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ECONOMIC COMMISSION FOR LATIN AMERICA  
Office for the Caribbean



SHIPPING STATISTICS

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## SHIPPING STATISTICS

### 1. Introduction

1.01 It has long been recognized that the lack of adequate information on the volumes of freight moving through the ports of the Caribbean severely hampered planning for both port facilities and shipping services.

1.02 In 1977 an attempt was made to redress this situation when as part of an Investment Study for the West Indies Shipping Corporation, carried out by the Caribbean Development Bank on funding provided by the Canadian International Development Agency, the ECLA Office for the Caribbean and CARICOM worked together to produce shipping statistics on WISCO routes. This work was published as the Inter-Island Shipping Survey (ECLA/CARIB 77/1).

1.03 When the Caribbean Group for Co-operation in Economic Development was formed, the usefulness of extending this original work was recognized. An examination of the transport sector by the World Bank reiterated the need for such statistics. The United Nations Development Programme agreed to provide funds for this purpose through the Caribbean Group for Co-operation in Economic Development (CGCED) and work commenced in January 1979. This action had previously been endorsed by the Caribbean Development and Co-operation Committee (CDCC) Meeting held in Belize in 1978 forming part of a programme of work on shipping as described in E/CEPAL/CDCC/35.

### 2. Planning the Survey

2.01 It was decided to use the methodology devised for the original survey. That was to extract the necessary data from ships' clearance documents. In-bound vessels are required to complete an "Inward Manifest" and out-bound vessels are required to complete an "Outward Contents". (Sample forms are shown in Appendix 1).<sup>1/</sup> These

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<sup>1/</sup> All Appendices referred to in this document are contained in document CEPAL/CARIB 80/9.

documents show the cargo discharged and loaded whilst the vessel is in port.

2.02 It was decided to carry out a census of all traffic passing through CDCC ports. The period chosen was October 1978. Thus the data is for the period exactly two years later than the original work.

2.03 The following data was collected:

- Ship's Name
- Lloyds Register Number
- Type of Vessel
- Net or Gross Registered Tonnage
- Flag of Registration
- Date
- Origin Port
- Destination Port
- Commodity
- Weight
- Originating or Transshipment
- Main Method of Packing

2.04 It was realized that the volume of data to be collected and analyzed was too large for the work to be carried out manually as had been done previously. Discussions were held with UNCTAD, the United Nations Statistical Office, UNDP and Regional Institutions. It was agreed that the data could be processed on the IBM System 32, located at the ECCM Offices in Antigua. An experimental United Nations Maritime Transport Commodity Classification was adopted for the Survey. This system has 36 commodity groupings which can be expanded to record an infinite number of sub-classifications. In this case a total of 275 sub-classifications were used. While this code can be made comparable to the SITC, this breakdown is based on end use rather than the basic description.

2.05 Discussions were also held with IBRD who required the output as a data base for an examination of containerisation in the Caribbean. This resulted in the packaging codes being considerably expanded to record the different types of containers being used. Of the 39 codes used, 25 were of different container types.

2.06 A coding sheet was designed to enable the data to be pre-coded at the ports. An instruction manual was also produced explaining how these sheets were to be completed. These can be found in Appendix 2.

### 3. The Coding Sheet

3.01 Columns 01-03 - Card Code: This was allocated for identification of the Survey during data processing for administrative purposes.

3.02 Columns 04-06 - Country Code: This was the United Nations three-digit numeric country code for the country where the data was collected.

3.03 Columns 07-08 - Card Number: Each line of entry recorded a separate commodity movement and to distinguish them a record of the vessel commenced with Card 01. Subsequent lines became 02, 03, 04, etc.

3.04 Columns 09-27 - Ship's Name: The ship's name was recorded here.

3.05 Columns 28-34 - Ship's Number: The Lloyds Register Number had to be entered here at the editing stage as this number was not available on the documents used.

3.06 Column 35 - Type: This distinguished small vessels (under 500 NRT), break bulk, container, break bulk and container mixed, bulk liquid, bulk dry and other vessels.

3.07 Columns 36-41 and 42-47 - Gross and Net Registered Tons: Either weight was recorded as given on the Manifests. In some instances both figures were given. If no weight was recorded, this data was added from Lloyds Register during the editing stage. A few very small vessels were not in Lloyds and so the information is omitted in those cases.

