

Philippine Institute for Development Studies
Working Paper 83-03

MEASURING THE IMPACT
OF CAGAYAN DE ORO PORT DEVELOPMENT

by

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Philippine Institute for Development Studies
February 1983

This paper is a preliminary report of a research study undertaken by the Micro Component of the Economic and Social Impact Analysis/Women in Development (ESIA/WID) Project. The views expressed in this paper are those of the author and do not necessarily reflect those of the Institute.

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I. INTRODUCTION

Whether or not transportation is the leading/triggering sector of development is still an unsettled issue in the research community.¹ Nevertheless, whether transportation causes development or economic growth necessitate the expansion of transport facilities, it is generally accepted that transportation is an important ingredient in the process of development, and the absence of transport facilities would significantly slow down the realization of the growth potential of a certain area. Transportation improvement should be viewed as an important component of a whole package of development projects rather than consider in isolation. As pointed out by Owen:

Improved transport of itself may not lead to any results -- that what is called the effects of a transport facility are the combined effects of many factors. The absence of these other factors explains why the development potentials of a transport facility are often not realized.²

*The assistance of Ms. Beda S. Tumampos in the preparation of this report is gratefully acknowledged.

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¹This issue was clearly brought out in Ledivina V. Cariño, "The Impact of Feeder Roads: A Review of the Literature," paper presented at the ESIA/WID (Micro Component) Second Workshop held at the Asian Institute of Tourism, Quezon City, Feb. 3, 1979.

²Wilfred Owen, Strategy for Mobility: Transportation for the Developing Countries (Honolulu: East-West Center Press, 1964), p. 53.

In most countries, sea transport exists primarily for the purpose of fostering international trade. However, because of the geography of the Philippines, sea transport does not exist primarily for enhancing foreign trade, but is a necessity in the whole domestic transportation network. Ports are therefore necessary in the transport system.

A port is the point at which goods in transit are transferred from land transport to sea transport, and vice-versa. Port is a service facility. It can induce and assist new commerce, help to exploit new business opportunities, and frequently is a decisive factor in industrial development. Nevertheless, the existence of a port cannot of itself create commerce. Other factors such as the needs of industry, of agriculture, of human wants, or of governmental policy operate in conjunction with it in inducing commerce.

Port improvement may take the form of new investments to increase the physical capacity of the port or of new rules for operation which make it possible to put the existing physical capacity to better use. In this study, port improvement is taken to mean primarily an increase in the physical capacity of the port. The case to be considered in this study is the Cagayan de Oro Port Development.

The objectives of the transport development program of the Government of the Philippines are Twofold:

1. To improve accessibility to the rural areas; and
2. To reduce transport costs to levels which can be afforded by the majority of the population.

Port development is a major component of the transport development program in the Philippines. The Cagayan de Oro Port was identified as one of the four high priority national ports to be improved.

The Cagayan de Oro port is the most important port entry on the north coast of Mindanao Island and is located in Macajalar Bay. At the time the development project was proposed in 1972, the existing facilities consisted of 338 m. by 12 m. reinforced concrete wharf. The port area about 1.65 ha. with a cargo shed of 494 sq. meters. Geared to round-the-clock operations, stevedoring on board the ships calling at this port is carried out by a combination of ship's gear and manual handling. Shore operations are largely mechanized, utilizing forklift trucks in conjunction with pallets.

The project seeks to improve and develop the facilities of the port in order to deal with the growth in traffic movement. The direct benefits envisioned to be derived from the project consist of savings in handling cost and in cost of vessels kept waiting at the port. It

is also hoped that the improvement of this port will hasten economic activities, reduce inter-regional differences, induce greater regional development, and trigger increased production in its hinterlands especially Misamis Oriental and Bukidnon provinces.

Although the port expansion was proposed in 1972, actual construction did not get started until 1976. The formal opening and turnover of the new facilities to the Philippine Ports Authority was on January 1980. The total cost of the expansion was ₱52.3 million, part of which came from a loan from the International Bank for Rural Development (IBRD). The composition of the port after the Phase I development³ includes the following:

1. Total quay length of 504.5 meters.
2. Two transit sheds covering a total area of 4,800 sq. m.
3. One open storage area of 15,232 sq. m.
4. An underground water tank with a capacity of 80,000 gallons of water which vessels can avail of at a reasonable price.

³ Further expansion of the port which is called the Phase II development is now on the process of getting started.

5. A fire station.
6. Amenity blocks (comfort and rest rooms) for laborers.
7. An open and closed storage area of about 17,000 sq. m.
8. PPA Administration Offices, gates amenity blocks and ancillary facilities.
9. Shallow log ponds divided by rock bulkhead are leased to TIPI and Vicmar Development Corporation
10. The port has a total land area of 71,400 sq. m.

II. ANALYTICAL FRAMEWORK

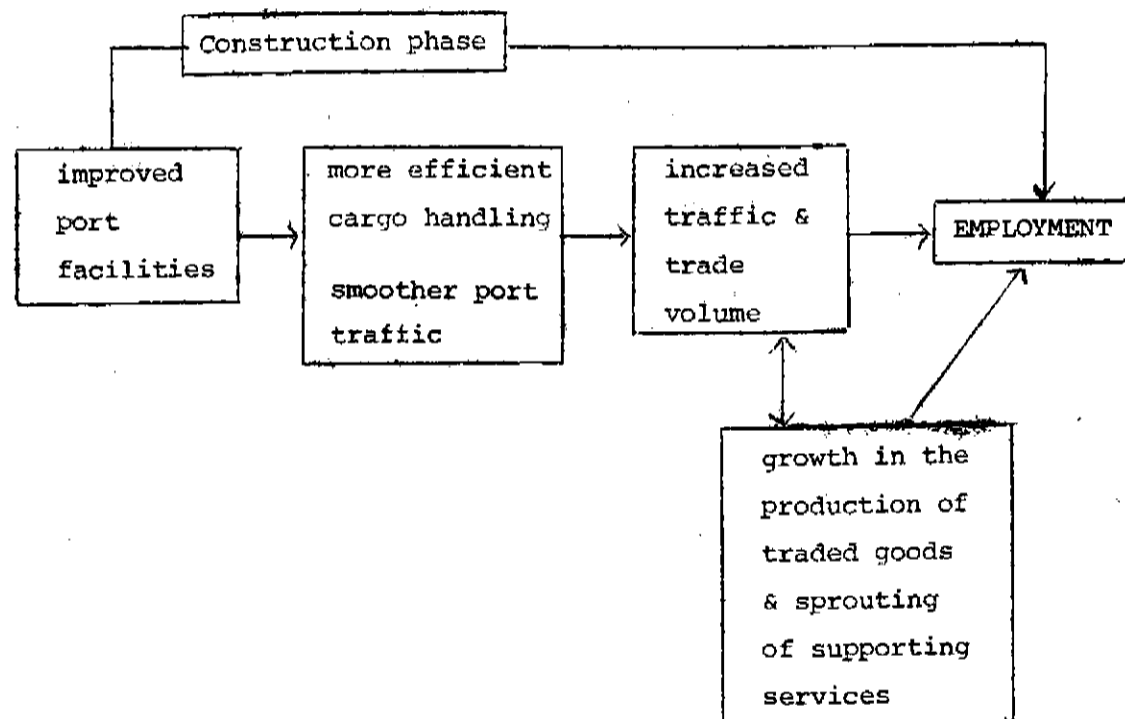
The immediate results of improved port facilities are:

(1) more efficient cargo handling and (2) smoother port traffic for both cargo and passenger ship. These would generate more traffic and trade volume which, in turn, would directly and indirectly affect various economic and social concerns. In this section, the issue of how port development affect employment, income growth, productivity, balance of trade, energy, environment, participation, population/fertility, health and nutrition, and education/literacy are discussed.

For greater clarity, the discussion of how port development affect each of the mentioned areas of concern is preceded by a

schematic diagram depicting the flow of relationship.

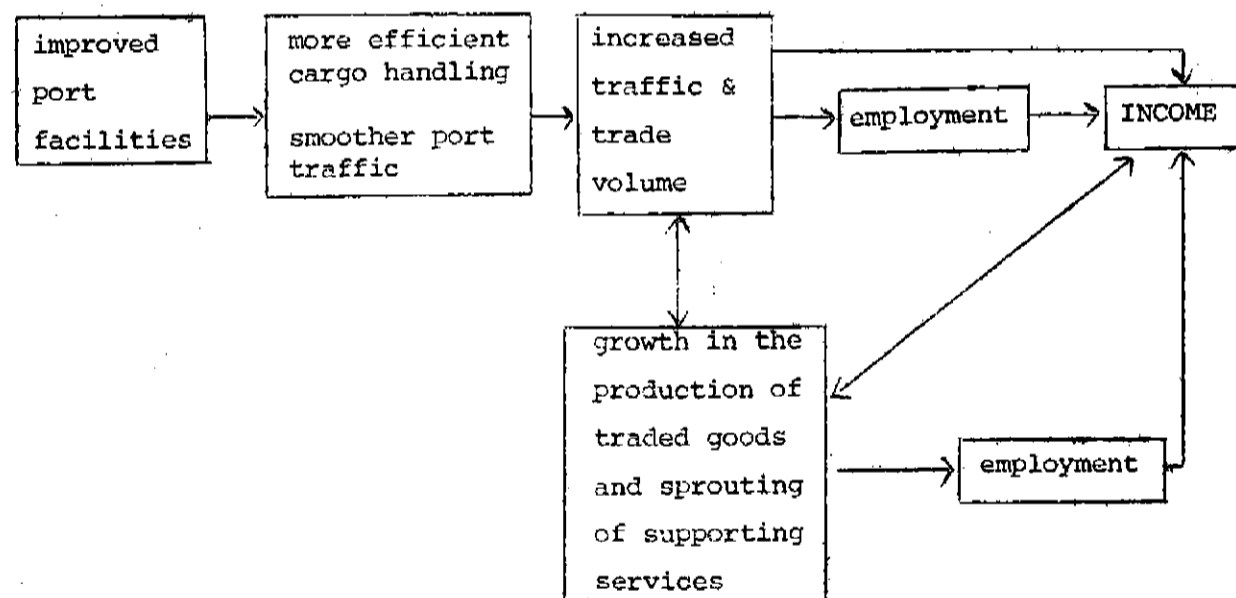
Port Development and Employment



Port development includes both direct and indirect effects on employment. The direct employment effect consists of both the port construction phase and the post construction phase is obvious. The increased traffic and trade volume after the construction phase would result in more cargo handling which, in turn, imply more stevedoring. Moreover, increased traffic and trade volume would also mean increased employment of clerical and operational personnel.

