In the feasibility study of the INCOP railway, the necessity to connect the railways between Guanacaste and Caldera was pointed out. If the financial difficulties that confront the Ferrocarriles de Costa Rica at the present time are resolved, new railway investments will be encouraged. This new tract can be regarded as a leading investment to develop the Guanacaste region.

9.3.3 Vehicles

The number of vehicles has also steadily increased as the G.D.P. has increased (see Table 9.15, and Figure 9.13). The number of automobiles and trucks especially has increased rapidly. The rapid increase of trucks reflects the rapid growth of the quantity of goods trnasported. The number of automobiles has increased at a faster rate than that of buses. The number of automobiles per one bus was 23.23 in 1965, 30.56 in 1970 and 38.51 in 1975. People prefer private transportation to public transportation. The number of automobiles includes taxis. But, if the number of automobiles owned by individuals also has increased rapidly, the transportation industry seems to have increased especially in the field of transportation of persons. The bus service network is shown by Figure 9.14.

The secular trend of increase of number of vehicles is expressed by the following equations:

$$V_T = -75.42628 + 0.02697\ P \qquad r = 0.987$$
$$V_A = -11.20784 + 0.00639\ P \qquad r = 0.995$$
$$V_{TR} = -34.75152 + 0.00978\ P \qquad r = 0.977$$
$$V_J = -8.83055 + 0.00342\ P \qquad r = 0.976$$
$$V_B = 0.68836 + 0.00031\ P \qquad r = 0.942$$
$$V_{ST} = 0.19940 + 0.00079\ P \qquad r = 0.947$$
$$V_{SP} = -7.24048 + 0.00192\ P \qquad r = 0.959$$
$$V_M = -14.30593 + 0.00437\ P \qquad r = 0.989$$

where V_T, V_A, V_{TR}, V_J, V_B, V_{ST}, V_{SP}, and V_M are the numbers of total, automobile, truck, jeep, bus, station wagon, special equipment, and motorcycle and related vehicles in 1,000 vehicles, respectively.

In 2000, when the G.D.P. in Costa Rica will become 35 or 40 billion colones, the number of vehicles will increase as follows:

V_T : 868.52 or 1003.37 thousand cars

V_A : 212.44 or 244.39

V_{TR} : 307.55 or 356.45

V_J : 110.87 or 127.97

V_B : 11.54 or 13.09

Table 9.15   Number of Vehicles

Year	Total	Automobiles	Trucks	Jeeps	Buses	Station Wagons	Special Equipment	Motorcycle and Related
1965	45,354	14,004	10,195	5,829	1,952	2,900	2,491	7,983
1966	52,496	16,526	12,297	6,919	2,058	3,709	2,617	8,370
1967	55,904	17,850	13,263	7,468	2,126	3,788	2,776	8,633
1968	60,038	19,384	14,651	8,091	2,206	3,853	2,934	8,919
1969	65,564	21,019	16,730	8,916	2,296	4,158	3,151	9,294
1970	73,395	23,834	19,555	10,037	2,402	4,358	3,460	9,749
1971	81,715	25,969	22,373	11,179	2,529	4,985	3,968	10,712
1972	90,817	28,411	24,784	12,284	2,605	5,198	4,422	13,113 5)
1973	103,296	31,286	29,695	13,500	2,675	5,396	5,127	15,617
1974	114,841	34,270	34,401	15,249	2,795	5,626	6,500	16,000 6)
1975	128,237	36,350	39,540	17,200	3,122	6,290	7,362	18,373

