PREFACE

Ports are economic and service provision units of a remarkable nature since they act as a place for the interchange of two transport modes, maritime and land, whether by rail or road. Therefore, the essential aspects of ports lie in their intermodal nature. India has a coast-line of around 7517 kms with 13 Major Ports and 187 notified Non-major (minor/intermediate) Ports along the coast-line and sea-islands.

Major Ports play a vital role in Indian economy. The share of cargo handled by Major Ports was two-third of the total cargo handled (849 million) by Indian ports in 2009-10. Major Ports are under the administrative purview of Ministry of Shipping. Providing and maintaining port facilities require huge investments. The lumpiness of port investments and large sunk costs necessitate the need for adequate and accurate information for port authorities and national planners.

During the past decade changes in policy to promote Public Private Partnership (PPP) in the port sector has introduced competition in the operating environment for Major Ports. In order to understand the changes, new parameters and indicators for monitoring and policy planning need to be identified. With a view to meet the data requirements of policy planners, the Department of Shipping, under the then Ministry of Shipping, Road Transport & Highways had set up a Working Group (WG) under the Chairmanship of Adviser (Transport Research), Transport Research Wing.

The Working Group obtained information from the Major Ports on existing practices and reviewed the existing status of Major Port Statistics. Information was also obtained from International Association of Ports & Harbor (IAPH) on port performance indicators used worldwide. Two Sub-Groups – one for Physical Parameters and one for Financial Parameters were set up by the Working Group to carry out the detailed background work required to address the issues arising out of the Terms of Reference. The respective Sub-Groups were chaired by Shri A. Janardhana Rao, Managing Director, Indian Port Association and Shri P.C. Parida, Deputy Chairman, Mormugao Port Trust. Shri M.M. Hasija, Adviser (Statistics), Transport Research Wing, was Convenor for both the Sub-Groups. The reports of the Sub-Groups were discussed and finalized by the Working Group.

The Working Group has suggested certain changes in accounting of cargo handled to correctly reflect the cargo imported, exported, transshipped and transited from Major Ports. The definition of Turn Round Time and its components have been defined to enable inter-port comparison of Major Ports' performance. Besides, Physical and Financial

parameters/indicators for inter-port comparison have also been refined. Uniform formats for supply of periodic data to/for various organizations/purposes-Indian Ports Association, Transport Research Wing and Administrative Reports of Major Ports have been designed to reduce compilation workload and duplication of effort. In addition, specific recommendations have been made to improve the quality of the Major Port Statistics.

I would like to place on record my deep appreciation of the sincere effort put in by the members of the Working Group namely, Shri A. Janardhana Rao, Managing Director, Indian Ports Association, Shri C.S. Venkataraman, Secretary, Tariff Authority for Major Ports, Shri S.N. Chakrabartty, Director, Indian Institute of Port Management (upto September 2010) and Shri M.K. Ghosh, Director, Indian Institute of Port Management (from October 2010 onwards), Shri P.C. Parida, Deputy Chairman, Mormugao Port Trust and now Deputy Chairman, Chennai Port Trust, Shri D.V. Ananth, FA & CAO, z
& CAO, Chennai Port Trust, Smt. Y. Jayanthi, Director (R/P), Visakhapatnam Port Trust (upto May 2010), Shri S.K. Mondal, Director (P&R), Kolkata Port Trust (upto April, 2010) and Ms. Rebecca Das, Director (P&R) (from May 2010 onwards), Shri S.N. Maharana, Chief Manager Operations, Jawahar Lal Nehru Port Trust and Shri M. M. Hasija, Director (Transport Research Wing-Ports) and now Adviser (Statistics), Transport Research Wing, whose valuable insight into the operations of the port sector has enabled the Working Group in completing the assigned task.

(Arvind Kumar)

C O N T E N T S

FORMATS

EXECUTIVE SUMMARY

Timely and correct data availability of Major Port Statistics is of utmost importance as it can serve as an advance indicator for future trends in the economy well before any other macro parameter becomes available. Hence, it may provide vital clues to policy makers for appropriate policy correctives. Standardized data compilation is necessary for comparison and policy evaluation. Need was felt for additional requirement of data and performance indicators on account of changes in cargo traffic and policy changes during last one and a half decade. Keeping these issues in view, the Ministry of Shipping had set up a Working Group under the chairmanship of Adviser (Transport Research), Transport Research Wing, in May 2009 for Strengthening of Major Port Statistics.

Keeping in view the enormity of the task and background work required to study the issues, two Sub-Groups were set up under the Working Group – one for Physical Parameters and another for Financial Parameters under the chairmanships of Shri A. Janardhana Rao, Managing Director, Indian Ports Association(IPA) and Shri P.C. Parida, Deputy Chairman, Mormugao Port Trust, respectively. The Sub-groups, after detailed deliberation on the present system of data collection, compilation and dissemination of Major Port Statistics, prepared their reports for consideration of the Working Group. The Working Group, after considering these Sub-Group reports, has made several recommendations for strengthening Major Port Statistics. The important recommendations of the Working Group for Strengthening of Major Port Statistics are given below.

Cargo Handled

For the purpose of determining the cargo handled by a port –

(i) Loading /unloading of cargo to /from the ship at sea/waterways within port limits from/to barges or dumb steel lighters, performing the transfer from/to the berth at port (i.e. topping up / lighterage), should not be separately counted as mid-stream operations as these operations are carried out due to draft limitations or some other technical reasons. Hence, the cargo loaded/unloaded in mid-stream should be counted only once.

(ii) Cargo availing 'Innocent Passage' through the port area e.g. petroleum crude moving through pipelines, which is not in the nature of cargo handled by the port, should not be considered as port traffic irrespective of the fact whether revenue is collected by the port or not.

(iii) Any transfer of liquid cargo, which does not involve ship to shore interface or vice versa, shall not be taken into consideration for the purpose of cargo throughput. Intermediary transfer from one tank to another or any other non-ship installation shall not be included in the cargo throughput.

Concepts and Definitions

Transhipment

In the Indian context, the Working Group, after considering the various pros and cons of the present transshipment definition, suggests that:

(i) The cargo destined for a port should be counted once only, even if it is transshipped from a vessel to another vessel/barge or any other mode in midstream/ inside the harbour and then brought to the berth.

(ii) If the cargo is not destined for the port but handled at the port from one vessel to another vessel/ barge and not brought to the berth, it shall also be counted once.

(iii) If the transshipped cargo is unloaded at the port, stored and then loaded to another ship, it should be counted twice.

(iv) The transshipped cargo, when counted once, will be considered as cargo unloaded while transshipped cargo being counted twice will be considered once as cargo unloaded and once as cargo loaded.

Turn Round Time (TRT)

TRT is the total time spent by a vessel at the port from its arrival at reporting station till its departure from the reporting station. It thus includes pre-berthing waiting time, navigation time (inward movement and outward movement time), stay at working and non-working berths and shifting time. However, the detention/idle time due to litigation, fire, repair/dry docking, delay in the decision regarding dismantling, etc. is not to be included.

Pre-Berthing Waiting Time

This is the time taken by a ship from its arrival at the anchorage and report to the reporting station till it arrives at the operational berth excluding time taken for inward movement.

Dwell Time

Dwell Time of cargo/ container is the time for which cargo / container remains in a terminal's in-transit storage area while awaiting shipment to vessels in case of export or evacuation by rail/road in case of import. Dwell time for import cargo is time between time and date of discharge of last tonnage of vessel till last tonnage of cargo is loaded from the port. For Export cargo, it is time and date of first arrival of cargo till the first tonne of loading on the vessel.

The Working Group is of the view that not much useful purpose would be served in compiling Dwell Time for Dry Bulk cargoes and Break Bulk cargoes by

Major Ports. As regards Containerised Cargo, Dwell Time is crucial and is generally used for making inter-port comparisons. Major Ports having specialized Container Berths or Terminals should compile Average Dwell Time of Containers with empty/loaded/import/export break up as these operations are mostly computerized.

Uniform procedures/methods for collection and presentation of statistics

Present classification of cargo traffic featuring seven-commodity statement (prepared by IPA) includes "Other Liquid Cargo" except POL Crude/Products being clubbed with 'Other Cargo'. In order to get the complete picture of Liquid Cargo, the existing seven commodities classification may be broadened to include Other Liquid Cargo (including Vegetable Oil) as separate category.

(ii) In present commodity classification of cargo traffic, as shown in the seven-commodity and seventeen-commodity statements (prepared by IPA), Thermal Coal and Coking Coal are separately recorded. In addition to above two categories of coal, Major Ports are handling other categories of coal/coke such as Steam Coal, Anthracite Coal, Industrial Coal, Petroleum Coke, etc. These coal categories are being clubbed with 'Other Cargo' in seven or seventeen commodity classification. In order to have a complete picture of coal cargo handled by ports coal traffic may be recorded in three categories i.e. Thermal Coal, Coking Coal and Other Coal/Coke (i.e. all coal/coke other than Thermal Coal and Coking Coal).

(iii) In order to assess the performance of Major Ports (excluding private operators), Major Ports should furnish separately for cargo traffic handled by the facility/terminal owned/operated by the Major Port and that handled by private/BOT operator. Similarly performance/efficiency parameters data pertaining to cargo handled by the facility/terminal owned/operated by the Major Port should be furnished separately on annual basis.

(iv) The data on cargo handled by a Major Port includes cargo handled by Private Terminal Operator(s). However, the financial data on various financial parameters namely Operating Income, Operating Expenditure (Head-wise), Operating Surplus, Net Surplus, Distribution of Revenue and Expenditure (Operational Head-wise), etc. pertains to cargo handled by the Major Ports themselves i.e. excluding income and expenditure of Private Terminal Operator(s). Thus Financial statistics being published in the publications of TRW and IPA do not give complete picture. The Working Group suggests that IPA and TRW should include basic financial statistics in respect of Private Terminal Operator(s) in their publications in a separate Table.

Parameters for Inter-Port comparison

The following parameters/indicators have been identified for inter-port comparison of performance of Major Ports:

Physical Parameters/Indicators

(i) Average Pre-berthing Waiting Time
(ii) Average Ship Berth-Day Output
(iii) Average Turn Round Time excluding Navigation Time
(iv) Percentage of Non-Working time to Stay at Working Berth

Financial Indicators

(i) Return on Capital Employed
   a. Net Surplus to Net Capital Employed
   b. Net Income to Total Capital Employed
(ii) Working Capital
(iii) Current Ratio
(iv) Asset Turnover Ratio
(v) Management & General Administration Expenditure to Operating Expenditure
(vi) Percentage of Salaries and Wages to Total Operating Expenditure

Benchmarking of Productivity and Efficiency

Considering the variations in Indian ports vis-a–vis world class international ports, benchmarking of productivity and efficiency of Major Ports with international ports is not feasible. However, benchmarking of Major Port efficiency in terms of Turn Round Time excluding navigation time, Pre-berthing Waiting Time, Percentage of Non-working Time to Stay at Berth and Stay at Berth for different category of cargo/vessels may be considered for Major Ports for comparison of cargo operations.

Dissemination of Major Port Statistics

All the Major Ports should disseminate data in uniform formats so that it becomes easy for the users to aggregate and compare the data. The Major Ports may uniformly publish 34 tables in the recommended formats V-I to V-V, C-I to C-VII, Co-I to Co-IV, P-1 to P-XII(except P-I and P-IV), P-I(AR), P-IV(AR), O-I to O-IV, F-V and FVI. In addition to these formats, the Major Ports may publish other statistics in their annual Administrative Report if such statistics give important information of that particular Major Port.

Role of Port Services in the Economy

(i) The importance of Service sector to the Indian economy, in terms of its contribution to Gross Domestic Product (GDP), employment generation and foreign exchange earnings has significantly increased over the years. In 2008-09, the sector contributed about 52% in the GDP. However to measure the dynamics of the service sector, short term indicators are required. The three service indices, namely Index of Service Production (ISP), Consumer Service Prices Index (CSPI) and Producers Price Index (PPI) may be compiled annually.

Transport Research Wing (TRW) may be entrusted with the work of compiling the indices.

(ii) The Major Ports may furnish the requisite data for Gross Domestic Product and other macroeconomic indicators to CSO through TRW.

Improving Quality of Major Port Statistics

(i) Periodic review of Major Port statistics is required to assess the system and identify the possible changes required for meeting the user needs. The Working Group suggests that such review of Major Port Statistics be undertaken once in five years.

(ii) TRW should organize training programmes / workshops for officials/staff involved in compiling statistics at Major Ports.. The workshops shall cover statistical concepts, definitions/issues of compilation, processing, and total quality management issues.

(iii) **"**Major Ports of India- A Profile" may be brought out by IPA within six months after closing of a Financial Year i.e. by the end of September for preceding Financial Year. 'Basic Port Statistics of India' should be brought out by TRW in the year following the end of the Financial Year i.e. for the year 2009-10 in 2010-11. For "Update on Indian Port Sector', a bi-annual publication, the existing timeframe of June for the period ending 31st March and in December for the period ending September may be maintained.