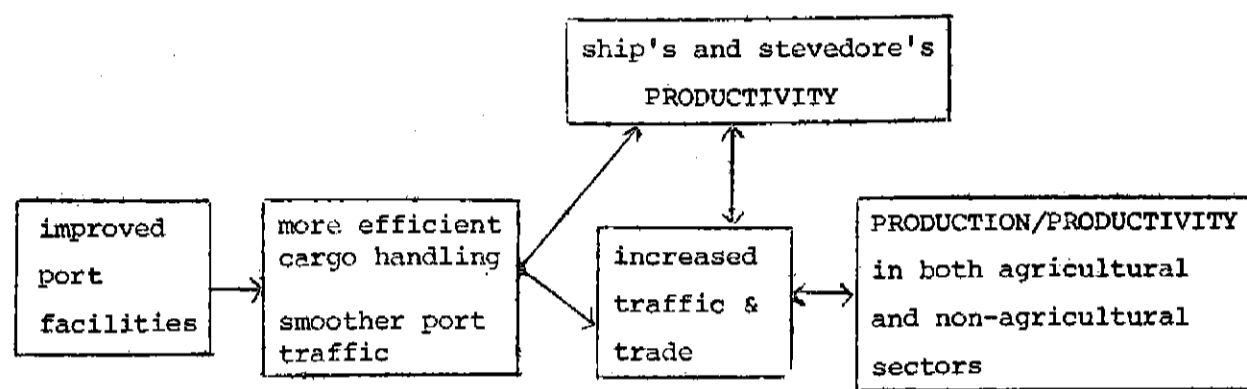
The indirect employment effect of port development would arise from the growth in the industries producing the traded goods and the growth of supporting services.

Port Development and Income



The income effect of port development includes the direct effect and indirect effect. The direct effect comes basically from two sources. One is through the employment effect and the other source relates to the income of agencies directly related to port operation. The indirect effect arises from the production and commerce generated by the direct income effect and from the growth in the production of the traded goods and supporting services.

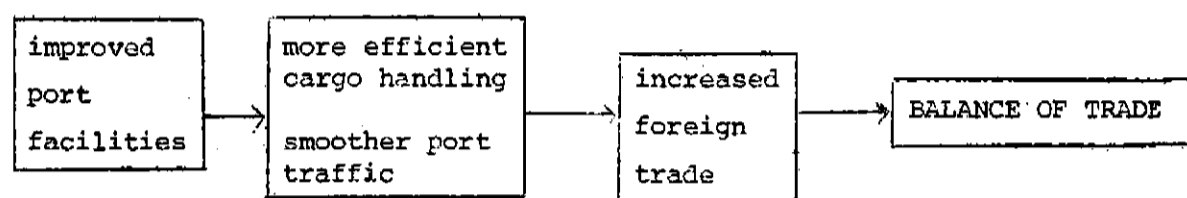
Port Development and Productivity



To the extent that port development induces new commerce and stimulates the growth of new business and industrial opportunities, production and productivity both in the agricultural and non-agricultural sector would be affected. However, production and productivity in these sectors are affected by a lot of other factors and the link with port development is very remote as compared to those other factors.

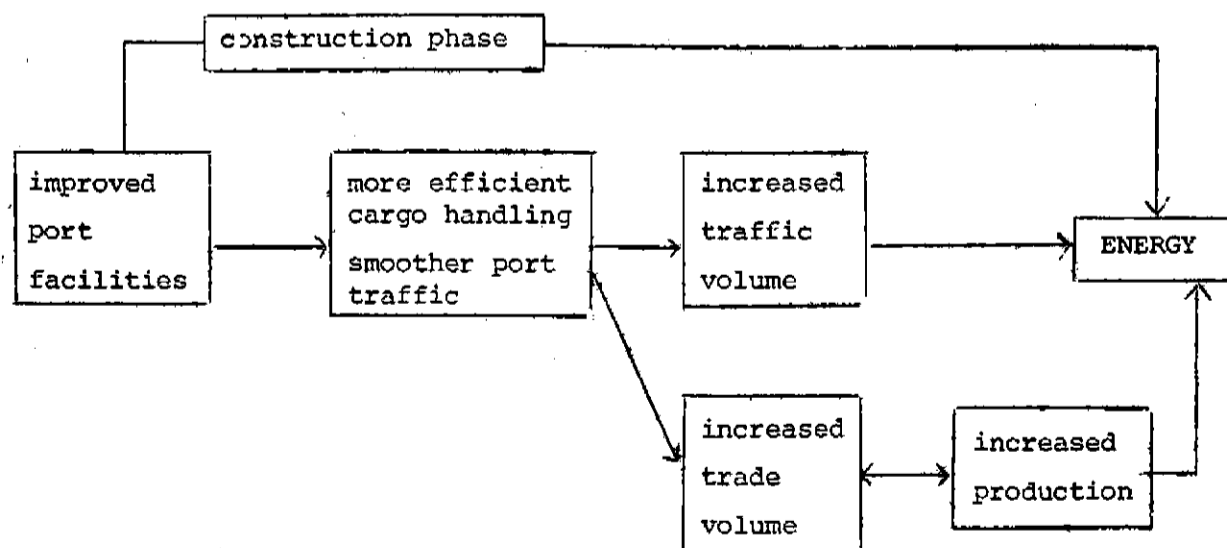
The more direct productivity effect of port development is on the ships and on the stevedores. By reducing ship's turnaround time in the port and by being able to accommodate more productive ships because of better port facilities, port development is expected to increase ship's productivity. Moreover, by reducing the idle time of stevedores because more ships can dock simultaneously and, therefore, can be serviced at the same time, and also through the increased traffic and trade volume generated, stevedore's productivity is also likely to increase.

Port Development and Balance of Trade



The improvement of port facilities would encourage and enable more foreign vessels, which are usually bigger than the domestic inter-island vessels, to call. This would obviously affect the balance of trade. It should be noted that this refers only to foreign trade carried out through the public port and excludes those that are undertaken through the private ports.

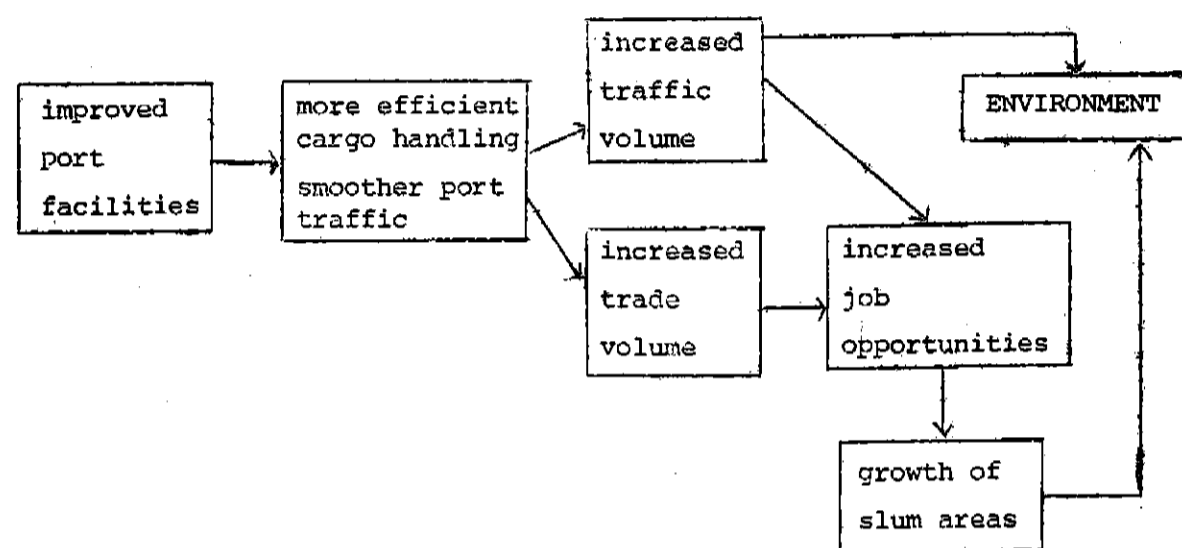
Port Development and Energy



The impact of port development on energy can also be classified as direct and indirect. The direct effect includes both the construction phase and the operational phase. The construction phase of port development obviously involves increased energy consumption. During the operational phase, the increased traffic movement would correspondingly result in higher energy consumption. Furthermore, within the port premises, some fuel-dependent shore operations such as the use of forklift trucks will also tend to increase and, thus, resulting also in higher energy consumption.

The increased energy consumption as a result of increased traffic movement through water transport should not be taken as an undesirable effect considering that with the geographical characteristics of the Philippines, water is the cheapest transport mode for bulk-cargo at the present time and still likely to be for quite a long time.

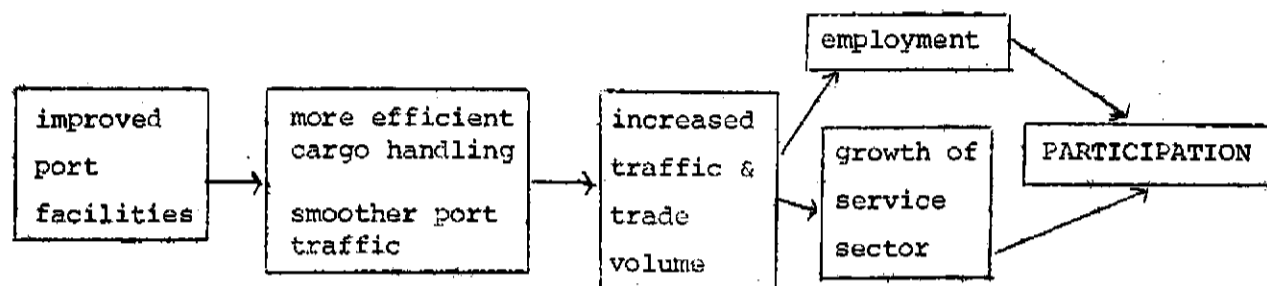
To the extent that port development induces new commerce and stimulates the growth of new business and industrial opportunities, production in the affected sectors increases. This, in turn, may lead to increased energy consumption. However, if economic growth is a targeted goal, then this should not be considered negatively since it is an inevitable consequence of economic growth.