3.08 Columns 48-50 - Flag: The United Nations country codes were used here also. Care was needed in determination of homeport, especially for small vessels registered in Associated States or Colonies in the Caribbean.

3.09 Columns 51-54 - Date: As the Census was taken for a year, the day and the month were sufficient to identify the date. The first day of the exercise became 01 10 (First of October 1977) and the last day became 30 09 (Thirtieth of September 1978).

3.10 Columns 55-58 and 59-62 - Origin and Destination Port: The three-digit IATA Airport Codes were used to identify Origin and Destination Ports. A fourth alpha digit was used to describe other ports in the same area that were without an IATA Code. The advantage of this system was that the coders could expand the system as the manifests were recorded. Lists were compiled of these sub-codes. For example, the IATA Code for Cardiff is CWL. This was recorded as CWLA. Newport with no IATA Code became CWLB and Barry also with no code became CWLC. Similarly, Port-of-Spain became POSA while POSB was Point Fortin, POSC - Point Lisas, POSD was Tembladora, POSE - Pointe-à-Pierre and POSF - Chaguaramas, etc.

3.11 Columns 63-68: This was coded as either a four or six-digit number. The first two numbers being the main headings of the United Nations experimental Maritime Transport Commodity Classification. The remaining digits were sub-codes giving the required breakdown; a total of 275 sub-codes were used. Thus, under 15 - foodstuffs, fresh/frozen, Code 1501 denoted meat, fresh, chilled or frozen while 150301 denoted butter and 150302 - cheese and curd. Some codes, like coffee - 1601, were the sole items in a group, while manufactured goods - Code 30, was sub-divided into nearly 50 sub-groups. The full list used is given in Appendix 2.

3.12 Columns 69-74 - Weight: Weight was recorded to the nearest metric ton of actual weight. This involved converting long and short tons to metric. Thus, freight tons, the usual measurement, was not used. Generally freight revenue is calculated by using either the weight or the measurement whichever yields the highest revenue. Thus

a freight ton could be 40 cubic feet or 35 cubic metres as well as being one weight ton. Manifests invariably contain both actual weights and measurement tons and actual weights were used.

3.13 Column 75 - Origin/Transshipment: Most cargo arrives at its destination on the same ship it was loaded on at the origin port; however, some cargo is transhipped en route. This is clearly marked on the manifests and was noted here.

3.14 Columns 76 and 77 - Main Method of Packaging: Cargo was distinguished by 39 different methods of packaging. More than half of these were different types of containers.

Full details are given in Appendix 2.

#### 4. Survey Method

4.01 The Survey method was adapted from that employed in the previous exercise. A team of coders was assembled and trained. CARICOM and ECCM were asked if they could provide staff. In addition help was solicited from the individual countries and was provided in Suriname, Jamaica and Haiti. The people were trained and sent into the field with a manual of instructions and the data collection was monitored as it progressed.

4.02 Port Authorities or Customs readily provided access to the necessary documents and the required data was extracted from the manifests as they were examined.

4.03 When this data reached Port-of-Spain it was edited and checked for missing data and obvious errors. The missing data was added at this stage and origin/destination codes added where this had not been done in the field. The data sheets had made provision for writing in port names, for example, where an appropriate IATA Code could not be found. These ports were then checked in "Ports of the World" to obtain the nearest airport and then coded accordingly.

4.04 The data was transferred from the sheets to diskettes under sub-contract in Trinidad and the diskettes were then sent to the ECCM in Antigua where the programming was completed and the sample tabulations were produced.

5. Survey Coverage

5.01 While it had been hoped to complete a full year's data for each CDCC port, this proved to be impossible.

5.02 Full data was obtained for Suriname, Trinidad and Tobago, Barbados, Grenada, St. Vincent, St. Lucia, Dominica, Antigua, St. Kitts-Nevis-Anguilla, Montserrat and Belize. About 80 percent of the data was obtained in Jamaica, while six months data was obtained in Guyana and Haiti. In the Bahamas, it was discovered that there was a similar pattern of trade at both Nassau and Freeport. A full year's traffic was obtained from Nassau only, with summaries of traffic at Freeport (including oil imports to the refinery) and the other islands. For details see Appendix 3.

5.03 No data was obtained from the Netherlands Antilles, Dominican Republic or Cuba. In all, 86,437 lines of entry were transferred to diskettes. After this operation, it was discovered that there were 536 errors (0.631 percent). It was found that 322 (0.373 percent) could be corrected while the balance of 214 (0.248 percent) remained uncorrected due mainly to missing data. This error rate was accepted as reasonable and these records were discarded.

