

PEFORMANCE AUDIT

CHAPTER - II

TRANSPORT, WATER RESOURCES AND COASTAL SHIPPING AND INLAND NAVIGATION DEPARTMENT

Performance Audit on Inland Water Transport in Kerala-Development of Waterways and Operation of Transport Services

2.1 Introduction

Inland Water Transport (IWT) is the most energy and cost efficient mode of transport and is best suited for moving bulk and hazardous goods. The components of IWT infrastructure are: (a) fair waterway and navigation facilities; (b) terminals, jetties and repair yards, with connectivity to mainland; and (c) vessels (barges, boats, jhankars etc.).

2.1.1 Inland Waterways in Kerala

Kerala has a total length of 1,687 km long waterways. It includes 590 km of West Coast Canal (WCC) from Neeleswaram in the north of the State to Kovalam in the south. The remaining portion comprises of feeder canals/rivers. The unique feature of WCC is that it flows parallel to the Arabian Sea with openings to the sea at several places. Several important roads including National (NH 66)¹ and State highways are also either connected or run parallel to WCC. This geographical feature ensures connectivity of the canal to minor ports and to hinterlands.

A portion of WCC (205 km), from Kollam to Kottappuram (168 km) and two other canals in Kochi (Champakara canal, 14 km and Udyogamandal canal, 23 km), constituting 12.15 *per cent* of the total IWT in Kerala, were declared by Government of India (GoI) as National Waterway-3 (NW-3) in the year 1993. This stretch is developed and maintained by the Inland Waterways Authority of India² (IWAI).

¹ NH 66 from Kanyakumari to Panvel (up to Kasargod it is parallel to WCC).

² IWAI, established in October 1986 under the Ministry of Shipping, Road Transport and Highways of Government of India (GoI). It performs functions such as infrastructure development and regulation on NWs, conducting Techno- economic feasibility studies of waterways, advising GoI on IWT matters, assisting States in IWT development, etc.

Figure No. 1: Form of the State Waterway network



2.1.2 Authorities in IWT Sector

The authorities/agencies executing various functions/components of IWT sector and their functional areas are summarised below.

Table 2.1: Components, Functions and Authorities in IWT sector

IWT Sector components	Functional area	Government Departments/ Agencies/ PSUs entrusted with execution	Functions	Private sector involved or not?
Waterways	National waterway-3	IWAI under GoI	Development, maintenance & navigational support	No
	State waterways	Irrigation Department under GOK	Development, maintenance & navigational support	No
Inland water vessels	All inland waterways	Port Department under GOK ³	Regulation of Inland water vessels	No
		Kerala State Inland Navigation Corporation (KSINC) and Steel Industries Kerala Limited (SILK), (Both PSUs)	Vessel manufacturing	Yes
		KSINC, State Water Transport Department (SWTD) of GOK	Vessel ownership and operations	Yes
		KSINC,SWTD, SILK	Vessel repairs/maintenance	Yes
Terminals / Jetties	National waterway-3	IWAI	Terminals/Jetties-construction/maintenance	No
	State waterways	Irrigation Department under GOK	Terminals/Jetties-construction/maintenance	No
	All inland waterways	KSINC, SWTD	Terminals/Jetties-operation	Yes

2.2 Audit objectives

The objectives of the Performance Audit were to assess whether:

- there was effective utilisation of the abundant inland waterways and the infrastructure created; and
- passenger and cargo operations on inland waterways were economical, efficient and safe.

2.3 Audit criteria

The activities of IWT Sector were examined with reference to the following:-

- IWT Policy of Government of India, 2001;
- Kerala Inland Vessel Rules, 2010; and
- Kerala Public Works Department Manual.

2.4 Audit scope and methodology

The Audit commenced with an Entry Conference with Secretary to Government, Transport Department (TD) and Joint Secretary to Government,

³ Since 2010, Port Department has been issuing license to the vessels after ensuring the safety aspects.

Water Resources Department (WRD), GOK on 22 August 2014 where the audit objectives and criteria were discussed and the audit methodology explained. The Audit was conducted between September 2014 and January 2015 and from October to November 2015 in WRD, office of the Chief Engineer (Irrigation & Administration) [CE(I&A)] and six⁴ out of eight divisions executing IWT works under the CE (I&A), Directorate of Inland Navigation and both division offices under the Directorate, KSINC, Directorate of SWTD covering the period 2010-15. The audit party also visited Port Office, Alappuzha, IWAI, Kochi, State Planning Board, National Transportation Planning and Research Centre (NATPAC), District Collectorates at Alappuzha, Kottayam, Kozhikode and Ernakulam and Directorate of Fisheries. Audit examined work files, progress reports and Government sanction files. As part of gathering audit evidence, joint inspections were also conducted along with the officials of Irrigation Divisions at Kottayam, Alappuzha and Thrissur. In the conduct of PA, certain activities which commenced prior to 2009 but were relevant to the period covered in audit have also been examined. Exit conferences were held on 10 March 2015 and on 8 September 2015 with the Secretary to Government, TD and Additional Secretary to Government, WRD during which audit findings were discussed. The replies from the State Government and Departmental officers have been taken into account while finalising the report.