Port Development and Environment

Increased traffic movement (both land and sea) brought about by port improvement would result in greater pollution which is a deterioration of the environment. This, however, is inevitable. It can be minimized but not eliminated.

Due to the greater manual employment opportunity within the port area which requires very little or no formal educational training at all, squatters tend to proliferate near such area. This would affect the environment around the port area. However, the environmental deterioration as a result of the influx of squatters is more properly the result of housing inadequacy rather than a negative effect of port development.

Port Development and Participation



The United Nations and other documents consider three aspects of participation:

1. People's sharing in the benefits of the development effort;
2. People's sharing in the burdens of the development effort; and
3. People's involvement in the decision making process and implementation stage.

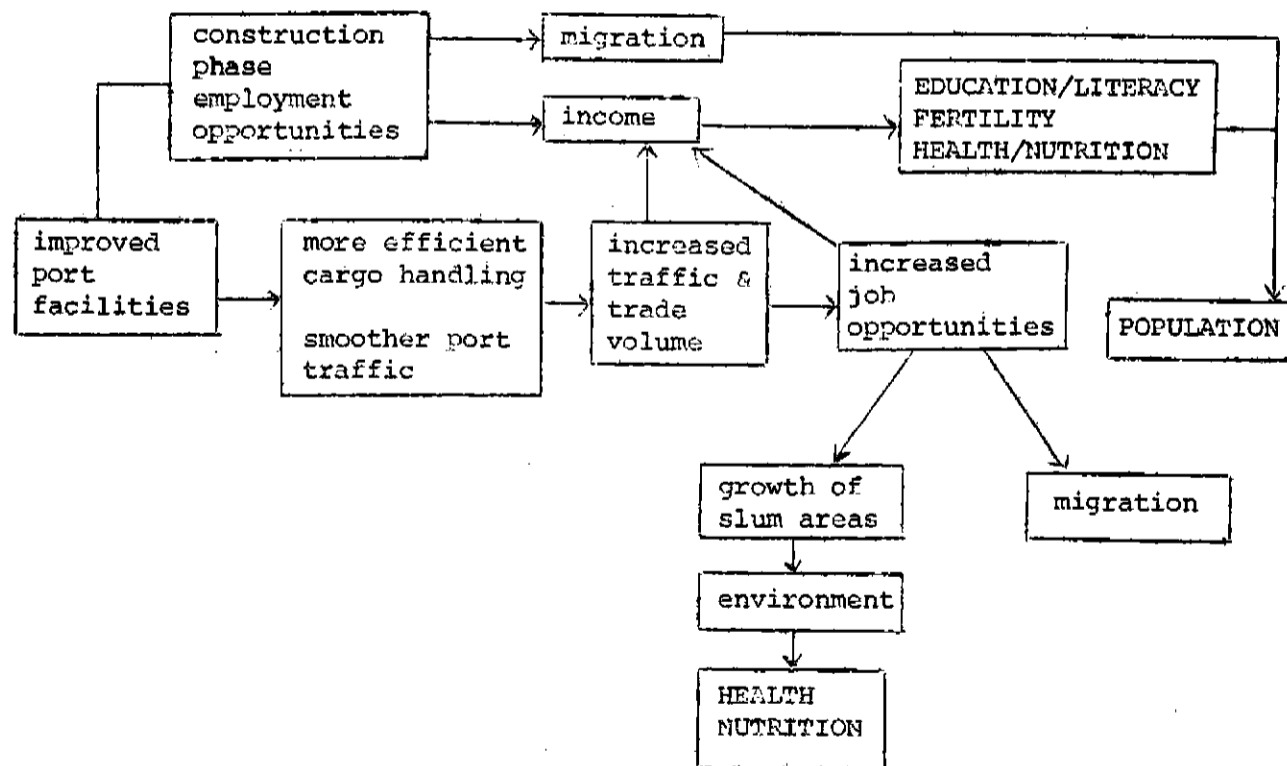
The first two aspects of participation are more or less reflected in the income and employment effects. However, it would be worthwhile to point out the employment effect on women of port development.

As mentioned in the section that deals with employment, the increased traffic and trade volume as a result of port development may lead to increased employment of clerical personnel. In the Philippines, majority of the clerical work is being done by women rather than by men. Moreover, port development is also likely to lead to an increase in the service sector around the port area such as food vending and

prostitution. Port development, therefore, is expected to lead to an increased in women employment.

Port development is an infrastructure type of project. The decisions for this type of projects are usually made by policy makers and technical experts. However, participation, taken to mean involvement in decision making, could be enhanced if consultation with people affected, such as those living around the port area, business community in the City, shippers, traders, etc. are conducted as to the manner and extent of port expansion.

Port Development and Other Areas of Concern



The link of port development with fertility, health/nutrition, and education/literacy is very remote and works primarily through the income effect. In addition, port development would also affect health/nutrition and fertility through the environmental effect.

The construction phase employment opportunity is likely to attract migrants into the city. Moreover, if the port expansion is successful in stimulating economic growth in the region, the employment opportunities generated would also attract migrants into the region. These would affect the population of the city and also the region. Population is furthermore affected by fertility and the health/nutrition status of the people. In the long run, population is also likely to be affected by education.

III. METHOD OF ANALYSIS

The primary objective of port development is economic rather than social. If successful in generating increased commerce, port development would have quite substantial impact on the economic variables such as employment, income and productivity. Particularly in the case where the expansion was brought about by necessity due to too much congestion, which is basically the case for Cagayan de Oro port. The social effects of port development operate mainly through its effect on income and employment and is not unique to the project. The quantification of the impact of Cagayan de Oro Phase I port

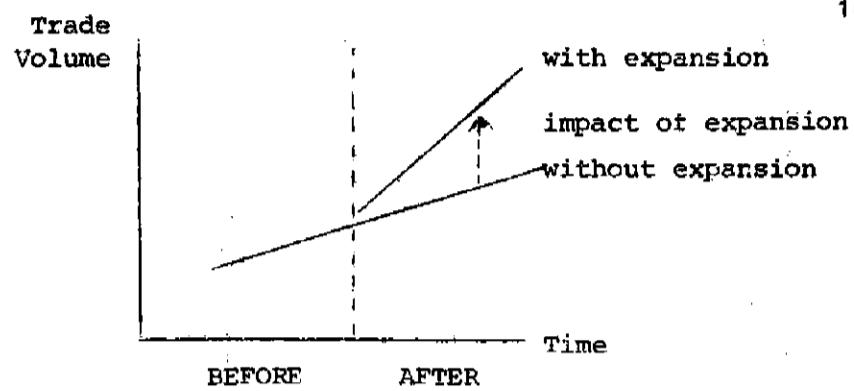
development in this study will therefore be focused on employment, income, productivity, and foreign trade.

As already mentioned previously, the immediate results of improved port facilities are more efficient cargo handling and smoother port traffic for ships. These would help generate more traffic and trade volume which would then affect directly and indirectly the various areas of economic and social concerns. To be able to quantify the impact, therefore, the first and most crucial step is to be able to estimate the change in trade volume, specifically, the change in the commodity flow through the port as a result of the improvement of port facilities.

Two alternative methods for estimating the change in commodity flow are used in this study. These are the "before/after method" and the "congestion theory method".

Before/After Method

This method involves comparison of the amount of each major commodity flowing through the port before and after the port expansion. The growth that would have occurred in the absence of the development has to be estimated and this is compared with the actual commodity flow after the expansion. The difference between the two is then attributed to the port improvement. Graphically, this can be represented as follows:



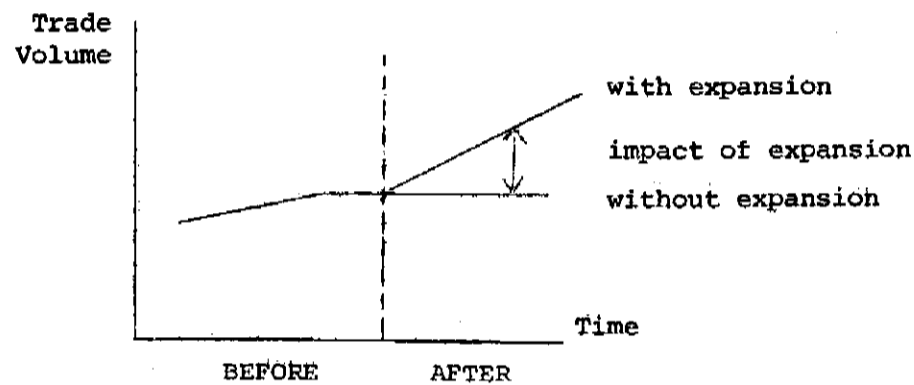
As very correctly pointed out by Peter Warr⁴, there are two major difficulties involved in using this approach:

- 1) It is very difficult to estimate how much growth could have occurred in the absence of the project because the port was virtually fully congested prior to the expansion; and
- 2) The time span of this study allows very limited data after the expansion with which to estimate the impact of the port because random variables operating simultaneously result in great difficulty of segregating the impact of the port from the impact of some other random elements.

Since it is true that the port was fully congested prior to the project, it would therefore not be unrealistic to assume that the

⁴Peter Warr is the foreign consultant of this study.

difference between the before and the after volume of trade is attributed to the port expansion. In other words, there is no need to do an estimate of the growth that would have occurred without the expansion. The situation can instead be graphically represented as follows:



The second problem involving the presence of random elements is more difficult to handle. To be able to arrive at some estimates, the following assumptions are adopted. In situations where the change in trade volume is clearly the result of random variables such as decreased production due to bad weather, appropriate adjustment are made and the estimate of change is used instead of the difference in actual figures. However, in cases where the decline is due to some external factors which are deemed to be permanent, then the change is assumed as zero since it would be unreasonable to attribute the decline in trade volume to the existence of the expanded port.

It should be noted that this method measures the impact of port expansion with reference to a specific length of time, for instance one year after expansion. Unless a long enough time series data after the port expansion is available, the full impact cannot be captured through this method of measurement.

Congestion Theory Method

An alternative method of computing for the changed commodity flow was suggested by Peter Warr which he called the "Congestion Theory Method". In this method, it is assumed that the new port facilities imply a shift from one state of congestion to another. With the rapid growth of cargo through the port, it is reasonable to expect that within a few years, the new facility will be congested. Make an estimate of the aggregate trade volume at the next level of congestion. The foreign composition of the flow is expected to increase with improved port facility. Using the available data after the expansion, make an estimate of the changed foreign and domestic composition of aggregate trade. Using this estimate of foreign and domestic shares, assume that the internal commodity composition of both foreign and domestic trade remain unchanged to estimate the change of the trade volume of each major commodity passing through the port.

