

## Sethusamudram Canal: An Expensive Voyage?

*The economic viability of the Sethusamudram Canal rests on weak grounds, for the savings in time for ships travelling from the east to west coasts are not as large as advertised and some shipping companies may even find the tariffs too expensive to make it worth switching from the current shipping lanes.*

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The Sethusamudram Ship Canal Project (SSCP) envisages the creation of a navigable canal from the Gulf of Mannar to the Bay of Bengal to facilitate movement of ships. The project documents claim that ships moving from the west coast to the east coast of India do not need to navigate around Sri Lanka but can use the channel to save 36 hours of shipping time and 570 nautical miles. The advantage provided by the project includes the creation of a shipping channel from the west to east coasts of India through the territorial waters of the country. This article scrutinises the claims made by the project proponents, reviewing how significant the savings are for ships using the canal. It also looks at the changed scenario after the project especially with the hardening of interest rates globally, and alternative possibilities for India to boost its shipping industry especially around the Tamil Nadu coast.

The repeated claims of the project that it will save up to 30 hours of shipping time, sounds suspiciously like a shoe sale that offers a discount of up to 50 per cent. Like the discount sale, where the offer is probably for a few items in the store, the savings of up to 30 hours are valid for just

a single journey: between Tuticorin and Chennai (and vice versa). Upon closer inspection, one finds that the savings on offer are considerably less than one initially imagined. A journey from Kanyakumari to Kolkata for example saves just 18 hours, while the average savings (after reducing pilotage) is around 22 hours. It is only upon closer inspection of the shoe sale that one realises the up to 50 per cent discount was a method to grab your attention, in the hope that you will buy something from the store. Similarly strategic was the careful selection of origin-destination pairs in order to show you the possibility of great savings.<sup>1</sup>

### Overstating Gains

The voyages that are used as reference points in the draft project report (DPR) start either at Kanyakumari (point C in map) or Tuticorin (point D) and move to the east coast. While this might be true for journeys that originate along the west coast of India, for other voyages, the choice of these starting points overstates the distance saved. Many naval hydrographers and navigation experts are of the opinion that with the exception of voyages from ports on the Indian west coast to the Indian east coast, there are unlikely to be any

significant gains for ships that are making the voyage through the Sethusamudram canal. For voyages from other destinations, including Europe and Africa (Mauritius), ships can deviate at points A and B, which means that the savings in distance will not be significant. Ships from these places will save just 215 and 70 nautical miles respectively: significantly lower than what is stated in the DPR.

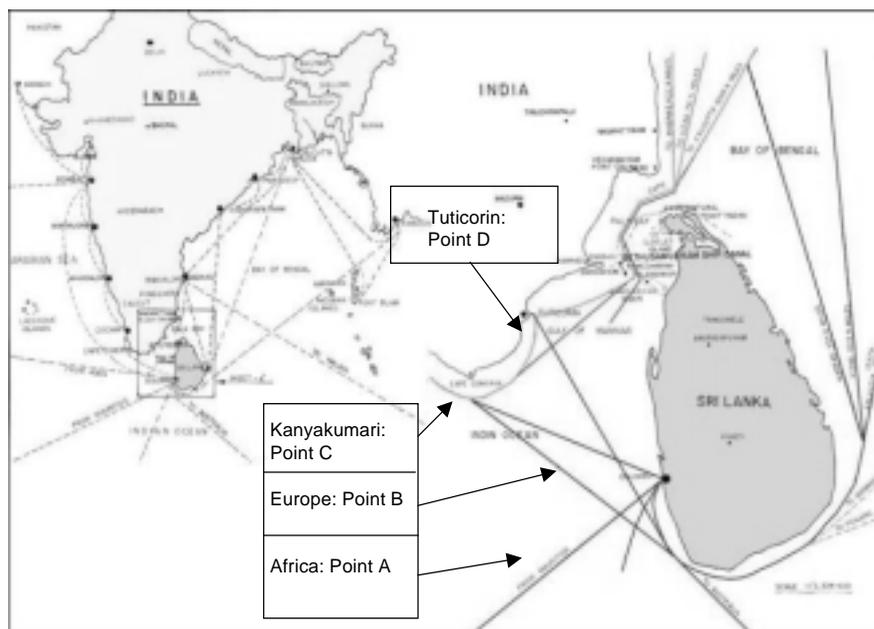
Importantly, over 60 per cent of the revenue from this project is to come from ships that are to come from ports other than on the Indian coast (and referred to as non-coastal destinations in the project documents). Without considering the differences in distance savings for different voyages, the DPR concludes that these ships will use the canal and even calculates a steady revenue stream from them. Not specifying the savings for different origin-destination pairs is a critical weakness in the DPR that makes the project appear beneficial for ships that may not normally use the canal.