2.5 Audit Findings

2.5.1 NW-3 and its utilisation

National Waterway-3 is an integral part of WCC and Inland Water Transport Infrastructure in Kerala. Smooth functioning of the IWT system requires coordinated efforts of waterway developers⁵. The Audit findings related to utilisation of NW-3 are discussed below:

- ***Underutilisation of developed waterways (NW-3)***

The Detailed Project Report (July 1992) for the development of NW-3 declared 'operational' in November 2007 had projected that cargo of around 41.73 lakh MT per annum could be transported through NW-3 by the year 2009-10⁶. NW-3, is running almost parallel to NH-66. IWAI had spent ₹228.60 crore during 1994-95 to 2014-15 for the development and maintenance of NW-3 and completed approximately 85 *per cent* capital dredging works. It had also established eight terminals in NW-3 with cargo handling facilities.

Audit analysis revealed that the potential of developed waterways remained under utilised as shown in Table 2.2.

⁴ Alappuzha, Ernakulam, Kottayam, Kozhikode, Malappuram and Thrissur

⁵ The developers include IWAI for NW-3, WRD, GoK for State Waterways, KSINC and SWTD.

⁶ The comparison of cargo transport was made with respect to DPR prepared by IWAI in 1992. In it the projections for cargo transportation were made only upto 2009-10. Hence, comparison was possible upto 2009-10.

Table 2.2: Cargo Movement in NW-3 during 2010-15

Sl. No.	Year	Quantity of cargo transported (in lakh MT)	Percentage of potential cargo transported
1	2009-10	06.83	16.37
2	2010-11	8.88	21.28
3	2011-12	13.44	32.21
4	2012-13	12.36	29.62
5	2013-14	10.33	24.75
6	2014-15	10.15	24.32

Further, out of the total quantity of cargo transported during 2014-15 (10.15 lakh MT) through NW-3, 99.60 *per cent* (10.11 lakh MT) was through the Champakkara (14 km) and Udyogamandal canal (23 km) which were bye-routes⁷ of NW-3. Utilisation of the remaining portion of NW-3 was less than one *per cent*. Thus, the utilisation of inland waterways for cargo transportation was limited to merely 37 km of the NW-3 and the remaining 168 km of NW-3 was not being utilised at all.

Audit further noticed that Kochi Port situated near NW-3, had been handling around 216 lakh MT of cargo annually. Several PSUs⁸ situated in the close proximity (near to en-route) of NW-3 were transporting large volumes of cargo such as petroleum products, hazardous chemicals, fertilisers etc. by road. On being pointed out by Audit about the scope of shifting cargo transportation from roadways to waterways, Travancore Cochin Chemicals Limited (TCC) replied (July 2015) that material to Kerala Minerals & Metals Limited (KMML), Chavara could be transported by IWT if proper unloading facilities were established at KMML. Government stated (November 2015) that action will be taken to construct terminals and other infrastructure facilities at the location of KMML. The Indian Oil Corporation (IOC) stated (July 2015) that preliminary feasibility studies are being made to locate a suitable land alongside water front in between Kollam and Thiruvananthapuram to develop a small storage facility for positioning product through waterways from their major terminal and effecting further supplies to retail outlets/ consumers located in that area.

- ***Lack of policy directions by State Government for increased utilisation of NW-3***

Kerala State Inland Navigation Corporation (vessel operators) and IWAI had been seeking⁹ Government directions for being made mandatory movement of hazardous cargo compulsory through waterways, introduction of subsidy scheme¹⁰ for cargo movement through inland waters, adoption of norms for the movement of a fixed percentage of cargo of PSUs through waterways etc.

⁷ The bye-route means the Champakkara canal and Udyogamandal canal joining the NW-3 at Kochi.

⁸ Kerala Minerals and Metals Limited (KMML), Travancore Cochin Chemicals Limited (TCC), The Fertilisers and Chemicals Travancore Limited (FACT), Indian Oil Corporation Limited (IOCL), Bharat Petroleum Corporation Limited (BPCL), Hindustan Petroleum Corporation Limited (HPCL).

⁹ July 2004 (IWAI), June 2010 (IWAI), June 2011 (KSINC), September 2012 (IWAI), December 2013 (KSINC), March 2014 (KSINC) and February 2015 (IWAI).

¹⁰ As introduced for coastal shipping in January 2013 by GoK.

for effective usage of NW-3. The Government, however, had not issued directions in this regard.

• **Fishing nets affecting navigability in NW-3**

Fishing nets erected by fishermen in waterways¹¹ have been hindering navigability through NW-3 ever since its formation in 1993. In the joint inspection conducted (July 2004) by IWAI and Fisheries Department in July 2004, 457 licensed and 714 unlicensed fish nets were found in NW-3. IWAI had been pursuing the matter of removal of fishing nets from NW-3 with GOK. Accordingly, after several rounds of discussion with fishermen communities, GOK decided to compensate the fishermen for removing licensed and unlicensed nets¹² and had paid ₹10.32 crore as compensation till date (July 2015). The payment of compensation to unlicensed nets encouraged fishermen to erect such nets again. It was observed that 74 nets were still remaining in NW-3 as of July 2015 thereby affecting cargo movement.