The major difficulty with this approach is that although it allows us to measure the change in commodity flow from one state of congestion to another, it does not tell us how long it takes to reach

the second state of congestion. This time element remains an empirical issue and cannot be verified with the limited time span data that would be available to this study.

After estimating the changed commodity flow due to port development, this information are then used to estimate the changes in income and employment. The income and employment effects of port development include the direct and indirect effects. The direct income effect basically refers to income generated at the port site itself which includes wages of stevedores and other personnels involved in port operation, fees collected by the port authority, income from port services, etc. The indirect effect, on the other hand, refers to the change in income stimulated by the increased trade volume through the port. Similarly, the direct employment effect refers to the labor used in constructing and subsequently operating the facility and related services while the indirect effect results from the increased production of traded goods.

This study will attempt to measure both the direct and indirect income and employment effects. The data on direct effects can be collected directly from the various agencies involved. On the other hand, the indirect effects will have to be estimated. Ideally, to estimate the indirect effects, regional input-output relationships are necessary. However, since regional input-output table is not available, the national input-output table, which is available, will be used

instead. Substituting the estimates of changed commodity flow into the input-output table can enable us to obtain the estimates of both indirect income and employment effects.

IV. DATA USED

The data needed for this study are mostly available in the Philippine Ports Authority (PPA) files.⁵ In addition, data pertaining to port related activities are obtained from the Gold City Integrated Port Services, Inc. which is the company taking care of the arrastre and stevedoring works in the Cagayan de Oro port at present and the various shipping lines. Furthermore, conversations with some people in the different sectors such as the vendors around the port area, the labor union president, shippers, traders, personnels from the Port Authority in Iligan are made to get some feedback regarding the qualitative impact of port development. For the measurement of the indirect income and employment effects, the 1974 Interindustry (input-output) accounts of the Philippines published by the National Economic and Development Authority, National Census and Statistics Office is used.

⁵ For a brief description of the Philippine Ports Authority which is the implementing agency for the port development, its monitoring system, and the data it routinely collects, see Appendix A.

The cargo traffic is recorded by the PPA files in terms of weight rather than value. For purposes of monitoring the port operations, this is actually sufficient. However, to be able to estimate the indirect effect of income and employment through the input-output table, change in value rather than quantity is the information needed. Although cargo manifests requested that information regarding value of the cargo specified, this is often disregarded and no value is declared or, if not, an arbitrary amount is recorded to satisfy the formality. To transform weights into value, therefore, the changed weights of the commodities are multiplied by their market prices to obtain their estimated values.

The PPA office in Cagayan de Oro was established only in 1976. Because of this, although data for shipping and cargo are available for that year, the PPA statistician however feels that those information might not be too reliable. Since the port development project only got started in 1976, and for practical purposes, the port facilities available in 1977 was just about comparable to that in 1976, information for 1977 were used as the baseline information on which to compare the impact of port development.

An inspection of the cargo and passenger statistics, Table 1, revealed that the total cargo throughout increased steadily from 1977 to 1979 and then there was a slight decrease from 1979 to 1980. The decline occurred in domestic trade. Foreign trade, both export and

Table 1
CARGO AND PASSENGER STATISTICS
PORT OF CAGAYAN DE ORO

Particulars	1977	1978	1979	1980
I. CARGO FLOW (metric tons)				
a. Cargo throughout	567028	668791	731394	730806
Discharged	225007	244823	271656	268061
Loaded	342021	423968	459738	462745
b. Domestic Trade	500943	565602	591374	583873
Conventional cargo	500943	561109	522312	438963
Inward	215475	230042	208810	178724
Outward	285468	331067	313502	260239
Containerized cargo	-	4493	69062	144910
Inward	-	3083	41467	66707
Outward	-	1410	27595	78203
c. Foreign Trade	66085	103189	140020	146933
Import	9532	11698	21379	22630
Export	56553	91491	118641	124303
II. PASSENGER TRAFFIC	388834	446691	486314	463574
Disembarked	186175	189653	203556	204432
Embarked	202659	257038	282758	259142

Source: FPA Statistics

import, had demonstrated a steady increase. Passenger traffic reflected the same trend as domestic cargo traffic with an increasing trend from 1977 to 1979 and then a slight decline from 1979 to 1980.

The decline in port traffic from 1979 to 1980 could be attributed to the general economic slow-down in the region in 1980 and do not have anything to do with the port facilities. As mentioned at the start of this report, a port is a service facility and its existence cannot of itself create commerce, although it can facilitate trade if the right combination of other factors exist.

To arrive at the estimates of the impact of the expanded port facilities, therefore, instead of using the data for 1980 to compare with the baseline data, the average for 1979-80 is used instead. This is justifiable since for all practical purposes, the expanded port facilities were almost completed in 1979 except for certain finishing touches. Although the formal inauguration was on January 1980, new facilities were mostly put into use already in 1979.

V. COMMODITY FLOW AT CAGAYAN DE ORO CITY⁶

Before discussing the impact of the Phase I development at Cagayan de Oro port, a brief description of the type of commodities handled through the port and some ideas as to their origins and destinations is presented to provide a better understanding of the situation.

The domestic inward cargo shipment is dominated by palay and rice, sugar, consumer goods, fertilizer and general cargo (Table 2). Palay and rice are mostly shipped through the Manila port and the ports of Bohol. Sugar is generally from Negros Occidental. Consumer goods which consist mostly of food contained in cans and bottles from Cebu and Manila. The main source of cement, fertilizers/vehicles/equipments, petroleum products and general cargo come mainly from Manila. Cereals which consists of flour and starch are from both Cebu and Manila. Copra comes from the province of Camiguin while lumber is usually from Agusan.

A careful look at Table 2 revealed that bottled cargo which used to be an important item in the domestic inward cargo had declined to a very insignificant component of domestic inbound trade, from 7.08% of domestic inward cargo in 1977 to only 0.49% in 1980. This

⁶The information regarding origin and destination of commodities presented in this section are taken from Beda Tumampos, "A Survey of the Commodities Handled at the Public Port of Cagayan de Oro".

Table 2

COMPOSITION OF COMMODITY FLOW THROUGH CAGAYAN DE ORO PORT
(in percentage)

Commodity Classification	1977	1978	1979	1980
A. DOMESTIC TRADE				
I. Total Inward Cargo	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
Live Animals	0.05	0.05	0.01	0.03
Palay and Rice	3.92	1.83	4.21	8.60
Corn	0.15	0.08	0.12	0.08
Other Cereals	1.27	2.03	0.93	1.17
Sugar	9.77	7.93	7.04	8.37
Bottled Cargo	7.08	4.23	0.90	0.49
Empty Bottles	7.60	4.95	5.91	4.46
Other Consumer Goods	9.26	8.53	9.54	8.99
Cement	0.54	0.38	1.18	0.45
Fertilizers	8.25	10.79	6.92	7.80
Chemicals	2.30	1.15	1.69	2.57
Lumber	1.12	0.77	0.37	0.17
Plywood & Veneer	1.72	1.31	0.74	0.57
Animal Feeds	2.13	2.14	3.07	3.43
Metal & Metal Products	3.33	1.98	4.22	4.94
Machineries/Vehicles	0.0	0.0	8.24	4.69
Copra	1.71	0.53	1.08	2.65
Petroleum Products	2.47	2.42	1.39	4.12
General Cargo	37.33	48.90	42.44	36.42
II. Total Outward Cargo	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
Live Animals	1.46	1.62	2.00	1.84
Palay and Rice	1.07	1.07	1.34	0.63
Corn	50.82	62.42	54.98	48.04
Cereals	0.23	0.71	2.38	3.50
Sugar	0.05	0.11	0.32	0.07
Bottled Cargo	6.21	3.55	4.13	1.07
Empty Bottles	4.76	2.64	0.72	0.51
Consumer Goods	1.37	1.30	1.08	0.74
Cement	0.12	0.16	0.20	0.33
Fertilizer	0.29	0.27	0.56	0.03
Chemicals	0.30	0.08	0.17	0.29
Lumber	4.42	4.10	4.18	4.92
Plywood & Veneer	2.02	1.04	1.36	2.87
Animal Feeds	2.80	2.71	6.37	7.65

Table 2
(continuation)

Commodity Classification	1977	1978	1979	1980
Metal & Metal Product	0.25	0.07	0.13	0.15
Machineries	0.0	0.0	0.69	0.67
Clay/Cullets	0.0	0.0	1.59	1.43
Coffee beans	0.0	0.0	1.60	1.24
Copra	2.94	1.22	0.49	0.31
Pineapple Products	3.45	0.77	1.50	8.72
Petroleum Products	0.04	0.04	0.04	0.04
Tomatoes	1.84	4.92	5.66	5.02
General Cargo	15.56	11.20	8.49	9.93
FOREIGN TRADE				
Total Imports	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
Wood Pulp	16.10	18.34	19.72	12.48
Fertilizers	42.80	29.92	50.05	83.58
Machineries	15.04	10.98	15.68	1.54
Cereals	0.0	17.95	4.16	0.0
Consumer Goods	0.0	0.0	8.98	0.22
General Cargo	26.05	22.31	1.41	2.18
Total Exports	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
Lumber	64.36	60.05	55.85	40.80
Veneer	2.61	1.22	0.69	4.28
Chromite	27.27	8.03	14.44	5.77
Charcoal	4.38	1.91	1.48	4.81
Sorghum	0.96	3.34	0.0	0.0
Sugar	0.0	23.81	25.94	43.89
Copra	0.0	0.0	1.18	0.0
General Cargo	0.42	0.37	0.29	0.45
Machineries	0.0	1.26	0.12	0.0

Source: PPA Statistics

decline was due to the opening of the San Miguel Corporation private port which started operation in August of 1978.

Another thing to note regarding the commodity composition of domestic inward cargo is the sudden increase of inward flow to Cagayan of machineries/vehicles, from zero percent in 1977 and 1978 to 8.24% in 1979. This does not imply that no inbound cargo of machineries/vehicles exist prior to 1979. This is a matter of reclassification. Prior to 1979, machineries/vehicles are classified as general cargo which is taken to include any cargo that cannot be properly classified due to non-regular shipments or shipped in insufficient quantities to warrant an independent category of classification.