(iv) Vessel traffic and cargo traffic data is commercially sensitive in nature and hence individual vessel wise traffic data should not be made available to the users.

(v) TRW may provide the metadata for Major Port statistics in the form of a manual on the website of Ministry of Shipping.

(vi) All Major Ports should invariably send the data through e-mail to reduce the cost and time in furnishing the data. This will also enable the receiving agencies to electronically process the data.

(viii) The Working Group is of the view that for parameters required for monthly monitoring, the data should be collected through Ship Card System. Implementation of Ship Card System should be enforced by the Ministry of Shipping.

(ix) All the regular publications on Ports, Shipping and Inland Waterways of TRW should be put on the website of Ministry of Shipping.

(x) Concurrent audit of statistical activities is necessary for early detection of errors and mistakes during the progress of work, and their rectification in time is

essentially an internal activity of the Major Port. However, the assessment of quality of the data produced by the Major Ports may be carried out once in two years through Statistical Audit by officers authorized by the Ministry of Shipping.

1. INTRODUCTION

Ports are nodes in national and international maritime transport and provide a vital link in the transportation chain. Ports provide the necessary economic environment to induce economic and industrial activity and thus act as a catalyst in socio-economic development of a region. With the rising volume of world trade, the ports have gained importance as majority of global merchandise trade is handled by ports. Indian Ports handled cargo traffic of 849 million tonnes in 2009-10. Major and Non-major Ports' share of cargo handled was 66% (561 million tonnes) and 34% (288 tonnes), respectively.

Major Ports

2. India has a coastline of 7517 km with 13 Major Ports and 176 notified Non-major Ports along the coastline and Island. Major Ports are the ports which are administered by the Union Government, while Non-major Ports are administered by the State Governments**.** Major Ports in the country are - Kolkata (including Haldia Dock Complex), Paradip, Visakhapatnam, Ennore, Chennai, Tuticorin on the East Coast and Cochin, New Mangalore, Mormugao, Nhava Sheva (Jawaharlal Nehru Port), Mumbai and Kandla on the West Coast. Port Blair was declared as India's 13th Major Port with effect from June 1, 2010. Port Blair Port Trust will have territorial jurisdiction over all 23 ports located in the Andaman & Nicobar Islands. All Major Ports except Ennore are administered by the respective Port Trusts, which are autonomous bodies. Ennore Port is a company registered under the Companies Act 1956. The administrative control of Major Ports is with Ministry of Shipping, which is also responsible for their planning and development.

3. Timely availability of correct Major Port data is vital for monitoring the trends in the economy or performance of a sector and policy formulation. Trends in cargo traffic also serve as a barometer of economic activity. Timely and correct data availability is of utmost importance as it can serve as an advance indicator for future trends in the economy well before any other macro parameter becomes available. Thus it can provide vital clues to policy makers which can facilitate appropriate policy correctives. Besides, standardized data can serve as benchmarks for comparisons and evaluation. This is more so in the case of efficiency indicators like turn around time, pre-berthing detention etc. Moreover, need for additional requirement of data and performance indicators, is being perceived on account of changes in cargo traffic and policy changes during the last one and half decades. Keeping these issues in view, the Department of Shipping has set up a Working Group under the chairmanship of Adviser (Transport Research) in May 2009 for Strengthening of Major Port Statistics.

Composition and Terms of Reference of the Working Group

4. The composition of the Working Group is as follows:

1. Adviser (Transport Research),

	Deptt. of Road Transport & Highways	Chairman
2.	Managing Director, Indian Ports Association	Member
3.	Secretary, TAMP	Member
4.	Director, IIPM	Member
5.	Deputy Chairman, Mormugao Port Trust	Member
6.	FA&CAO, New Mangalore Port Trust	Member
7.	Director(R/P), Visakhapatnam Port Trust	Member
8.	Director (P&R), Kolkata Port Trust	Member
9.	Chief Manager (Operations), JNPT	Member
10.	Director (TRW-Ports)	Convener

5. The Terms of Reference (TOR) of the Working Group are as follows:

(a) To look into the concepts, definitions and methodologies followed by port authorities in compilation of sea-borne cargo and physical performance indicators.

(b) To suggest uniform procedures/methods for compilation and dissemination of various physical and financial performance indicators to facilitate comparison and benchmarking productivity and efficiency.

(c) To recommend/suggest efficiency/performance indicators relating to container handling.

(d) To suggest time frame for timely compilation and finalization of port statistics.

6. Order for setting up of the Working Group for Strengthening of Major Port Statistics by the then Department of Shipping is at **Annexure - I**

Progress of Work

7. The first meeting of the Working Group (WG) was held on 20th May, 2009 at Kolkata. In this meeting, the WG discussed existing status of statistics being provided by Major Ports and the problems faced while obtaining correct and timely data for making inter- port comparisons for monitoring port performance. The WG decided that information from all Major Ports be obtained on cargo traffic and operational efficiency parameters/indicators for which data is being collected, underlying definitions, formats for reporting and recording sea-borne cargo traffic, etc. from all Major Ports. Their views/comments were also sought on problems/shortcomings encountered in the present system and additional parameters/indicators required to be generated for performance analysis.

8. The WG requested Managing Director, Indian Ports Association to approach select international ports (Singapore, Antewerp, International Association of Ports & Harbours (IAPH)) to obtain information on port

performance indicators being generated by them. It was also decided that various data sets being generated by Major Ports shall be looked into.

9. The second meeting of the WG was held on 12th August, 2009 in Delhi. The WG reviewed the information furnished by Major Ports, IAPH, container related performance indicators and discussed the issues to address the Terms of Reference. Keeping in view the enormity of the task and background work required to discuss the issues, the WG decided to set up two Sub-Groups – one for Physical Parameters and another for Financial Parameters with the following composition:

Sub-Group I on Physical Parameters

1. Sh. A. Janardhana Rao, Managing Director, IPA - Chairman
2. Smt. Y. Jayanthi, Dir(R&P), Visakhapatnam Port Trust - Member
3. Sh. S.N. Maharana, Chief Manager (Operations), JNPT - Member
4. Sh. S.K. Mondal, Dir(P&R), Kolkata Port Trust - Member
5. Sh. M.M. Hasija, Director (now Adviser (Statistics)), TRW - Convenor

Sub- Group II on Financial Parameters

1. Sh. P.C. Parida, Dy. Chairman, Mormugao Port Trust - Chairman
2. Sh. C.S. Venkatraman, Secretary, TAMP - Member
3. Sh. D.V. Ananth, FA&CAO, NMPT - Member
4. Sh. M.M. Hasija, Director (now Adviser (Statistics)), TRW - Convenor

10. The Sub-Groups were required to

i. Identify parameters on which data should be collected for compiling.

ii. Identify efficiency/performance indicators to be followed uniformly by all the ports.

iii. Identify concepts, definitions and methodology to be followed for collecting the identified parameters and efficiency/performance indicators.

iv. Identify indicators which can be used for inter-port comparisons and benchmarking of productivity and efficiency.

v. Design formats for data collection and compilation for uniform adoption by ports

vi. Design formats for data dissemination in various publications

11. SG-II was also required to identify the services which could be quantitatively measured, revenue generated from those services, cost of those services for compiling indices of port services.

12. To complete the assigned task, the Sub-Group I on Physical Parameters requested members to initially prepare notes on Physical Parameters (operational, commercial and other statistics except efficiency indicators and container cargo traffic); Efficiency/Performance Indicators (except container traffic) and on Container Traffic covering the TOR, based on the notes and information received from ports, Issues for discussion were identified. These were discussed in the first meeting of the Sub-Group in Delhi on 18-19th March, 2010. The Sub-Group after discussion firmed up the parameters and formats for data collection. The concepts and definitions were also tentatively decided. These formats for data collection and concepts and definitions were discussed with the officers of Ministry of Shipping on 7th April, 2010. Before finalising the report, the proposed formats and definitions were discussed with officials at Visakhapatnam Port and JN Port to study their implementation feasibility.

13. The Sub-Group II on financial parameters met three times on 4th Sept., 2009 in Mumbai, 22nd April, 2010 in Chennai and on 15th November, 2010 in Delhi. In the first meeting the Sub-Group discussed the scope of Terms of Reference, in general. The Sub-Group recognized that Major Ports are preparing statements which provide accurate data but do not reflect financial viability of the port operations from the point of view of decision making in a competitive environment. The Sub-Group identified the various financial performance parameters and indicators and modifications required in concepts and definitions for assessing the financial health of the activity accurately.

14. In the second meeting, financial parameters/financial performance indicators identified in the first meeting were reviewed and some additional parameters were identified. The concepts and definitions to be followed for compiling the identified parameters and indicators were discussed threadbare. Relevant financial indicators for enabling the Ministry of Shipping to make inter-port comparisons were firmed up. The formats for data collection and dissemination in Administrative Reports were finalized. The Sub-Group broadly identified the services to be included for compiling the three indices namely (i) Index of Consumer Price which will measure the relative change in the price paid by consumer for a service or group of services. (ii) Index of Service Production which will measure the relative change in the services produced by ports and (iii) Index of Producers Price to measure the relative change in the price at which different services/activities are produced. The report of the Sub-Group was finalized in the third meeting,

15. The Reports of the two Sub-Groups were discussed in the third meeting of the WG during 14-15 December, 2010 at Delhi. Measures for improving the

quality of data were also discussed in the meeting. The draft report of the WG was discussed and finalized in the 4th Meeting of the Working Group on 14th February, 2011 at Delhi.

Organization of the Report

16. The report has been divided into eight chapters. Chapter 1 is introductory in nature giving in brief the background leading to the formation of the WG, its composition, the Terms of Reference and the programme of work followed. Chapter 2 gives the importance and need for review of Major Port statistics. Parameters and indicators in accordance of which data should be collected by Major Ports are identified in Chapter 3. Chapter 4 reflects important concepts and definitions to be followed by the Major Ports. Uniform procedure for collection and compilation of Major Port statistics have been suggested in Chapter 5. Parameters and indicators for inter-port comparison and benchmarking of productivity and efficiency have also been identified in Chapter 5. Chapter 6 gives the formats for data compilation by ports and for dissemination of the same in Administrative Reports. The data requirements for Index of Services and National Account aggregation have been covered in Chapter 7. Chapter 8 deals with issues for improving the quality of Major Port Statistics.

2. MAJOR PORT STATISICS – A REVIEW

Ports are large organizations that provide services. They have prominent role in local and national economy. Public authorities, maritime service providers like Shipping Agents, Chambers of Commerce and Industries, exporters and importers, media, researchers, etc. have an interest in the statistics of ports.

2. Timely availability of port statistics is vital for monitoring of trends in the economy, performance of the port sector and policy formulation. For instance, the data of overseas cargo traffic handled at ports, indicates the foreign trade activity (import and export of cargo in terms of volume). Its timely and correct availability is of utmost importance as it can serve as an early signal for future trends in the economy well before any other macro parameter like GDP, Foreign Trade and Index of Industrial Production become available. It can thus provide vital clues to policy makers who can facilitate appropriate corrective measures.

3. Statistics and other port-related data are used by the port management as tools for managing and ensuring efficiency in working of the port. Ports essentially provide services to vessels, cargo and inland transport. The port activity is a complex one because most of its components are inter-related. As a result, a decision, which is good for one activity may produce unfavourable effects on other activities of the port. A sound decision, therefore, has to be preceded by a detailed analysis of the possible effects on the whole system. This is possible if the relations between activities of the port system can be quantified with the help of accurate data.

4. Port statistics are required to provide an appropriate basis for planning port development. Providing and maintaining port facilities such as breakwaters, locks, dredged deep-water berths, etc. require huge investments. The indivisibility of port investments due to the difficulty of changing the layout of a port once made necessitates the need for adequate and accurate information for port authorities and national planners. A mistake may have a strong negative influence in the long run.

5. Ports are an important source of data for studies related to subjects such as structure and level of freight rates, organization of shipping services, shipping policies, etc.

Major Port Statistics

6. Major Ports are complex organizations whose components are closely related. Its activities generate vast data which is used by management as a tool to improve port operations. The data used for analyzing Major Port operations requires an intimate understanding of the functioning of the port. Necessary decisions for increasing the efficiency of the port can be taken on the basis of such data analysis. Ports are providers of service activities, particularly for vessels, cargo and inland transport. There are different groups of port users who

look forward to have satisfactory services. Due to inter-relation of the various service sectors /components of the port, a decision which may be good for one sector may produce adverse impacts in other sectors of port. A sound decision therefore has to be preceded by a detailed analysis of the possible effects on the whole system.

7. Every Major Port maintains detailed data regarding various aspects of its activity. Some data are basic and are collected by all Major Ports. The decision to collect other data depends on the statistical requirements of Major Ports, which may differ from one Major Port to another depending on the nature and exclusivity of port operations.

8. The Major Ports generate statistics at a detailed level for effective management and decision making. Some of those statistics, as per requirement is being furnished to the Ministry of Shipping for monitoring and policy planning purposes.