Source: Ministerio de Obras Públicas y Transportes, Dirección de Planificación con Base en Información de la Dirección General de Transporte Automotor y Estimaciones.
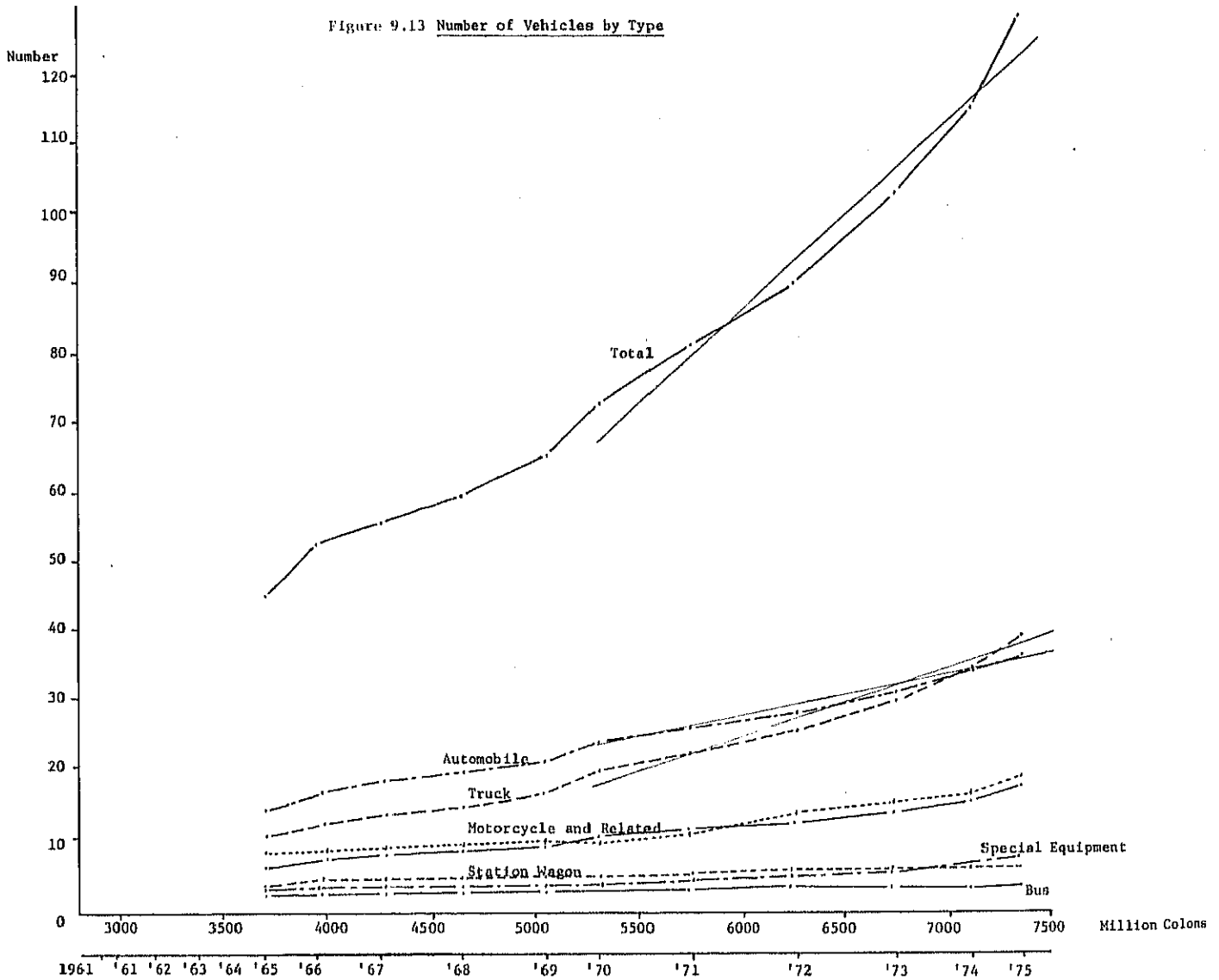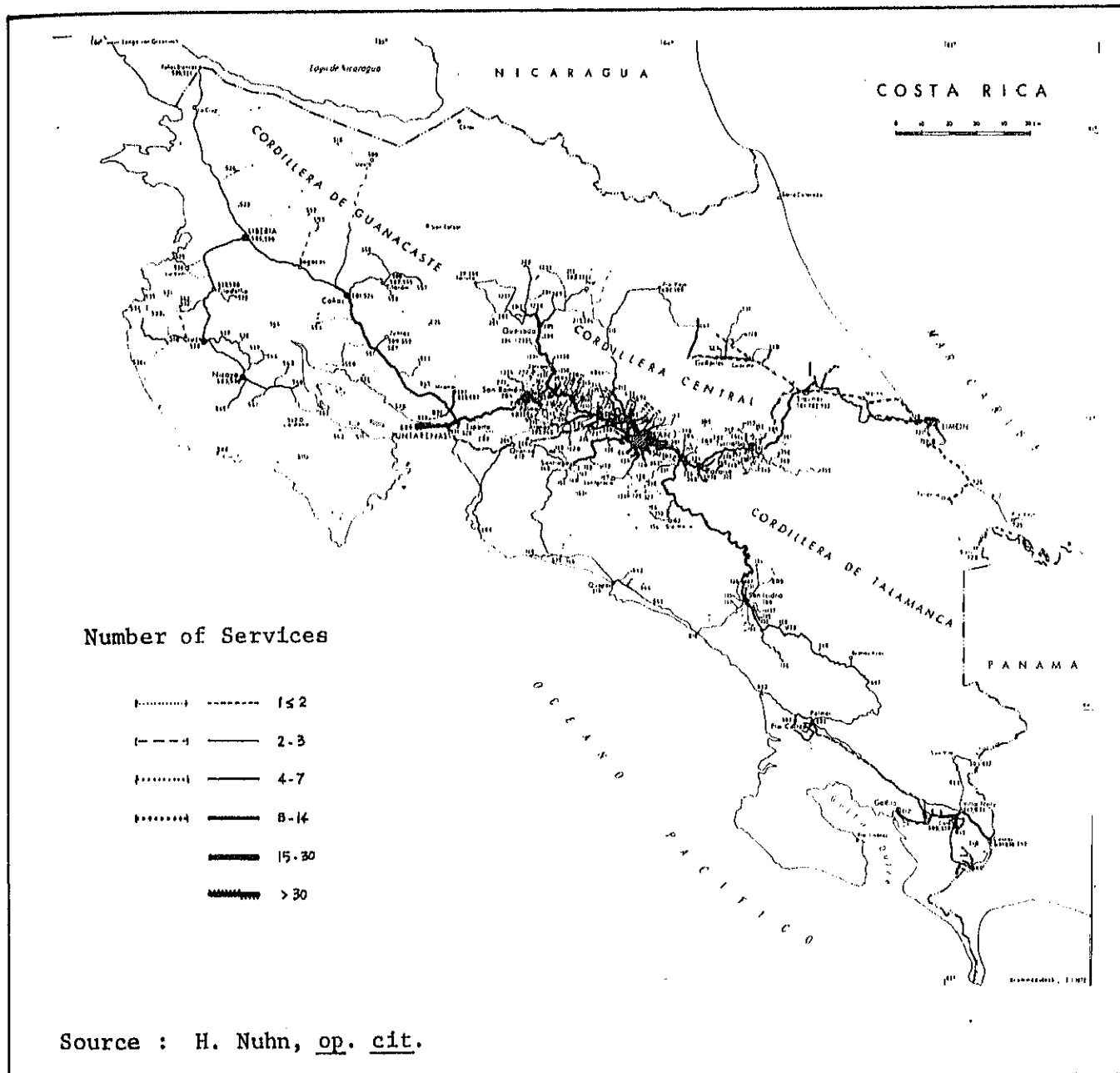
Figure 9.13 Number of Vehicles by Type