The inability to remove all the fishing nets resulted in underutilisation of NW-3 even after incurring ₹228.60 crore for development and maintenance of the waterway.

Additional Chief Secretary, CSIND (November 2015) replied that Fisheries Department was taking measures to remove the fishing nets by paying compensation and the problem will be permanently solved only when there was regular movement of vessels. The reply was not tenable as both the envisaged activities i.e. complete removal of nets and vessel movement, were not taking place. As such, the objective of waterway utilisation had not been achieved.

Recommendation No. 1 : Government may ensure policy intervention for mandatory movement of hazardous cargo by inland waterways; complete removal of encroachments and fishing nets and ensure availability of infrastructural facilities at locations suitable to PSUs for effective use of NW-3.

2.5.2 Development and maintenance of State controlled and managed waterways by Irrigation Department

The Irrigation Department is responsible for development and maintenance of canals and rivers forming part of State waterways. It undertakes works such as dredging, side protection works and construction of boat jetties and landings to ensure continuous navigability through inland waters. Various deficiencies observed during the execution of development and improvement works of State waterway are discussed below.

i) Poor progress in execution of development/ maintenance works

As per the instructions of Irrigation Department, IND was to carry out improvement works in WCC and feeder canals. Scrutiny of records relating to the period 2006-07 to 2014-15 revealed as under:

¹¹ Fisheries Department of GoK had been issuing licence to fishermen for erecting fishnets in inland waterways till 1986.

¹² At the rate of ₹0.10 lakh per licenced net (w.e.f. February 1999), ₹1.00 lakh per licenced net and ₹0.50 lakh per unlicenced net (w.e.f. February 2011) and ₹2.50 lakh per licenced net and ₹1.25 lakh per unlicenced net (w.e.f. June 2013).

• **Waterways**

The overall physical progress in the WCC development/maintenance work was poor as detailed below:

Table 2.3: Details of physical progress of waterway works

Particulars	(in kms)			
	Natural Waterway	Artificial Waterway	Uncut portion	Total
Available length	241.127	137.795	42.41	421.332
Planned length	92.345	131.05	17.61	241.05
Completed length	92.25	19.21	3.30	114.76

Source: Progress report of Irrigation Department

As of March 2015, only 27 per cent of total length had been completed at a cost of ₹118.60¹³ crore by the Department in a period of 10 years, mainly due to delay in land acquisition, survey and investigation. Failure to complete the planned length of artificial waterways and uncut portions had resulted in lack of continuous availability of waterways for navigation.

• **Canals and boat jetties**

Similarly, the achievement in number of canal works undertaken by the Irrigation Department during the period between 2006 and 2015 was poor as summarised in the table below:

Table 2.4: Details of number of canal works

Particulars	(₹ in crore)							
	Main canal works		Jetties, landings construction works		Feeder canal works		Total	
	No. of works	Expenditure	No. of works	Expenditure	No. of works	Expenditure	No. of works	Expenditure
Completed	153	142.73	122	14.09	52	37.41	327	194.23
In progress	25	21.65	02	0.18	11	8.16	38	29.99
Not arranged	37	0.00	29	0.00	0	0.00	66	0.00
Foreclosed, terminated, dropped etc.	37	17.78	05	0.00	0	0.00	42	17.78
Total	252	182.16	158	14.27	63	45.57	473	242.00

Source: Progress report of Irrigation Department

The Department was not able to arrange 37 main canal development works owing to the delay in the finalisation of tenders, technical sanctions and demarcation of canal boundaries. Likewise, 29 works of construction of boat jetties could not be arranged as the Department had failed to complete the tender procedure as well as the completion of the works before the close of 12th Finance Commission from where it was being funded.

As per clause 15.2.2(d) of the Kerala PWD Manual, the availability of hindrance free land is to be ensured prior to the award of tender. Audit analysis revealed that out of 37 main canal-development works which were foreclosed/terminated, nine works (length : 14.29 kms in artificial waterway) were foreclosed/terminated due to failure of the Department in ensuring hindrance free land and 14 works (length: 11.26 kms in artificial waterway) were foreclosed/terminated due to expiry of 12th Finance Commission period. Of this, 10 works alone could be re-arranged so far.

¹³ Natural waterway – ₹9.57 crore; Artificial waterway - ₹96.71 crore and uncut portion - ₹12.32 crore.

ACS, CSIND stated (December 2015) that few works were tendered in anticipation of availability of land before commencement of work and admitted that delay in land acquisition and delay in payment to contractors were responsible for slow progress of work. The reply was not tenable since about 10 years had elapsed in such land acquisition and procedural issues.

ii) Encroachment of waterways

As per departmental instructions, the Junior Engineer should inspect the entire length of the navigation route atleast twice every month to identify locations where there is insufficient draft or insufficient width or obstructions of any kind and take urgent remedial action. Particular care should be taken to prevent private persons from encroaching the navigable waterway by driving in fishing stakes or creating any other form of hazard to navigation. Such encroachments should be promptly got removed by seeking help of Revenue and Police Officers.