Dissemination of Major Port Statistics

9. Major Port statistics are being disseminated to the users at aggregated level periodically. Major Port's statistics are being published by Major Ports in their Administrative Reports. These reports, as per statutory requirement, are placed in the Parliament.

10. Transport Research Wing (TRW), Ministry of Shipping, is the nodal agency inter-alia for collection, compilation and publication of data on Indian Ports. The data is disseminated through the annual publication titled 'Basic Port Statistics (BPS)'. The publication contains port-wise data on commodity-wise cargo traffic, container traffic, performance indicators, port capacity and utilization, passenger traffic, employment, financial performance, plan expenditure for Major Ports, etc. Besides the BPS, the TRW also brings out bi-annual update on Indian Port Sector, which provides data/information on the latest developments in the Indian Port Sector. The publication covers state-wise analysis of the development in the area of the sea-borne traffic handled by Maritime States/Union Territories, particularly in respect of cargo traffic, performance indicators and status of projects under implementation. Indian Ports Association (IPA) disseminates Major Port-wise data on cargo traffic and performance indicators on a monthly basis. IPA also publishes data on cargo traffic, vessel traffic, physical and financial performance indicators in their annual publication namely 'Major Ports of India - A Profile'.

11. The primary sources of data on Major Ports are the respective Port Trusts and their Administrative Reports. Most of the data on Major Ports for the above two publications are obtained from them directly in the prescribed formats.

Major Port Statistics – Need for Review

12. The concepts and definitions used for computing performance indicators of Major Ports were reviewed in 1995 and subsequently in 2002. However,

categorization of commodities has not been reviewed for more than two decades. Over the years the type of cargo being handled has undergone structural change, with the container traffic gaining in importance. Most of the ports have set up or are in the process of setting up dedicated container berths/terminals. Performance indicators for container handling are important parameters that need continuous monitoring.

13. During the last one and half decade, due to changes in policy such as allowing Public Private Partnership (PPP), development of ports by private sector etc., the operating environment for Major Ports has undergone changes. In order to understand the changes, new parameters and indicators for monitoring policy effects need to be identified for data collection.

14. Port activities are essentially service oriented. Office of the Economic Adviser, Ministry of Commerce & Industries has initiated work on development of Service Price Index. Central Statistical Organization has also set up a Technical Advisory Committee for compiling Index of Service Production. The technical aspects of the construction of indices i.e. formula for compilation of index, coverage, methodology including appropriation of weights to the various service sectors and base year of index will be decided by the respective Technical Committees. However, data on price/cost of various service activities of ports and output of these activities would have to be ultimately provided by the Major Ports. A mechanism for collecting price and output of the service activities of the port and cost of the output should be in-built in the statistical system of the ports.

15. In addition to the above, the data published in various publications was analysed. It was observed that

(i) There are variations (although minor) in the data published by TRW, IPA and Administrative Reports of the Major Ports, particularly at commodity level and regarding types of cargo. The reasons for such variation are the supply of data by Major Ports to IPA and TRW at different points of time. The Major Ports furnished provisional data till Administrative Reports of respective ports are finalized. This made the task of reconciling the data for consistency at TRW daunting and consequently caused delay in the release of TRW's annual publication.

(ii) The data published in the Administrative Report of the Major Ports was not uniform, particularly the classification details given in the tables. A comparative statement of the important data published in the Administrative Reports of the Major Ports, 'Major Port Statistics - A Profile' and 'Basic Port Statistics' is given in **Annexure-II.**

3. PARAMETERS AND INDICATORS FOR DATA COLLECTION

Every organization collects data as per compatibility of the various aspects of its activity to achieve specific objectives. Each Major Port generates vast amount of data. In addition, data is required for forecasting vessel and cargo traffic, policy formulation/planning and port development. It is essential to identify those data which is important enough to record in relation to the objectives of Major Port and Ministry of Shipping.

2. The statistical requirements of all Major Ports differ owing to their nature of operations. Hence, the Working Group is of the view that complete standardization of Major Ports is neither feasible nor desirable due to difference in individual port's layout and operational requirements. However, uniformity is needed in the methods, form of collection and presentation of data/information in order to facilitate inter-port comparisons, which are essential not only for broad analytical purpose but also for evaluation of port performance.

3. The statistical information required for policy planning and port development purpose by Ministry of Shipping including TRW and IPA concerning Major Ports, can be classified in the following categories:-

(i) **Vital Port Infrastructure**: It is basic and is important for measuring the impact of changes on port performance.

(ii) **Cargo Traffic**: It is the key data which gives a picture of the port activity during a period.

(iii) **Port Performance Parameters/Indicators**: These are measures of various aspects of port operations, which provide insight into the operations of key areas for planning and control.

(iv) **Vessel Traffic**: The data is of vital interest owing to the high cost of port facilities necessary to handle vessels at the port.

(v) **Financial Statistics**: As a provider of commercial services, the ports have a close interest in the revenue generated by those services and cost incurred in providing them.

(vi) **Other Port Statistics:** Manpower deployed, man-days lost, financial parameters, accidents, etc. which are useful for planning and policy formulation.

4. Keeping in view the scenario stated above, the Working Group has identified parameters and indicators to meet the requirements of the Ministry of Shipping for policy planning, port development and statistical dissemination. The list of parameters and indicators for the above categories appears at **Annexure-III**. The Working Group has also identified a list of statistics to be compiled by the Major Ports for internal use/MIS purpose. The list of such statistics is given at **Annexure-IV.**

4. CONCEPTS AND DEFINITIONS FOR MAJOR PORT STATISTICS

Data on several parameters are being collected by each Major Port, following the concepts, definitions and methodologies, which have evolved over the years. The Ministry of Shipping had set up a Committee in 1995 under the Chairmanship of Adviser (TR) for standardization of concepts/definitions of port performance indicators to be followed by the ports. The Ministry had reviewed those definitions again in 2002 and suggested modifications. Ports were required to work out port performance indicators on the basis of the modified definitions. On perusal of the information furnished by the ports, it was observed that all the ports are not following uniform procedures.

2. The Working Group discussed present concepts / definitions of sea-ports and performance indicators being followed by the Major Ports and deliberated on the pros and cons of the present concepts/definitions. **The Working Group suggests following definitions/concepts for important parameters and indicators.**

A. CARGO TRAFFIC

Cargo Handled

3. Cargo is the goods or produce transported generally for commercial gain by ship or any other mode of transport. Cargo handled at the port is the key data of the port as it reflects nature of port activity. As the port has to provide different facilities according to the type of the cargo being handled, the cargo handled by the port may be categorised as :

(a) **Break Bulk Cargo**: The cargo is handled in units, packages, crates, bags and the like.

(b) **Dry Bulk Cargo**: Homogeneous dry cargo (solid or pulverised) that is unpacked or undivided into parts and handled in mass. Liquid Bulk and Gas.

(c) **Liquid Bulk Cargo**: Homogeneous Liquid cargo (including gas) that is unpacked or undivided into parts and handled in mass.

(d) **Containerised Cargo** : Cargo packed in containers for easy handling and transporting of the same as a unit.

4. The cargo handled by ports is classified by type of trade. Main types are:

(a) **Overseas traffic** i.e. the traffic between ports in two different countries, with the inward movement of goods termed ‘Imports’ and outward movements termed ‘exports’, both movements comprising the country’s foreign trade.

(b) **Coastal Traffic** i.e. the traffic between different ports in the same country.

(c) **Transit Traffic** i.e. the traffic physically passing through a port in one country (without entering into that country's foreign trade) having originated in a second foreign country, and being consigned to a third country. The transit traffic may leave the country by sea or any other mode of transport (rail, canal, road, pipeline or air).

5. The cargo handled in a port is differentiated into:

(a) **Cargo loaded** i.e. goods placed on a merchant ship for transport by sea

(b) **Cargo unloaded** i.e. goods taken off a merchant ship.

This distinction shows whether the inward and outward traffic of a port is balanced or not, which affects the general pattern of ship traffic and hence port facilities required to cater to the traffic.

(c) **Transshipment** - A port may handle some cargo, which is destined for some other port, by unloading this cargo from a merchant ship and loading it on to another to complete journey is termed as Transshipment Cargo**.** The cargo may even have dwell time ashore before its outward journey.

6. The definitions of cargo loaded, cargo unloaded and transshipment are as per European Commission (EC) published in their publication "Glossary of Transport Statistics". Further as per their definition, the transshipment cargo is counted twice – once as unloaded and then as loaded.

7. In India, Major Ports are following the same definition in respect of cargo loaded and cargo unloaded. However, in respect of transshipment, present definition of transshipment being followed by the ports (as per MOS Committee, 2002) is:

(i) If cargo is transshipped directly from one ship/barge to another without unloading at the port or where cargo is transshipped in the midstream, the transshipped cargo should be counted once.

(ii) If transshipped cargo is unloaded at the port and again loaded, it is to be counted twice. It is clarified that where the cargo transshipped to a daughter vessel is brought to the shore and then unloaded into another ship, the cargo transshipped should not be counted thrice.

8. In the above definition, the treatment of transshipped cargo within the port limit depends upon whether the cargo is handled in mid-stream or at berth. Following present definition, if the cargo is destined for the port and is transshipped to the berth in a daughter vessel (due to some technical reasons / draft restrictions) then that cargo is being counted twice by some of the ports.

9. In the Indian context, the working Group after considering the various pros and cons of the present definition, suggests that:

(i) The cargo destined for a port should be counted once only, even if it is transshipped from a vessel to another vessel/barge or any other mode in midstream/ inside the harbour and then brought to the berth.

(ii) If the cargo is not destined for the port but handled at the port from one vessel to another vessel/ barge and not brought to the berth, it shall also be counted once.

(iii) If the transshipped cargo is unloaded at the port, stored and then loaded to another ship, it should be counted twice.

(iv) The transshipped cargo, when counted once, will be considered as cargo unloaded while transshipped cargo being counted twice will be considered once as cargo unloaded and once as cargo loaded.

10. **Cargo Handled** during a period will be the total of cargo loaded, cargo unloaded and cargo transshipped during that specified period (e.g. Financial Year i.e. from 1st April of a year to 31st March of the next year).

11. Some Indian Ports handle transit traffic for land-locked countries such as Nepal, Bhutan, etc. The transit traffic for such countries may be included in the Annual Administration Reports of major ports and to be shown in a separate table.

12. The Working Group noted that Major Ports are following different starting times of the year on 1st April for counting of cargo handled depending upon the start/change of shifts at the respective ports. However, as the total time for counting purposes remains one full year, the Sub-group is of the view that the ports may continue with the existing practice.

13. For the purpose of determining the cargo handled by a port –

(i) Loading /unloading of cargo to /from the ship at sea/waterways within port limits from/to barges or dumb steel lighters, performing the transfer from/to the berth at port (i.e. topping up / lighterage), should not be separately counted as mid-stream operation as these operations are carried out due to draft limitations or some other technical reasons. Hence, the cargo loaded/unloaded in mid-stream should be counted only once.

(ii) Cargo availing 'Innocent Passage' through the port area e.g. petroleum crude moving through pipelines, which is not in the nature of cargo handled by the port, should not be considered as port traffic irresp[ective of the fact whether revenue is collected by the port or not.

(iii) Any transfer of liquid cargo, which does not involve ship to shore interface or vice versa, shall not be taken into consideration for the purpose of cargo throughput. Intermediary transfer from one tank to another or any other non-ship installation shall not be included in the cargo throughput.

Weight/Volume Measurements of Cargo Handled

14. The cargo handled by port is measured by weight or volume (subsequently converted into weight). To measure cargo weight/ volume, the following method is suggested by the Sub-group for uniform compilation of cargo statistics by all Major Ports.

(i) Dry Bulk and Liquid Bulk Cargo

For accounting the throughput of Dry Bulk and Liquid Bulk cargo, "Survey" method, which is prevalent, may be adopted. Any other information available to measure cargo weight/volume, which forms the basis of charging for cargo handling services, will be given preference.

(ii) Break Bulk Cargo

Weight of cargo, as declared in the Bill of Lading, may be taken as the throughput. Any other method (e.g. survey), carried out to measure cargo weight and which forms the basis of charging cargo handling services, will be given preference.

(iii) Containers

Actual tonnage of the cargo inside the container alongwith the tare weight of the container or weight of cargo as declared in Bill of Lading plus tare weight of the container may be taken as the throughput. For the purpose of calculating tare weight, if actual tare weight is not available, the following values may be considered as tare weight:

20' Container – 2.25 Tonnes
40' Container – 3.75 Tonnes
Non-Standard containers – Actual tare weight

Methodology for Accounting of Cargo

15. The Working Group suggests the following method for accounting of cargo traffic:

(i) Cargo destined for a port is discharged within its port limit to any other mode of transport (barge/ship etc.) and thereafter brought to the berth and unloaded or cargo originating from a port is loaded to barge/ship at the berth and subsequently loaded to a ship within its port limit, the cargo handled should be counted only once for throughput purposes.