Number

120
110
100
90
80
70
60
50
40
30
20
10
0

Total

Automobile
Truck
Motorcycle and Related
Station Wagon
Special Equipment
Bus

3000   3500   4000   4500   5000   5500   6000   6500   7000   7500   Million Colons

1961 '61 '62 '63 '64 '65 '66   '67   '68   '69 '70   '71   '72   '73   '74 '75

Figure 9.14   Bus Service Networks

Number of Services

⊢············⊣	--------	1 ≤ 2
⊢— — ⊣	————	2 - 3
⊢·········⊣	————	4 - 7
⊢·········⊣	———	8 - 14
	■■■■■	15 - 30
	⋀⋀⋀⋀⋀	> 30

Source : H. Nuhn, op. cit.

V_{ST} :   27.85 or   31.80 thousand cars

V_{SP} :   59.96 or   69.56

V_{M} : 138.64 or 160.49

The great demand for transportation by such vehicles necessitates a sufficiently increased supply of paved roads.

9.3.4   Airlines

Costa Rica had 226 airports in 1975. Among then, we can find only airports with really sufficient facilities. These airports are owned by the government (see Table 9.16).

Juan Santamaria airport is a large international airport. Recently, R. Dixon Speas Associates, a U.S. consulting firm, studied Costa Rica's future airport needs and concluded that Juan Santamaria International Airport is the best choice for an airport to serve the growing needs of Costa Rica during the next decades and it need not have to worry about competition (with other airports). On the other hand the managerial conditions of domestic airlines are not good. For example, LACSA Airlines, a domestic airline in Costa Rica, is confronted with financial difficulties. According to the Tico Times, the executive president of LACSA said that "LACSA faces a choice of purchasing new equipment and charging higher fares for its domestic runs or closing down its domestic operations entirely and granting other airlines its routes."

9.3.5   Terminals

As the size of the economic activity is enlarged, the quantity of the flow of goods transported and the number of trnasportation vehicles also increases, as suggested in 9.3.3 by showing the relation between the number of vehicles and the G.D.P. When the quantity of goods transported and the number of vehicles become large, terminals must be supplied.