In order to calculate the differences in distances saved, the distances were mapped using Google™ Earth software and validated by both hydrographers and marine geographers for accuracy. This was further validated using the distance calculator on the world shipping register, where the deviation between the calculated figures was very small.<sup>3</sup> After calculating the distances, the method followed in the DPR to calculate time savings for journeys to Kolkata from different origins was used.<sup>4</sup> In open sea, the speed that ships travel at is around 12 knots while this speed is restricted for the 82 nautical miles (nm) within the canal to 8 knots. Two hours of pilotage also need to be added for travel through the canal. For ships making a voyage from Tuticorin, the savings in time can be significant: around 22 hours (including pilotage). For journeys from Europe, the

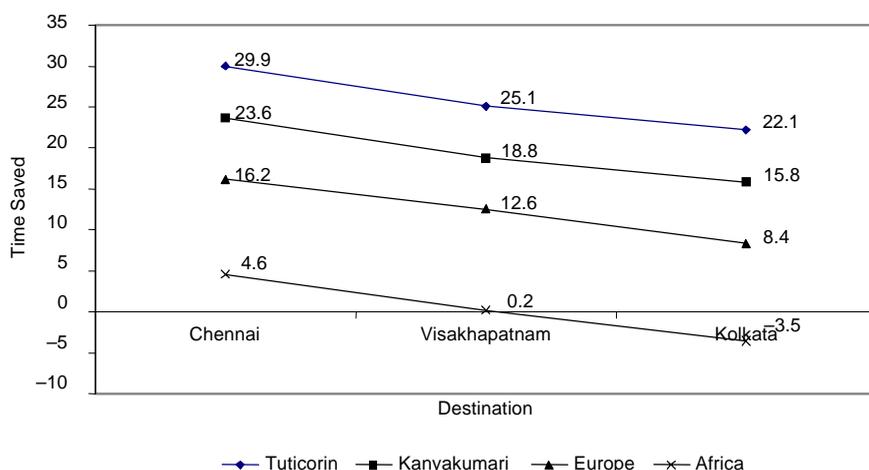
Table 1: Calculating Time Saved

From	To	Existing Route		SSC Route					Savings in Time (Hours) Including Two Hours for Pilotage <sup>2</sup>	
		Distance (nm)	Time @ 12nm (Hours)	Distance (nm)	Canal Length (nm)	Time @ 8 nm (Hours)	Open Sea (nm)	Time @ 12 nm (Hours)		Total Time Required (Hours)
Tuticorin	Kolkata	1371	114.3	1041.0	82	10.3	959	79.9	90.2	22.1
Europe	Kolkata	3301	275	3135	82	10.3	3053	254.4	264.7	8.4
Africa	Kolkata	3217	268	3194	82	10.3	3112	259.3	269.6	-3.5

**Figure 1: Distance Savings for Different Routes**



**Figure 2: Time Saved for Different Origin Destination Pairs (in hours)**



savings for ships making the voyage is significantly lower: around 8 hours. For journeys from Africa (Mauritius) the savings in time are nearly four hours.

Using the method above, it is then possible to calculate time savings for different origin-destination pairs (Figure 2). When compared for different destinations (like Tuticorin and Kanyakumari), over 60 per cent of the ships that the DPR claims will use the canal save much less than projected. For destinations like Europe or Africa (Mauritius), the savings in time are on average just over 6 hours. There is a substantial difference between coastal ships (originating from Tuticorin/Kanyakumari) and non-coastal ships (originating from

Aden/Mauritius and points outside the Indian peninsula).

The primary claim of the SSCP is that less time at sea will mean both lower time charter rates (to hire ships) and lower fuel expenses as less distance has to be covered. The reduced expenditure by using the canal can then be charged as a tariff by the SSCP. In order to calculate the validity of this claim, the first step was to calculate potential time and fuel saved for different classes of ships. Savings made by a 20,000 dead weight tonne (DWT) ship are used as an example. A comparison is made of the savings of the same ship making two different kinds of voyages: one coastal and the other non-coastal. The average distances

for each of these voyages and time taken during these voyages are considered.

Savings are calculated in time charter rate: or the savings in hiring a ship for a particular amount of time. For the two categories of ships: coastal and non-coastal, the differences in time charter rates are significantly different.

The same ship of 20,000 DWT saves almost four times the amount when making a voyage that is coast to coast, when compared to voyages that start in Europe and Africa. A similar calculation for fuel savings shows us that the total fuel savings for both coastal voyages and non-coastal voyages are similarly different. The method used in the DPR is illustrated in the table below. The DPR uses a consumption figure of 29.2 kg/km of fuel for a 20,000 DWT ship. When using the canal, it has to use the more expensive marine diesel oil (MDO) when compared to open sea when it can use the less expensive intermediate fuel oil (IFO). By calculating the fuel used for coastal as well as non-coastal voyages, one sees that coastal voyages (Kanyakumari and Tuticorin) on average save almost ten times more when using the canal as non-coastal voyages (Aden and Mauritius).