(ii) Cargo not manifested for the port is discharged in the port limit to any other mode of transport (barge/ship etc.) and subsequently moves directly to the destination port, it shall be counted only once for throughput purposes. The cargo will be accounted as transshipped cargo unloaded.

(iii) Cargo manifested for some other port is unloaded in a port (directly or transshipped through daughter vessel), stored and again loaded on to another

ship for the destination port, it shall be counted twice -- once as transshipped cargo unloaded and once as transshipped cargo loaded.

(iv) In the event of transfer of cargo in the mid-stream but outside the port limits, the cargo transferred should be counted only when the port has rendered services. If the cargo is brought into the port for further discharge or vice versa this should be counted only once if it is destined for the port, otherwise twice.

Example

16. A ship carries 200000 tonnes of cargo to Mumbai Port from Jeddah Port, out of which 50,000 tonnes is for Mormugao Port and 40,000 tonnes is for Kandla Port. The cargo for Mormugao is unloaded to another ship in midstream and cargo for Mumbai and Kandla Port is unloaded onto a daughter vessel and unloaded at berth. The cargo for Kandla is subsequently loaded to a ship destined for Kandla.

Thus the total cargo handled by Mumbai Port should be 2,40,000 tonnes i.e. 50,000 tonnes (transshipped to Mormugao) + 1,10,000 tonnes (Mumbai cargo) + 2x40,000 (transshipment cargo for Kandla).

B. SHIP TRAFFIC

17. A port is usually visited by a variety of ships which differ in type, size and flag. In addition, same ships may call several times in a year at one port. These calls may frequently differ in respect of the origin and destination, the type of operations, the nature and volume of cargo carried to/from that port. Details of ships handled are essential for detailed analysis of present traffic and projecting future traffic so as to plan for most adequate facilities.

18. The number of ships handled/sailed should be shown under two categories (i) Cargo vessels and (ii) Non-cargo vessels. The grouping of the vessels should be done in the following manner:

(i) **Cargo Vessels** : Break Bulk, Dry Bulk – Mechanical and Conventional, Liquid Bulk, Container, Lash, Passenger-cum-Cargo, RORO

(ii) **Non-cargo Vessels** : Passenger, Fishing, Navy, Research-cum-Survey, Others (to be specified).

Ships Arrival

19. It is the number of cargo and non-cargo ships that actually arrived at the port during a specified period (e.g. Financial Year i.e. from 1st April of a year to 31st March of next year).

Ships Sailed

20. It is the number of cargo and non-cargo ships that actually sailed from the port during a specified period (e.g. Financial Year i.e. from 1st April of a year to 31st March of next year).

21. For the purpose of counting of the number of ships sailed / vessel traffic and calculation of performance parameters the following procedure shall be followed:-

(i) A ship which enters the port during the previous year but continues cargo operations in the current year will be counted in the current year.

(ii) A ship which enters the port in the current year but does not start cargo operations in the current year will not be counted in the current year.

(iii) A ship which entered the port in the current year, completed cargo operations but detained in the port due to any reason till 31st March of the current year will be counted in the current year.

(iv) A ship which completed cargo operations in the previous year but sailed from the port in the current year will be included in the current year.

C. PORT PERFORMANCE PARAMETERS

Berth Occupancy

22. The time spent by a ship at a berth is the berth occupancy. Berth availability for a berth can be worked out by both on the basis of total days in a year i.e. 365 days (366 days for leap year) and the actual days for which the berth is available, after excluding the days for which the berth is not available due to dredging, repair, bore tide restriction, etc. In compilation of Berth Occupancy, the specific cases shall be dealt with as follows:

(i) In case of double banking or accommodation of more than one vessel at a berth, the overlapping period should be counted once only.

(ii) In case the berth is occupied by a vessel due to litigation, weighting for dismantling, etc. or occupied by navy vessels, dredgers, exhibition vessels, port's own vessels, etc. that period should be excluded.

Berth Capacity

23. The quantum of cargo (metric tonnes/TEUs) a berth is designed to handle in a year is the Berth Capacity.

Port Performance

24. The operational performance of a port is generally measured in terms of certain efficiency parameters and indicators such as 'Turn Round Time', 'Pre-Berthing Waiting Time', 'Average Ship Berth-day Output', etc.

Dwell Time of Cargo

25. Dwell time of cargo broadly reflects the efficiency of the port. Any reduction in dwell time will reduce the transaction cost and also increase the capacity of the existing port infrastructure. This would facilitate the trade in general and enhance the competitiveness of Indian goods in the international markets.

26. The duration for which an entity stays in the port for service is the dwell time of that entity. In the port parlance, the entities are mainly the vessel and cargo/containers. Thus, **Dwell Time of cargo/ container** is the time for which cargo / container remains in a terminal's in-transit storage area while awaiting shipment to vessels in case of export or evacuation by rail/road in case of import. Dwell time for import cargo is time between time and date of discharge of last tonnage of vessel till last tonnage of cargo is loaded from the port. For Export cargo, it is time and date of first arrival of cargo till the first tonne of loading on the vessel.

27. The role of the port in the entire logistics chain is only to provide the infrastructure facilities for handling of vessels and cargo/container. Rest of the time the container dwells in the port on account of other stakeholders like Shipping Agents, Customs, Clearing Agents / Transporters, etc., who have to play their respective roles in preparing and furnishing requisite information to the port authority, arranging for funds for paying the port charges, arranging for transportation of cargo/container, etc. This gives the time taken for various activities for handling containers at the terminal.

28. The Working Group discussed the issue of standard procedure for measuring Dwell Time of cargo at Major Ports. While deliberating it emerged that for Liquid Bulk cargoes Dwell Time is not an issue since at most of the ports the cargo is pumped out of the port premises or to user tank farms directly from the vessel. As regards export of Dry Bulk cargoes, the shippers have to consolidate cargo for shipment and once full quantity of cargo is consolidated and is ready for export and all other formalities are completed, only then the role of port commences. Although it is possible to calculate Dwell Time for Dry Bulk and Break Bulk cargoes, however, for Major Ports, cargo's stay at port beyond free time is a source of revenue. It was also pointed that the time involved in compiling Dwell Time is quite substantial, particularly when the recording of entry/ departure of cargo is done manually. **The Working Group is of the view that not much useful purpose would be served in compiling Dwell Time for Dry Bulk cargoes and Break Bulk cargoes by Major Ports.** As regards Containerised Cargo, Dwell Time is crucial and is generally used for making inter-port comparisons.

29. **The Working Group Recommends that Major Ports having specialized Container Berths or Terminals should compile Average Dwell Time of Containers with empty/loaded/import/export break up as these operations are mostly computerized.**

Turn Round Time

30. Ship's Turn Round Time (TRT) in the port is the primary indicator to judge the quality of service being given by the port to the ships. Prior to May 2002 the Major Ports have been following the definition for TRT as given below:

> "Turn Round Time is the total time spent by a vessel at the port from its arrival at the reporting station till its departure from the reporting station for outward journey. It includes pre-berthing waiting time, time taken for cargo operations, idle time at working / non-working berths, inward/outward pilotage time and shifting time from one berth to another". However, detention /idle time due to litigation, fire, repair/dry docking, delay in decision regarding dismantling, etc. were deducted.

31. The definitions for various efficiency parameters were reviewed by Ministry of Shipping and communicated to Major Ports vide letter No. RW/6-PPM/2002 dated 24.05.2002. In May 2002, the modified definitions were adopted by the Major Ports for working out the port performance indicators. As per the modified definition, TRT is the total time taken by a vessel from immediately when the vessel is ready for berthing till it leaves the berth. However, the time taken for waiting due to non-port account shall not be taken into account.

32. Thus Turn Round Time was to start when the vessel is ready for berthing. However, time taken by the shipper or agent in making the vessel ready for berthing i.e. waiting time due to non-port account reasons was excluded. TRT thus included time taken for inward and outward movement of the vessel, idle time at the berth and time taken to complete loading/unloading of cargo. The waiting time spent by the vessel in the harbour on shipper's account, after sailing order was given, was also excluded.

33. This was confirmed by the Ministry in their subsequent communicated dated 25.11.2002. The Major Ports vide Ministry's subsequent communication No. RW/PPM-6/2002 dated 31.03.2003 were required to furnish figures of TRT on 'Other than Port Account'. As a consequence of the above communications, some ports computed the TRT from the time taken by a vessel from immediately when the vessel is ready for berthing till it leaves the berth while some continued to follow the Ministry's earlier definition.

34. The Working Group, after discussing the definitions of TRT and its various components, suggests the following definition.

> 'The total time spent by a vessel at the port from its arrival at reporting station till its departure from the reporting station. It thus includes pre-berthing waiting time, navigation time (inward movement and outward movement time), stay at working and non-working berths and shifting time'. However, the detention/idle time due to litigation, fire, repair/dry docking, delay in the decision regarding dismantling, etc. is not to be included'.

In case a vessel undertakes the cargo and passenger operations in the same voyage, time relating to passenger operations may be excluded.

35. The Turn Round Time shall comprise the following components:

(i) **Pre-Berthing Waiting Time**
(ii) **Inward Movement Time**
(iii) **Stay at Working / Non-working Berths**
(iv) **Shifting Time**
(v) **Outward Movement Time**

(i) Pre-Berthing Waiting Time

36. This is the time taken by a ship from its arrival at the anchorage and reported to the reporting station till it arrives at the operational berth excluding time taken for inward movement.

37. The average pre-berthing waiting time can be obtained by dividing the total pre-berthing waiting time of all cargo vessels sailed from the port during a period by the number of cargo vessels sailed during that period. The pre-berthing waiting time on port account and non-port account shall be maintained separately.

ii) **Inward Movement**

38. This is the navigation time taken by a ship for moving from anchorage or reporting station to an operational Jetty/Berth/Mooring as the case may be.

39. In case the navigation is first to non-working berth, Inward Movement will be the time taken from anchorage point to non-working berth and time taken for shifting from non-working berth to operational berth/jetty/mooring.

(iii) **Stay at Working / Non-working Berth**

40. This is the total time spent by a cargo ship at one or more berths in one voyage. Thus, it is the sum of stay at each berth including anchorage, holding points, mid-stream, etc. However, the detention / idle time due to litigation, fire, repair/dry docking, delay in the decision regarding dismantling, etc. may be deducted since this does not form a part of the TRT.

41. The berthing time of a cargo ship comprises two components i.e. Stay at Working Berth and Stay at Non-working berth. The Stay at Working berth comprises working time and non-working time. The non-working time spent at working berth is the time for which cargo operations are not carried out owing to various reasons including reasons not attributable to the port.

42. Non-working time is to be analysed for the entire vessel and different vessel/cargo categories separately. Reasons for non-working time at working berth may be analysed separately on Port account and Non-Port account. The time spent by a vessel at a non-working berth is to be analysed for different reasons like want of working berth, poor performance, want of cargo, etc., and any other reasons. In case single loading/unloading facility is available for more than one berth, one ship loader

and pipeline for two berths the idle time of ship awaiting loading/unloading may be treated as time spent at non working berth.

(iv) Shifting Time

43. This is the navigation time taken by a ship for moving from one working / non-working berth/anchorage to another working / non-working berth/anchorage.

(v) Outward Movement

44. This is the navigation time taken by a ship from the time of unberthing from the last berth till the vessel reaches reporting station.

45. The components of Turn Round Time are diagrammatically shown below:

(I) P.B.W.T.
(Pre-berthing Waiting Time)

VESSEL ANCHORED	TO	WEIGHED ANCHOR FOR OPERATIONAL BERTH($)

(II) I.M.
(Inward Movement)

WEIGHED ANCHOR FOR OPERATIONAL BERTH	OR	PILOT BOARDED (*)	TO	TIME OF BERTHING AT OPERATIONAL BERTH ($)

(*) In case of vessel directly berthed "IM" should be calculated from "Pilot Boarded" to "Time of Berthing" at operational berth.

($) In case the navigation is first to non-working berth, Inward Movement will be the time taken from anchorage point to non-working berth and time taken for shifting from non-working berth to operational berth/jetty/mooring.

(III) Stay at Working/ Non-working Berth

TIME OF OCCUPATION OF FIRST OPERATIONAL BERTH	TO	TIME OF VACATION OF FIRST OPERATIONAL BERTH
TIME OF OCCUPATION OF SECOND BERTH	TO	TIME OF VACATION OF SECOND BERTH

……
……

TIME OF OCCUPATION OF N^{th} BERTH	TO	TIME OF VACATION OF N^{th} BERTH

Where "N" is the number of last berth

(IV) S.T.

(Shifting Time)

TIME OF VACATION OF FIRST BERTH	TO	TIME OF OCCUPATION OF SECOND BERTH
TIME OF VACATION OF SECOND BERTH	TO	TIME OF OCCUPATION OF THIRD BERTH

……
……

TIME OF VACATION OF N-1^{th} BERTH	TO	TIME OF OCCUPATION OF N^{th} BERTH

Where "N" is the number of last berth

(IV) O.M.