Corn grains and corn grits constitute approximately 50% of total domestic outward cargo. The main source of corn is the province of Bukidnon although most of the processing (milling) is done in Cagayan de Oro. By-products of corn such as corn bran, corn cakes, etc. are classified as animal feeds. Corn and corn products are shipped out for distribution in the Visayan provinces and for Manila. Live animals, mostly cattle and hogs which come from Bukidnon also, are shipped to Manila regularly. Coffee beans, clay, culllets, tomatoes are shipped for Manila too. Tomatoes are shipped out only during the second half of the year. Most of the pineapple products, lumber, plywood and veneer are for Manila and

some are for the provinces of Visayas. The products of Coca-Cola Bottling Company which make up the bottled cargo are bound for Dipolog, Ozamis, Surigao, Zamboanga, and other nearby provinces of Misamis Oriental.

In foreign trade, imports consist mainly of wood pulp, fertilizers and machineries. Exports are dominated by lumber and sugar. The lumber are exported to Japan, Europe and the United States. Sugar are bound for Communist China and Russia. Exportation of sugar through Cagayan de Oro port started only in 1978. The source of the exported sugar is Bukidnon Sugar Company in Quezon, Bukidnon. Chromite and charcoal are exported to Japan.

VI. ANALYSIS OF IMPACT

The quantifications of the impact of port development are made for income, employment, productivity and foreign trade. The impact on the other areas of concern are treated qualitatively.

A. Quantitative Estimates of the Impact of Port Development

A.1 Impact on Income and Income Growth

The income effect of port development includes the direct and indirect effects. The measurement of income effect cannot be divorced from that of employment effect since as depicted in the conceptual framework, one source of income effect is through the employment effect.

Measurement of Direct Income Effect

The direct income effect comes from two basic sources, these are the employment effect and the change in the income of agencies directly involved with port operation due to change in trade flow arising from the expanded port facilities.

The direct income effect due to employment effect are arrived at the following manner. From the personnel information provided by the Philippine Port Authority, the Gold City Integrated Port Services, Inc. (INPORT), the Bureau of Customs, the Pilot Association, and the various shipping lines, estimates of the changes in labor force due to port development are obtained. Using the conservative estimate that everybody is paid only the minimum wage, the direct income effect due to employment effect can be estimated and these results are presented in Table 3. It is interesting to note that the income effect due to employment change are positive in all instances except for the case of INPORT. This is because of the negative effect on stevedores' employment which will be discussed in greater detail in the next section.

To get the change in the income of agencies related to port operation, we estimated the revenue increase resulting from port expansion from information gathered from the relevant agencies and information regarding change in commodity flow. The resulting estimates are presented in Table 3 also and we estimated this effect to be approximately ₱16 million.

Table 3
INCOME EFFECT OF PORT DEVELOPMENT

Component	Impact (in pesos)
I. Direct	
A. Via Employment Effect	-129,220
1. INPORT	-1,135,290
2. PPA	212,290
3. Bureau of Customs	295,360
4. Pilot Association	36,920
5. Shippers	461,500
B. Agencies Related to Port Operations	16,095,853
1. PPA	1,082,795
2. INPORT	6,045,182
3. Shippers	8,967,876
II. Indirect	
A. Before/After Method	378,617,218
B. Congestion Theory Method	1,005,500,497

Measurement of Indirect Income Effect.

To measure the indirect effect of port development, the input-output table is used. As discussed in the section regarding methodology, two methods of estimating the changed commodity flow for the purpose of estimating the income and employment effect are used. The estimated income effect using the before/after method will be discussed first, then the congestion theory method.

Before/After Method

In estimating the indirect income effect, only goods which account for some substantial proportion of outward trade (both domestic and foreign) are considered. Specifically, commodities included in the estimates are live animals, corn, cereals, lumber, plywood and veneer, animal feeds, pineapple products, tomatoes, chromite, charcoal, and sugar. General cargo, although representing a substantial portion of outward domestic cargo was not included because of the impossibility of assigning a reasonable price for it and the problem of allocating its components into their appropriate sectors. These problems exist because of its function as the catch-all category for anything not properly classified due to insufficient quantity and irregularity of shipment to warrant independent classification.

Part II, latter section A of Table 3 presents the estimated indirect effect using the before/after method of computing changes in commodity flow. The indirect income effect due to increase in the production of traded goods and its supporting industries results in an income growth in the region of ₱379 million. A note of explanation on the meaning of this figure is necessary. This amount is not the actual indirect income effect attributable to port development but rather it is the upper limit of the indirect effect. The actual impact would only be a fraction of this figure; but as to exactly what proportion of this figure, it is impossible to say. As was already discussed previously, port is only a service facility and cannot of itself generate commerce. Its role is simply as facilitator. This estimate more properly represents the combined effects of good transport network system linking the hinterland to Cagayan de Oro City and the high level of economic activity in the region and the regions it trade with.

Congestion Theory Method

As explained in the method of analysis section, this involved the estimation of the level of cargo at the next stage of congestion. To obtain this estimate, the following assumptions are made.

There are approximately 285.75 meters of quay length available during 1977. Dividing the cargo throughout during that year of 567,028 metric tons with the available quay length indicates that 1,984 tons of cargo is handled per meter during that year. Considering that the total available quay length is now 504.5 meters, one way of arriving at an estimate of the next stage of congestion is to multiply 504.5 m. with 1,984 tons per meter. However, considering that the working space available in the port area is tremendously increased after the port development, the investigator feels that 1,984 tons per meter per year might be too low a figure to assume. Taking into consideration that the average berth occupancy rate in 1979 and 1980 is 63%, and the total cargo volume handled during those two years, the investigator settles for 2,300 tons per meter per year to be a reasonable assumption for the next level of congestion. The next stage of congestion is therefore assumed to be reached when the total cargo throughout for a year is 1,160,350 tons. The following additional assumptions are made to arrive at estimates regarding the flow of specific commodities:

1. During the next congestion stage, foreign trade accounts for 25% of total cargo throughout with 35% being exports and 15% imports.

2. Domestic trade is 75% of total cargo throughout with 58% outward and 42% inward.
3. The relative shares of individual commodity in the outward domestic and foreign trade is the same as the average relative share of each commodity in 1979 and 1980.

Similar to the before/after method, only the major commodities mentioned previously were considered. The resulting income change is estimated to be ¥1.0 billion. Again, this figure is to be interpreted as an upper limit rather than the actual impact.

Implicit in this method of estimation is the assumption that the necessary complementary factors needed for economic growth are present. Total cargo throughout had been growing at a rate of approximately 8.9% per annum from 1977 to 1980. If this rate is sustained, it would take approximately five to six years to reach the next stage of congestion.

A.2. Impact on Employment

Similar to income effect, the employment effect includes both a direct and an indirect components. The employment effects

of port development are summarized in Table 4. These estimates are arrived at from the information gathered from the relevant agencies.

Worthy of note is the substantial negative effect of port development on unskilled dock workers. A closer investigation of the aggregate data reveal that the total number of employees of INPORT decline by 12% from 1977 to 1980 (Table 5). This marked the fact that Staff and Office workers actually increased by 12% while the number of dock workers decreased by 15%.

Another adverse employment effect to note results from trade diversion from the port of Medina, a municipal port of Misamis Oriental, to the newly expanded Cagayan de Oro Port. As a result, the number of stevedores in the port of Medina had decreased from 220 to only 15.

It should be noted that the indirect employment effect has to be interpreted in the same manner as the indirect income effect.

Table 4

EMPLOYMENT EFFECT OF PORT DEVELOPMENT

Component	Impact (Number of Laborers)
I. Direct	
A. Construction Phase (Ave. over 4 years)	<u>309</u>
1976	132
1977	300
1978	601
1979	202
B. Operation Phase	<u>-16</u>
1. stevedores/porters	-123
2. PPA	23
3. Bureau of Customs	32
4. Pilot Association	4
5. Shippers	74
II. Indirect	
A. Before/After Method	<u>16,760</u>
B. Congestion Theory Method	<u>44,910</u>

Table 5

NUMBER OF EMPLOYEES IN THE GOLD CITY INTEGRATED PORT SERVICES, INC.

Work Classification	1977	1980
Staff and Office Workers	95	107
Operators and Laborers	853	727
Porters	50	41
TOTAL	998	875

Source: Gold City Integrated Port Services, Inc.

A.3. Impact on Productivity

The impact of port development on productivity are discussed under these headings, namely: ship's productivity, port productivity, and stevedores' productivity.

Ship's Productivity

A look at the data regarding the total number of shipcalls from 1977 to 1980 (see Table 6) shows a declining trend in the number of vessels calling at the Cagayan de Oro port. The number of shipcalls declined by 13% from 1977 to 1980. Broken down into calls of domestic vessels and of foreign vessels, we can see that the decline was brought about by fewer domestic shipcalls. Foreign shipcalls had in fact increased from 58 in 1977 to 76 in 1980 representing a 31% increase. Domestic shipcalls, on the other hand, decline from 2265 in 1977 to only 1929 in 1980 representing a 14.8% decline.

Decline of the number of shipcalls in itself does not mean much because it could mean either one of the following two situations:

1. decline in the total trading activities, thereby necessitating fewer shipcalls; or

Table 6
SHIPPING TRAFFIC INFORMATION
Port of Cagayan de Oro

PARTICULARS	1977	1978	1979	1980
Number of Shipcalls	2323	2253	2013	2005
Domestic	2265	2179	1921	1929
Foreign	58	74	92	76
Average Gross Registered Tonnage	776	1011	1248	1092
Domestic	649	812	915	890
Foreign	5710	6838	8161	6215
Average Net Registered Tonnage	397	491	638	583
Domestic	321	364	434	458
Foreign	3392	4212	4876	3740
Average Length (meters)	56	57	62	61
Domestic	54	55	58	59
Foreign	121	128	136	121
Average Waiting Time to Berth (hours)	11.3	8.4	3.3	2.2
Domestic	10.9*	7.9*	2.4	1.7
Foreign	24.5	24.5	19.8	14.0
Average Service Time at Berth (hours)	24.4	24.1	24.7	23.4
Domestic	23.9*	23.5*	23.5	22.1
Foreign	44.1	40.0	49.0	56.8
Average Idle Time (hours)	12.1		7.8	7.3
Domestic	21.2		8.6	9.1
Foreign	11.8		7.8	7.2
Average Turnaround Time (hours)	35.7	32.7	27.9	25.6
Domestic	34.8*	31.6*	25.9	23.8
Foreign	68.6	64.5	68.8	70.9
Number of Vessels Shipped		107	19	0
Berth Occupancy Rate** (%)	95.78	77	62	64

*Excludes vessels that shipsided

**Main berth only

Source: PPA Statistics

2. an increase in ship's carrying capacity, thus also necessitating fewer shipcalls.

