection) Act, 1972, with amendments of 1983,1986 and1991

Many national specifications and regulations relating to loading and safety at sea are largely based on international agreements and conventions. International regulations relevant to ports and harbours are:

- International Convention for the Prevention of Pollution from ships (MARPOL)[39]
  (Deals with the prevention of pollution of the marine environment from discharges of oil and other harmful substances during the operation of the port and the minimisation of accidental discharges)
- International Maritime Dangerous Goods Code (IMDG-code)[40]
  (Concerned with methods of safe transport of dangerous cargo and related activities. It sets procedures for labelling, documentation, marking, storage, segregation, and packing of dangerous goods)
- United Nations Convention on the Law of the Sea (UNCLOS)[41]
  (The Law of the Sea Convention defines the rights and responsibilities of nations in their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources. The main objective is the obligation to prevent pollution damage by addressing particular sources of pollution, including those from land-based activities, sea-bed activities, dumping, vessels and from or through the atmosphere)

[38] Water (Prevention & Control of Pollution) Act 1974 amended in 1988. Air (Prevention and Control of Pollution) Act 1981 amended in 1988
[39] See http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258
[40] See http://www.imo.org/Safety/mainframe.asp?topic_id=158
[41] See http://www.un.org/Depts/los/index.htm

Environmental clearance and ports

The main notifications dealing with port clearance were the CRZ Notification, 1991, the EIA Notification, 1994 and the EIA Notification 2006.

The Tenth Five Year Plan highlights the fact that environmental issues need to be addressed in port development projects (Planning Commission 2002). It mentions the following points:

(i) the impact of dredging and disposal of dredged material on the marine environment;
(ii) impact of a project on shore line stability i.e. accretion/erosion;
(iii) impact on ecologically sensitive areas like mangroves, coral reefs, sand dunes, breeding and nesting grounds, migratory path of turtles etc.;
(iv) impact on the hydrological balance of the area, including quality of ground water;
(v) impact on coastal water due to pollution (liquid effluents and solid waste) from port activities;
(vi) impact on fisheries and the fishermen;
(vii) risk analysis and its impact on both aquatic and terrestrial ecology, including humans;
(viii) disaster management/contingency plans to meet emergency situations, if any.
(ix) disaster management/contingency plans to meet emergency situations, if any.

While stating the above it however notes that *"the procedure with regard to environmental clearance needs to be reviewed and simplified"*. This is reflective of the ongoing conflict between development and protection objectives. Both the CRZ and EIA Notifications were victims of repeated amendments as a result of development pressures (Kohli & Menon 2005; Sridhar 2005)

EIA Notification, 1994 and minor ports

As mentioned earlier, the term 'minor' only denotes those ports that are under the administration of the State Government, while 'major' ports are administered by the Central Government. This distinction played a role in the application of certain environmental regulations. An acknowledged fact is that most 'minor' ports are not really minor in scale or investment (Sekhsaria 2002; Sridhar & Parthasarathy 2003). Under the Environmental Impact Assessment (EIA) Notification of 1994[42], however, minor ports were exempt from the environmental clearance process. In 2006 the Indian Ministry of Environment and Forests (MoEF) replaced the 1994 EIA Notification with the 2006 Notification. The 2006 version incorporates all ports (both major and minor). However, in the interim, no minor port had to obtain environmental clearance under the EIA Notification 1994 process.

Although exempt under the EIA 1994 notification, minor port projects were required to conduct certain assessments and seek environmental clearance under another law – the Coastal Regulation Zone (CRZ) Notification, 1991[43] as the sites fell within the coastal regulation zone. Therefore, though the minor port projects of this time did undergo some environmental scrutiny, they missed out on the dedicated coverage of an impact assessment law. For instance, unlike the EIA Notification, 1994, the CRZ Notification does not require public hearings as part of the clearance process (Sridhar 2001; Sridhar & Parthasarathy 2003).

The implications of escaping the attention of the 1994 EIA Notification was that the minor port development projects proposed at this time (such as Dhamra in Orissa) did not undergo any public hearings. Neither did these proposals come under the purview of the regulatory committees and agencies specified under the EIA Notification. Although the new EIA 2006 notification now covers minor ports as well, much damage has already taken place by this serious omission in the earlier notification.

[42] Issued under the Environment (Protection) Act, 1986.
[43] Notification S.O 114(E) was issued on 19th February 1991.

EIA Notification, 1994 and major ports in the CRZ

The Environment Impact Assessment Notification, 1994 stated that any person who desires to undertake any new project in any part of India or the expansion or modernisation of any existing industry or project listed in Schedule-I of the notification, should obtain environmental clearances from the Ministry of Environment and Forests. However, the EIA Notification 1994 also stated:

> *3. Nothing contained in this Notification shall apply to:*
> *(a) any item falling under entry Nos. **3,** 18 and 20 of the Schedule-I to be located or proposed to be located in the areas covered by the Notifications S.O. No.102 (E) dated 1st February, 1989, S.O. 114 (E) dated 20th February, 1991; *S.O. No. 416 (E) dated 20th June, 1991* and S.O. No.319 (E) dated 7th May, 1992.*
> *(b) any item falling under entry no. 1,2,**3**,4,5,7,9,10,13,14,16,17,19,21,25,27 of Schedule-I if the investment is less than Rs 100 crores for new projects and less than Rs. 50 crores for expansion / modernization projects.";*

In Schedule I of the EIA Notification Item No 3 was Ports, Harbours, Airports (except minor ports and harbours).

Para 3(a) of the EIA Notification had some serious implications:

➔ Firstly, it is clear that minor ports were exempt from the provision of the EIA Notification, 1994. This is despite the fact that there were certain proposals for minor ports where the investment and size exceeded that of existing major ports.

➔ Secondly, the provisions of the EIA Notification did not apply to areas within major ports that fell under the CRZ Notification. This is because all activities in Item No 3 were exempt from the EIA Notification if they were located within the areas covered by the CRZ Notification. Since ports (both major and minor) are located on the coast, they inevitably fall within the jurisdiction of the CRZ Notification.

➔ Port projects (both major and minor) nevertheless require environmental clearances from the Ministry of Environment and Forests as per Para 3(2) (ii) of the CRZ Notification.

➔ The MoEF has also published guidelines for according this environmental clearance for port projects (both major, minor and also its components, expansion etc). However, as seen earlier, these guidelines lack the element of public participation and are not subject to the procedure or scrutiny of the agencies specified under the EIA Notification. This also meant denying the public legitimate access to information such as the Environment Impact Assessment Reports, Environment Management Plans etc as mandated by the EIA Notification, 1994.

➔ The absence of a clear public participation and consultation element from the clearance procedure was a setback for several communities and citizens who would be impacted by port development that was cleared in this period.

Transfer of powers to the Ministry of Surface Transport (MoST) 1997-2001

The second gap in the environment clearance came from an amendment on July 9, 1997 to the CRZ Notification which transferred the powers and responsibility of according environmental clearance to port projects from the Ministry of Environment and Forests (MoEF) to the Ministry of Surface Transport (MoST). A Writ Petition was filed in the Delhi High Court [CWP 4198/97] where the petitioner stated that the delegation of powers from MoEF to MoST was an abuse of the delegated power of the Central Government and was *utravires* of the Business Allocation Rules 1961. The petitioner in CWP 4198/97 had prayed for the entire notification to be quashed. An amendment dated August 4, 2002 divided the responsibility of granting environmental clearances between the Ministry of Environment and Forests and the Ministry of Surface Transport. However, finally in light of the Writ Petition [CWP 4198/97], the amendment to the CRZ dated April 12, 2001 withdrew the delegation of powers to accord clearances to the MoST. Though the transfer of power was reversed the earlier clearances given in this period were held valid.

Implications

The absence of a clear public participation and consultation element from the clearance procedure till 2006 was a setback for several communities and citizens who would be impacted by port construction. It did not allow local coastal communities living in the vicinity or fisherfolk using these waters an opportunity to express their viewpoints and participate in the environmental decision-making process. In India, several faults with the EIA reports prepared by consultants have come to light only through public hearings and the availability of reports through the public hearing related procedures where these reports are kept in local district offices, as per the EIA Notification, 1994 (Rodriguez & Sridhar 2008).