(Outward Movement)

TIME OF VACATION OF LAST BERTH	TO	TIME PILOT DISEMBARKED THE VESSEL

TRT = PBWT+IM+BT+ST+OM

46. The average turn-round time may be obtained by dividing the total turn-round time by the number of vessels sailed. The turn-round time on port account and non-port account shall be maintained separately.

47. **Other Performance Indicators**

(a) Cargo Traffic

(i) Average Stay at Working Berth = Total Stay at Working Berth of Vessels sailed / Total Number of Vessels sailed

(ii) Average Pre-Berthing Waiting Time= Total Pre-Berthing Time of Vessels sailed

Total Number of Vessels sailed

(iii) Average Non-working time= Total Non-working time at Working & Non-working Berths
Total Number of Vessels sailed

(iv) Average Parcel Size = Total Cargo handled by Vessels sailed
Total Number of Vessels sailed

Note:- Vessels where loading and unloading operations involve two different types of cargo e.g. coking coal, iron ore, iron and steel, etc., the number of vessels/voyages should be counted twice.

(v) Average Parcel Size (For Container Vessels in terms of TEUs) = No. of TEUs handled by Container Vessels sailed
Total Number of Container Vessels sailed

(vi) Percentage of Non-working time at Working Berth = Non-working time at Working Berth X 100
Total Stay at Working Berth

(vii) Average Ship Berth-Day Output = Total Cargo handled by Vessels sailed
Total Stay at Working Berth

(viii) Effective Output per Ship Berth-Day = Total Cargo handled by Vessels sailed
Total Working Time at Working Berth

(xi) Average Hook-shift Output = Total Tonnage handled
Total Number of Hook-shifts deployed

(x) Average Gang-shift Output = Total Tonnage handled
Total Number of Gang-shifts deployed

(xi) Availability and Utilisation of Cargo Handling Equipment:

(a) **Availability:** It is the ratio of actual number of hours the equipment are available for use in a certain period to the number of possible equipment-hours in that period.

(b) **Utilisation:** It is the ratio of actual hours the equipment is engaged for work in a certain period to the number of possible equipment-hours in that period.

Let **A = Number of possible equipment hours in a month** (24 hours may be taken in a day if the port operates in three shifts and if the port operates in two shifts, 16 hours may be considered), then

A = Number of equipment in the fleet X Number of days in a month X 24

B = Number of Hours the equipments are available for work in a month

C = Number of Hours the equipment are under major overhaul or under scheduled (or periodic) maintenance or preventive maintenance in a month.

D = Number of Hours the equipment are under breakdown / maintenance or recess in a month

E = Actual hours for which the equipment are engaged for work in a month (for calculation of actual hours of work, the number of shift-hours may be taken. However, necessary adjustment in the total shift-hours may be made. For example, if the equipment is engaged for work for say 50 shifts in a month and the average recess period in each of the 8-hour shifts is say 0.5 hours, then the number of hours the equipment was used = 50 x (8 - 0.5) = 375 hours).

Actual availability (B) = A – C – D

% Availability = $\frac{B}{A} \times 100$

% Utilisation =

(i) In terms of Actual Equipment Availability Hours = E / B x 100

(ii) In terms of Possible Equipment Hours = E / A x 100

(b) Container Traffic

(i) Average Dwell Time = $\frac{\text{Time of container stay at port}}{\text{No. of containers handled}}$

(ii) Moves per Crane hour = $\frac{\text{Total No. of crane moves}}{\text{Total crane hours}}$

(iii) Effective Moves per Crane hour = $\frac{\text{Total No. of crane moves}}{\text{Effective crane hours}}$

(iv) Moves/berth hour = $\frac{\text{Total Moves}}{\text{Total berth hours}}$

(v) Effective Moves/berth hour = $\frac{\text{Total Moves}}{\text{Effective berth hours}}$

(vi) TEU per Meter quay = $\frac{\text{Total TEUs handled}}{\text{Total length of quay}}$

D. Financial Parameters and Indicators

48. The Major Ports are preparing their Audited Financial Statements – Balance Sheet, Profit and Loss account etc., as per the accounting norms and in line with formats/instructions from Comptroller and Auditor General of India from time to time. These statements though financially accurate and provide a broad aggregate

picture but do not reveal the real financial health/soundness of the activity guiding the Port management to take corrective measures to improve it in the current competitive environment and the need of the time to provide the service at the optimum cost to the Exim trade. After detailed discussion, the sub-group recommends the following:

Income

1. Operating Income

49. The operating income shall consist of :

i) Cargo Handling and Storage Income,
ii) Vessel Related income,
iii) Railways Income

50. As regards the operating income stated above, the Port shall collect the operating income as per their normal practice taking the incomes realized by virtue of operation of notified Scale of Rates. The income by way of royalty or revenue share received from the Concessionaire shall not be taken as a part of operating income in view of the fact that the Port makes no contribution to generate the royalty income received. The Railway Income received by providing Railway service to the cargo handled at port/terminal and Marine income received by providing service to the Vessels, handled at the BOT terminal shall be taken as a part of the Port Operating income, as port receives the income for performing the operation utilizing its resources. The rentals received from the BOT Operator shall be taken as a part of the Operating Income in the Head i.e. Cargo Handling and Storage.

51. Usually the income generated by Storage and Handling of cargo inside the Custom bound area is taken under cargo handling income whereas the Storage & Handling income generated from the area outside the custom bound area is taken as Estate income in many Ports. In view of this to standardize the compilation of Operating income the working Group recommends to consider the income generated by storage/handling of cargo exported or imported through the Port as Operating income despite of it being handled outside the Custom bound area. The working Group noted that the land outside customs bound area is given to users for storage of cargo which are imported or to be exported. Some users want to accumulate cargo outside before being transported to customers. The land is allotted on 11 months or even on long term lease. Some ports account the income in Cargo handling income and some in Estate income. The Working Group recommends that income from such land be included in cargo handling and storage income. The Working Group also noted that sometimes major ports lease out land outside the Custom bound area for storage of cargo that are neither imported nor exported through the port, the income generated from such activity shall not be taken as operating income.

52. The basic idea behind the classification is that the Port operating efficiency should be ascertained from the income generated from the activities operated/executed by the Port only but not from the activities executed/done by any other agency(ies) in the Port premises which should be considered as non-port activity.

2. Non Operating Income

53. The Non-operating income shall include the finance and miscellaneous income as reported as per the current Accounting Policy plus the revenue share/royalty income.

Expenditure

1. Operating Expenditure

54. The operating expenditures shall be classified under the following heads :

i) Cargo Handling and storage
ii) Vessel related
iii) Railway

55. The Management and General Administration expenses and Estate expenditure which are accounted as Operating Expenditure in the Annual accounts is recommended to be allocated to the aforesaid three categories of expenditure on the following basis:

i. Store keeping expenses – Proportion to cost of stores consumed during the year.
ii. Labour welfare and Medical expenses – Proportion to the salary and wages less overtime or Number of employees in each activity / sub-activity.
iii. Engineering and Workshop overheads – Proportion to the repairs and maintenance of each activity / sub-activity.
iv. Accounting and Auditing – Expenses relating to audit, preparation of bills & collection relating to the particular activity to be allocated directly to the relevant activity / sub-activity. Expenditure not attributable to an activityshall be apportioned on the basis of income of that activity.
v. Police and Port security – Number of persons deployed at various locations.
vi. Residual expenses including management and general overheads – Proportion of direct cost of various activity / sub-activity.
vii. Contribution to pension fund and pension payment, if any – proportion to salary and wages
viii. The expenditure relating to staff quarters to be apportioned on the basis of manpower strength of the activity.

56. After allocating the Management and General Administration expenses, to the aforesaid segments, the total segment-wise expenditure shall be ascertained and compared with the income generated out of such operations to find out the net contribution from each segment and also the total contribution from the operating activity i.e. operating surplus.

2. Non Operating Expenditure

57. The expenditure reported as finance and miscellaneous expenditure as per the accounting policy i.e. social security expenditure, Corporate Social Responsibility expenditure, interest paid/payable and other expenditure shall be non operating expenditure.

Classification Of Assets

58. Assets shall be classified based on their utilization in the following categories:

i) Cargo Handling and storage
ii) Port and Dock facilities
iii) Railway
iv) Estate
   (a) Operating Assets (Assets attributable to services which are obligatory and for which expenditure would have to be incurred by port if the assets had not been created e.g. Housing, Medical etc.)
   (b) Non-operating assets (assets attributable to services which are not obligatory such as schools, stadiums, parks etc.)
v) Others (i.e. assets not covered under aforesaid four categories)

Financial Performance Ratio

59. After classifying income, expenditure and assets, activity wise efficiency ratios can be worked out as follows:

1. Cargo Handling operating Ratio = $\frac{\text{Cargo handling and storage expenditure}}{\text{Cargo handling income}}$
2. Vessel Related operating ratio = $\frac{\text{Vessel Related expenditure}}{\text{Vessel related income}}$
3. Railway related operating ratio = $\frac{\text{Railway related expenditure}}{\text{Railway related income}}$
4. Operating Ratio = $\frac{\text{Total Operating Expenditure}}{\text{Total operating income}}$

60. The above activity wise Financial Performance ratios of each port shall indicate the activity wise performance to assess the strength and weakness of the activity to plan the future course of action to improve the financial performance. The above ratios shall also indicate the extent of cross subsidization among various activities.

Efficiency Parameters

61. Efficiency of any Port can be evaluated with the Financial strength as indicated in the Balance Sheet of the Port. However, in order to have uniform indicators, the followings are recommended:

Return on Capital Employed

62. The Sub-group after detailed deliberation came to the conclusion that it is required to ascertain the return on capital employed in two segments i.e.:

a) Operating Surplus to Net Operating Assets

63 The Operating Surplus shall be arrived as the difference between the total operating income less total operating expenditure. The Net operating assets shall be the net block of the assets utilized for cargo handling operation, Storage operation, Port and dock facilities, Railway activity and operating assets as identified in Para 58(iv)(a) at the end of Financial Year.

b) Net income to Total capital employed.

64. The net income shall be the difference between the total income and the total expenditure. The capital employed shall be calculated on the net fixed assets plus working capital. The work in progress need not be taken into account since it is not used for generating income.

(ii) Working Capital per Employee

65. The Working Capital is the difference between the Current Assets and the Current Liabilities, which mainly consists of Sundry Debtors, Stores, Bank Balance and Sundry Creditors. The Working Capital shall include Sundry Debtors not beyond 3 years of age. For this above purpose, each Port shall maintain age-wise Debtor analysis. The Sundry Debtors beyond 3 years should not be considered for Working Capital calculation not only in view of it being the amount not realized due to inefficiency but also due to long legal disputes. Therefore, it is not to be included. In a similar way, the Sundry Creditors beyond 3 years shall also be not considered for arriving at the working capital. Also the Sundry Debtors or Creditors should not include the amounts receivable or payable to Tax authorities. Bank balances should not include the Long / short term investments in Fixed deposits or in Bonds etc. for more than one year. The Bank balances should include only the balances in Current/Savings account in Banks together with cash balances and investments less than one year.

Working Capital per Employee = $\frac{\text{Working Capital}}{\text{Number of Employees}}$

iii) Current Ratios = $\frac{\text{Current Liabilities}}{\text{Current Assets}}$

iv) Asset Turnover Ratio = $\frac{\text{Operating Assets}}{\text{Operating Income}}$

v) Management and GA expenditure to Operating expenditure:

$$\frac{\text{Management and General Administration expenditure}}{\text{Total operating Expenditure}}$$

vi) Percentage of salaries and wages to total operating expenditure:-

$$\frac{\text{Total salaries and wage expenditure}}{\text{Total operating expenditure}}$$

66. The above ratios can give a comparison of each ports fixed nature of expenditure which is beyond control and variable expenditure which can be controlled by improving efficiency.

67. Other important definitions generally used in compiling port statistics are given in **Annexure - V.**

5. UNIFORM PROCEDURES/METHODS FOR COLLECTION AND PRESENTATION OF STATISTICS

Reliable system for uniform collection, processing and dissemination of port statistics is not only a tool for efficient port management but is necessary for making inter-port comparisons and sound policy and planning for port development in the country.

2. All Major Ports have well-established system of data collection and compilation for Management Information System (MIS). Statistical Cells/ Departments/ Divisions exist in all Major Ports to meet the data requirement of port management. They also provide periodical data to IPA and Ministry of Shipping as per their requirement. The data requirement of IPA and Ministry of Shipping are mainly for policy and planning purposes and performance monitoring of Major Ports.

3. The Working Group studied the cargo traffic and performance/efficiency indicators data being supplied by the Major Ports to IPA, TRW and to various sections of Ministry of Shipping. The Working Group noted that the Major Ports are furnishing data to the Ministry/TRW/IPA in the prescribed formats as per the instructions of the Ministry issued from time to time.