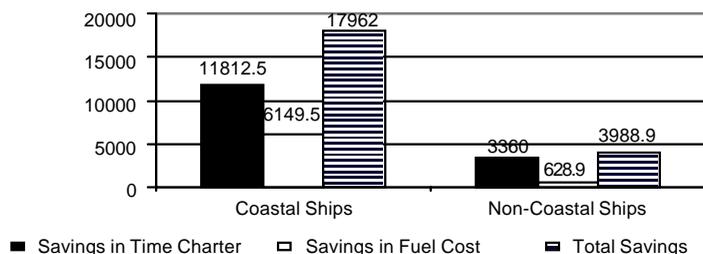
The savings in fuel costs and savings in time charter rates are added to get the total savings for ships going through the canal. The result one obtains gives an idea of why stores pitch up to 50 per cent off everything on sale. The 20,000 DWT coastal ships (the ones that were covered in the DPR) save on average \$ 17,962 by using the canal. Non-coastal ships (the ones that were not covered in the DPR) save on average \$ 3,989 by using the canal. What this means is that the total savings for the same ship making two different kinds of voyages is dramatically different. Non-coastal ships save just 28 per cent of the amount saved by coastal ships by using the canal, but are to be charged the same (or very similar) tariff and constitute over 60 per cent of the revenue stream of the SSCP.

In dollar terms, the DPR hopes to charge up to 50 per cent of the calculated savings

**Table 2: Time Charter Savings for a 20,000 DWT Ship**

	Coastal Ships	Non-Coastal Ships
Savings in time (hours)	22.5	6.4
Time charter rate (in \$ per day)	12,600	12,600
Savings in time charter (\$)	\$ 11812.5	\$ 3360

**Figure 3: Comparison of Savings for Coastal/Non-Coastal Ships (20,000 DWT Ships, in \$)**



as a tariff for using the canal. The saving as calculated by the DPR for a 20,000 DWT ship will give a canal tariff of around \$ 8,981. On average, non-coastal ships, that constitute 70 per cent of the projected users, will lose \$ 4,992.1 if they use the canal at the current tariff structure. Many from the shipping industry opine that ships will go around Sri Lanka rather than have to go through a canal with draught restrictions and with a need for a pilot to embark and disembark from the ship. If on the other hand, the company charges the total savings made by the ship (around \$ 4,000), the pre-tax internal rate of return (IRR) of the project falls to just 4.5 per cent. On the other hand, if the SSCP charges 50 per cent of the amount saved by these ships, the pre-tax IRR falls to just 2.6 per cent!

### Lack of Support?

For a project like the SSCP, that is to be completed by November 2008,<sup>5</sup> it is time to ask the company why it has not been signing up customers to use the canal or published possible sea lanes around the canal. The focus has been proclamations on how the canal would be beneficial for ship users, but there is little evidence in terms of customers (especially foreign shipping lines). Despite appeals by the finance minister that the shipping industry shares the costs of building the canal,<sup>6</sup> there have been no takers for this proposal. In fact, if it is, as many report, the fulfilment of a 100-year-old dream, why are there no shipping companies lining up outside the SSCP office waiting to sign contracts with the company?

Even on the assumption that ships will use the canal for practically negligible gains (and losses for some ships), other critical issues remain. As retired hydrographer from the Indian Navy John Jacob Puthur states in an unpublished article ('Sethusamudram Ship Canal Project... Where Is It Headed?', circa January 2006), the canal practically runs on the median line between India and

Sri Lanka. However, the data that has been collected in order to study the site of the project uses points only on the Indian side of the median line. There are no studies on the Sri Lankan side of the median line, thereby exposing the canal to effects that have not been studied or accounted for anywhere in the DPR. Many studies suggest that the lack of serious study could mean an underestimation of the total amount of maintenance dredging. Currently estimated at 2 million cubic metres per annum, the total amount of maintenance dredging could in fact go up significantly due to the fact that the Palk Bay is a sediment sink for the rivers of the southern peninsula as well as due to the action of the sea on the coastline of Tamil Nadu.<sup>7</sup>

Even the capital dredging costs could be underestimated by a significant amount. After two rounds of international bidding, there were no bidders for the project that would meet the specified costs in the project documents! At the end of the first round, the winning bidder insisted on an advance payment of Rs 200 crore resulting in the contract being cancelled.<sup>8</sup> At the end of the second round, the winning bids quoted well in more than double the projected project costs: Rs 5,000 crore.<sup>9</sup>