The transfer of environmental clearances from MoEF to MoST created a situation where essentially, the MoST which has a primary mandate towards the growth of shipping and ports in the country had granted clearance to a project which would benefit it. This reflects a grave conflict of interest (Rodriguez & Sridhar 2008). Though the 1997 amendment was reversed by another amendment to the CRZ in August 2000, the earlier clearances held good.

In fact both these gaps made the environmental clearance 'easier' for state governments and the project proponents (Sekhsaria 2005). It should be noted that many important port projects with environmental and social concerns were cleared prior to 2006 (no public hearing) and during the period when the Ministry of Surface Transport was giving clearances. Examples are the Mundra and Dhamra port (Rodriguez & Sridhar 2008). Sridhar and Parthasarathy (2003) have highlighted past loopholes and gaps in environmental laws and also the poor state of implementation of laws governing maritime trade and the marine environment.

EIA Notification, 2006

In 2006, the MoEF replaced the EIA Notification, 1994 with a fresh notification which broadly classified ports and harbours by their handling capacity into categories as shown below:

	Category A: Requiring central clearance	**Category B: (B1 , B2) Requiring state clearance**
Ports and Harbours	Ports with more than 5 million TPA of cargo handling capacity (excluding fishing harbours)	Ports or harbours having less than 5 million TPA of cargo handling capacity Harbours having 10,000 TPA of fish handling capacity

Category A requires clearance from the central government level while category B1 and B2 from state government. Only categories A and B1 require public hearings. Category B2 Category 'B2' and do not require an Environment Impact Assessment report.

Implications

In the current EIA legislation, the guidelines as to what constitutes B1 and B2 categories are not clear and it would be seem that currently it is left to the arbitrary discretion of the state government. (B1 and B2 fall into category "B' of projects requiring clearance by a respective state government with the latter not requiring an EIA at all).

Another important omission in the current EIA legislation of 2006, given the type of impacts that ports, jetties and harbours have (especially on shorelines) is that ports and harbours less than <10,000 TPA of handling capacity are exempt for the clearance process.

Public hearing and social concerns

The public hearing provision though introduced for ports into the legislation only in 2006, in general for all projects and sectors is perhaps one of the weakest elements in the EIA process. Unlike other countries where public participation takes place at various stages of the EIA - screening, scoping, report making and decision-making, in India it is confined to the period just preceding the final decision and is often viewed as just a formality by the government and project proponent. Very rarely has a project been rejected based on the findings of public hearings.

EIAs are controversial in India and is a function of poor participatory democracy in the formulation and implementation of environmental legislation (Thapliyal 2010). The MoEF has made many attempts to remove participation and public hearing from projects over the last 5-6 years, some of which have been successful (Kerdeman 2009).

Public hearings are often the only formal window for communities to address socio-economic concerns and impacts within the legal framework. Even if public hearings are taken in the spirit of participatory democracy and decision-making, one wonders if the MoEF is the correct agency to address such issues or if they have the capacity and mandate to evaluate and review such concerns. Often, the public hearing process takes place independent of the rehabilitation process and programme which is usually handled by the respective state government as land and rehabilitation fall under state government jurisdiction.

EIA Guidelines - Lack of sector specific guidelines

MoEF Guidelines

One of the early attempts to assess environmental impacts was made in 1989 when the Ministry of Environment and Forests brought forth its 'Environmental guidelines for Ports and Harbour Projects.' This evolved into guidelines that the MoEF's infrastructure committee followed while considering the clearance of port related projects under the CRZ Notification.

NEERI EIA Manual for ports

In 2001, NEERI prepared manuals for conducting EIAs for various sectors for the MoEF[44]. However, these manuals do not cover marine and coastal aspects at all and are mostly terrestrial in nature (dealing with air, water and soil pollution). The currents status of the NEERI manuals is not clear, particularly whether they are being adopted as part of the environmental clearance protocols (Sridhar 2006). However, many legal experts regard it as within the purview of the legislation under the Environment (Protection) Act, 1986[45].

NIOT Guidelines for Ports and Harbours

Under the MoEF project 'Environment Management and *Capacity* Building" funded by the World Bank, '*EIA Guidelines* for *Ports and Harbours*' was developed by the National Institute of Ocean Technology in 2003. This guideline intended to be an aid to preparing EIAs for port and harbours. It was comprehensive, India-specific and provided specific guidelines, protocols and standards to be followed. It would not only protect the environment from costly mistakes but also aid as a tool for the review of port and harbour EIA reports. The guidelines would also help in developing EIA reports that were not only comprehensive in their context but would also reduce the delays and cost of EIA preparation. However, the MoEF did not commission a peer review of it by a committee as is convention and did not finalise the report and issue it as one of its policy guidelines (B. R. Subramaniam, pers. comm., 2010).

The report on '*EIA Guidelines* for *Ports and Harbours' does mention when a comprehensive EIA is required. It states that "breakwater projects, port and harbour projects initiated for the sake of industries, projects involving resettlement and rehabilitation issues, projects located in critical habitats etc require an extensive or comprehensive EIA"* (NIOT 2003) and that captive jetty or projects that do not involve ancillary growth, resettlement issues, induced developments and projects located in non-critical habitats may adopt rapid EIAs.

Section 1.3 of the MoEF's EIA Manual states 'The difference between a Comprehensive EIA and a Rapid EIA is in the time-scale of the data supplied (NEERI 2001). The Rapid EIA is meant for a speedier appraisal process. While both types of EIAs require the coverage of all significant environmental impacts and their mitigation, a Rapid EIA achieves this through the collection of *'one season' (other than monsoon) data only to reduce the time required.'* Thus, in a comprehensive EIA, the time scale of the primary data supplied is three seasons' baseline data.

Are present there are no clear guidelines mandated by law for the preparation of EIAs for ports and harbours. With neither the MoEF nor state governments following procedures that insist on conducting comprehensive EIAs, most port project proponents conduct only a rapid EIA. The Sethusamudram Ship Canal Project (Rodriguez 2007; Rodriguez 2008) and Dhamra Port (Rodriguez & Sridhar 2008) are examples of the same.

[1] Under the "Environment Management and Capacity Building" project of the World Bank, the MoEF awarded a contract to the National Environmental Engineering Research Institute (NEERI), Nagpur to produce a National Guidance Manual on EIA Practice with support manuals.

[2] T. Mohan, pers.comm. , 2009.

Need for Regional EIAs in port projects

Port and harbour projects normally trigger the growth of industries and result in the rapid industrialisation and urbanisation of the region (Aiyar 2009). This consequently brings in further environmental impacts and this has been highlighted in NIOT's *EIA Guidelines* for *Ports and Harbours* that port projects resulting in development of an entire region in terms of ancillary industries and/or induced developments require a regional EIA (NIOT 2003). Regional EIAs involve an EIA assessment of the cumulative environmental impacts of a proposed project and likely ancillary development of the surrounding region, about a radius of 50-80 km.

Problems with EIA quality

The EIA quality in most projects are found wanting with many gaps. The Dhamra port EIA is one such example, many experts unanimously agree that the Kirloskar EIA study of this project was inadequate, incomplete and had poor baseline ecological data and alarmingly little references to the mass nesting and breeding grounds of sea turtles. Its Hazard Analysis and Risk Assessment was also of very poor quality. It did not take into account impacts of oils spills, illumination from the port, continuous dredging, ship movement or any mention of the impact on shoreline ecology (Johnston & Santillo 2007; Rodriguez & Sridhar 2008). One of the reasons attributed for weak EIAs is that in most projects the EIAs are done by consulting firms and agencies that have no experience and expertise in marine and coastal systems in addition to the fact that port sector specific guidelines have not been issued by the MoEF.

Lack of monitoring and mitigation measures adopted by ports

A common gap in EIAs in all sectors is that they do not mention in detail the cost of implementation of their Environment Management Plan (EMP), or the responsibility and time period of implementation (Paliwal 2006). In many cases the EMP is not implemented or followed and this is also coupled by weak enforcement by the regulatory agencies providing no motivation to the proponent to comply.