The government of Costa Rica proposed a plan for the construction of terminals. This plan showed that terminals are needed in many urbanized areas in San Jose, Limon, Caldera, Cañas, Liberia, Turrialba, San Isidro del General, Palmar, etc. Among the plans for constructing terminals in these cities, those for San Jose, Limon, and Caldera are concretely shown. According to the plan, San Jose should have 3 terminals, and Limon and Caldera should have one terminal each. Their location should not be fixed for a long time because urban areas will expand steadily in the future.

Table 9.16   Airports by Types of Runway Surface and Facilities

Owner	Surface					Facilities*			
	Asphalt	Concrete	Gravel and/or Pasture	Sea Coast	Total	Everything	A	B	Nothing
Government	9	6	20	11	46	4	17	5	20
Private owner	11	2	163	4	180	-	20	15	145
Total	20	8	183	15	226	4	37	20	165

Note: Everything: Hotel, Highway to San Jose, Radio Communication

Class A: Hotel, Radio Communication

Class B: Radio Communication

Nothing: No facilities to be mentioned

Source: Ministerio de Obras Públicas y Transportes, Dirección General de Planificación: Cuadros Estadísticos Sobre el Sector Transporte 1975. San Jose, 1976

9.3.6 Ferry-Boat

There is a ferry-boat service between Puntarenas and Playa Naranjo. This ferry-boat, operated by Transbordadores, S.A., a branch of Grupo Proin S.A. is a large company which has five departments of operations: (1) financial operations, (2) industries, (3) realty, agriculture and cattle-breeding, (4) automobile and machinery, and (5) services and commerce. The ferry boat company which belongs to the Department of Services and Commerce was established in 1971, and began to operate with one boat in 1972. From 1974, they had two boats. But as operation costs rose from 1976, they reverted to one-boat operation again.

The number of passengers and vehicles transported by the ferry boat are shown in Table 9.17 and Figure 9.15. These numbers increase steadily year after year. This demonstrates the importance of this service in connecting Puntarenas and areas in the Nicoya Peninsula.

Table 9.17   Number of Passengers and Vehicles
Transported by Ferry Boat

Year	1972/73*	1973/74	1974/75	1975/76
Persons	204,435	259,561	300,834	317,779
Vehicles	29,278	39,581	49,149	58,352

(*)   From October, 1972 to September, 1973.

Figure 9.15   Number of Passengers and Vehicles
Transported by Ferry Boat
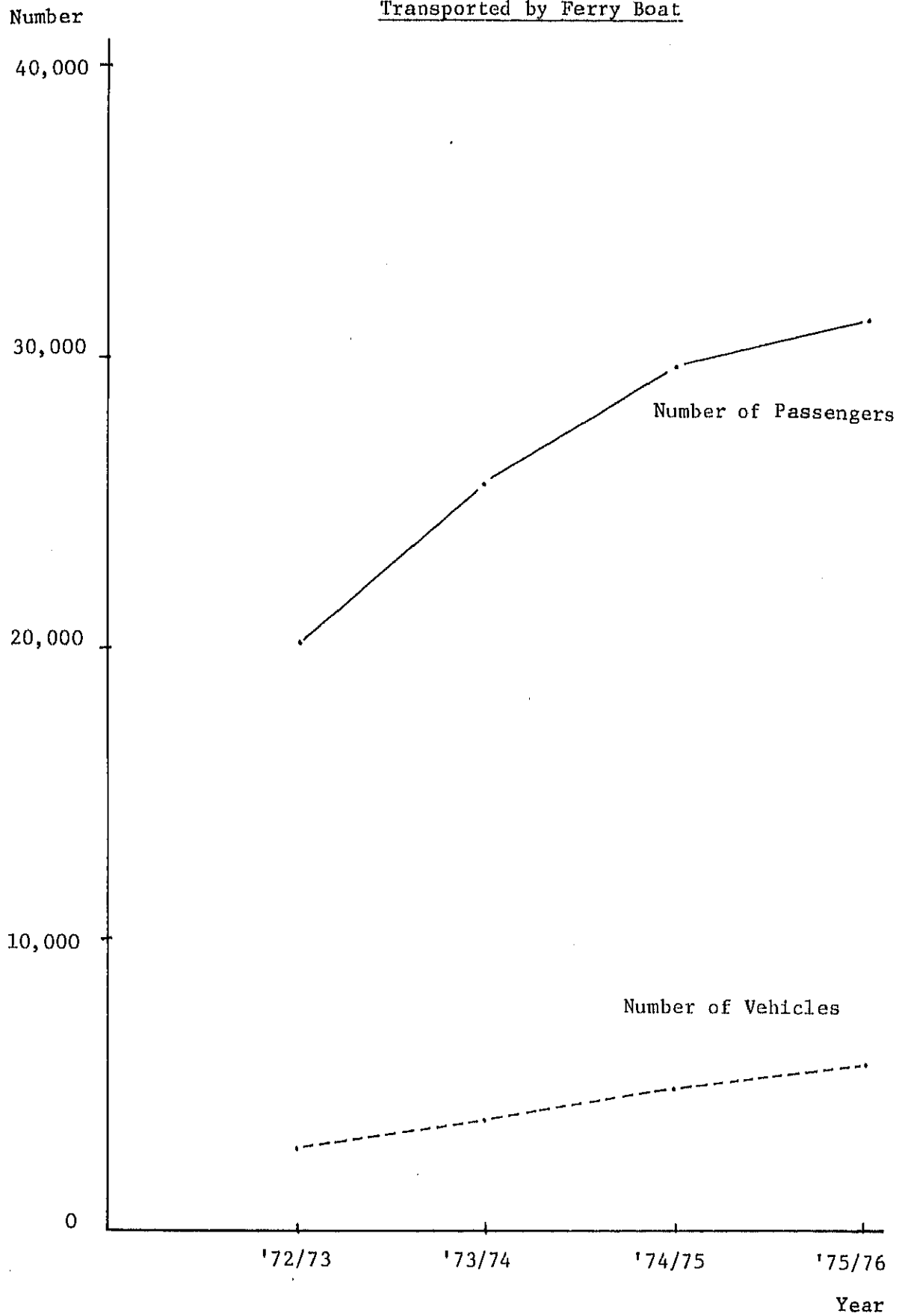
9.4 Delimitation of the Area in Question