Audit scrutiny revealed that departmental instructions were not being adhered to properly for stopping encroachment of such land (**Appendix 2.1**). The instances of encroachments as on October 2015 noticed during review are mentioned below:

- **Thiruvananthapuram and Kollam district:** 1,128 families were residing along a length of 36.70 km of the waterways from Kovalam (Ch. 0.00 km) to Nadayara *Kayal* (Ch. 55.17 km).
- **Thrissur district:** 832 families were residing along the waterways at Kodungallur (214), Mukundapuram (78), Thrissur (97) and Chavakkad (443).
- **Malappuram district:** 18 shops were situated on the banks of PC Canal in Ponnani *Taluk*, which are to be removed.

The Irrigation Department also did not have comprehensive data as to the locations and extent of land encroached upon in the inland waterways in the State due to absence of survey and demarcation of boundaries of waterways which were to be done by Director of Survey Wing of Revenue Department and CE (I&A) of Irrigation Department respectively.

The only eviction carried out (August 2015) by the Department was the 7.86 km (eight chainages) from Eravipuram *kayal* to Ashtamudi *kayal* in the WCC with the help of Revenue Department.

Government replied that the cases of encroachments were being brought to the notice of the revenue authorities as and when noticed and action was being taken to evict them. The fact however, remains that the department took seven years to clear the encroachment in a small stretch of seven km on the banks of Kollam *thodu* (waterway connecting Eravipuram *kayal* to Ashtamudi *kayal*) in Kollam. Thus, the Department's efforts towards removing encroachments were not encouraging.

iii) Poor prioritisation of works

(a) In the waterway network, two adjoining natural waterways are connected with artificial canals to facilitate navigability in more areas. The depth, width and siltation of the natural waterway are high as compared to

artificial canals. During monsoon, the waterways are filled up due to deposit of sand, silt etc. The simultaneous dredging of the both artificial and natural canals are of equal importance as the exclusion of one would affect the continuous navigability.

The Department carried out dredging operation in natural canals while dredging was not carried out largely in artificial canals. Out of 87 works (188.65 kms) involving dredging in different chainages taken up by the Department during 2006-15, 21 works (62.65 kms) were in natural waterway (₹9.78 crore) and 66 works (126 kms) were in artificial canals (₹111.60 crore). Though, the Department carried out cent *per cent* (62.65 km) of dredging operations in natural canals, only 15.25 *per cent* (19.22 km) of dredging operations was completed in artificial canals. Thus, lack of prioritisation in dredging resulted in non-removal of large scale siltation in artificial canals impeding continuous navigability in the entire waterways.

CSIND agreed with the audit observations.

(b) Audit noticed that, Irrigation Department had constructed (2008-10), 20 boat jetties between Kollam and Kovalam stretch of WCC by spending ₹3.07 crore, though waterways were not navigable and no public boat service was in operation whereas the priority should, have been on improvement of the waterways. Further, boat jetties were being constructed instead of cargo terminals, as waterways were to be developed with the main objective of shifting cargo transportation from road.

Government replied that the natural portion of waterway was already used by the public for navigation purpose and hence, construction of boat jetties was a matter of public interest. The reply was not tenable as the total connectivity between Kovalam and Kollam had not been established to operationalise the sector so far due to non-development of artificial canals in this stretch. Besides, a joint inspection by Audit with EE, IN Division, Kollam of the jetties revealed that five¹⁴ jetties out of 20 were in a dilapidated condition due to non-use as can be seen in the picture given below.

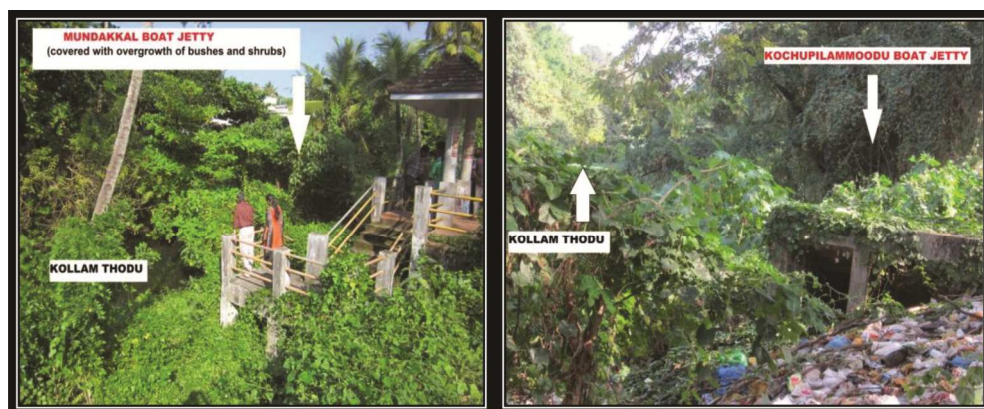


Figure 2: Dilapidated jetties along Kollam Thodu

The inadequate development of State controlled waterways can be attributed to the absence of a detailed policy and strategic plan.