Given its nature of impact, a port must, consequently, minimise sedimentation and coastal impact. Attention has not always been paid to these requirements. The result is that many ports trap large amounts of sand and suffer from severe sedimentation. In most cases ports are supposed to monitor and report shoreline changes. Most ports are supposed to take mitigation measures to address this problem e.g. for the east cost - dredging and replenishing the sand in the northern side of port). Some mention mitigation measures in their Environment Management Plan (EMP) of the EIA but do not actually implement these.

Some ports are supposed to have a sand bypass system in the port's design to address and prevent sea erosion, where silt from the harbour would be dredged and artificially pumped to the other side, restoring the movement of sediments along the coast. In most cases the systems for this are not in place or not implemented which results in severe erosion north of the port. The only port carrying out such measures is the Vishakapattinam Port (B. R. Subramaniam, pers. comm., 2010). Another example of erosion is Puducherry, where the problem began in 1989, when a harbour was built at the southern tip of the Union Territory. As mentioned earlier, this problem was anticipated and a sand bypass system was incorporated in the harbour's design to mitigate sea erosion problems. The sand bypass system was installed but seldom used except for a brief period between 2000 and 2001, when small stretches of beach began to reappear. However, the system was discarded in 2002, and the beaches disappeared once again (Anon 2008b). By 2002, Northern Puducherry beach had lost all its sand.

A moratorium: Enough is not really enough

The idea of a moratorium on new ports and port expansion

On June 15, 2009, the Ministry of Environment and Forests (MoEF) constituted a four-member Committee under the Chairmanship of Prof. M.S. Swaminathan to recommend future steps on the draft Coastal Management Zone (CMZ) Notification, 2008.

In its report titled 'Final Frontier', among other issues, the committee pointed out that India's shoreline was undergoing a major change due to a large number of port projects and that there was little information of their cumulative impact on the coastline. It stated that many of these infrastructure projects had caused significant shoreline changes, as in Ennore (Tamil Nadu), Puducherry, Alibag (Maharashtra), Digha (West Bengal) and Dahej (Gujarat). The report recommended that *"the government must immediately study the cumulative impact of the individual projects on the coast line, pending which there should be a moratorium on expansion of existing ports and initiation of new projects along the coast"* (MoEF 2009a).

Based on the above recommendation, on August 21, 2009 the MoEF issued an office memorandum imposing a three-month moratorium on proposals it had received for new ports or harbours besides expansion of existing projects (MoEF 2009b). The note said that the Ministry would evolve a policy for consideration of projects along the coast, particularly the activities relating to ports, harbours, jetties and expansion of such activities. It also said that the projects that have been recommended by the Expert Appraisal Committee till July 2009 would be processed on merit while decisions would be deferred on proposals received after that, till October 2009 when the study would be completed. The MoEF requested the Ministry of Earth Sciences (MoES) through its Integrated Coastal and Marine Area Management (ICMAM) Project Directorate to initiate a study on the cumulative impact of the existing projects. It was generally expected that a study of the cumulative impact of the individual port projects on the coast line would at least take a year and half or more.

Ministry of Earth Sciences (MoES) Report – limiting the moratorium

In October 2009, the ICMAM Project Directorate, Chennai and Indian National Centre for Ocean Information Services, both under the Ministry of Earth Sciences submitted their report "*Report on the use of Satellite data for detection of violation of land use along the Coastal Regulation Zone and impact of port structures on shoreline changes*". The first part of the report was only a review of case studies of individual impacts of port projects on shorelines. It also was the first comprehensive report giving an overview of areas affected the coastal erosion. In fact the ICMAM report mentions coastal structures constructed for port operations as the major anthropogenic cause of shoreline erosion (MoES 2009). Its main recommendations were:

- Avoid port structures at least 5 km on either side of eroding locations (listed in the report).
- Location of ports should be avoided around 10 km on either side of ecologically sensitive areas, estuaries and lagoons of biodiversity importance.
- For other locations (not listed in the report), the status of erosion should be verified first.
- Ports and harbours may be permitted in non-eroding locations confirmed by the state government on the condition that if the predictive models indicate that the impact of ports cause erosion or accretion, remedial measures must be part of the Environment Management Plan.

The 10 km buffer was recommended based on the assumption that ports do not normally follow remedial measures (such as sand bypass systems). These remedial measures should normally be incorporated into the Environment Management Plans. The second assumption was that shoreline impact s are usually felt up to 2-3 km on either side of a port (B. R. Subramaniam, pers. comm., 2010).

These assumptions are valid and represent actions taken under the precautionary principle. However, while the above assumptions are true in terms of the quantum of beach and sediment loss, it may not hold true in terms of the impact on the nature of the beach type and profile in terms of gradient, grain size, etc (Naveen Namboothri[46], pers. comm., 2010).

Withdrawal of the moratorium

Based on the study the MoES on November 3, 2009, the MoEF issued an office memorandum withdrawing the moratorium on new ports and port expansion projects subject to conditions summarised below (MoEF 2009c).
Expansion of existing ports and harbours within their notified port limits could take place if:

- If hydro-dynamic studies indicate that the expansion activities of an existing port do not have significant impact to the shoreline abutting the project [Section 5A(i)].
- If the project has no significant impact on the ecologically sensitive areas along the stretch. [Section 5A(ii)].
- New projects proposed at sites identified as Areas of Critical Erosion are to undertake a Comprehensive Environment Impact Assessment [Section 5B].
- No projects are to be permitted in hotspot stretches viz. those areas which are prone to high erosion above 1 meter per year (identified by the concerned central/state government agencies) [Section 5C].
- No port project are to be permitted within 10 km on either side of the eco-sensitive areas categorised as Coastal Regulation Zone-I(i) and water bodies with high bio-diversity [Section 5C].
- Ports to be located in the Andaman and Nicobar Islands are to be follow the CRZ and approved Coastal Zone Management Plans. Port projects above 5 MTPA should undertake a comprehensive EIA [Section 5D].

Table 12: Comparison of the MoES report and MoEF November 2009 Office Memorandum

MoES/ICMAM Report	MOEF Office Memorandum
No project to be located within 5km of eroding locations listed in its report	5B. Comprehensive EIA required port projects in areas of critical erosion areas_ 5C. No projects in areas where erosion is above one meter per year.
No project in ecological sensitive areas such as estuaries and lagoon of biodiversity importance	5C. No projects in locations: a) identified within 10 km on either side of the eco-sensitive areas categorised as Coastal Regulation Zone-I(i) b) Water bodies with high bio-diversity, *Contradictory clauses* Expansion of existing ports and harbours, jetties allowed subject to the condition that it has no significant impact on the ecologically sensitive areas along the stretch.

[46]Marine Biologist, Dakshin Foundation and Post Doctoral Fellow, Centre for Ecological Sciences, Indian Institute of Science, Bangalore.