6. Problems

6.01 With a pioneering exercise such as this, it was to be expected that problems would develop and eventually these grew to such a magnitude that the work took a full year longer to complete than had been planned. It is useful to document these problems so that future exercises can learn from the experience. An attempt is therefore made here to highlight the major difficulties.

6.02 The first group of problems can best be described as natural disasters. That is, the type of problem that is unforeseeable but should normally be overcome during the course of an exercise. In this case, there seemed to be an abnormal number of these ranging from a stolen shipment of calculators, illness of coders and the physical collapse of a record storage system.



6.03 The second group of problems concerned the administration of the project by the United Nations System. This aspect needs serious attention to avoid future problems. The resultant delays accounted for almost all of the total delay to the completion of the project. This work highlighted severe administrative problems between different parts of the United Nations family generally, and in particular the relationship between ECLA Santiago and the ECLA Office for the Caribbean.

6.04 The crux of the problems lay with the fact that UNDP financed the work through the CGCED. The work was done in the ECLA Office for the Caribbean yet the only way for routing the project funds was through Headquarters in Santiago causing serious delays. The difficulties experienced in completing the project will hopefully not be repeated since it is now intended to elevate the status of the Caribbean Office to that of a sub-regional headquarters.

6.05 As an example, severe delays were experienced in obtaining permission to proceed in a normal and logical manner. Sixteen weeks elapsed between a request being made to sub-contract the transfer of data from data sheets to diskettes to a firm in Trinidad, even though it had been established that this was by far the cheapest way of proceeding. In this case, the delay increased the project cost as the ECCM Secretariat had planned to provide programming assistance and computer time to complete the tabulations in December 1979. As a result of the delay, the data was not ready for processing until May 1980, and by this date, other commitments precluded this from taking place. The work was eventually completed on overtime with the project bearing the additional costs involved.

6.06 In another instance, although the financial arrangements with the project were kept flexible by UNDP so that on-the-spot decisions could be made to expedite the work as problems occurred, this flexibility was not understood in Santiago. As a result, a further long delay occurred in the data collection stage when permission was delayed to change expenditure from travel funds for United Nations Officials to payment for employment of research assistants and travel when necessary.

Delegation of authority to the Office for the Caribbean would have avoided these problems and allowed the work to proceed as scheduled. Under that system it proved extremely difficult for the Office for the Caribbean to execute CGCED or other projects on behalf of CDCC Governments.

6.07 The third group of problems were basically of a technical nature and again could have normally been expected and overcome in any exercise of this type.

6.08 In Haiti, access to the documents was restricted by the relatively short working day. With the assistance of staff of l'Autorité Portuaire, six months data was collected, but this took much longer than expected.

6.09 In Jamaica, the Port Authority employed research assistants to collect the data. It was surprising that that organization normally did not obtain copies of manifests from which to compile their regular statistics. Documents are maintained in various places in the Port and there were varying degrees of co-operation in making this data available for the exercise.

6.10 Although training was given to the supervisors in Jamaica, the explicit instructions in the manual were not exactly followed. Instead of consolidating the manifests by commodity, every line of entry on the manifest was recorded individually. This meant much repetition and the ship's records were longer than necessary. Although these additional lines of entry were summated during the tabulation stage, the following problems occurred:

1. The coding process was severely slowed as each line of entry had to be converted to metric tons.
2. The number of entries for any ship calls exceeded 99, causing problems with the card numbering. In some instances, a single ship's call amounted to up to 500 entries. More than 99 entries were also recorded in one or two cases in Trinidad where the entries beyond 100 were recorded 00 then 01, 02, 03, etc. To differentiate between the original 01, 02, 03, etc., it was intended to add 40 to the date so that for instance, May 11 would become May 51. However, in Jamaica this subsequently proved unworkable due to the large number of records involved. Therefore, in Jamaica the card numbers were changed as above and 1 day added to the date so May 11 99 was followed by May 12 00, 01, 02, etc.