Presently Puntarenas has economic relations over a considerably wide area. This is demonstrated in the maps shown in Figures 9.16, 9.17 and 9.18 in which the centers of commerce and their area of influence area shown. According to these maps, Puntarenas as a commercial center has relations with areas in Peninsula de Nicoya and areas in the vicinity of Miramar, especially when the area of influence for middle and high class commodities are observed.

Table 9.18 shows the amount of commercial traffic (number of trips) between major commercial centers, key locations and the region around Barranca.

This table shows a heavy flow of traffic between San Jose and Puntarenas (see Figure 9.19).

Additionally, we can show the flow of the goods transported by railroads between Puntarenas and other regions. Table 9.19 is the origin-destination table for the goods transported by railroads (INCOP) in 1974. From this table, we can find also a heavy flow of goods between Puntarenas and Barranca, and San Jose. Therefore, we deduce that Puntarenas is a gateway to the inner parts of this country, especially to San Jose.

Based on these observation, the main areas in question in this transportation study are the Pacifico Central, the region surrounding Puntarenas and Caldera, the Region Central, and San Jose and surrounding region. Subsidiary areas are Pacifico Norte, Region Norte and Pacifico Sur (see Figure 9.20).

The passenger fare and average freight between San Jose and Limon or Puntarenas are shown in the Table 9.20. According to this table, both the fare and freight rose in 1975 (except the freight between San Jose and Puntarenas remained unchanged). Unfortunately, management of the railroads (JAPDEVA and INCOP) did not improved.
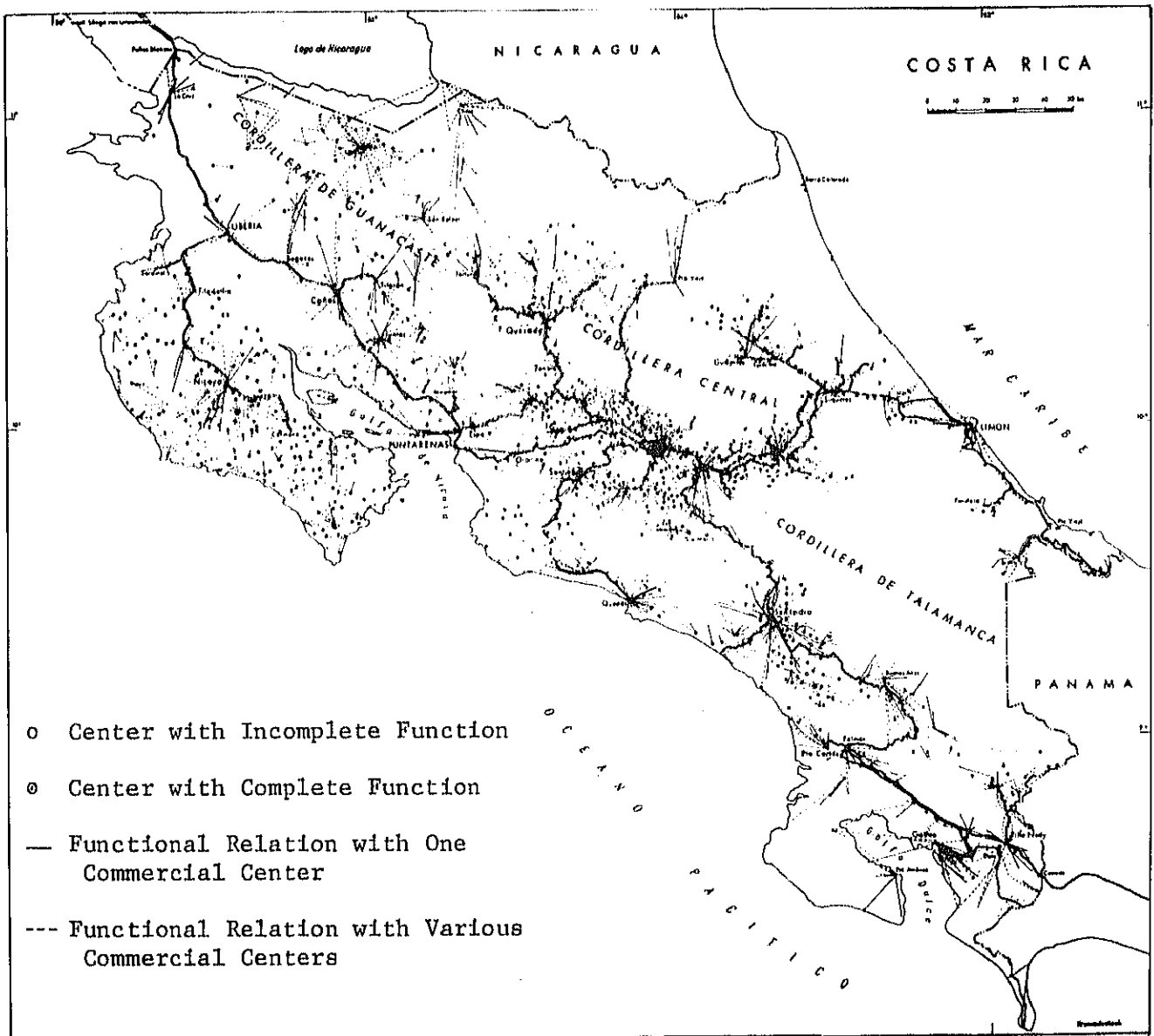
9.5 Development of Gran Puntarenas and Its Influence on National Development

9.5.1 Necessity of Development of Gran Puntarenas

The volume of goods (in 1,000 metric ton) imported to (M) and exported from (E) Costa Rica has increased year after year, as shown in Table 9.21. This volume is closely correlated to the G.D.P. (in million colons) of this country. (See Figures 9.21 and 9.22) These relations are expressed approximately by linear functions:

$$M = -220.8354 + 0.2540 \ P \qquad r = 0.960 \quad (9.5.1)$$
$$E = -151.1270 + 0.2447 \ P \qquad r = 0.919 \quad (9.5.2)$$

Figure 9.16   Center of Commerce and the Area of Their Influence:
              Law Class Commodities

o   Center with Incomplete Function

⊙   Center with Complete Function

—   Functional Relation with One
     Commercial Center

--- Functional Relation with Various
     Commercial Centers

Source : H. Nuhn, op. cit.

Figure 9.17 Center of Commerce and the Area of Their Influence:
Middle Class Commodities