This MoEF Office Memo reverses the earlier August 2009 moratorium on port development. The earlier moratorium (recommended in Final Frontier) was the result of campaigns by various groups that highlighted problems created by ports - namely shoreline changes and displacement, amidst a range of other points such as loss of access to beach space, pollution and changes to social structures along the coastline. The relaxations and conditions of the MoEF Office Memo are highly problematic. Through the MoEF memo, port development can be resumed provided points A-D of point 5 of the memo are considered. It is not clear who will monitor these though. Some of the problems with this memo are presented here:

- The definition of ecologically sensitive areas is missing. Specifically, the words used in the MoES report such as 'estuaries and lagoons' are not used.
- There is no definition of 'water bodies of high-biodiversity value' (where ports are prohibited according to Section 5c).
- In the context of point 5C, why is there no mention of the Dhamra port close to Gahirmatha? (no locations identified within 10 km on either side of the eco-sensitive areas categorised as Coastal Regulation Zone-I(i))
- Section 5D assumes that the finalised CZMPs for Andaman and Nicobar Islands and Lakshadweep Islands actually exist and that their categorisation is universally accepted.
- The conditions are based on the existing CRZ notification and its accurate implementation - such as with the identification of the CRZ -I (i) areas.
- ICMAM's work on violations has not found any mention in the memo and it is not clear what action will be taken on those recommendations.
- The MoEF memo in effect tries to locate ports (known to create shoreline changes) in places that didn't have any existing shoreline changes (listed by the ICMAM study). Even if port developers aren't keen on locating in high-erosion areas, the MoEF appears to be okay with permitting ports even in areas that have shoreline changes. [See point 5 B].
- The conditions suggest that all new port projects need to conduct comprehensive and meaningful sounding EIAs (as in the NIOT/ICMAM report on EIA guidelines for ports) only if they take place within these high erosion areas. This suggests that other projects can be satisfied with rapid EIAs.
- While the MoES report states that no project would be located within 5 km of areas with high erosion listed in its report, the MoEF Office Memo states that no projects would be located in areas where erosion is above one meter per year.
- What is the significance and basis of the threshold of erosion is above one meter per year mentioned in 5 A(i)?
- It is not clear what the need is to locate ports in areas of high erosion in the first place.
- There is no mention of the fact that even in non-eroding areas, ports can result in erosion and shorelines impacts. Neither is it recognised that ports do not usually factor in their EMPs any remedial measures or implement these.
- Between the earlier August 2009 moratorium and the latest November 2009 MoEF office memo, the public's objections to port development has coalesced into only one problem shoreline changes.
- No mention is made of any of the social factors in deciding port development. Cited problems of beach and sea access and displacement are not considered by the MoEF in this memo.

There appears on the whole, to be a disconnect between the initial people's demands, leading to the Minister Jairam Ramesh's promises regarding a moratorium on ports, the ICMAM study and finally the November 2009 memo, all of which seem to be floating in independent universes.

Holistic approach: wholly missing

The second part of the report consisted of a comprehensive proposal to study and identify the shoreline changes at the micro level and map them in at least 1:25000 scale maps. The MoES /ICMAM Phase II Study on Shoreline Studies would involve an analysis of time series satellite images from 1960 onwards. The office memo provides details about the ICMAM Phase II study. However, this study does not seem to have any clear purpose as far as a regulatory objective is concerned. For instance, it does not study which kind of port development causes 'significant impacts to shorelines'. It is not clear what decisions will be taken on existing port development based on Phase II of the study?

The memo also stated that based on this above study, a national policy on setting-up of new projects pertaining to development of ports and harbours would be drawn up in consultation with concerned Ministries/Agencies.

The policy of the MoEF regarding port development in the country is centred only on one environmental aspect of the impact of ports, namely on shoreline erosion. It does not include other dimensions mentioned in this report such as social factors in deciding port development - problems of beach and sea access and displacement of communities. Other serious environmental impacts, such as pollution, ballast water discharge and pollution from regular port operations are ignored in the port development approach of the MoEF. If the objective indeed is to develop a national policy pertaining to development and planning of ports and harbours, then a holistic approach and investigation into problems and solutions is the very minimum effort one should expect from the MoEF.

Conclusion and recommendations

The previous sections have revealed gaps and concerns in port planning with grave implications for the environment and coastal communities.

Currently, according to our study, there are 181 minor ports notified and proposed along the coast of mainland India. This translates to a port being located every 30 km of the Indian mainland. Besides its own impact, port development is often accompanied by other activities such as the location of industries, power plants, railway lines, highways, hotels, SEZs, residential complexes, etc. that have multiple detrimental impacts – environmental, social and (with particular reference to the coastline) erosion related. Such a development model would not confer any economic advantage and will not be optimal given that most major ports in India currently not only lack efficiency (CAG 2010; Sundar 2000)[47] and but also have the potential for significant improvements in terms of operations, expansion of capacity and modernisation (Planning Commission 2007; Ministry of Shipping, Road Transport and Highways 2003).

There is need to formulate a series of interventions, programmes and policy changes both at the central and state levels to incorporate these systemic issues into structures and processes of regulation and planning. The focus should be based on optimisation and rationalisation of port development through central planning of port sites (major and non-major) in terms of numbers, location, sizes, type (captive/multi-user, coastal/non-coastal shipping) and capacity. Here, profitability, economic and technical viability, and issues of environmental and social equity need to play a continuous and equally important role. State governments can continue to earn revenues from minor ports that are planned in this manner.

Based on the observations and review, the following are recommended:

➔ *National port planning policy:* The MoES /ICMAM study is not comprehensive and holistic enough to be the basis for developing a national policy on setting-up of new projects pertaining to the development of ports and harbours. It does not seem to have any clear purpose from a regulatory point of view. A detailed study from economic, environmental and social dimensions is needed to supplement the MoES /ICMAM study. This must include a study and review of social and environmental impacts (including cumulative and ancillary development impacts) of all existing port projects and their operations till date in the country with a one and half year time frame. A start in this direction would be to develop a terms of reference for this study and open it for public discussion and inputs. Its objectives need to be clear and should feed into regulatory and policy processes. The stakeholder representatives, experts involved should be drawn from the Planning Commission, Ministry of Environment and Forest, Ministry of Shipping and National Fishworkers' Forum, academic institutions, experts from shipping and port sector and NGOs.

➔ *Role of public port authorites:* As compared to major ports, non-major ports operate with lesser regulatory oversight. The government has taken initiatives to simplify regulations. However, such disparities in regulation must be removed to create a level-playing field. There is also an immediate need for a public port authority that could be considered at the central level with a mechanism for coordination with the state governments as a means to increase focus on areas such as long-term planning, infrastructure development, asset management, and regulatory functions such as maritime safety, environment protection, social concerns and fair competition. A task force consisting of the Planning Commission, Ministry of Shipping and respective state representatives could be constituted to develop this further with clear roles and functions.

[47] CAG Report available at http://www.cag.gov.in/html/reports/civil/2010_3AB_PA/contents.htm and Sundar, 2000 is available at http://www.teriin.org/upfiles/pub/papers/ft22.pdf

➔ The MoEF should assess and develop very clear guidelines and terms of reference (ToR) for identifying ecologically sensitive and important socio-cultural areas in the coastal zone. Once this is done, a buffer 'no development' zone for at least a 10-25 km radius around these areas may be demarcated. Ports, harbours and industrial development in this zone must be prohibited, and all other activities, should be vetted and monitored to ensure they do not adversely affect the habitat. This could be done through the declaration of these areas as Ecologically Sensitive Areas through the appropriate legislations. Traditional artisanal fishing rights, practices and settlements should be fully safeguarded, recognised and protected from inappropriate development schemes through a participatory and transparent process.

➔ All states should carry out pre-feasibility and environmental and social due diligence studies on ports site identification and planning. The Central Government (Planning Commission, MoES and MoEF) should first develop guidelines, protocols and ToRs for such studies.

➔ A guideline and manual on EIAs for ports and harbours should be developed and made mandatory for adoption by all project proponents as per law. In this context, the MoEF should immediately set up a committee of experts to review the '*EIA Guidelines* for *Ports and Harbours*' developed by National Institute of Ocean Technology, Chennai. Based on the review committee recommendation the same could be finalised and adopted at the earliest.

➔ Carrying capacity assessments as well as comprehensive cumulative and individual assessments should be the basis for planning and providing safeguards to ensure that such projects are not located in the vicinity of sensitive areas.

➔ No SEZ (port based or otherwise) should be located in the CRZ area.

➔ Comprehensive EIAs and public hearings should be mandatory for all categories of ports (including captive port projects within minor port limits), harbours and jetty projects.

➔ Regional EIA (comprehensive) for all proposed ports above a certain threshold, should be made mandatory.

➔ Post-clearance monitoring should be conducted by an independent third party institution which will report directly to the MoEF. The costs of the same should be borne by respective port developer. Post-clearance monitoring by civil society should be facilitated and supported.

➔ Land acquired by port developers should be used only for port related activities and expansion. A list of port-based activities requiring the waterfront should be developed. Only these activities and development can be allowed within the CRZ. Captive power plants for ports should be located outside the CRZ. Activities and development that are not permitted in the CRZ should not be allowed in the CRZ area of ports.