To verify what is happening, let us take a look at the registered tonnage (both gross and net) in Table 6 which can be taken to represent the carrying capacity of the vessels. Average G.R.T. for domestic ships increased by 43% from 1977 to 1980 while N.R.T. increased by 43%. The average size of the vessel as reflected in the average length also increased slightly. The change in size and capacity of foreign vessels in terms of percentage increase is not as significant as that of the domestic vessels. This is expected since foreign vessels are originally significantly bigger (almost ten times bigger) than domestic vessels. The data in foreign vessels likewise demonstrate bigger ships to be calling at the port after the expansion.

However, bigger ships calling at the port would not be enough to indicate that ship's productivity has increased. To get the overall picture, we need to consider the volume of cargo carried by these vessels. Referring to Table 1, we can see that cargo throughout in metric tons had increased from 567,028 tons in 1977 to 730,806 tons in 1980 representing an increase of 29%. Considering only domestic trade, cargo flow increased by 17% from 500,943 tons in 1977 to 583,873

tons in 1980. This represents an average cargo carried per vessel of 303 tons in 1980 as compared to 221 tons in 1977 (Table 7).

A new development which may be directly attributed to port expansion is the trend toward containerized cargo handling.⁷ Containerization started in December of 1978. As can be seen from Table 8, its share in total domestic cargo handling is increasing from less than one percent in 1977 to 25% in 1980, and may be expected to get bigger as shippers are forced to containerize to stay in business. Some of the more popularly cited reasons for preference to containerization of cargoes by traders are: (a) it results in negligible pilferage; (b) it also reduces damages of cargoes; and (c) it is more convenient since containerization of cargoes enable traders to deal only with the Shipping Lines and thus save them the inconveniences of going to so many regulating agencies such as the arrastre operator, the PPA, the Bureau of Customs, Coast Guards, Bureau of Animal Industry, Bureau of Plant Industry, etc. There are to date three shipping lines offering container services in Cagayan de Oro, namely: William Lines, Inc., Aboitiz Shipping Lines, and Lorenzo Shipping Lines.

⁷ Some may argue that containerization may have occurred regardless as to whether or not the port facilities are expanded as in the case of port of Iligan. However, this seems unlikely in the case of Cagayan de Oro because prior to the port development, the port area is only 1.65 ha. and the state of congestion would render containerized cargo handling impossible.

Table 7

AVERAGE VOLUME OF CARGO CARRIED PER VESSEL
(In metric tons)

Year	Domestic	Foreign	Both
1977	221	1139	244
1978	260	1394	297
1979	308	1522	363
1980	303	1933	364

Table 8

INCIDENCE OF CONTAINERIZATION
Port of Cagayan de Oro

Year	% of Total Domestic Trade
1977	0
1978	0.8
1979	11.7
1980	24.8

The above evidences clearly indicate greater ship's productivity as a result of port expansion.

Port Productivity

Data on shipping statistics show that in 1977, vessels have to wait an average of 11.3 hours to be able to berth. This figure declines to only 2.2 hours in 1980 (Table 6) representing a decline of 80%. The average time vessel are serviced at berth remains more or less the same before and after the expansion. However, the fact that the average cargo carried per vessel has increased (refer to Table 7 again) would indicate that there is an increase in productivity. Furthermore, average idle time of vessels has also decreased from 12.1 hours in 1977 to only 7.3 hours in 1980 representing a decline of 40%. Consequently, the average turnaround time of ships calling at the port declines by 25% from 35% hours in 1977 to 25.6 hours in 1980.

The average ship in port cost of domestic vessels is approximately ₱11,000 per day.⁸ The average waiting time to berth has decreased by 9.2 hours from 1977 to 1980 for domestic

⁸ Information provided by Mr. Tomas C. Quintos, Jr. of the Philippine Port Authority.

vessels (Table 6). This implies an average cost-savings of ₱4,216 per ship. On the other hand, the average ship in port cost of foreign vessels approximately \$3,000 per day.⁹ The average waiting time to berth for foreign vessels is reduced by 10.5 hours from 1977 to 1980 implying an average cost-savings of \$1,312 per vessel.

Before the port expansion, double-banking and even triple-banking is not an uncommon sight in the Cagayan de Oro Port. The data on the number of vessels that shipsided in 1977 were not available. However, for 1978, 107 vessels representing 5% of total domestic shipcalls of that year shipsided upon arrival. Incidence of shipsiding was expectedly more in 1977. By 1980, no vessels had to ship-side upon arrival due to lack of docking space. This could be attributed to the longer available quay length and also to shorter turnaround time of vessels

It is therefore clear that the port development had increased the efficiency of port facilities and thereby increased its productivity.

⁹Information provided by Mr. Mariano de Jesus of Eastern Shipping Lines.

Stevedores' Productivity

As mentioned in the conceptual framework, by reducing the idle time of stevedores because more ships can dock simultaneously and therefore be serviced at the same time, and also through increased trade volume generated, stevedores' productivity is likely to increase.

Table 9 presents the different port labor productivity statistics from 1977 to 1980. The percentage of gang hour idle did not show any significant decline. Nevertheless, average tonnage handled per gross gang hour increased from 8.8 tons in 1977 to 10.3 tons in 1980 representing an increase of 17%; while the average tonnage handled per net gang hour increased from 10 tons to 11.6 tons indicating an increase of 16%.

Although the percentage increase in tonnage handled per gang hour did not seem to be very big, when we take into account the change in the number of men that make up a gang in 1977 and 1980, then the change would be quite significant. The average number of men per gang in 1977 was 16 persons while that in 1980 was only 12. Taking this into account, let us then examine the average tonnage handled per man-hour, instead of per gang-hour. The average tonnage handled per gross man-hour in 1977 was only 0.55 tons, while in 1980, it was 0.86 tons representing an increase of 56%. The average tonnage handled per net man-hour likewise indicated a 56% increase in 1980 over that of 1977.

Table 9
 PORT LABOR STATISTICS
 Port of Cagayan de Oro

PARTICULARS	1977	1978	1979	1980
Average Tonnage Handled per Gross Gang Hr.	8.8	7.9	9.5	10.3
Domestic	8.6	7.7	9.3	10.1
Foreign	15.7	13.6	13.8	14.9
Average Tonnage Handled per Net Gang Hour	10.0	9.3	10.6	11.6
Domestic	9.7	9.1	10.3	11.4
Foreign	18.6	16.6	15.4	16.7
Average Number of Men per Gang	16	12	12	12
Domestic	16	12	12	12
Foreign	17	12	11	12
Average Number of Gang per Vessel	2.5	2.1	2	2
Domestic	2.5	2.1	2	2
Foreign	3.9	2.9	2	2
Percent Gang Hours Idle	12.2	15.7	10.4	11.3
Domestic	12.0	15.4	10.4	11.4
Foreign	15.5	19.5	10.6	10.8
Average Tonnage Handled per Gross Man Hr.	0.55	0.66	0.79	0.86
Domestic	0.54	0.64	0.77	0.84
Foreign	0.92	1.13	1.26	1.24
Average Tonnage Handled per Net Man Hr.	0.62	0.78	0.88	0.97
Domestic	0.61	0.86	0.86	0.95
Foreign	1.09	1.38	1.40	1.39
Average Number of Employees per Day	227	146	116	119

Source: FPA Statistics

Considering the fact that the cargo carried per vessel had increased (discussed in previous section) and that the number of men that made up a gang decrease, it is interesting to note that it even requires less number of gang to work per vessel in 1980 than in 1977. These clearly signify that stevedores' productivity had also increased as a result of the port expansion. However, due to the increase in labor productivity and the trend toward containerization, the average number of laborers per day had reduced from 227 in 1977 to only 119 in 1980. This is another indication of the negative employment effect discussed in the employment section.

A.4. Impact on Balance of Trade

The total foreign cargo flowing through Cagayan de Oro port increases by 122% from 1977 to 1980 (Table 10). Despite this tremendous increase, however, the relative share of imports and exports in the total foreign trade had remained approximately constant with import accounting for 15% and export, 85% of total foreign trade cargo. This implies that the situation of favorable balance of trade through the port has been maintained. Nevertheless, the internal composition of imports and exports had undergone changes through time.

With regards to imports, fertilizer had maintained its positions as the commodity that accounts for the greatest bulk of shipment. Its relative importance, however, had undergone some changes. In 1977, it accounted for only 43% of total imports through the port, but its share had increased sharply to 84% by 1980.

With reference to exports, lumber which account for 64% of total export in 1977 had shown a declining trend in its share or importance as the principal commodity exported through Cagayan de Oro port. Sugar was the commodity that is competing with lumber as the principal export commodity through the Cagayan de Oro port. Sugar was exported through the port only in 1978 and by 1980, it had already surpassed the share of lumber in terms of weights.

Table 10
FOREIGN TRADE STATISTICS*
Port of Cagayan de Oro

Commodity Classification	1977	1978	1979	1980
TOTAL FOREIGN TRADE	66085	103189	140020	146993
Total Imports	9532 (100.0)	11698 (100.0)	21379 (100.0)	22630 (100.0)
Wood Pulp	1535 (16.1)	2146 (18.3)	42177 (19.7)	2824 (12.5)
Fertilizers	4080 (42.8)	3500 (29.9)	10700 (50.1)	18915 (83.6)
Machineries	1434 (15.0)	1284 (11.0)	3352 (15.7)	349 (1.5)
Cereals	0 0	2100 (18.0)	889 (4.1)	0 0
Consumer Goods	0	0	1920 (9.0)	49 (0.2)
General Cargo	2483 (26.0)	2668 (22.8)	301 (1.4)	493 (2.2)
Total Exports	56553 (100.0)	91491 (100.0)	118641 (100.0)	124303 (100.0)
Lumber	36398 (64.4)	54937 (60.0)	66265 (55.8)	50717 (40.8)
Veneer	1477 (2.6)	1112 (1.2)	823 (0.7)	5314 (4.3)
Chromite	15422 (27.3)	7348 (8.0)	17127 (14.4)	7172 (5.8)
Charcoal	2476 (4.4)	1750 (1.9)	1750 (1.5)	5985 (4.8)
Sorghum	544 (1.0)	3060 (3.3)	0	0
Sugar	0	21786 (23.8)	30781 (25.9)	54556 (43.9)
Copra	0	0	1400 (1.2)	0
Machineries	0	1156 (1.3)	147 (0.1)	0
General Cargo	236 (0.4)	342 (0.4)	348 (0.3)	559 (0.4)

*Figures without parentheses are in metric tons while figures inside parentheses represent percentages.