3. Although the manual stated "to the nearest metric ton" in Jamaica actual tons to two decimal places were used. This had to be corrected at the editing stage. As a result of all these problems, the Jamaica data was only about 80 percent completed. The two main reasons for failing to complete the work were: (1) unavailability of documents to the Port Authority; (2) extra time involved in calculating each shipment.
4. At the editing stage, it was noted that data had been recorded for traffic transhipped in Jamaica with both origin and destination outside the region. This data had been recorded in error. However, due to the experimental nature of the project these records have been included with Origin/Transshipment code being changed to 3.

6.11 Notwithstanding these comments, it must be stated that without the full and willing co-operation of the Jamaican Port Authority, it would have proved impossible to collect any Jamaica data at all.

6.12 The fourth group of problems concerned the detailed design of the survey. These are summarized below:

1. Some manifests were not correctly filled out. In most ports, some data is missing from the records. In many instances, it was possible to correct this as it concerned technical details that could be found in Lloyds Register, such as the size of the ship or its port of registration. In some instances, origin or destination ports were either omitted or were too vague. Country names were a common occurrence without their port names. In a few instances, only continents were given or nothing recorded at all. In many instances, weights were not correctly entered. It is, of course, in the interest of the Port Authorities and Customs Authorities to ensure that these records are complete. In cases where cargo details are incomplete, this has a serious effect on the Customs Officials in clearing the vessel. From the evidence it is impossible to say if these errors and omissions when they occur are caused by carelessness or by a deliberate attempt to avoid payment of duty.
2. The details required for the commodity classification were probably over-ambitious for an exercise of this type. The object was to strike a compromise between a classification that was quick to record and easy to remember on the one hand while giving a reasonable detailed commodity classification for analysis on the other. In retrospect fewer classes would have speeded up the coding process, while detracting little from the analysis.

3. The main method of packing codes were far too detailed. As explained above, this section had been expanded to accommodate the data requirements of the proposed study on containerisation. In practice, however, it was found that the required level of detail was rarely given on the manifests. Container numbers however were recorded and it would perhaps be better in the future to record these and obtain type of information from the ship operators. In passing, it must be noted that in some cases the coders gave the main method of packing as say, "pallets or cartons" even if these were inside containers. As a result, containerised traffic in the region has been under-counted.

## 7. Editing

7.01 When the data was received in Port-of-Spain, it was checked for both consistency and completeness and corrections were made where appropriate. A secondary editing took place and the data was transferred to diskettes.

7.02 Due to the late running of the data collection stage, the initial editing was probably inadequate resulting in extensive secondary editing being necessary. A more thorough editing is desirable in future exercises. A considerable number of records were sent for processing with incomplete data and had to be subsequently corrected.

## 8. Data Processing

8.01 The data was entered on diskettes produced under contract in Trinidad. This facilitated the editing process.

8.02 The programming and production of the tabulations were produced on the IBM 32 installed by UNDP at the ECCM Secretariat in Antigua. This level of collaboration between United Nations Agencies and CARICOM and ECCM illustrates both the concern felt in the region for improving the information systems needed for meaningful planning and investment decisions to be made in the transport sector and the ability of these bodies to work together to improve the situation.

9. Sample Tabulations

9.01 The project has resulted in the bringing together of a wealth of data in an easily accessible form. It is obvious that if all possible combinations of data were printed out, the result would be a mass of hard-to-digest statistics on hundreds of pages.

9.02 It was therefore decided to produce a set of sample tabulations to illustrate the type of data that can be provided together with a complete listing of all data collected at each port so the relevant authorities can see the usefulness of obtaining such data on a regular basis. The sample tabulations contain the following:

1. Total traffic in-bound to each survey port by two-digit commodity code, showing traffic from the survey area, other Caribbean ports, United Kingdom, Europe, North America, Far East/Australia, Rest of the World.
2. As above but for out-bound traffic from survey ports. (Traffic to other survey ports has been excluded as this would duplicate data above).
3. Total movement of selected commodities. Fresh and frozen foodstuffs, bauxite/aluminium, dried or canned milk, alcoholic beverages and rice were chosen as being important commodities.
4. Complete tabulation of data for each survey port. (This complete listing has not yet been produced due to a computer paper shortage at ECCM). It is hoped to provide the complete tabulation when the Shipping Statistics Unit commences work in the St. Lucia project.
5. In addition a number of tabulations directly comparable to ECLA/CARIB 77/1 were produced.