➔ A framework and process to address social and livelihood concerns of communities in port based projects should be developed and adopted as part of the national port development policy. Till the above are complied with, no new port project should be cleared.

➔ Until fishing communities are accorded land rights and acess rights to areas they have lived in and accessed, and until these are legally recognised by the State in the form of legislation, no new port project should be permitted along coastal stretches if there is opposition to the project from fishing communities.

References

Aiyar, Swaminathan Anklesaria. 2008. *The Benefits of Port Liberalization: A Case Study from India.* The Cato Institute, December 03, 2008. Available on http://www.cato.org/pub_display.php?pub_id=9811

Anil, A.C., Clarke, C., Hayes, T., Hilliard, R., Joshi, G., Krishnamurthy, V., Polglaze, J., Sawant S.S. & Raaymakers, S. 2004. *Ballast Water Risk Assessment, Ports of Mumbai and Jawaharlal Nehru, India, October 2003: Final Report.* GloBallast Monograph Series No. 11. IMO London.

Anonymous. 2001. Bulwark of Umbergaon protest, Col Save succumbs to injuries. I*ndian Express*. Dated April 21, 2001. Available on http://www.expressindia.com/news/ie/daily/20000421/ina21042.html

Anonymous. 2006a Gangavaram port row: Fisherman killed. *Business Line*. Dated March 28, 2006. Available on http://www.thehindubusinessline.com/2006/03/28/stories/2006032803821000.htm

Anonymous. 2006b. A hill stands between Andhra fishermen, Gangavaram port. *Business Line*. Dated March 29, 2006. Available on http://www.blonnet.com/2006/03/29/stories/20060329031801 00.htm

Anonymous. 2006c. 280 protesting fishermen held. *The Hindu.* Dated May 06, 2006. Available on http://www.thehindu.com/2006/05/06/stories/2006050624910100.htm

Anonymous. 2008b Blocking the sea. *Down to Earth,* Vol. 17, No. 8, September 15, 2008. Available on http ://www.downtoearth.org.in/full6.asp?foldername=20080915&filename=news&sec_id=4&sid=1

Anonymous. 2008a *Port based SEZ gets priority among investors*. Dated July 29, 2008. Available on http://www.siliconindia.com/shownews/Port_based_SEZ_gets_priority_among_investors-nid-44977.html

Anonymous. 2009a Gangavaram port inaugurated. *Business Line*. Dated July 13, 2009. Available on http ://www.thehindubusinessline.com/2009/07/13/stories/2009071350851300.htm

Anonymous. 2009b Future belongs to non major ports. *Indian Express*. Dated December 10, 2009 Available on http://www.expressbuzz.com/edition/print.aspx?artid=q91Hd8rEWh8=

Anonymous. 2009c. Please leave 'minor' ports alone. *Financial Express*. Dated August 19, 2009. Available on http://www.financialexpress.com/news/fe-editrorial-please-leave-minor-ports-alone/503554/0

Anonymous. 2010. 17 power projects likely to come up in north Andhra. *Deccan Chronicl*e. Dated March 09, 2010. Available on http://www.deccanchronicle.com/visakhapatnam/17-power-projects-likely-come-north-andhra-355

Asher, M. and K. Kohli. 2007. Uneasy quiet on the POSCO front, *India Together*. Dated October 04, 2007. Available on http://www.indiatogether.org/2007/oct/eco-posco.htm

Asher, M. and P. Oskarsson. 2008. Se(i)zing the coast and the countryside. *Seminar, No* 582 *,* February 2008.

Bakshi, R. 2001. Civil disobedience in Umbergaon. *The Hindu***.** Dated July 22, 2001. Available on http://www.thehindu.com/thehindu/2001/07/22/stories/1322061c.htm

Bhaskar, U. 2007. Krishnapatnam to be India's largest power-generation hub. *Mint,* Dated June 04, 2007

Bhaskar, U. 2009, Power projects in coastal areas to drive jetty construction. *Mint.* Dated February 14, 2008. Available on http://www.livemint.com/2008/02/14002747/Power-projects-in-coastal-area.html

Bijulal, M.V., M.Asher, S. Panikkar, S. Chakravartty. 2007. Report of an Independent Fact Finding Team on Orissa's POSCO Project. *Mainstream*, Vol XLV No 21. Available on http://www.mainstreamweekly.net/article110.html

Comptroller & Auditor General of India (CAG). 2010. Report No. 3 - Performance Audit of Functioning of Major Port Trust in India - Ministry of Shipping, Comptroller & Auditor General of India, Government of India. Available on http://www.cag.gov.in/html/reports/civil/2010_3AB_PA/contents.htm

Chandramohan, P., B. K. Jena and V. Sanil Kumar. 2001. Littoral Drift Sources and Sinks along the Indian Coast. *Current Science*, Vol. 81, No. 3. pp 295.

Das, M. and Srinivasa-Raghavan, T.C.A. 2009. A safe harbour for ports. *Business Line*. Dated August 18, 2009. Available on http://www.thehindubusinessline.com/2009/08/18/stories/2009081850290900.htm

Dash, B. 2009. Orissa plans maritime board. *Business Standard*. Dated September 22, 2008. Available on http://www.business-standard.com/india/news/orissa-plans-maritime-board/335086/

Dutta, A.P. 2008. Block the Sea. *Down to Earth*. Vol. 17, No 8 , September 15, 2008, New Delhi.

Haralambides, H.E. and Behrens, R. 2000. Port Restructuring in a Global Economy: An Indian Perspective. *International Journal of Transport Economics*, Vol. XXVII, No 1, 19-39.

Integrated Coastal and Marine Area Management (ICMAM) Project Directorate. 2006. *Shoreline Management for Ennore Coast.* 6th November 2006, Integrated Coastal and Marine Area Management (ICMAM) Project Directorate. Ministry of Earth Sciences, Government of India.

Infrastructure Leasing & Financial Services Limited IIL&FS). (nd). Indian Port Sector, IL&FS Available on http://www.ilfsindia.com/downloads/bus_concept/ports.pdf

Kohli, K. and Menon, M. 2005. *Eleven Years of the Environment Impact Assessment Notification, 1994.* Kalpavriksh, Just Environment Trust, Environment Justice Initiative (HRLN). 94p.

i-maritime. 2003. *India Port Report: Ten years of reforms and challenges ahead.* I-maritime. Mumbai.

Kohli, K. and Menon, M. 2005. *Eleven Years of the Environment Impact Assessment Notification, 1994.* Kalpavriksh, Just Environment Trust, Environment Justice Initiative (HRLN). 94p.

Johnston, P. & D. Santillo. 2007. *The Dhamra-Chandbali Port: Critique of the Environmental Impact Assessment.* Greenpeace India, Bangalore. 15pp.

Kerdeman, M. 2009. *Identifying Rollbacks in EIA: Examining threats to Environmental Impact Assessment as a result of fiscal stimulus packages.* Access Initiative. Dated April 06, 2009. and Forests, New Delhi.

Kumar, R. 2003. Reviving investor interest in minor ports. *The Hindu.* Dated August 04, 2003. http://www.thehindu.com/thehindu/biz/2003/08/04/stories/2003080400040200.htm

NEERI. 2001. *Environmental Impact Assessment Manual.* Impact Assessment Division, Ministry of Environment and Forests, New Delhi.

Manoj, P. Container trade takes to coastal sea route, lowers logistics costs, *Mint*, 5th March 2009 Available at http://www.livemint.com/2009/03/05224503/Container-trade-takes-to-coast.html

Ministry of Earth Sciences (MoES). 2009. *Report on use of Satellite data for detection of violation of land use along the Coastal Regulation Zone and Impact of Port structures on Shoreline changes.* Report submitted to Submitted to Ministry of Environment and Forests (MoEF), Integrated Coastal and Marine Area Management (ICMAM) Project Directorate and Indian National Centre for Ocean Information Services (INCOIS), Hyderabad Ministry of Earth Sciences, Government of India.

Ministry of Environment Forest (MoEF). 2006. Environment Impact Assessment Notification. 14th September 2006. Ministry of Environment Forest, Government of India, New Delhi.