¹⁴ Chamakkada, Eravipuram *kayal*, Kochupilammoodu, Mundakkal and Thannikadavu

Recommendation No. 2: Government may formulate a detailed strategic plan for leveraging its rich endowment of inland waterways. It must on priority undertake dredging works in both natural and artificial waterways and construct cargo terminals.

2.5.3 Improvements / maintenance of feeder canals

i) Execution of works in feeder canals not meeting prescribed standards

The Irrigation Department had been executing development and improvement works of various feeder canals joining NW-3 and the remaining parts of WCC in order to facilitate cargo and passenger movement. The Department had carried out improvement works in 53 feeder canals

Audit scrutiny revealed that improvement works of 17 feeder canals (**Appendix 2.2**) were not taken up as per the approved standard norms¹⁵ of Irrigation Department, but were based on requests from public representatives and local residents. In fact, these 17 feeder canals required major rectification works such as removal of rail over bridge, road over bridge, etc. hindering navigability. Thus, the improvement works carried out were not useful since major rectification works were left unattended causing obstructions in cargo and passenger movement.

ii) Lack of subsequent maintenance of improved feeder canals

Joint inspection of seven of the 53 improved feeder canals (three in Alappuzha District, three in Kottayam District and one in Thrissur District), revealed that though the Department had spent ₹6.95 crore on their improvement, these canals were not in navigable conditions due to lack of subsequent maintenance (**Appendix 2.3**).

Though the initial developments were made by the Irrigation Department, the subsequent maintenance was to be done by LSGIs concerned. Audit observed that LSGIs had failed to formulate any norms for improvement and subsequent maintenance of feeder canals.

GOK accepted the audit observation and stated that hereafter, the feeder canals would be taken up for renovation as per IWA norms for facilitating transportation. The fact, however, remains that expenditure of ₹6.95 crore already incurred during September 2008 to July 2014 on the seven works did not serve the intended purpose.

2.5.4 Multiplicity of agencies leading to lack of direction, co-ordination and monitoring

The activities of inland navigation in the State are regulated by Chief Engineer (Irrigation & Administration). Besides, GOK formed an Inland Navigation Directorate (IND) in 2005 under CE (I&A) headed by a Director for development and maintenance of inland waterways. The West Coast Canal passes through the jurisdiction of eight Irrigation Divisions of which only two Divisions¹⁶ are under the control of the Director, IND. The remaining six

¹⁵ Minimum width - 14 metre, minimum draft -1.70 metre, minimum vertical clearance - five metre

¹⁶ Divisions at Kollam (covering Thiruvananthapuram and Kollam Districts) and at Kannur (covering Kannur and Kasaragod Districts)

divisions of Irrigation Department are under the control of SEs in the respective Circles. Thus, IND has no control over a length of 207 km of WCC coming under Thrissur, Malappuram and Kozhikode Irrigation Divisions. Similarly, feeder canal in four districts viz. Alappuzha, Ernakulam, Kottayam and Thrissur are under the respective Irrigation Divisions.

The activities of inland waterways and navigation are carried out by three Government agencies as detailed below:

- i) Irrigation Department, including IND, for development of State Waterways;
- ii) KSINC for cargo operations; and
- iii) SWTD for passenger operations.

Apart from the leading role played by Irrigation Department and SWTD, the agencies /Departments such as LSGIs, Revenue, Fisheries, Tourism, Transport etc. have various roles in the activities connected with the maintenance, development and utilisation of Inland Waterways. Audit examination revealed that the roles and responsibilities of these agencies were not clearly defined by GOK resulting in overlap, non-coordination and delayed responses, avoidance of responsibility etc. Multiplicity of agencies and Departments and lack of co-ordination amongst them was a major contributing factor for poor development and operation in the waterways leading to instances of encroachments by public, erection of fish-nets in waterways impeding the movement of vessels, non-removal of water hyacinth, non-dredging of boat channels as required by SWTD, operation of unsafe vessels and existence of unsafe jetties in waterways.

GOK stated that various works were being monitored by convening meetings of all concerned Departments such as Revenue, Fisheries, Tourism and Transport. Reply was not tenable because despite such meetings, the issues such as lack of continuous navigability, non-removal of encroachment and fishnets, idling of boat jetties, low draft in NW-3 and boat service channels etc. were yet to be addressed in a meaningful manner.

Recommendation No. 3: Government needs to constitute an Apex Authority to monitor activities of the different departments concerned with Inland waterways for timely development and maintenance of waterways including removal of various obstacles in waterways.

2.6 Cargo transport operations in Inland Waterways

GOK established Kerala Shipping and Inland Navigation Corporation Limited (KSINC)¹⁷ as a State PSU for transportation of goods and passengers in inland waters within and outside the State of Kerala. The KSINC had eight barges for transportation of cargo as on 31 March 2015. Private players were also in the field.