4. After detailed deliberations on problems of classification, compilation, inter- port comparison and dissemination of data, the **Working Group recommends the following**:

(i) Present classification of cargo traffic featuring seven-commodity statement (prepared by IPA) includes “Other Liquid Cargo” except POL Crude/Products being clubbed with ‘Other Cargo’. In order to get the complete picture of Liquid Cargo, it is recommended that the existing seven commodities classification may be broadened to include Other Liquid Cargo (including Vegetable Oil) as separate category.

(ii) In present commodity classification of cargo traffic, as shown in the seven-commodity and seventeen-commodity statements (prepared by IPA), Thermal Coal and Coking Coal are separately recorded. In addition to above two categories of coal, Major Ports are handling other categories of coal/coke such as Steam Coal, Anthracite Coal, Industrial Coal, Petroleum Coke, etc. These coal categories are being clubbed with ‘Other Cargo’ in seven or seventeen commodity classification. In order to have a complete picture of coal cargo handled by ports, the Working Group recommends that coal traffic may be recorded in three categories i.e. Thermal Coal, Coking Coal and Other Coal/Coke (i.e. all coal/coke other than Thermal Coal and Coking Coal).

(iii) Fertilizer Raw Material (Dry) cargo consisting of Rock Phosphate and Sulphur is to be shown under the category ‘Raw Materials for Fertiliser’. However, Fertiliser Raw Material (Liquid) cargo, comprising Phosphoric Acid and Liquid Ammonia, may be considered under the category ‘Other Liquid Cargo’ in the seven-commodity statement (proposed to be amplified in (i) above).

(iv) Shipping lines/companies generally provide information on the port of country from where the cargo is loaded or where the cargo is to be unloaded and not the country of origin and destination of the cargo. Hence the Major Ports shall publish details regarding origin and destination ports/countries from where the cargo was originally loaded/ or where the cargo is to be finally unloaded.

(v) Some of the commodities are received / dispatched in bulk as well as Break Bulk. In order to have a complete picture of the commodities identified for monthly traffic monitoring, it was felt that such commodities need to be included in Dry Bulk as well as Break Bulk. Four commodities namely foodgrain, fertilizers, sugar and cement have been identified for inclusion in both Dry Bulk and Break Bulk.

(vi) The maintenance of commodity-wise data moving in containers would help in analyzing commodity-wise trend of cargo and hence such data needs to be maintained.

(vii) In order to assess the performance of Major Ports (excluding private operators), Major Ports should furnish separately for cargo traffic handled by the facility/terminal owned/operated by the Major Port and that handled by private/BOT operator. Similarly, performance/efficiency parameters data pertaining to cargo handled by the facility/terminal owned/operated by the Major Port should be furnished separately on an annual basis.

(ix) In tables showing Berth particulars, some ports are publishing scheduled/designed depths while some are publishing drafts. Similarly, in respect of maximum size of vessel that can be accommodated, some ports are publishing quay length while some ports are giving maximum DWT of the vessel that can be accommodated. It is recommended that all Major Ports should publish uniform information on the following parameters: -

a. Berth No./Name
b. Type of Berth
c. Designed depth
d. Permissible draft
e. Quay length

(ix) In the cargo handling equipment data, some ports are publishing data on equipment owned by port while some ports are publishing data for equipment hired by port also. The Working Group recommends that Major Ports should publish data relating to cargo handling equipment owned by port and Private operators separately.

(x) In the storage capacity of the ports, the information on Container Freight Station (CFS) and reefer points may also be included.

(xi) The data on cargo handled by a Major Port includes cargo handled by Private Terminal Operator(s). However, the financial data on various financial

parameters namely Operating Income, Operating Expenditure (Head-wise), Operating Surplus, Net Surplus, Distribution of Revenue and Expenditure (Operational Head-wise) etc. pertains to cargo handled by the Major Ports themselves i.e. excluding income and expenditure of Private Terminal operator(s). Thus financial statistics being published in the publications of TRW and IPA do not give complete picture. In order to provide complete picture and analysis, IPA and TRW should include basic financial statistics in respect of Private Terminal Operator(s) in their publications as a separate Table.

5. The Working Group, as per the Terms of Reference was required to identify the physical parameters/indicators to meet the requirements of policy planners and other users; standardize concepts and definitions to be followed by the ports for Physical and Financial parameters and indicators and identify indicators to be used for inter-port comparison. The Working Group has accordingly identified the Physical parameters and indicators (Chapter 3), reviewed important concepts and definitions to be followed by ports for Physical and Financial parameters and indicators (Chapter 4). The Working Group has in following paragraphs identified indicators to facilitate inter-port comparison and benchmarking of Productivity and Efficiency.

Parameters and Indicators for Inter-Port Comparison

6. The parameters and indicators for uniform compilation by Major Ports are given in Annexure-II. Due to differences in the topography, berthing facilities, cargo handling equipment, storage facilities, etc, it is difficult to make inter-port comparisons in most of the parameters/indicators identified in **Annexure-II**. Keeping in view the problems in inter-port comparison, the following parameters/indicators have been identified by the Working Group for inter-port comparison of performance of Major Ports:

Physical Parameters/Indicators

(ii) Average Pre-Berthing Waiting Time

(ii) Average Ship Berth-Day Output

(iii) Average Turn Round Time excluding Navigation Time

(iv) Percentage of Non-Working time to Stay at Working Berth**.**

Financial indicators

(i) Return on Capital Employed

a. Operating Surplus to Net Operating Assets

b. Net Income to Total Capital Employed

(vii) Current Ratio

(viii) Asset Turnover Ratio

(ix) Management & General Administration Expenditure to Operating Expenditure

(x) Percentage of Salaries and Wages to total Operating Expenditure

Benchmarking of Productivity and Efficiency

7. In India, when Productivity Parameters in Major Ports are discussed, traditionally, the following parameters are reckoned with for assessment of the effectiveness and efficiency of a Major Port:

1. Average Pre-Berthing Detention of Vessels (In hours)
2. Average Turnaround Time of Ships (In days)
3. Average Ship Berth- Day Output (In tonnes)
4. Average Idle Time (%)
5. Average Berth Occupancy (%)
6. Percentage of Capacity Utilisation of Berths
7. Average Gang Output per Shift
8. Average Stay at Berth

8. Total volume of traffic, number of vessels and total number of TEUs handled are also computed to indicate how big or small the port is. But, these parameters definitely do not indicate how efficient a port is, unless they are correlated with the number of berthing points a port possesses and the kind of cargo it handles viz. dry bulk, break bulk, liquid bulk and containerised cargo. Further, after commissioning of container terminals in the country, calculation of "Average Moves per Crane-Hour" in each of the terminals, which ultimately show the productivity of the terminal, is also considered.

9. However, when comparison is to be made with internationally accepted parameters, the above parameters are not much in vogue in international ports either in Asia, South Africa, Europe or United States. There is no concept of "Pre-Berthing Detention" or "Pre-Berthing Waiting Time" in world class ports, as the capacity is much more than the actual traffic. Hence, there is no question of any ship waiting on the outer harbour or at anchorage. Average Turnaround Time depends upon the parcel size of the vessel calling, length of the channel in which pilotage takes place, type of commodity and the mode of discharge/loading. It cannot be generalised and averages mask the nature of ports which may not provide a correct picture and may lead to wrong interpretation. One commonly referred parameter that can be attributed to port's internal efficiency is how much cargo that the port discharges/loads from/to a ship in a day which is nothing but Ship Berth-Day Output. However, it will also differ according to the nature of commodity. Still, comparisons could be made commodity-wise as it gives a fair comparison of port's handling efficiency. Of course, it does not indicate non-shore (water side) efficiency nor reflect whether a port has adequate capacity to serve the demands of traffic/trade. It pre-supposes that the port has built adequate capacity and no Pre-Berthing Detention accrues.

10. With the advent of containerisation of general cargo due to its advantages, ports have seen creation of container terminals in the world with relatively less emphasis on handling of traditional bulk cargo. Container vessels are sophisticated and expensive which need efficient container handling equipment so as to ensure quick turnaround time. Hence, many innovative methods and handling systems have been introduced to achieve higher productivity in a container terminal. As a consequence, monitoring of terminal performance is important and done meticulously, watching the performance of Shore Cranes. The best parameter for the purpose is "Average Moves per Crane-Hour". Associated and derivative parameters like Number of Moves Per Hour (meaning total moves of all cranes working for vessel – also known as Vessel throughput per hour) , Terminal Throughput (meaning the total TEUs handled by the terminal in a day), Yard Productivity (meaning the number of containers handled in a yard), etc., have also emerged.

11. A survey of some available literature on the subject does not give any standard productivity indicators defined for the port sector. However, various sources of information like UNCTAD Monographs on Port Management, other informal data obtained from respective ports, etc. an attempt has been made to draw comparisons across global container terminals.

PORT	**Crane Productivity for small vessels**	**Berth Productivity for small vessels**	**Crane Productivity for large vessels**	**Berth Productivity for large vessels**
Singapore PSA	23	45	36	140
Port Rashid and Jebel Ali	22	40	30	110
Khor-Fakkan, Fujairah	20	32	28	100
Salalah	N/A	N/A	29	90
Aden	N/A	N/A	28	70
India				
NSICT	18	30	22	40
JNPCT	16	24	20	36
Tuticorin	14	14	-	-
Colombo - SLPA	14	23	18	45
Colombo -SAGT	13	25	24-25	
Belgium Ports	-	-	30-35	-
Shanghai	-	-	35	-
International Standards	**-**	**-**	**27-33**	**-**

12. If one expands the productivity parameters from Turnaround Time to Dwell Time and compare with Port of Singapore, in general terms, the position emerges as follows:

Ports	Dwell Time (days)	Crane productivity (Moves/hr)	Evacuation System	Vessel Evacuation Rate (Containers/hr)	Turn Round Time (days)
Major Indian Ports	3.78	20	Manual	40	1.77
Singapore	0.60	30	Automatic flow –thru gate system	100	0.50

13. It could be seen from the above table, that there is a difference in three chief performance indicators viz., Crane Productivity=> Container Evacuation rate=> Turnaround Time between a world-class port like Singapore, Rotterdam and Major Ports in India. These variations are on several counts such as

(i) Availability of terminals for handling containers
(ii) Area available for terminals at ports
(iii) Expansion/construction constraints
(iv) Draft available at berth and in channel
(v) Availability of equipments
(vi) Volume of cargo
(vii) Level of mechanisation

14. The Working Group, having considered variations in Indian ports vis-a–vis world class international ports, is of the view that **benchmarking of productivity and efficiency of Indian Major Ports with international ports is not feasible.** However, **benchmarking of Major Port efficiency in terms of Turn Round Time excluding navigation time, Pre-Berthing Waiting Time, Percentage of Non-working Time to Stay at Berth and Ship Berth-Day Output for different category of cargo/vessels may be considered for Major Port's inter-port comparison of cargo operations.**

6. FORMATS FOR DATA COMPILATION AND DISSEMINATION

The Major Ports are furnishing several returns with varying periodicity to Ministry of Shipping, IPA and Transport Research Wing (TRW). These returns have been prescribed over a period of last two decades. A list of returns being sent by Major Ports on monthly basis to MOS, IPA, TRW, etc. are given below:

(i) Traffic handled during and upto the month (7 commodities).
(ii) Traffic handled during and upto the month (Loaded, unloaded and transshipped) (17 commodities)
(iii) Commodity-wise Overseas Cargo handled.
(iv) Monthly Cargo Traffic - Proforma MS/1/A-1
(v) Monthly position of Cargo Ships arrived
(vi) Monthly Vessels waiting and details of Containers lying in port area.
(vii) Equipment Availability & Utilization.
(viii) Labour Productivity Report (Ministry's letter No. MR-11014/6-89/P dated 09.08.1990).
(ix) Proforma-10 (Ref- IPA/MSD/S-4/97 dated 21.07.1997)
(x) Revised Proforma-10 (Telex No. 600/1/DTD dated 16.01.91)
(xi) Performance Indicators (Leter No. MR-11019/1/2000-TRW (P) dated 29.11.2000)

2. Some of the above returns are being sent by only a few Major Ports. IPA at present is compiling the following returns: -

(1) Weekly Report for Cabinet Committee on Industrial Infrastructure as per Proforma-100
(2) Monthly Report of Ship-card Report
(3) Commodity-wise Traffic Statement in terms of Principal Commodities (7-commodities) for Major Ports.
(4) Commodity-wise Traffic Statement for Major Ports (17 commodities)
(5) Performance Indicators for Major Ports.
(6) Availability & Utilisation of Cargo/Container handling equipment at Major Ports.
(7) Labour Productivity Report

3. The data and indicators being furnished in various returns were scrutinized. It was observed that there is overlapping/duplication of data. It was also observed that several returns were prescribed long ago to meet the extant purpose. Over time the specific purpose may have been fulfilled. However some ports continue to supply the data.