Ministry of Environment Forest (MoEF). 2009a. *Final Frontier: Agenda to protect the ecosystem and habitat of India's coast for conservation and livelihood security*. Ministry of Environment and Forest, Government of India. New Delhi

Ministry of Environment Forest (MoEF). 2009b. *Moratorium on expansion of existing ports and initiation of new projects along the coast - Regarding*. Office Memorandum dated 21st August 2009, Ministry of Environment Forest, Government of India, New Delhi.

Ministry of Environment Forest (MoEF). 2009c. *New Policy on expansion of existing ports and initiation of new projects along the coastline - regarding*. Office Memorandum dated 3rd November, 2009, Ministry of Environment Forest, Government of India, New Delhi.

Ministry of Finance (MoF). 2002. *Economic Survey 2001-2002*. Ministry of Finance, Government of India. Available on http://indiabudget.nic.in/es2001-02/infra.htm

Ministry of Finance (MoF). 2004. *Economic Survey 2003-2004*. Ministry of Finance, Government of India. Available on http://indiabudget.nic.in/es2003-04/chapt2004/chap96.pdf

Ministry of Finance (MoF). 2008. *Economic Survey 2007-2008*. Ministry of Finance, Government of India. Available on http://indiabudget.nic.in/es2007-08/chapt2008/chap96.pdf

Ministry of Finance (MoF). 2009. *Economic Survey 2008-2009*. Ministry of Finance, Government of India. Available on http://indiabudget.nic.in/es2008-09/chapt2009/chap910.pdf

Ministry of Finance (MoF). 2010. *Economic Survey 2009-2010*. Ministry of Finance, Government of India. Available on http://indiabudget.nic.in/es2009-10/chapt2010/chapter10.pdf

Ministry of Shipping, Road Transport and Highways. 2003. *National Maritime Development Programme (Ports)*. Ministry of Shipping, Road Transport and Highways, Government of India

Ministry of Shipping. 2008. *Annual report 2007-8*. Ministry of Shipping, Government of India. Available on http://shipping.nic.in/writereaddata/linkimages/ar4928082787.pdf

National Fishworkers' Forum (NFF). 2008. *Save the Coast, Save the Fishers: Report of "Machhimar Adhikar Rashtriya Abhiyan", May - November 2008*. National Fishworkers' Forum, Kolkata, West Bengal, India.

National Institute of Ocean Technology (NIOT). 2003. *Environmental Impact Assessment Guidelines for Ports and Harbours.* Prepared for the Department of Ocean Development under the Integrated Coastal and Marine Area Management Program, National Institute of Ocean Technology, Chennai. October 2003.

Ocean Engineering Centre. 1996. Identification of potential sites for development of ports along Orissa coast, May 1996, Ocean Engineering Centre, IIT – Madras, Madras, India.

Paul, J. 2005. More major ports a key requirement to meet export targets. *The Hindu.* Dated August 22, 2005. Available on http://www.blonnet.com/2005/08/22/stories/20050822001110600.htm

Paliwal , R. 2006. EIA Practice in India and Its Evaluation using SWOT Analysis. *Environmental Impact Assessment Review.* Volume 26, Issue 5, July 2006, Pages 492-510.

Planning Commission. 1997. *Ninth Five Year Plan 1997-2002:Volume II*. Planning Commission, Government of India. Available on http://planningcommission.nic.in/plans/planrel/fiveyr/9th/vol2/v2a7-1.htm

Planning Commission. 2002. *Tenth Five Year Plan 2002-07,Volume II : Sectoral Policies and Programmes*. Planning Commission, Government of India. Available on http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf

Planning Commission. 2006. *Towards Faster and More Inclusive Growth:An Approach to the 11th Five Year Plan*. Planning Commission, Government of India. Available on http://planningcommission.nic.in/plans/planrel/apppap_11.pdf

Planning Commission. 2007. *Eleventh Five Year Plan 2007-12:Volume III :Agriculture, Rural Development, Industry, Services and Physical Infrastructure*. Planning Commission, Government of India. http://planningcommission.nic.in/plans/planrel/fiveyr/11th/11_v3/11th_vol3.pdf

Port Planning and Construction Committee. 2001. '*IAPH Guidelines for Port Planning and Design'.* September 2001. International Association of Ports and Harbours, Tokyo, Japan.

Press Information Bureau. 2009. *Committee Of Maritime States Proposed On Traffic & Security Issues*. Dated Thursday, November 12, 2009, Press Information Bureau, Government of India. Available on http://www.pib.nic.in/release/release.asp?relid=54056

Puthur, J.J. 2007. *Coastal sediment dynamics*. Presentation at "Consultation on Restoration and Protection of Tamil Nadu and Pondicherry Coastline" organised by Auroville Coastal-area Development Centre and Pondicherry Citizens Action Network on 3 November 2007 at Auroville, Pondicherry, India.

Raja Simhan, T.E. 2006. Major plans for minor ports. *Business Line.* Dated December 04,2006. http://www.thehindubusinessline.com/2006/12/04/stories/2006120400260600.htm

Raja Simhan, T.E. 2009. Make separate traffic lanes for fishing vessels, ports told. *Business Line.* Dated May 10, 2009. Available on http://www.thehindubusinessline.com/2009/05/10/stories/2009051050950100.htm

Ramesh, S. 2009. Post details: Minor Ports to Drive Port Capacity Expansion in India. Available on http://www.imaritime.com/blogs/htsrv/trackback.php?tb_id=23

Rodriguez. S. 2007.Review of the Environmental Impacts of the Sethusamudram Ship Canal Project (SSCP). *Indian Ocean Turtle Newsletter* 6, 2007, 16-20.

Rodriguez, S. 2008. A Mockery of Science, Conservation and Environmental Laws (Op-ed piece). *The Hindu*. Dated May 9, 2008.

Rodriguez, S. and Sridhar, A. 2008. Dhamra Port: How Environmental Regulatory Failure Fuels Corporate Irreverence. *Marine Turtle Newsletter* 121:21-24.

Rodriguez, S., J. John, R. Arthur, K. Shanker, A. Sridhar. 2007. *Review of Environmental and Economic Aspects of the Sethusamudram Ship Canal Project (SSCP)*. pp 76.

Sanil Kumar, V., Anand, N. M., Gowthaman, R., 2002. Variations in nearshore processes along Nagapattinam coast, India. *Current Science*, Vol. 82,. No 11. 1381-89 pp.

Sanil Kumar, V., Pathak, K. C., Pednekar, P., Raju, N.S.N and R. Gowthaman. 2006. Coastal processes along the Indian coastline *Current Science*, VOL. 91, NO. 4, 25 August 2006, 530-536pp

Schiavina, A. 2007. *Coastal erosion at Pondicherry and Tamil Nadu.* Presentation at the "Consultation on Restoration and Protection of Tamil Nadu and Pondicherry Coastline", organised by Auroville Coastal-area Development Centre and Pondicherry Citizens Action Network on 3 November 2007 at Auroville, Pondicherry, India.

Schiavina, A. 2009. *Impacts of ports and harbours on the Coastal Ecology, Livelihood Resources and Communities along the Pondicherry-Tamil Nadu coastline.* Presentation at Consultation on the Government Policies on Ports and Harbours and its Impacts on Coastal Ecology, Livelihood Resources and Fishing Communities, organised by Coastal Action Network (CAN) and Pondicherry Citizen's Action Network (Pondy CAN), May 04, 2009, Pondicherry.

Sekhsaria, P. 2002. Minor ports, major trouble. *Business Line.* Dated July 27, 2002.

Sekhsaria, P. 2005. The Dhamra Port in Orissa. *Indian Ocean Turtle Newsletter.* 1:14-16.

Sridhar, A. 2001. Portending Threats. *Deccan Herald*. Dated July 27, 2001

Sridhar A., 2005. Statement on the CRZ Notification and Post Tsunami Rehabilitation in Tamil Nadu. UNDP Discussion Paper, New Delhi, India

Sridhar, A. 2006. *Environmental Governance Reforms, Rephrasing the Reform Process*. International Institute for Environment and Development, New Delhi. 15p. *In press*.