The expansion of the Cagayan de Oro Port facilities has played a very significant role in boosting foreign trade through the port as evidence by the increasing number of foreign shipcalls (Table 6) and the increasing volume of foreign trade, especially exports, through the port.

B. Qualitative Aspects of Port Development Impact

B.1. Port Development and Participation

There are indications that the port development together with better management at the Cagayan de Oro port have brought about increased participation of certain groups of people who seek livelihood around the port area. One of the groups concerned is the food vendors inside the port area. As a result of the expanded port area, space is available to provide the food vendors with their own individual stalls to sell their commodities. Previously, vendors used to scramble up the ships docked at the port to try to sell their goods to passengers. With the new management rule, this was not allowed anymore but had to do their business transactions in the stall provided for them. This gives rise to more order inside the port area. The vendors, for their mutual protection and security, formed themselves into an association to look after their common interest.

Informal conversations are carried out with 24 of these vendors to find out how they feel about the new arrangement and their income. Most of them feel that the arrangement is agreeable because it provides them with more security and stability despite the fact that for some of them, the new arrangement actually reduced their earnings. The new arrangement tends to reduce the earnings of those whose stalls are located farther away from the docking area of the ships. Previous to the new arrangement, their earnings depend very much upon how fast, alert and persistent they are in trying to get the passenger to notice their commodities. With the new arrangement, they have to wait for the passenger to come to them. When asked about how much net income they earned, their answers given provide such a wide range that it is impossible to make any averaging. The minimum earnings per day reported is ₱10 before the organization while the maximum went as high as ₱500. After the organization, however, the minimum earning reported is ₱5 per day and the maximum earnings is ₱200. However, despite this indication of lower income, most of them feel that the new arrangement accord them with more human dignity.

Another reorganization is the integration of all the various arrastre and stevedoring services which resulted into the Gold City Integrated Port Services, Inc. A labor

union exists among the port laborers known as the Macajalar Labor Union which is an affiliation of the Federation of Free Workers. This labor union existence, however, is the net result of the port development since it was organized already since 1945. However, the integration of all the arrastre and stevedoring operators into one unit could possibly lead to easier bargaining since the labor union now just have to deal with one management instead of several.

Another evidence of participation, although not exactly a direct result of Phase I development is the organizing of the squatter families in the areas affected by the Phase II development into an association to discuss and negotiate with PPA and the city government the problems regarding their relocation.

B.2. Port Development and Income Distribution

A careful inspection of the commodity composition of the cargo flow through Cagayan de Oro (Table 2) reveal that, so far, the commodity structure after the port development shows some favorable bias to the agricultural sector. Notice the sharp increase in the share of the importation of fertilizer, the increasing importance of sugar export, and the increasing share of tomatoes in domestic outward cargo.

Since most of those planting tomatoes and sugarcane in the region are small farmers, this implies a favorable bias towards them.

B.3 Port Development and Environment

With the decreasing demand for dock workers due to the trend toward containerization arising from the expanded port facilities, it would be logical to expect a worsening of the economic situations of those families living around the port area and depending upon stevedoring for their livelihood. However, the National Housing Authority have some on-going projects with the communities surrounding the port area to help them organize and start productive projects and ventures. It successfully carried out, this could be a way of preventing the slum environment from worsening.

As to the port area itself, the sanitary condition is tremendously improved from the near chaos state it was in prior to the expansion. This can be attributed to the larger available working space, more storage area, and better organization and management of the port authority.

It is not possible to test whether or not the port development has increased water pollution due to availability of data. However, since the number of shipcalls has declined after the port

development (Table 6), it may not be unreasonable to say that at least in the very short run, the port development has not generated any serious pollution problem.

VII. CONCLUSIONS AND IMPLICATIONS

The analysis reveals that the indirect impact of a port development is more substantial than the direct impact. However, a port is simply a service facility, for it to be able to generate these impact, the other complementary factors necessary in promoting economic growth, such as road network system linking the hinterland to the port and a high level of economic activity in the region, must be present. As clearly reflected in the cargo statistics from 1979 to 1980, due to the economic slow-down in the region in 1980, cargo throughout also decline, since port being only a service facility, it cannot create commerce but is there to assist and make the flow of goods easier.

There were some allegation by businessmen in Iligan that big multi-million companies have diverted their cargo to Cagayan de Oro port due to the very high arrastre rate in Iligan. This prompted the PPA Port Management Unit in Iligan to investigate the validity of this allegation. The result of their study¹⁰

¹⁰Noeme W. Calderon, "Investigation Conducted to Different Private Companies RE: Division of Cargoes to Cagayan de Oro Port," July 20, 1981.

which involved interviews of key personnel of 10 major big companies, was that the reasons Cagayan de Oro was chosen as their major distribution point are mainly because of its good geographical location, its bigger market and certain special arrangement granted to them by shipping lines in Cagayan de Oro. The high arrastre rate in Iligan is not a primary consideration since even with the higher arrastre rate, it would have been cheaper to ship directly to Iligan goods destined there if these advantageous factors do not exist in Cagayan. Among the things that can be deduced from that report is the general acceptance by the business sector that due to its location, Cagayan de Oro is the ideal distribution center linking Northern Mindanao with the rest of the Philippines. However, without good port facilities, this potential cannot be fully realized. One of the reasons which prompted San Miguel Corporation into developing their own private port is the problem of long waiting time to berth of their chartered vessels and slow discharging/loading of cargoes and consequently high shipping expenses when they were still using the Cagayan de Oro port before the Cagayan de Oro port development.¹¹ Phase I development of Cagayan de Oro port is therefore an integral component for the sustained growth of Cagayan de Oro and the development of Northern Mindanao.

¹¹ Ibid., p. 3.

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APPENDIX A

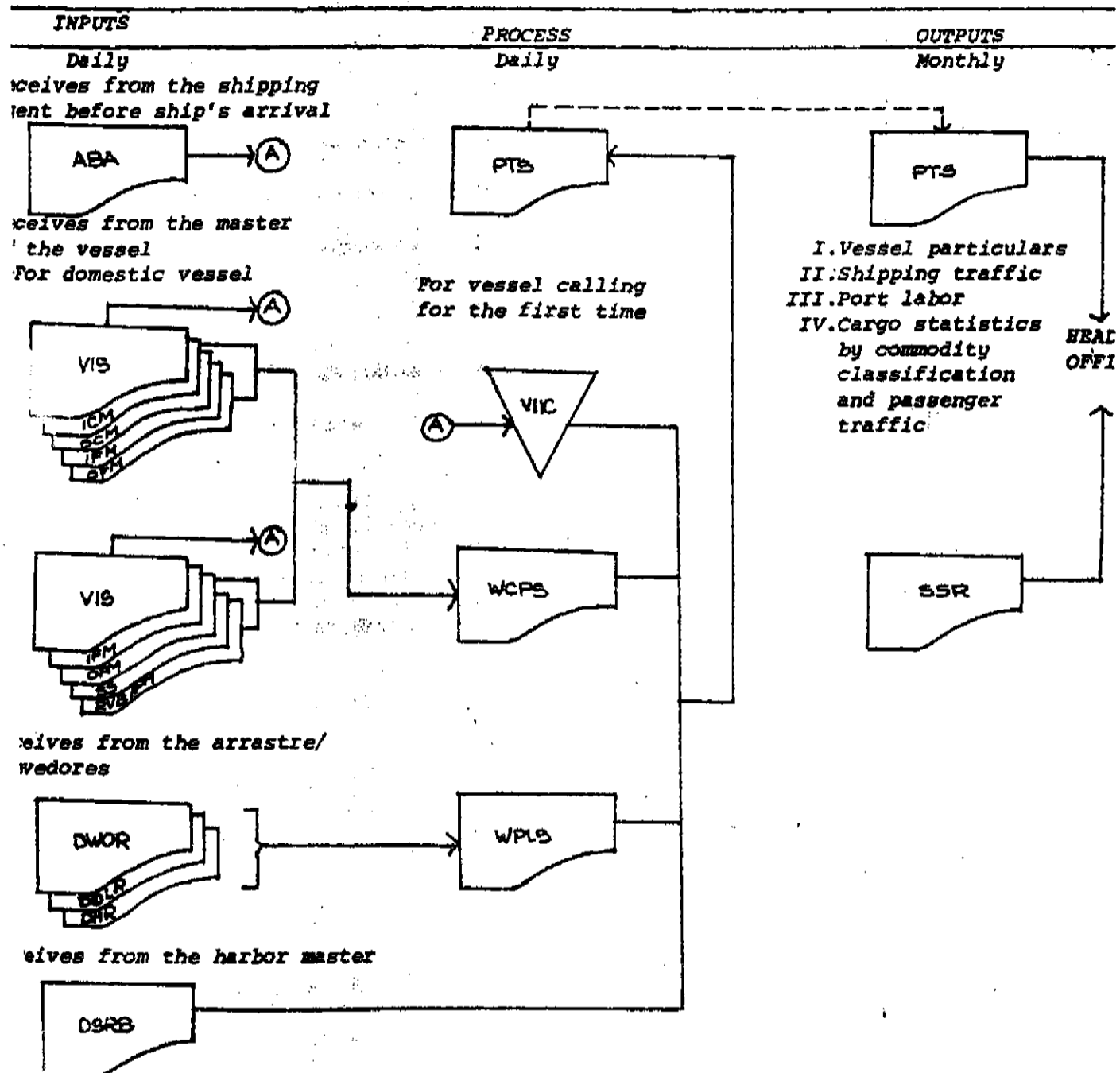
THE PHILIPPINE PORT AUTHORITY

The Philippine Port Authority (PPA) was created in July 1974 under Presidential Decree No. 505 to provide for the reorganization of port administration and operation functions in the country. Under P.D. 505, the PPA was limited to the exercise of broad supervisory and regulatory powers without autonomous power over the management and operations of individual ports. Because of this limitation, integrated port planning, development and management was not possible. To make the PPA viable, P.D. 357 was issued in December 1975 which broaden the scope of PPA's powers and functions and gave it the responsibility for the implementation of an integrated program for the planning, development financing, operation and maintenance of ports or port district for the entire country.