Cargo transportation remained the major revenue segment for KSINC, followed by tourism boat service, boat construction and repair etc. KSINC was

¹⁷ Incorporated on 7 July 1989 by amalgamating Kerala Inland Navigation Corporation Ltd. (established in 1975) and Kerala Shipping Corporation Ltd. (established in 1974).

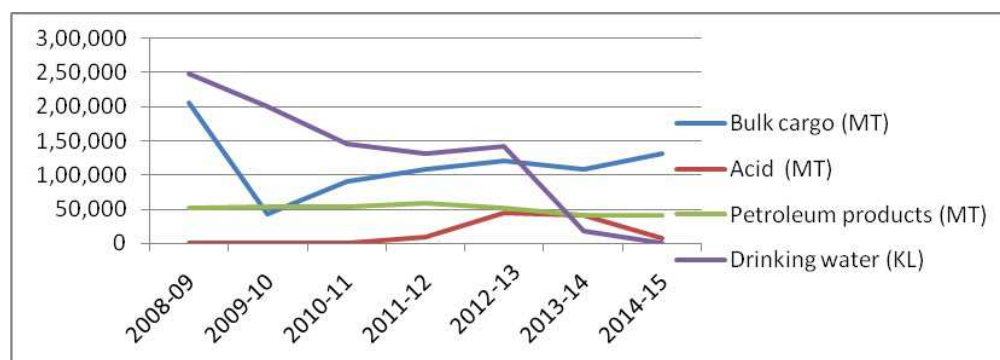
incurring operating loss throughout the period covered by Audit and the accumulated loss stood at ₹13.01 crore as on 31 March 2015.

Audit noticed various deficiencies in cargo transportation which are discussed in succeeding paragraphs.

2.6.1 Deficiencies in executing transportation contracts of bulk cargo and acid leading to consequential loss of business

The cargo transport operations of KSINC showed a decreasing trend compared to 2008-09 as shown in Chart 2.1 below:

Chart 2.1: Details of cargo transport operations by KSINC



During the period 2009-15, The Fertilisers and Chemicals Travancore Limited (FACT), Kochi, a Central PSU had awarded three biennial contracts for transportation of bulk cargo (Sulphur and Rock Phosphate) and two biennial contract for transportation of Phosphoric acid from Kochi Port at Willingdon Island to its divisions at Ambalamedu and Udyogamandal through NW-3¹⁸ using barges.

The work for the transportation of 10.45 lakh MT of cargo was awarded by FACT to the KSINC. However, KSINC could transport only 7.37 lakh MT (70 per cent of the contracted quantity). The shortfall in quantity transported resulted in loss of revenue of ₹368.62 lakh to KSINC.

The Government replied that adequate quantity was not available for transportation at all the times in the godowns of FACT and whatever quantity available was being shared with the other private operators. Test check of daily closing stock data of FACT for the year 2014-15 indicated that adequate quantity was available for transportation for more than 90 per cent of the days.

KSINC was not able to transport the quantity awarded mainly due to its own inefficiencies such as high turnaround time of barges, non-utilisation of full capacity of barges, non-availability of barges due to excess repair time taken etc. as discussed below.

- **Excessive time taken for completion of trips**

The Managing Director of KSINC had formed a Committee (January 2009) to fix standard time required for transporting bulk cargo to FACT. Though the Committee had recommended a standard time of 15 hours per trip for carrying bulk cargo to FACT, no further action was taken in the matter to implement

¹⁸ Champakkara canal of 13 km and Udyogamandal canal of 24 km which are part of NW-3.

this recommendation. While quoting in the tender of FACT for the transportation of bulk cargo, the KSINC had, however, estimated that 24 hours would be required for a trip by each vessel.

Audit found that only 465 (38 *per cent*) out of 1,234 trips operated during the five year period (2010-15) were within 24 hours. In respect of the balance 769 trips, the average time taken was 36 hours per trip. Audit further noticed that private sector barges had been completing the trips with lesser time.

Audit further found that, in some of the trip sheets, though reasons for taking excess time such as low draft in the channel, tidal variations, fish nets in waterway, etc. were mentioned, the reasons were too general in nature and not specific. Apparently, the Management of KSINC had not made use of these trip sheets for possible improvement in the operations. KSINC admitted the Audit findings that the time taken for completion of trip was high.

- ***Non-utilisation of full capacity of barges***

During 2010-15, KSINC used two barges for transportation of bulk cargo to FACT. Audit, however, noticed from Barge Operation Register that on several occasions, the quantity carried by barges was less than their capacity, as given below:

1. Barge Athulya with a carrying capacity of 600 MT operated 637 trips during 2010-15 of which 269 trips were with load less than its capacity.
2. Barge Bhagya with a capacity of 300 MT operated 597 trips during 2010-15 of which 149 trips were operated with load less than its capacity.

On account of the above there was under-utilisation of 12,738 MT (6.20 *per cent*) of cargo carrying capacity.