o   Center with Incomplete Function

⊙   Center with Complete Function

——   *Functional Relation with one*
        Commercial Center

----   Functional Relation with various
        Commercial Centers
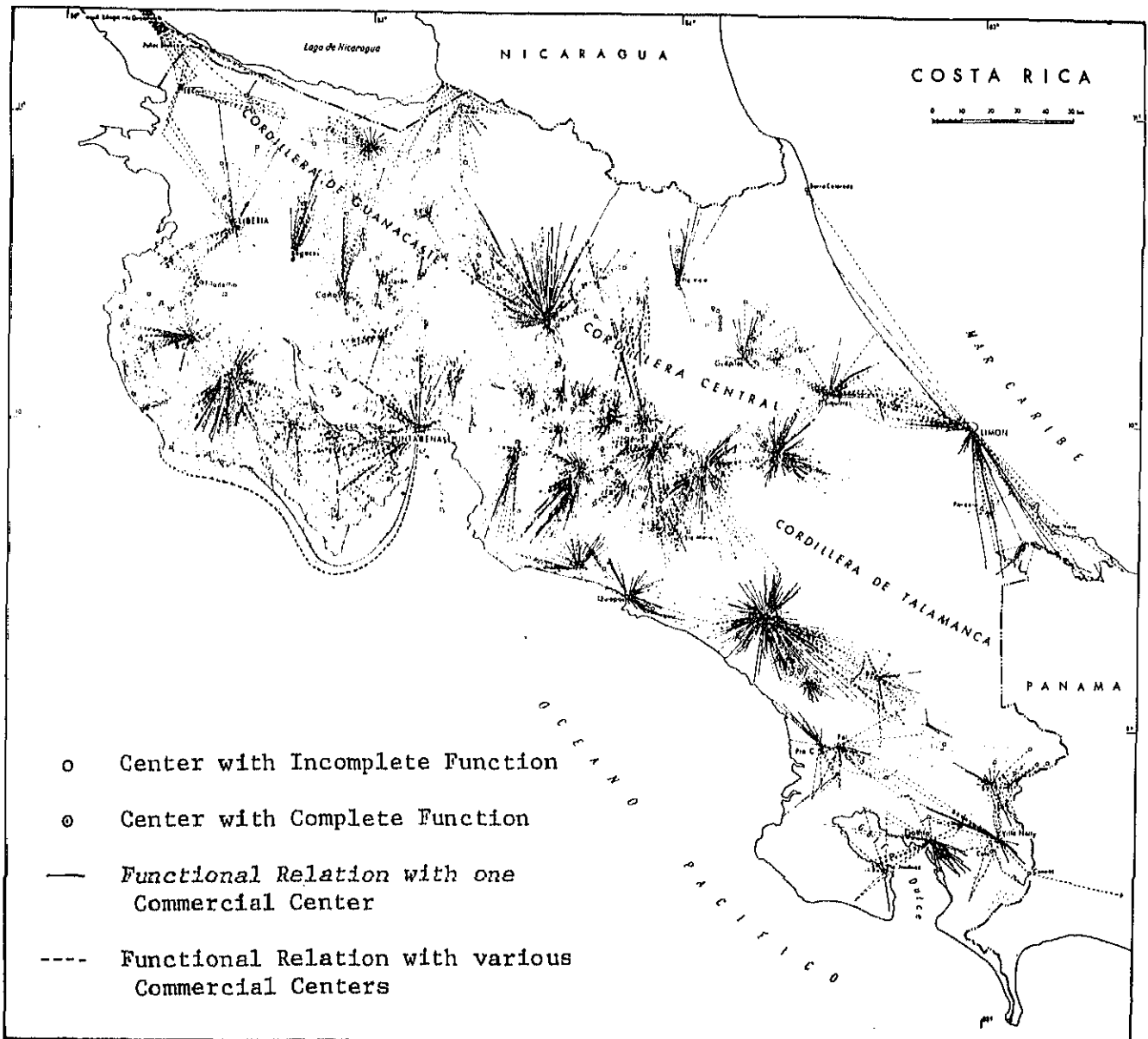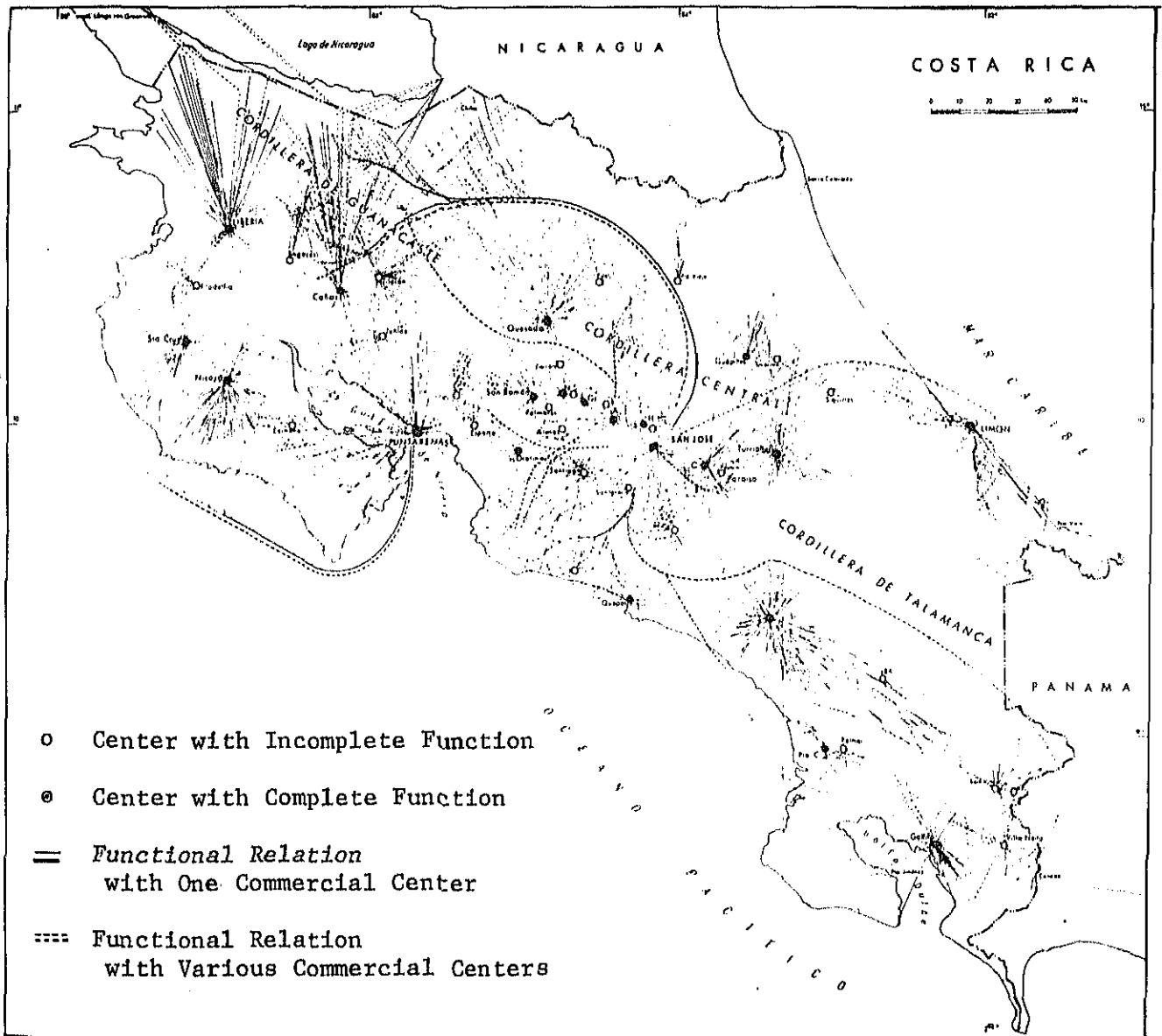
Source : H. Nuhn, op. cit.