Sridhar, A. & M. Parthasarathy. 2003. *An account of the environmental and legal implications of minor port development in India***.** 103p. (Unpublished)

Sridhar, A. 2009. Subject: *Email/ Note on MoEF's latest office memo (namely the delicious No.15-3/2009-IA-III which is attached here) and the MoES-ICMAM-INCOIS report.* Email dated 18th November 2009.

Srividya, P.V. 2010. CPI(M) opposes proposed thermal power projects. *The Hindu.* June 07, 2010.

Sundar, S. 2000. Port restructuring in India. Presented at *Second SAFIR core training course on Infrastructure Regulation and Reform*, 4-15 December 2000, Sri Lanka.

Tata Consultancy Services (TCS). 2003. *Report on the Development of Coastal Shipping*. Tata Consultancy Services. December 2003. Available on http://www.dgshipping.com/dgship/final/tcsrep/Default.htm

Thapliyal, A. 2010. P*ublic Participation in Environment Impact Assessment*. Dated February 14, 2010.

United Nations Conference on Trade and Development (UNCTAD). 2009. *The Review of Maritime Transport: Report by the UNCTAD Secretariat.* United Nations, New York and Geneva, 2009.

UNESCAP. 1992. *Assessment of the Environmental Impact of Port Development: A Guidebook for EIA of Port Development.* United Nations Economic and Social Commission for Asia and the Pacific, United Nations, New York.

Annexure I:
Notified Ports in India

Major Ports
1. Chennai
2. Cochin
3. Ennore
4. Jawaharlal Nehru
5. Kandla
6. Kolkata + Haldia
7. Mormugao
8. Mumbai
9. New Mangalore
10. Paradip
11. Tuticorin
12. Visakhapatnam
13. Port Blair

Andaman and Nicobar Islands
1. Campbell Bay
2. Car Nicobar
3. Castle Bay
4. Chowra
5. Cinque Island
6. Diglipur
7. Dugong Creek
8. East Island
9. Havelock
10. Hut Bay
11. Jolly Buoy Island
12. Katchal
13. Kondul
14. Mayabunder
15. Mus
16. Nancowry
17. Neil
18. Pillow Millow
19. Rangat
20. South Bay
21. Teressa
22. Tillonchong

Andhra Pradesh
1. Bhavanapadu
2. Bheemunipatnam
3. Gangavaram
4. Kakinada Achorahe
5. Kakinada Deep water
6. Kalingapatnam
7. Krishnapatnam
8. Machilipatnam
9. Mutyalammapalem
10. Narsapur
11. Nizampatnam
12. Rawa
13. Vaderu/Vodarevu

Daman and Diu
1. Daman
2. Diu

Goa
1. Betul
2. Chapora
3. Panaji
4. Talpona
5. Tiracol

Gujarat
1. Bedi (Including Rozi)
2. Beyt
3. Bhagwa
4. Bharuch
5. Bhavnagar
6. Billimora
7. Chhara
8. Dahej
9. Dholera
10. Ghogha
11. Hazira
12. Jaffrabad
13. Jakhau
14. Jamnagar
15. Jodiya
16. Khambhat
17. Kolak
18. Kotda
19. Koteshwar
20. Madhvad
21. Magdalla (Surat)
22. Mahuva

23. Mandvi
24. Mangrol
25. Maroli - Umergaon
26. Mul-Dwarka
27. Navabandar
28. Navlakhi
29. Mundra Port of Gujarat Adani Port Limited
30. Okha
31. Old Mundra
32. Old Dahej
33. Onjal
34. Pindhara
35. Pipavav -Gujarat Pipavav Port Limited (GPPL)
36. Pipavav- Victor
37. Porbandar
38. Positra
39. Rajpara
40. Rupen (Dwarka)
41. Sachana
42. Salaya
43. Sikka
44. Sutrapada
45. Talaja
46. Umarsadi
47. Valsad
48. Vansi Borsi
49. Veraval

Karnataka

1. Belekeri
2. Bhatkal
3. Hangarakatta
4. Honnavar
5. Karwar
6. Kundapura
7. Malpe
8. Old Mangalore Port
9. Padubidri
10. Tadri

Kerala

1. Alappuza/ Alleppey
2. Azhikkal
3. Beypore/Kozhikode/ Calicut
4. Kannur
5. Kasaragod
6. Kayamkulam
7. Koavalam /Vizhinjam
8. Manakkodam
9. Manjeswaram
10. Munambam/Kodungallur (Kodungallore)
11. Neeleswaram
12. Neendakara
13. Ponnani
14. Quilon/ Thankasserry
15. Thalassery
16. Thiruvananthapuram/ Valiathura
17. Vadakara

Lakshadweep

1. Agatti
2. Amini
3. Andrott
4. Bitra
5. Chetlat
6. Kadmat
7. Kalpeni
8. Kavaratti
9. Kiltan
10. Minicoy

Maharashtra

1. Achara
2. Alibag
3. Arnala
4. Bandra
5. Bankot
6. Bassein- Vasai
7. Bhiwandi
8. Borli-Mandla
9. Borya
10. Dahanu
11. Dabhol- Anjanvel
12. Deogad
13. Harnai
14. Jaigad
15. Jaitapur
16. Kalyan
17. Karanja

18. Kellwa-Mahim
19. Kelshi
20. Kiranpani
21. Kumbharu
22. Malvan
23. Mandad
24. Mandwa
25. Manori
26. Mora
27. Murud-janjira
28. Nandgaon
29. Nawapur
30. Niwti
31. Palshet
32. Purnagad
33. Rajpuri (Dighi)
34. Ratnagiri
35. Redi
36. Revdanda
37. Thal-Rewas
38. Satpati
39. Shriwardhan
40. Tarapur
41. Thane
42. Tiwri-Varoda
43. Trombay
44. Ulwa-Belapur- Panvel
45. Uttan
46. Vengurla
47. Versova
48. Vijaydurg

Orissa

1. Astarang /Nuagaon
2. Bahabalpur
3. Bahuda Muhan (Sonepur)
4. Baliharchandi
5. Barunei Muhan
6. Bichitrapur (Talsari)
7. Chandipur
8. Chudamani/ Chandabali
9. Dhamara
10. Gopalpur
11. Inchuri
12. Jatadhar Muhan
13. Palur
14. Subarnarekha Muhan (Kirtania)

Pondicherry

1. Pondicherry
2. Karaikal

Tamil Nadu

1. Colachel
2. Cuddalore
3. Ennore
4. Kanyakumari
5. Kattupalli
6. Kaveri
7. Kundankulam
8. Manappad
9. Mugaiyur
10. Nagapattinam
11. Pamban
12. Punnakayal
13. Py-3 Oil Field
14. Rameswaram
15. Silambimangalam
16. Thiruchppuram
17. Thirukkadaiyur
18. Thirukkuvalai
19. Valinokkam
20. Vanagiri

West Bengal

1. Kulpi

Annexure 2:
MoEF Office Memorandum dated August 21, 2009

No. 15-3/ 2009-IA.III
Government of India
Ministry of Environment & Forests

Paryavaran Bhavan,
CGO Complex Lodhi Road,
New Delhi-110003.
Telefax: 24362434

Dated the 21st August 2009

OFFICE MEMORANDUM

Subject: Moratorium on expansion of existing ports and initiation of new projects along the coast - Regarding.

Ministry had issued a Draft Coastal Management Zone Notification vide S.O. No. 1070(E), dated 01.05.2008 and an amendment providing for inclusion of green field airports in CMZ area issued vide S.O. No.112(E), dated 09.05.2008 inviting public suggestions and objections in accordance with Environment (Protection) Act, 1986 within a period of 60 days from the date of issue of the Notification. Further, based on the requests made by the State Government the Draft Notification was re-notified on 22.07.2008.

2. The Ministry had constituted a Committee under chairmanship of Prof. M.S. Swaminathan, go in to the public suggestions and objections on the Coastal Management Zone Notification. The Committee after consultations submitted its report, which was accepted by the Ministry.