For recording and monitoring purposes, each Port Management Unit (PMU) of the PPA are required to prepare and submit to the Head Office in Manila two output reports monthly, these are the Port Traffic Statistics (PTS) and the Summary Statistical Report (SSR). Figure 1 illustrates the flowchart of the port statistics system of the PPA.

The PTS presents data on a per vessel basis and includes information on four areas of port activity, namely Vessel Particulars Shipping Traffic, Port Labor, and Cargo & Passenger Statistics. The

Figure 1. PORT STATISTICS SYSTEM FLOWCHART



- A Application for berth/anch.
- M Inward cargo manifest
- M Outward cargo manifest
- M Outward passenger manifest
- S Vessel information sheet
- M Inward foreign manifest
- M Outward foreign manifest
- S Statistical supplement
- M Record of vessel boarded/passenger manifest

- DWOR Daily work order report
 - DDLR Daily discharging & loading report
 - DHR Daily hatch report
 - DSRB Daily shipping record book
 - VIIC Vessel information index card
 - PTS Port traffic statistics
 - WCPS Worksheet on cargo & passenger stat.
 - WALS Worksheet on port labor statistics
- > Flow of documents
 - - - - -> Same document

Appendix A-3

data pertaining to vessels and shipping are taken from the PHU's files. The flowchart for the preparation of data regarding Vessel Particulars is presented in Appendix A, while that for Shipping Statistics is in Appendix B.

The Vessel Particulars section in the PTS contains the following information:

- type of vessel
- nationality of vessel
- vessel characteristics which include the gross registered tonnage, net registered tonnage, deadweight tonnage, length of vessel, beam of vessel, and draft of vessel.

The Shipping Statistics section includes the following data:

- vessel's voyage number
- actual arrival/departure day and time of the vessel at anchorage and/or at berth
- waiting time to berth and service time, including idle time
- vessel's draft upon arrival and upon departure.

The information pertaining to port labor are taken from the various daily reports accomplished by the arrastre/stevedores. For cargo discharged and loaded at the port, the Port Labor section of the PTS form contains the following data:

- total number of men (arrastre/stevedore) working per vessel
- total number of gangs
- gang hours utilized for discharging and loading of cargo, including idle time (gross/net gang hours), and reason for idle time.

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Finally, the source of documents for the Cargo & Passenger section are the cargo and passenger manifests submitted by the ship agent/master. It provides information on the following:

- total number of passengers disembarking and embarking
- cargo tonnage discharged and loaded per vessel
- cargo tonnage discharged and loaded per vessel by commodity classification.

The Summary Statistical Report summarizes the data reported in the PTS form for the month and also gives a narrative explanation of the trends and variations in port statistics. The SSR is designed to provide the PPA Head Office and the PMU Management with data to serve as basis for evaluating the performance of the PMU and for operational planning and control.

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APPENDIX B

PROFILE OF CAGAYAN DE ORO CITY

Cagayan de Oro City is the regional center for Northern Mindanao region. The city is bounded on the north by the Macajalar Bay, on the west by the municipality of Opol, on the south by the provinces of Lanao del Norte and Bukidnon, and on the east by the municipality of Tagoloan. It has a total land area of 412.8 sq. km.

POPULATION AND EMPLOYMENT

As of the 1975 Census, Cagayan de Oro has a total population of 165,200 and a population density of 400 persons per sq. km. The population age structure reveals that the population is young with 43% below 15 years of age. Population had been growing at a rate of 5.19% annually from 1970 to 1975. Natural rate of population increase for that period is only 2.99% annually. So we can see that migration is an important factor contributing to the increase in the city's population.

Roughly 64.5% of the population aged 15 and over in 1975 are in the labor force. Out of this, 93.4% are gainfully employed. The economy in the city is basically commercial with 53.4% of its labor force in this sector. The manufacturing sector, agro-based industries, and agricultural sector follow with 15.2%, 14.0% and 11.3% of total labor force, respectively.

INFRASTRUCTURE AND UTILITIES

Transportation

The city has a total of 261.6 km. of road as of June 1975. Of this total, 39% are paved (asphalt or concrete), 58% are gravel roads, and the rest are earth roads.

Cagayan de Oro airport has a runway of 2,000 m. by 36 m. which can accommodate medium range domestic jet planes. There are two air transport companies serving the city. The Philippine Air Lines services the route to and from Manila, Cebu and Davao while the Philippine Aerotransport services flights for Zamboanga, Camiguin, Ozamis, Malaybalay, Butuan and Surigao.

Cagayan de Oro Port caters to both domestic and foreign traffic. In addition to this general port, there are a number of private ports which are used exclusively by particular industrial firms.

Water System

As of 1975, the city's existing water system includes twelve low capacity deep wells, one spring course, six small reservoirs and distribution mains, delivering 3.9 million gallons per day and servicing approximately 41% of the population.

Electric Power

Power supply in the city comes from the Maria Cristina Hydro-Electric Plant in Iligan City. Electricity reaches thru a 69,000 volt line of NPC. It is then purchased and distributed either by the

Appendix B-3

Cagayan Electric Power and Light Company (CEPALCO) which distributes the power to the poblacion and the suburban district, or by the Misamis Oriental Rural Electric Service Cooperative (MORESCO) which serves the rural areas of the city.

Communication

The telephone system in the city has a total of 2,600 subscribers as of 1975. Other means of communication include four long distance telephone service (both domestic and overseas), twelve telegraph offices, five radio stations, and eleven freight forwarding offices in addition to the Cagayan de Oro Post Office.

SOCIAL SERVICES

Education

As of 1975, the school age population (ages 7-21 years) in the city totalled 64,607. The actual enrollment, however, was only 50,549 representing 78% of total school age population.

As of school year 1977-78, Cagayan de Oro City has a total of 39 elementary schools (six private and 33 public), 23 secondary schools (eight private and 15 public), six tertiary schools (five private and one public) and seven vocational schools.

There are a total of 1,879 teachers in the city during SY 1977-78. Student-teacher ratios are as follows: 37:1 for elementary level,

50:1 for secondary level, 25:1 for tertiary level, and 32:1 for vocational schools.

Health

In 1975, there are ten hospitals in the city with a total capacity of 682 beds. This means a bed population ratio of 242 persons per bed. In 1977, number of hospitals increases to twelve and bed capacity increases to 946. Bed population ratio decreases to 193 persons per bed.

In 1975, there is one doctor for every 1,242 persons and one nurse for every 903 persons. All hospitals are in the urban area, with six of the ten in the poblacion itself while the other four in the immediate vicinity. The City Health Office has 20 permanent health units outside the poblacion which is visited by the city health doctor once per week.

Housing

Houses in Cagayan de Oro are predominantly made of wood. Due to the rapid population increase, there is a housing backlog in the city. In 1970, the shortage is estimated to be 1,434 units while in 1975, it increases to 4,089 units.

In a survey conducted by the City Technical Staff in June 1977, the estimated slum and squatter population in the city numbered 32,119 which is approximately 17.6% of the city's population. This group of population has a median income of ₱345.00 per month. Barangay Mabacalan, where the port area is located, has the largest squatter area housing

Appendix B-5

a population of 9,567 covering 50 hectares of land.

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APPENDIX C

CARGO STATISTICS BY COMMODITY CLASSIFICATION
PORT OF CAGAYAN DE ORO
(in metric tons)

Commodity Classification	1977	1978	1979	1980
A. TOTAL DOMESTIC TRADE	<u>500943</u>	<u>565602</u>	<u>591374</u>	<u>583873</u>
I. Total Inward Cargo	<u>215475</u>	<u>233125</u>	<u>250277</u>	<u>245431</u>
Live Animals	103	129	30	81
Palay and Rice	8450	4261	10540	21101
Corn	318	182	289	186
Other Cereals	2749	4736	2329	2879
Sugar	21062	18487	17608	20547
Bottled Cargo	15257	9854	2248	1202
Empty Bottles	16381	11538	14794	10952
Other Consumer Goods	19951	19886	23876	22054
Cement	1168	884	2957	1107
Fertilizers	17770	25149	17323	19149
Chemicals	4949	2681	4218	6311
Lumber	2408	1811	921	419
Plywood and Veneer	3711	3053	1854	1388
Animal Feeds	4586	4980	7689	8411
Metal & Metal Products	7169	4618	10570	12121
Machineries/Vehicles	-	-	20611	11504
Copra	3680	1232	2704	6512
Petroleum Products	5323	5650	3489	10120
General Cargo	80440	113994	106227	89387
II. Total Outward Cargo	<u>285468</u>	<u>332477</u>	<u>341097</u>	<u>338442</u>
Live Animals	4157	5377	6811	6219
Palay and Rice	3041	3541	4561	2127
Corn	145064	207533	187535	162578
Cereals	664	2363	8130	11849
Sugar	146	366	1108	231
Bottled Cargo	17718	11821	14081	3641
Empty Bottles	13593	8789	2463	1728
Consumer Goods	3902	4342	3684	2509
Cement	347	534	686	1133
Fertilizer	831	888	1927	95
Chemicals	864	264	582	988
Lumber	12608	13635	14241	16641
Plywood & Veneer	5778	3449	4644	9723
Animal Feeds	7995	9011	21733	25895
Metal & Metal Products	717	223	458	521
Machineries	-	-	2357	2256

Commodity Classification	1977	1978	1979	1980
Clay/Cullets	-	-	5434	4842
Coffee Beans	-	-	5466	4193
Copra	8404	4047	1661	1057
Pineapple Products	9836	2553	5113	29508
Petroleum Products	123	147	136	129
Tomatoes	5253	16363	19313	16985
General Cargo	44427	37231	28973	33594
B. TOTAL FOREIGN TRADE	<u>66085</u>	<u>103189</u>	<u>140020</u>	<u>146933</u>
Total Imports	<u>9532</u>	<u>11698</u>	<u>21379</u>	<u>22630</u>
Wood Pulp	1535	2146	4217	2824
Fertilizers	4080	3500	10700	18915
Machineries	1434	1284	3352	349
Cereals	-	2100	889	-
Consumer Goods	-	-	1920	49
General Cargo	2483	2668	301	493
Total Exports	<u>36553</u>	<u>91491</u>	<u>118641</u>	<u>124303</u>
Lumber	36398	54937	66265	50717
Veneer	1477	1112	823	5314
Chromite	15422	7348	17127	7172
Charcoal	2476	1750	1750	5985
Sorghum	544	3060	-	-
Sugar	-	21786	30781	54556
Copra	-	-	1400	-
General Cargo	236	342	348	559
Machineries	-	1156	147	-



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