4. Keeping in view the requirements of data of the Ministry of Shipping, the Working Group is of the view that apart from data on cargo handled and performance indicators, data on availability and utilization of cargo handling equipment is required by Major Ports to make inter-port comparisons and assess

capacity for policy purposes and hence such data should be collected on monthly basis in the current format.

5. The Working Group, while deliberating on the formats for Major Ports, was of the view that formats for data collection should be so designed that they serve the needs of Ministry of Shipping and other user organizations/individuals and the compilation workload on Major ports is also reduced. The Working Group has accordingly designed formats for data collection in a manner that same formats (with few exceptions) could be used for data collection and dissemination. The periodicity of data collection has been suggested keeping in view the utility of data. These formats were discussed in a meeting with officials of the Ministry of Shipping, IPA and TRW on 7th April, 2010. The suggestions of the Ministry of Shipping have been incorporated.

6. The following formats for data collection on monthly, quarterly and half yearly basis in respect of cargo traffic and port performance have been suggested by the Working Group:

Monthly Formats

M-I Commodity Group-wise and Category-wise Cargo Traffic Handled (10 commodities)

M-II Commodity-wise & Category-wise Cargo Traffic Handled
- i) During the Month
- ii) Cumulative during the Financial year

M-III Performance of Major Ports
- i) During the Month
- ii) Cumulative during the Financial year

M-IV Distribution of Pre-berthing Waiting time
- i) During the Month
- ii) Cumulative during the Financial year

Quarterly Formats

Q -I - Performance Indicators for Container Terminals.

Half-Yearly Formats

H-I - Cargo Traffic Handled at Major Port

H-II - Performance in Terms of Vessels Handled
- i) All Vessels
- ii) Overseas Vessels
- iii) Coastal Vessels

7. Half yearly data may be furnished for six month period ending September and for the whole year for the period ending March.

8. The formats have been designed for annual compilation of data by Major Ports. The Major Ports may provide annual data to TRW and IPA in following 36 formats

Vital Port Infrastrucure

V-I - Topography of Port
V-II - Berth Particulars
V-III - Floating Crafts
V-IV - Cargo Handling Equipments
V-V - Storage Facilities.

Cargo Traffic (except Container)

C-I - Commodity-wise & Category-wise Cargo Traffic Handled
C-II - Flag-wise Distribution of Traffic
C-III - Origin and Destination-wise Overseas Traffic Handled
C-IV - Commodity-wise Traffic Handled (During last 5 years)
C-V - Commodity-wise Loaded Cargo Received by Different Modes of Transport
C-VI - Commodity-wise Unloaded Cargo Despatched by Different Modes of Transport
C-VII - Commodity-wise & Category-wise Transit Traffic of Other Countries Cargo Handled

Container Traffic

Co-I - Number & Types of Containers Handled
Co-II - Container Cargo & Tare Weight of Containers Handled
CO-III - Inland (Landward) Container Movement - Outgoing from Port after Unloading from Ship
Co-IV - Inland(Landward) Container Movement - Incoming to Port for Loading on to Ship

Performance Indicators

P-I - Performance of Major Port
P-II - Distribution of Pre-Berthing Waiting Time
P-III - Distribution of Non-working Time at Working Berth
P-IV - Commodity-wise Performance Indicators
P-V - Berth Occupancy
P-VI - Availability of Cargo Handling Equipments.
P-VII - Shore Labour Productivity
P-VIII - Dock Labour Productivity
P-IX - Availability and Utilization of Equipments (other than Container Handling)
P-X - Availability and Utilization of Container Handling Equipment

P-XI - Performance of Container Handling Equipment
P-XII - Performance of Dredgers

Financial Statistics

F-I - Income and Expenditure of Major Port
F-II - Application of Funds and Other Financial Statistics of Major Port
F-III - Operating Expenditure by Head of Expenditure
F-IV - Financial Data of Private Terminal Operator

Other Major Port Statistics

O-I - Number, Type and Size of Ships Sailed
O-II - Passenger Traffic at Major Port
O-III - Accidents at Major Port
O-IV - Employment and Mandays Lost at Major Port

9. The above formats are expected to meet the requirements of the Ministry and the users for policy planning and monitoring purposes.

Formats for Data Dissemination in Various Publications

10. The port statistics is disseminated primarily through the following publications:

i) Administrative Reports of Major Ports (except Ennore Port)
ii) 'Major Ports of India - A Profile' by Indian Ports Association.
iii) 'Basic Port Statistics of India' by Transport Research Wing

11. The data being disseminated through these publications were scrutinized. It was observed that data being published by Major Ports in the above three publications differ not only in content but also in the categorization/classification. A comparative list of important data being disseminated through the Administrative Reports of Major Ports and Annual Publications of IPA and TRW is given in Annexure-I.

12. The Working Group is of the view that all the Major Ports should disseminate data in uniform formats so that it becomes easy for the users to aggregate and compare the data. The formats V-I to V-V, C-I to C-VII, Co-I to Co-IV, P-1 to P-XII(except P-I and P-IV) and O-I to O-IV stated above have been so designed that same formats can be used for data dissemination as tables in Administrative Reports of Major Ports. Formats P-I and P-IV have been designed with a view to collect category-wise and commodity-wise data on Major Port performance parameters and indicators for analysis purpose. The Working Group

is of the view that the Administrative Report of Major Ports should only publish important Vessel Performance parameters and indicators only. Formats P-1 (AR) and P-IV (AR) have been designed for dissemination of Vessel Performance and Commodity-wise Performance Indicators. As regards Financial Statistics, Major ports may publish in their Administrative reports, data on

Financial Indicators and Capital Expenditure on Plan and Non-Plan schemes in the formats at **F-V** and **F-VI** respectively. However individual Major Ports may also publish any other financial data considered important by them in their administrative reports. Existing financial data series in “Basic Port Statistics of India” and “Major Ports of India - A Profile” may be continued.

13. **The Working Group recommends that Major Ports may uniformly publish 36 tables in the recommended formats**. **In addition to these formats, the Major Ports may publish other statistics in their annual Administrative Report if such statistics give important information of that particular Major Port**.

7. ROLE OF PORT SERVICES IN THE ECONOMY

The importance of Service sector to the Indian economy, in terms of its contribution to Gross Domestic Product (GDP), employment generation and foreign exchange earnings has significantly increased over the years. In 2008-09, the sector contributed about 52% in the GDP. However to measure the dynamics of the service sector, short term indicators are required which at present are absent.

A. Compilation of Index of Port Services

2. Ports are economic and service provision units of critical importance since they act as a place for interchange of two transport modes, maritime and land. Ports are responsible for handling 90% of international commodity trade by volume. In view of the requirement for short term indicators, Government had decided to compile Service Sector Indices. Ports services are one of the sectors for which indices are proposed to be developed.

3. In order to assess the changes in port service sector, the dynamics of Port sector needs to be considered both from the supply side and consumption side. From supply side, the growth/movement of production of various services are to be monitored to assess their availability. On consumption side, the prices charged from consumers for these services and cost at which producers are producing these services are to be studied to find its affordability and availability for the consumers. To measure the dynamics of production and cost of services, it is desirable to have Index of Service Production (ISP) whereas change in the price of services for consumer can be measured by Consumer Service Prices Index (CSPI) and change in cost of producing the service by major ports can be measured by Producers Price Index(PPI).

4. To provide Technical guidance in the compilation of ISP, a technical committee has been constituted under the Chairmanship of Shri C.P. Chandrashekhar in Central Statistical Organisation (CSO). A Committee has also been constituted in D/o Industrial Policy and Promotion, M/o. Commerce and Industry under the Chairmanship of Shri C.P. Chandrashekhar for compilation of Consumer Service Price Index. The Committee's mandate is for construction of indices for the entire gamut of service sector, inter-alia, port services. The technical aspects of index compilation i.e. formula for compilation of index, coverage, methodology including appropriation of weights to the various service sectors and base year of index will be decided by the respective Technical Committees. These indices, compiled for the important services being provided by ports, would enable major ports and other users of data to compare the relative changes in consumer prices, producer prices and production of various services by ports.

5. The Working Group was apprised of the work carried out by Department of IP&P and CSO in respect of compilation of service indices for consumer prices and Production by TRW. The following paragraphs detail the work carried out

and views of the Working Group on the issues concerning Major Ports, particularly with regard to the services to be included, supply of data and periodicity.

Consumer Service Prices Index

6. A price index is a measure of the proportionate or percentage change in a set of prices over time. A Consumer Service Price Index measure changes in the price of services that a consumer of service pays. As the price of various services do not change at the same rate, a price index only reflects their average movement.

7. D/o. IP&P, M/o. Commerce & Industry had entrusted a study on Development of Service Price Index for ports to ICRA Management Consulting Services Ltd. In this Index, the basket of Port Services used for compilation of Index by the consultant is at broader group service level. As the prices fixed by the TAMP for ports are at individual commodity/service level, the services will need to be categorized till the lowest level for which prices are fixed by TAMP. This will enable the construction of Index and to measure the relative change in the Prices of those service. The Sub-Group noted the fact that prices fixed by TAMP for port services are the maximum that can be charged by the Port and not the actual prices charged from consumers by Major Ports. The Working Group is of the view that for index purposes actual per unit price charged for the service shall be considered. In some cases ports give price discount to some important customers for certain services. For such services, the price charged without discount is to be taken as the price. The final decision on such issues would have to be taken at the time of index compilation in consultation with the concerned Technical Committee. The Working Group has identified the services to be included for compiling the index of consumer prices. The identified services for index of service production are at **F-VII**.

Index of Service Production- Port Services

8. CSO had attempted to compile Index of Service Production in port service for Major Ports on annual basis from the published data. The Index was compiled using Laspeyre's Index Formula.

9. The major limitation of that experimental index was that cargo handled and container handled were only parameters for which separate data were available and assigning of weights to ports was done on the basis of total revenue earned. The utility of experimental index of service production is limited as important services of ports were not covered. The dynamics of changes in different services produced by ports over time can be studied only when all important services are included in index. The Working Group identified the services produced by ports and their unit of measurement which may be included in the index. For such identified services, separate revenue earned will also be required for the base year (to be decided in consultation with CSO by TRW) at least and more appropriately every year for assigning weights (relative

importance) to the services. The identified services for index of service production are at **F-VIII**.

Index of Producers Prices

10. Another important index which is of importance is Index of Producers Prices i.e. the price at which the services are produced by the producer i.e. Major Ports for our purpose. This index will indicate relative change in cost of production of services for all major ports as well as for individual ports. The Working Group identified the services produced by ports which may be included in the index. The identified services for index of service production are at **F-IX**.

11. The data requirements for compiling the three indices of port services have been identified for cargo handling and storage activities, vessel traffic activities, railway activities and cargo handling equipment activities are given in formats **F-X to F-XIII** respectively.

12. Keeping in view the requirement of data, resources required for its compilation and frequency of price changes, the Working Group proposes **that all three service indices namely Index of Service Production (ISP), Consumer Service Prices Index (CSPI) and Producers Price Index (PPI) may be compiled annually. TRW may be entrusted with the work of compiling the indices.**

B. Contribution of Major Ports in National Accounts

13. In the national accounts, ports are covered under supporting and auxiliary water transport activity. In the present system of national accounts twelve Major Ports are included. Minor ports are not being covered due to non-availability of financial data pertaining to these ports.

The following three macro economic aggregates are compiled

A) Gross Domestic Product (GDP) = Output - Intermediate consumption (Production Approach)

- Where output mainly includes Sales, other Income and Rental
- Intermediate consumption mainly includes purchase of goods and services, Electricity, Insurance, repair & maintenance etc.

OR

GDP=Compensation of employees + Operating Surplus + Depreciation (CFC) (Income Approach)

- Where Operating Surplus is a balancing item in the worksheet. OS includes Interest paid, Rent paid and Profit before tax.

In practice, the above two approaches give the same value of GDP.

B) Saving: Conceptually saving is the retained profit of the ports. In practice, Saving= (Loss on Exchange +Loss due to sale of investment + Provision for Bad & Doubtful Debts + Transfer to Reserve + Expenditure of Previous Year + Transfer to Balance Sheet) - (Capital Gain + Gain on Exchange + IDSOI + EPWB+ Transfer from Reserve + Transfer from Last Account)

C) **Capital Formation:** Net acquisition of produced assets viz. Building, P&M, Other Construction, Transport Equipment, Office Equipments and CWP etc is capital formation of ports.

14. The compilation of different macro economic aggregates viz. Gross Domestic Product (GDP), Savings and Capital Formation of Ports is based on the analysis of annual accounts (P&L account and Balance Sheet). GDP and Savings figures are compiled from the information provided in the P&L Account whereas Capital formation information is obtained from Gross Block of Balance Sheet.