3. One of the recommendations of the Committee is that "The Government must immediately study the cumulative impacts of the individual projects on the coast line, pending which there should be a moratorium on expansion of existing ports and initiation of new projects along the coast."

4. The Ministry will now evolve a policy for consideration of projects along the coast and particularly the activities relating to the ports, harbours, jetties and expansion of such activities etc. and till such time the policy is finalized, it has been decided as follows:-

(a) The projects which have been recommended by Expert Appraisal Committee till July, 2009, when the Swaminathan Report was accepted by MoEF, will be processed on merit for the issue of Environmental Clearance/CRZ Clearance; and

(b) Defer the consideration till Oct 2009 of all such coastal projects particularly those relating to ports, harbours, jetties and their expansion cases, which have been received after 31st July, 2009.

(c) Not to accept new proposal till the policy is finalized.

This issues with approval of Competent Authority.

Bharat Bhushan
Director

To
All the Officers of IA-II (T) and IA- III Division

Copy to:-
1. PPSto AS(JMM)
2. Advisor(G KP)
3. Advisor(N B)

Annexure 3:
MoEF Office Memorandum dated November 3, 2009

No.15-3/2009-IA-III
Government of India
Ministry of Environment & Forests
(IA-III Division)

Room No.744,
Paryavaran Bhawan,
CGO Complex, Lodhi Road
New Delhi-110 003

Dated the 3rd November, 2009

OFFICE MEMORANDUM

Sub: New Policy on expansion of existing ports and initiation of new projects along the coastline - regarding.

****

The Ministry of Environment and Forests had constituted an Expert Committee under the Chairmanship of Prof. M. S. Swaminathan to review the comments received on the draft Coastal Management Zone 2008. The Committee in its Report* dated 16th July, 2009 at para 7.4 had recommended an immediate study to be undertaken to examine the cumulative impacts of port projects on the coastline, pending which there should be a moratorium on expansion of existing ports and initiation of new projects.

2. Accordingly, the Ministry issued an Office Memorandum (OM) dated 21st August, 2009 in which it was decided to defer consideration of proposals pertaining to development the ports and its expansion projects received in the Ministry after 31st July, 2009 and not to accept any new projects seeking environmental/CRZ clearance till a policy is finalised.

3. As a part of the above decision a study was assigned to the Ministry of Earth Sciences (MoES) for identifying the coastal stretches with regard to erosion/accretion. Based on the discussions held with MoES, the study was initiated in two phases namely,- (a) phase-I to submit a report based on existing data/information by 15th October, 2009; (b) phase - II of the study involves micro level analysis that would be carried out for the entire country for the purpose of examining shoreline changes due to existing projects and identify suitable sites for development.

4. Ministry of Environment and Forests has now received a report from the Chennai based, Integrated Coastal and Marine Area Management (ICMAM), MoES on the phase-I of the programme. The copy of the Report is available on Ministry's website**. The Report has analyzed time series satellite images of the certain stretches of the coastline where data were available.

* Report of Expert Committee (Final Frontier) on the draft Coastal Management Zone (CMZ) Notification, constituted by the Ministry of Environment and Forests, under the Chairmanship of Prof. M. S. Swaminathan dated 16th July, 2009 (available on the Ministry's website).
** http://www.envfor.nic.in

5. Ministry has examined and accepted the above Report of ICMAM and accordingly stipulates the following, for undertaking development with regard to ports and harbour:-

A. Expansion of existing ports and harbours, jetties etc., within their notified port limits shall be undertaken subject to the condition that:-

(i) The hydro-dynamic studies indicate that the expansion activities of the existing port do not have significant impact to the shoreline abutting the project; and
(ii) has no significant impact on the ecologically sensitive areas along the stretch.

B. New projects to be located at the sites indicated in Table 1, shall be subjected to **Comprehensive Environment Impact Assessment,** based on a minimum of 3 seasons data, and Environment Impact Assessment report prepared based on actual field measurements, appropriate modelling studies etc.

C. With regard to the hotspots stretches viz. those areas which are prone for 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. However, fishing jetties/embarkation facilities for local communities could be set-up with Environment Impact Assessment as per Environment Impact Assessment, 2006.

D. With regard to Andaman & Nicobar and Lakshadweep Islands the port and harbour projects shall be undertaken in accordance with Coastal Regulation Zone Notification, 1991 and approved Coastal Zone Management Plans. The port projects of more than 5 Million Tones per annum in these islands which are to be located in these islands, shall be subjected to Comprehensive Environment Impact Assessment including physical and mathematical modeling and ground verification.

6. The Ministry has initiated phase-II of the project through Institute for Ocean Management (IOM), Chennai and ICMAM, to identify the shoreline changes at micro level and map them in atleast 1:25000 scale map. This study would involve analysis of time series satellite images from 1960 onwards. Based on the above study Report, further stipulations if any, shall be indicated for development of foreshore facilities along the Indian coast. A decision in this regard will be taken by 31st October, 2010.

7. Based on the above study, a National policy on setting-up of new projects pertaining to development of ports and harbours would be drawn up in consultation with concerned Ministries/Agencies.

8. Till such time, the consideration of the projects related to development of ports and harbour projects could be considered as per A to D of the para 5 above.

This issues with the approval of Minister of State (Independent Charge) for Environment and Forests.

(Dr. A. Senthil Vel)
Additional Director

Encl: Table 1

To,

1. PS to MEF (Independent Charge);
2. PPS to Secretary (E&F);
3. PPS to AS (JMM);
4. Chairman and Member Secretaries of State/Union territories Coastal Zone Management Authorities;
5. Joint Secretary (Ministry of Shipping);
6. All the Officers of IA Division
7. Website of Ministry of Environment and Forests

Tabl

Sl. No.	Name of State	Districts / Division / locations of critical erosion
1	Gujarat	Valsad, Navsari, Surat, Bharuch.
2	Maharashtra	Mumbai, Suburban, Thane, Raigad, Ratanagiri, Sindhudurg.
3	Goa	South Goa, North Goa.
4	Karnataka	Mangalore, Udupi, Kundapur, Bhaktal, Honnavar, Kumta, Ankola, Karwar.
5	Kerala	Thiruvananthapuram, Alappuzha, Thale, Manjeri, Kozhi, Kasargode.
6	Tamil Nadu	Chennai north, Kovalam, Devanampattinam, Poomuhar, Tharangambadi, Kanyakumari.
7	Andhra Pradesh	Uppada, Chinnagollapalem.
8	Orissa	Gopalpur, Rushikulya, Puri, Satbhaya, Chandabali.
9	West Bengal	Digha, Shridarnagar, Buraburirttat, Gobardhanpur Frezerganj, Shibpur, Beguakhali, Kusumtala.
11	Pondicherry	Along Gandhi Statue stretch
12	Andaman & Nicobar	-
13	Lakshadweep	Agatti, Amini, Androth, Bitra, Chetlat, Kadmat, Kiltan, Kalpeni, Kavratti, Minicoy.

Dakshin Foundation is a non-profit, non-governmental organisation registered as a charitable trust. Our mission is to inform and advocate conservation and natural resource management, while promoting and supporting sustainable livelihoods, social development and environmental justice. We adopt interdisciplinary and transdisciplinary approaches in our research and conservation interventions, drawing from the fields of ecology, conservation biology, sociology, economics, and law. Our work aims at building community capacities for conservation and enhancing community stakes and rights in environmental decision-making, towards strengthening networks and supporting advocacy campaigns. Our goal is to promote ecologically and socially appropriate approaches to conservation and management in coastal, marine and mountain ecosystems in India.

www.dakshin.org

About 213 notified ports dot the country's coastline. Roughly, this means there's a port every 33 km of our fragile shoreline! At least 69 minor ports are slotted for development with every state governments competing to attract greater investment in port development on its shores.

The Indian coast is home to more than 3.5 million marine fisherfolk and several thousand more coastal residents. What are the implications of port development for these communities and their environments? Is the galloping development trend in this sector optimal? How effective is the regulatory framework to harness port related impacts on the environment?

This report reviews the social and environmental implications of port development and planning in India. It analyses the policy environment and trends in the port sector and makes key recommendations for environmentally and socially sustainable planning.