9.03 The tabulations that are possible from this data are determined by the inputs. Briefly, it is possible to tabulate any set of data against any other. In this exercise, the fields of data are ship's identity, size, type, flag, data, origin and destination port, commodity, weight and packaging, so that any combination of this data can be produced. Some sample tabulations contained in the Appendix give an indication of the type of data that can be produced. Although these samples are for the full year, the data can be produced over any time period.

9.04 Due to a programming error the initial sample tabulations did not contain any data from or to Guyana. This has been corrected for the tabulations produced of Small Vessel traffic in the Eastern Caribbean.

10. Continuation of the Programme of Work

10.01 While this data collection exercise has been taking place, a comprehensive project for "Regional Co-operation in the Development of Shipping including Support for Small Vessels and Schooners" has been initiated in the Caribbean. This project will last initially for about three years and be located in St. Lucia. The total cost of the project is more than US\$.8 million and funding has been obtained through UNDP.

10.02 A major part of this work concerns Maritime Statistics and a team comprising an expert in Maritime Statistics together with two statisticians and a programmer from the United Nations Volunteer Service will commence work shortly.

10.03 Their immediate task will be to continue the work of this project to produce annual statistics on shipping. The team will also assist participating governments in developing the national capability in this field. At the end of the exercise, recommendations will be made to the participating governments on the desirability of establishing a method of producing this type of statistics on a permanent basis including methods of financing the work. During the life of this project, it is anticipated that the usefulness of this work will become apparent to the participating governments.

10.04 There are several uses for such data. Without meaningful statistics of this type, it is not possible for governments to plan investment in port facilities. Owing to the high cost of facilities to receive ships in ports such as piers, breakwaters, channels, docks, locks, berths, cranes and warehousing this information becomes vital for orderly development of facilities.

10.05 Data on cargo flows gives details of port activity and changes over periods of time. Analysis of this information is essential for the establishment of cargo forecasts and hence the identification of the type of additional facilities needed for the future.

10.06 This data becomes the basic tool for the work of a Shipping Investigation Unit which needs to be established if meaningful policies are to be devised to handle traffic by liner type services. The function of such a unit is to protect a country's or a group of countries' interests. Traditionally data on cargo movement by liner service is generally lacking especially in cargo flows, vessels in the trade and vessel movements. This data is therefore required to examine alternative solutions taking into account the general interests of shippers, the interests of particular shipping groups and the national and regional interests including that of any national or regional shipping line.

10.07 While this may be the main end use, it is already clear that such data is also useful in a number of ancillary areas. For example, a port might want to produce a monthly check list of all vessel movements with tons loaded or discharged to ensure that the correct level of harbour dues has been levied. Or a government might wish to produce a quarterly tabulation of imports or exports of specific commodities to provide a cross-check of statistical data produced from other sources. Such a listing might be of use to produce a check against custom duties levied on specific commodities imported or exported.

10.08 The exercise has proved that the methodology for collecting the data is sound. Even though certain refinements may be introduced, the basic system is appropriate to regional requirements.

10.09 The exercise has shown that records are currently difficult or impossible to analyze, due to the current method of information collection and storage. The fact that this exercise has produced a system where this data can be retrieved in an orderly and systematic basis, should be justification enough for its establishment on a permanent basis.

10.10 It will be up to the statistical team in St. Lucia to extend this work, refine it as necessary and demonstrate its usefulness to the participating governments.

10.11 After this report and the sample tabulations have been examined it is expected that other tabulations will be required. It is therefore proposed that the diskettes will be handed over to the St. Lucia project so that these further tabulations can be produced.

10.12 So that this continuing exercise can provide the most benefit to participating governments any comments, queries or suggestions about this work will be gladly received. These should be directed to:

Economic Affairs Officer (Transport)  
Economic Commission for Latin America (ECLA)  
P.O Box 1113  
Port-of-Spain  
TRINIDAD



TOTAL TONNAGE IMPORTED INTO THE BAHAMAS

(October 1977 - September 1978)

NASSAU	723,480
FREEPORT	41,200,701*
ELEUTHERA	33,429
ANDROS	26,335
EXUMA	10,292
ABACO	9,587
INAGUA	1,717
BIMINI	2,109
CAT CAY	7,664
WEST END GRAND BAHAMA	3,808
SAN SALVADOR	167
GREAT HARBOUR CAY	136
TREASURE CAY	1,266
TOTAL	<u>42,020,691</u>

\* Approximately 500,000 tons of general cargo with the balance being crude petroleum

Source: Comptroller of Customs