Given the likelihood of overestimation of the revenues and underestimation of costs, it is a big question on whether the project will be viable on the grounds it was granted approval. Therefore, do mechanisms need to be built into project design, that stop projects that have significantly changed vis-a-vis the original approval documents? For example, if the project costs go up by more than 20 per cent of the figures that were used to gain approval, should it go through a re-approval process that requires it to gain all the clearances all over again? Or if the project gets 20 per cent less than the revenues that were projected, should it be continued at all? At the heart of this debate is the way many projects are projected to give stratospheric gains for the economy, employment, GDP,

etc, but in reality there is little check once the entire project has been approved and operationalised. While many in the industry might refer to built-in clauses for review of projects as anti-industry, there is a duty of those promoting projects to consider the impacts it has on people, and allow people to review these impacts especially in the early years of a project. For example, how many jobs has a particular special economic zone (SEZ) generated as against its promise? What kind of jobs were these and how many of the people were local? If this process is built into the project design itself, it is then possible to ask for accountability for companies setting up industrial centres and governments that approve them.

### Need for Reconsideration?

Even if the costs of the SSCP are correctly calculated and revenues are accurate, is there a need for a reconsideration of the project? The cost of debt financing has currently been factored in with an Indian rupee loan at 8 per cent and a US dollar loan at 4 per cent. While this might have been true at the time of writing the DPR, interest rates are today significantly higher than what was factored in the DPR. The prime lending rate for the US dollar is around 8 per cent, while the comparable benchmark in India is around 13 per cent. The cost of credit has been significantly underestimated and if current figures are used, the project is likely to constantly drain the Indian economy.

Given this increase, what might actually be more economically prudent would be to invest the entire capital cost of the

**Table 3: Fuel Savings for a 20,000 DWT Ship**

	Coastal Voyages	Non-Coastal Voyages
Fuel consumption (kg/km)	29.2	29.2
Fuel rate IFO (\$ per 1000 l)	180	180
Fuel rate MDO (\$ per 1000 l)	350	350
<i>Existing route</i>		
Distance (km)	1943	5400
Fuel consumption (kg)	56735.6	157692
Fuel consumption (\$)	10212.4	28384
<i>Canal route</i>		
Canal distance (km)	151.9	151.9
Fuel consumption (kg)	4435.5	4434
Fuel consumption (\$)	1552.4	1552.1
Open sea (km)	1170	1233.4
Fuel consumption (kg)	34164.0	145576.3
Fuel consumption (\$)	6149.5	26203.7
Total fuel Cons (\$)	16361.9	27755.8
Savings in fuel cost (\$)	6149.5	628.9

Note: \* Calculations done as per method of DPR.

Sethusamudram project either in a project that provides a greater return or place the funds in a bank account. The returns on this other financially viable project, or the interest on the investment, could provide a subsidy to all ships that reach the Indian east coast after going around Sri Lanka. This will firstly provide a greater economic return, and secondly provide a boost to the shipping industry! In fact, due to the economics of the project, if the government wants to seriously encourage more ships to call on Tuticorin and Chennai, they should simply pay a subsidy for these ships, rather than spending so much money on a project that has environmentalists up in arms for damage to the Gulf of Mannar Biosphere Reserve, and is likely never to be economically viable.

This review of the SSCP has been on economic and financial grounds. The promises of the project may be valid for some ships, but there has been a serious deficiency in studying its impact for other ships. This deficiency is likely to make the project economically unviable and more expensive for some ships to use. It is a project that is also likely to cost considerably more than what was originally proposed due to a lack of study on the amount of dredging needed. Given the likely escalation of costs and its extremely limited benefit, there is a need for mechanisms that ensure accountability of the project to its original claims. **EW**

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## Notes

[This article is an abridged version of a chapter from a larger report titled 'Review of Environmental and Economic Impacts of the SSCP' by Sudarshan Rodriguez, Jacob John, Rohan Arthur, Kartik Shanker and Aarthi Sridhar which is to be published soon.]

- 1 There are many newspaper clippings that will give this to you. For a sample, see the frontpage, *The Hindu*, May 20, 2005, *Hindustan Times*, June 13, 2007 and *Business Line*, October 22, 2005.
- 2 Two hours need to be taken out of the total saved time to account for pilotage.
- 3 Access to the World Shipping Register is on <http://www.e-ships.net/dist.htm>
- 4 DPR, Table 15-5, paragraph 15-3.
- 5 *The Hindu*, June 12, 2007.
- 6 *The Hindu*, July 11, 2004.
- 7 R Ramesh, 'Sethusamudram Shipping Canal Project', *Current Science*, Vol 88, No 4, February 2005, pp 536-37.
- 8 *Business Line*, June 2, 2006.
- 9 *Business Line*, September 22, 2006.