While admitting audit observation, GOK replied that operation at reduced capacity was due to low draft in the channel (at Thevara in Champakkara Canal forming part of NW-3) and KSINC had taken up the issue with IWAI for ensuring sufficient draft.

- ***Non-operation of trips targeted***

KSINC had targeted to transport (September 2011) 500 MT of phosphoric acid per day from Willingdon Island to FACT Ambalamedu and Udyogamandal by taking two trips per day per barge with the two barges in possession. However, as against 3,274 trips targeted (2010-15), KSINC operated 606 trips (18.5 *per cent*) only due to non-cooperation of operating staff. Though barge operating staff were repeatedly directed by the management to complete two trips per day per barge, adequate progress could not be achieved.

While KSINC stated that the operating staff was not heeding to management's directions, GOK replied that situation had since improved and now the barges were taking two trips on most days. Audit, however, noticed that there was no desired improvement as the number of trips operated during the first half of 2015-16 was 92 only as against scheduled 120 trips in 60 days of operation.

• **Delay in repair of barges**

KSINC had not fixed any norms regarding the time required for dry dock repair of vessels. Audit noticed that, compared to the time of two months fixed when repair work was proposed for outsourcing, there was considerable delay in repair of their own vessels at SWC as shown below.

Table 2.5: Details showing delay in repair of barges

Sl. No.	Barge	Withdrawal from service for repair	Due date for completing repair works	Actual date of re-starting service	Delay (in months)	Impact of delay
1.	Bharatha	8 October 2009	8 December 2009	28 April 2010	4.5	During this period, KSINC could not offer adequate number of barges suitable for POL ¹⁹ transportation, which caused a loss of revenue of ₹65.46 lakh to KSINC.
2.	Bhama	5 May 2010	5 July 2010	28 October 2010	3.5	
3.	Bharatha	31 January 2012	31 March 2012	13 July 2012	3.5	
4.	Bhama	4 November 2012	4 January 2013	10 November 2013	10	
5.	Archana	10 November 2013	10 January 2014	5 November 2014	10	

Audit further observed that due to delay in repairing its vessels on time though found repairable, barges were either disposed of as scrap or repaired incurring additional expenditure as shown in **Appendix 2.4**.

Government replied that labour issues created by trade unions in the Slipway Complex caused delay in completing repair works. They further stated that KSINC was finding it difficult to take decision as whether to go in for repair or for scrapping. However, it was observed in Audit that BoD had decided to go for repair but this decision was not implemented in time. This worsened the condition of barges and ended up in scrapping.

Recommendation No.4: KSINC may consider installation of GPS in the vessels to facilitate monitoring of their movement and to detect causes for delay, which may help in reduction in time for completion of trips. Repairs of vessels must be completed on schedule to minimise idle time.

2.7 Passenger transport operations in Inland Waterways

Public passenger water transport services (ferry services) in inland waters of Kerala are run by three bodies/departments viz: State Public Works Department, Local Self Government Institutions and State Water Transport Department.

2.7.1 Performance of SWTD in IWT sector

SWTD operates passenger boat services from 14 operating centres²⁰ in the inland waterways covering six districts of the State. As of 31 March 2015, SWTD had been operating 51 schedules consisting of 49 public passenger / ferry service and two tourism oriented schedules.

Audit findings relating to SWTD are given in the succeeding paragraphs:

¹⁹ Petrol, oil and lubricant.

²⁰ Alappuzha, Changanassery, Edathuva, Ernakulam, Kavalam, Kollam, Kottayam, Muhamma, Nedumudy, Panavally, Parassinikkadavu, Pulinkunnu, Payyanur and Vaikom.

2.7.1.1 *Increasing loss of SWTD*

The operational statistics of SWTD revealed that its losses were increasing year after year (from ₹18.78 crore in 2010-11 to ₹34.64 crore in 2014-15) and the accumulated loss as on 31 March 2015²¹ was ₹345.30 crore. The average loss per km operated had increased from ₹90.74 to ₹154.37 (70 per cent increase) during the five year period. The major reasons for increasing loss were uneconomic operation of services, reducing number of passengers, inefficient fleet management, etc. as discussed in succeeding paragraphs.

2.7.1.2 *Uneconomic operation of services*

The fuel cost per km of operation was ₹42.26 in 2012-13 and ₹51.26 in 2013-14 against which the Earning Per Kilometre (EPKM) was only ₹23.04 and ₹31.73 respectively. Audit analysis revealed that none of the passenger schedules operated by SWTD were able to meet even the fuel cost of operation due to inadequate number of passengers as explained below.

- *Reducing number of passengers*

The total number of passengers travelled by SWTD boats decreased from 242 lakh in 2000-01 to 144.16 lakh in 2014-15 (40.4 per cent). It had good passenger patronage only in those places where the origin and / or destination of trip is located near places²² connected by road.

Audit also noticed that attempts at boosting passenger traffic by tying up with two tourism schedules and two-wheeler carrying boats were also not able to attract more passengers.