15. Macro Economic aggregates for the twelve Major Ports for the year 2007-08 are given below. (Aggregates for 2008-09 are under compilation)

Name of the Port	Value Added*	Gross Saving	GFCF
Mumbai Port Trust	56027	24771	2692
New Mangalore Port Trust	18993	9901	3940
Kandla Port Trust	23240	21858	5832
Pardip Port Trust	43830	26929	4515
Mormugao Port Trust	16664	3600	1199
Chennai Port Trust	56153	23277	3632
Cochin Port Trust	11731	1567	5229
Vishakhapatnam Port Trust	43630	14840	3722
Kolkata Port Trust	75762	51878	6000
Tuticorin Port Trust	16832	8793	4386
J. L. N . Port Trust	65622	70833	6674
Ennore Port Limited	10246	4762	4877

* - Contribution to GDP

Source : National Accounts Division, CSO

16. At present CSO uses specifically designed worksheets for the purpose of compiling the contribution of Major ports as the data in the Administrative Reports and Annual Accounts is not as per their requirement. Basically, through these worksheets the information provided in the business accounts of ports are translated into national account aggregates. The analysis sheet of Mumbai Port Trust for the year 2007-08 is enclosed at **F-XIV** for reference. The table is complex and not easily understandable.

17. While compiling macro economic aggregates, CSO faces difficulty due to non-availability of Operating Expenditure details in the annual accounts of some of the major ports. Moreover, CSO requires data within 6-7 months of completion of financial year to accurately reflect the contribution of Major Ports in National

Accounts. In order to overcome the above problems, CSO has devised a format for collection of data from major ports. The format is at **F-XV**.

18. **The Working Group is of the view that Major Ports can furnish the requisite data for CSO through TRW.** The CSO also compiles quarterly estimates of GDP for which data requirements are less compared to those at F-XV. The data required for Quarterly GDP estimates is given in Format **F-XVI.**

8. IMPROVING QUALITY OF MAJOR PORT STATISTICS

Data is a valuable input as it plays a critical role in decision making at all levels of an organisation. In this era of information-driven global society, data is the main tool for shaping strategy and policy. It is not only the volume of data but its quality.

2. Confidence in the quality of information produced by any statistical agency is vital. If the information provided by any statistical agency becomes suspect, credibility of the official statistics would be questioned and its reputation as an independent, objective source of trustworthy information would be undermined. Thus attention to quality of Major Port Statistics is one of the important aspects to which the Working Group has devoted its attention.

3. The word 'Quality' is not amenable to definition or exactitude. The word has many different meanings depending on the context in which it is used. The quality of statistical output can be viewed in two dimensional perspective- one as a dimension of the system itself and second as an attribute of data in data quality. Statistical methods play central role in the latter dimension of quality.

4. During the last two to three decades, quality has become an over-used term. Total Quality Management (TQM) movement and other management frameworks have broadened the concept of quality beyond the statistician's traditional concept of data quality in accuracy, which most easily lend itself to rigorous mathematical development and to the fitness for use. This later dimension emphasizes the need to build quality into the production and delivery process of the statistical agency and stresses on the importance of the employee involvement in process redesign and commitment towards improvement of the final product or service. Statistical methods and processes, which are central to data quality, are part of the larger picture of data quality, management approach.

5. TQM thus advocates: knowing and understanding the clients'/users' needs; involving employees in decision making associated with meeting these needs and continuously seeking to improve methods and processes. Attention to these three aspects will lead to quality improvement.

6. Major Port statistics collected and published by TRW/IPA are oriented to the need of users. The TQM definition of fitness for use by clients is operationalised through several dimension of information quality. The most important and commonly used components of quality are: - (i) Relevance (ii) Accuracy (iii) Timeliness and Punctuality (iv) Accessibility (v) Interpretability and (vi) Coherence.

7. The following paragraphs give a brief description of the quality components and their assessment in respect of Major Port Statistics issues for improving the quality of data and the recommendations of the Working Group.

(i) **Relevance**

8. The relevance of statistical information reflects the degree to which it meets the real needs of clients. It is concerned with whether the available information sheds light on the issues of greatest importance to users. Assessing relevance is a subjective matter depending upon the varying needs of users.

9. Maintaining relevance requires keeping in touch with full array of current and potential information users, not only to meet their current needs but also to anticipate their future needs. Information needs are rarely formulated clearly in statistical terms. Users generally express their interest in particular topic or data requirements translating expression of interest into information need and its availability to the users can be meaningfully managed by the agency which handles the Port statistics i.e. TRW.

1o. To ensure relevance, TRW needs to put in place a mechanism whereby it stays abreast of the current and future information needs of its main user communities. The above mechanism will generate user feedback on current Major Port Statistics in addition to information about new and future needs. Periodic review of Major Port Statistics System is required to assess the system and identity the possible changes required for meeting the user needs. **The Working Group suggests that such review of Major Port Statistics be undertaken once in five years.**

(ii) **Accuracy**

11. The accuracy of statistical information is the degree to which the information correctly describes the phenomena it was designed to measure. It is usually characterized in terms of error in statistical estimates and is traditionally decomposed into bias (systematic error) and variance (random error) components. It may also be described in terms of the major sources of error that potentially cause inaccuracy (i.e. coverage, sampling, non-response, etc.)

12. Major Port Statistics which is compiled from the administrative records of the ports, the accuracy of Major Port Statistics can be affected by errors occurring due to coverage, non response, measurement and processing of data. The errors can occur at individual port or in TRW/IPA, which consolidates and releases the data for dissemination.

13. The Major Port Statistics are compiled by staff in the Statistical Cells of Major Ports. These officials need to be periodically made aware of the importance of accurate data compilation and likely sources of error at each and every stage of data compilation and processing and how to control/check these errors.

14. Compilation of Major Port Statistics requires knowledge of the concepts and definitions used in port statistics, compilation of methodologies, data scrutiny, validation and data processing. Periodic training of officials in these areas to do the job more efficiently is imperative. At present, no system for

training and sharing of experiences in respect of Major Port Statistics exist. The Working Group recommends that **TRW should organize training programmes /workshops for officials/staff involved in compiling statistics at Major Ports. The workshops shall cover all statistical concepts, definitions/issues of compilation, processing, and total quality management issues.**

i) **Timeliness & Punctuality**

15. Timeliness of information refers to the length of time between the reference points, or the end of the reference period to which the information relates, and the time of its availability to the users. The desired timeliness of information derives from considerations of relevance for which period the information remain useful for its main purpose. Timeliness is an important characteristic that needs to be monitored over time to ward off deterioration. Timeliness can be directly observed by users.

16. Punctuality refers to the time lag between the actual release date of the data and the target date when it should have been made available. The target date of availability is pre-decided/announced in some official release calendar.

17. The Working Group noted that monthly cargo traffic data of Major Ports is compiled by 5th of the following month and is posted on IPA's website. IPA also brings out the publication " Major Ports of India- A Profile". The publication contains data for a financial year. The publication is generally brought out in the month of September-October after a lag of six to seven months. The Working Group suggests that **Major Ports of India- A Profile may be brought out within six months after close of Financial year i.e. by the end of September of preceding Financial Year.**

18. TRW disseminates Port Statistics through annual publication **'Basic Port Statistics of India'**. The publication contains information on Major Ports and Non-Major Ports in respect of cargo traffic – volume of cargo and its composition, performance indicators, port capacity and its utilisation, financial performance, International Port Statistics and other related statistics. The Working Group suggests that the publication '**Basic Port Statistics of India' should be brought out in the year following the end of the Financial Year i.e. for the year 2009-10 in 2010-11**.

19 "Update on Indian Port Sector', a bi-annual publication being regularly brought out by TRW as a follow-up of the decisions of the Maritime State Development Council is being brought out in the months of June for the period ending 31st March and in December for the period ending September. **The TRW may maintain the existing timeframe.**

(iv) **Accessibility**

20. Accessibility of information refers to the ease with which users can learn of its existence, locate it, and import it into their own working environment. The aspects of accessibility that require attention are:-

(i) System that allows users to find out what information is available;
(ii) Access to users in formats that suit them;
(iii) Medium through which the information can be accessed; and
(iv) Cost of information.

21. The statistical information in respect of individual Major Ports is available on the websites of individual Major Ports. Major Ports give basic information about cargo handled, revenue income and expenditure, etc. The Administrative Reports of Major Ports are also accessible on their websites.

22. Monthly statistics of cargo handled and performance indicators for Major Ports are available on the website of IPA. Aggregated data of Major Ports is available on the websites of Ministry of Shipping. The detailed statistics being published by IPA and TRW, is available in printed book form only. The publications of IPA are priced publication while the publications of TRW are free.

23. The Government has National Policy on dissemination of statistical data. As per the policy, apart from dissemination of official statistics in the form of reports, ad-hoc publications and regular publications, validated data though unpublished, including unit level data after deleting their identification particulars to maintain confidentiality, should also be made available to the national and international data users in the form of hard copies and on magnetic media on payment basis. Moreover, the price of data to be supplied above should include the cost of stationery, computer consumables and computer time for sorting information. Postal charges to be included with the cost of data to be supplied. However, the concerned source agency has the prerogative to decide on the sensitivity of the official statistics produced by it and the right to withhold its release or to release selectively.

24. The Working Group deliberated on the feasibility of making available individual vessel wise data of Major Ports to users. The Working Group is of the view that **vessel traffic and cargo traffic data is of commercially sensitive nature and hence individual vessel wise traffic data should not be made available to the users.**

(v) **Interpretability**

25. Statistical information, that users cannot understand, can easily be misunderstood, has little value. Providing sufficient information to allow users to properly interpret statistics, is generally the responsibility of the statistical agency i.e. TRW in respect of Major Port Statistics. Information about information is known as meta-information or metadata.

26. The information needed to understand statistical data falls under three broad headings:-

(a) Concepts and classifications that underlie the data;
(b) The methodology used to collect and compile the data; and
(c) Measures of accuracy of data.

27. The statistical publication currently being brought out by TRW gives definitions of important terms used in the publication. However, detailed concepts and methodology used in collection and compilation of data is not being provided. The Working Group recommends that **TRW may provide the metadata for Major Port Statistics in the form of a manual on the website of Ministry of Shipping**.

(vi) **Coherence**

28. Coherence of Major Port Statistics is their amenability to be combined in different ways and for various uses. This requires compilation of Major Port statistics using same approach, classifications and methodological standards. **The Working Group has suggested standardized concepts, definitions, classifications and formats for compiling data, so that coherence of data is achieved.**

Other Quality Related Issues

(a) Data Collection Methodology

29. One of the objectives of the Working Group is to minimise the response burden of all data providers. For this purpose uniform formats for data collection and dissemination have been designed which will be used for publishing in the Administrative Reports and for supply of Major Port Statistics to IPA, TRW and Ministry of Shipping. At present hard copies of the data are being supplied by the Major Ports. The Working Group **suggests that all Major Ports should invariably send the data through e-mail to reduce the cost and time in furnishing the data.** This will also enable the receiving agencies to electronically process the data for further analysis.

30. A comprehensive computer based information system (Ship Card System) was developed in 1989 by IPA to monitor the performance of ships sailed out from Major Ports. The Information System's contemplated aim was:-

(i) Minimizing the need for repeated references by the Ministry to ports for information on traffic handling ships performance etc. by having a centralized data bank.
(ii) Improving the presentation of information required.
(iii) Reducing the time lag between the occurrence of the event and the reporting time.

31. In addition, the system was to provide on-line access to status and performance of vessels at ports, generation of certain structured and unstructured statistical statements for monthly and annual time series. Several formats have been designed to obtain data from ports on vessels basic characteristics, arrival, shipping, departure and its working.

32. The Working Group was informed that data through Ship Card System is not being furnished by all the ports. **The Working Group is of the view that for**

parameters required for monthly monitoring, the data should be collected through Ship Card System. Implementation of Ship Card System should be enforced by the Ministry of Shipping.

(b) Dissemination of Statistical Output

33. At present the statistics being disseminated to the users is through publications. There is a time gap of one to two months between compilation of statistics and availability to the public. The present method of dissemination needs to be improved so that users are able to access the statistics at the earliest with ease and also the statistics can be made available in digital form. The Working Group recommends **that all the regular publications on Ports, Shipping and Inland Waterways of TRW should be put on the website of Ministry of Shipping.** As regards the publication "Major Port Statistics – A profile" of IPA, which is priced publication, IPA may take a view on its being made available on the website of the IPA at a cost

(c) Statistical Audit of Major Port Statistics

34. Statistical Audit is necessary to assure the user not only of the quality of data presented but also of the soundness of concepts, definitions and the entire system of collection, processing, summarisation and dissemination of data.

35. For the purpose of good practice in data collection and compilation, data audit is required to evaluate how effectively the data is being collected and compiled. There are several items which needs to be audited at a Major Port such as design of form for recording and summarizing, treatment of missing data, definitional consistency, checks on errors, procedures for control and assessment of errors, manual and computerised procedures of scrutiny and editing of data, data handling errors, errors in data capture, coding, data processing, etc.

36. Concurrent audit of statistical activities is necessary for early detection of errors and mistakes during the progress of work, and their rectification in time is essentially an internal activity of the Major Port. The Working Group recommends that assessment **of quality of the data produced by the Major Ports may be carried out once in two years through statistical audit by officers authorized by the Ministry of Shipping.**