The GOK / SWTD attributed the decrease in passenger traffic to the increased road connectivity and consequent reduction in scope of operations of the Department. It was further replied that the boat services were being operated with the social objective of providing transport facilities to those who were residing in water logged areas.

- *Increased cost of operations*

Around 66 per cent of the total expenditure of SWTD was related to salary and establishment expenditure and 30 per cent for fuel. While the average revenue from a passenger during 2014-15 was ₹5.28, the expenditure incurred by SWTD per passenger was ₹29.31. Thus, the GOK had to carry a financial burden of ₹24.03 for each passenger. Thus, ferry services being operated by SWTD were uneconomic.

2.7.2 **Inefficient fleet management in SWTD**

At the end of March 2015, SWTD was having 84 boats (29 wooden boats and 55 steel boats). Audit noticed that one third of the fleets (28 boats) were under repair. The extent of delays in repair and their impact are explained below.

- *Repair of boats delayed abnormally*

The SWTD has repair facilities (Slipways) at Alappuzha and Ernakulam capable of carrying out major repair of six and two boats respectively, at a

²¹ Provisional

²² Source: NATPAC Study Report, 2013

time. A period of three months was fixed for major repair for each boat. The excess time taken during 2010-15 for major repair ranged from two to 28 months at Alappuzha and from three to 18 months at Ernakulam, resulting in loss of 13,860 operating days. The SWTD had not maintained any data regarding the reasons for delay.

The GOK replied (October 2015) that fixing three months period for executing major repair works as a whole was not logical as it depended upon a variety of factors. The reply was not tenable as the norms were fixed after considering all such factors. Moreover, while approving the proposal for outsourcing repair works of SWTD, Transport Department had also fixed (September 2002) three months time for repair of boats.

SWTD switched over to the use of steel boats in the place of wooden boats for safety reasons from 2004. However, it did not carry out in-house repair of the steel boats and thus 18 boats were awaiting repair for period ranging from one month to five years as of March 2015.

Audit noticed that, on account of prolonged docking, all the steel boats were in deteriorated condition.



During the period 2010-15, SWTD had acquired 29 steel boats from SILK²³ at a cost of ₹12.84 crore. Of these, 18 boats were purchased during October 2010 to March 2014 at a time when nine to 26 wooden and steel boats were pending repair. Audit observed that had the repair been carried out in time, purchase of 18 new steel boats costing ₹7.93 crore during this period could have been avoided.

Audit further noticed that during the period 2009-13, cost of repair had doubled²⁴. As a result, SWTD has to bear a minimum additional financial liability of ₹45 lakh in respect of 10 steel boats docked during November 2009 to January 2013.

SWTD pointed out (April 2015) lack of sufficient infrastructure facility and staff as reasons for not repairing steel boats. It further stated that a new slipway was constructed at Alappuzha for the purpose. Audit noticed that the additional slipway constructed at a cost of ₹1.82 crore had not been utilised till March 2015 though its trial run was conducted in January 2013. Meanwhile, SWTD had issued (February 2015) work order for outsourcing the repair work of steel boats. Audit observed that there was no justification for keeping steel boats idle for period ranging up to five years as SWTD could have made the

²³ Steel Industries Kerala Limited, a State Government PSU.

²⁴ Estimated PAC as per Schedule of Rates for repair of boats.

required arrangements for repair in time either at its own yard or by outsourcing.

2.7.3 Navigation channels were not dredged

In the Report of the E. Mytheenkunju Commission of Enquiry (Thekkady Boat Tragedy, September 2009) it was emphasised that navigable waterways shall be properly maintained by dredging and removing obstacles.

More than 50 *per cent* of the waterways used by SWTD for boat operation were facing the problem of inadequacy of draft. Though SWTD had been requesting the Irrigation Department for dredging of these waterways for the past several years, dredging work was yet to be arranged (December 2015). Audit also noticed that there was no system in place to assess the safety of navigation channels by any authority. Further, in the absence of coordinated efforts among the multiple agencies currently existing in inland water sector, passenger transport operation in inland water was prone to accidents.

GOK / SWTD replied that Irrigation Department had been requested to execute dredging works in navigation channels and SWTD had been working with the initiative for ensuring coordinated efforts with related agencies. The reply was not acceptable as dredging work had not been completed so far (March 2015) by Irrigation Department.

Recommendation No. 5: In order to increase operational efficiency and cost optimisation, GOK may consider instituting PPP arrangements in passenger services for efficient operations.

2.8 Conclusion

Despite being energy and cost efficient with least carbon footprint, the State of Kerala has failed to fully leverage its abundant inland waterways. The Government did not issue directions about using waterways for cargo movement and prohibition of movement of hazardous cargo by road. Due to lack of infrastructural facilities, various PSUs were not shifting cargo movement from road to waterways. GOK failed to address issues like availability of hindrance free land, obstacles like fishnets and encroachment for development of waterways. There was no apex authority to monitor implementation of development works. Dredging works were not prioritized which prevented thorough navigability in waterways. The number of passengers using waterways has been decreasing. A comprehensive strategic plan to address these issues needs to be formulated and notified on priority.