Figure 9.18   Center of Commerce and the Area of Their Influence:
              High Class Commodities

Source : H. Nuhn, op, cit.

Table 9.18   Table of Commercial Connections for Key

Locations and Regions around Barranca

(The average number of trips in 1974)

Commercial Connects	Average Number of Trips
San José - Puntarenas and Ferry	871
San José - Barranca	41
San José - Guanacaste	650
Esparta - Puntarenas and Ferry	600
Esparta - Barranca	193
Esparta - Guanacaste	142
Alajuela - Puntarenas and Ferry	70
Alajuela - Barranca	4
Alajuela - Guanacaste	66
San Ramon - Puntarenas and Ferry	59
San Ramon - Barranca	4
San Ramon - Guanacaste	25
Heredia - Puntarenas and Ferry	26
Heredia - Barranca	2
Heredia - Guanacaste	49
Naranjo and others - Puntarenas and Ferry	37
Naranjo and others - Barranca	2
Naranjo and others - Guanacaste	18
Grecia and others - Puntarenas and Ferry	33
Grecia and others - Barranca	2
Grecia and others - Guanacaste	28

Commercial Connects	Average Number of Trips
Cartago and others - Puntarenas and Ferry	74
Cartago and others - Barranca	4
Cartago and others - Guanacaste	22
Palmares - Puntarenas and Ferry	20
Palmares - Barranca	2
Palmares - Guanacaste	9
Southern Frontier - Northern Frontier	19
San Jose - Northern Frontier	184
Atenas - Puntarenas and Ferry	7
Atenas - Guanacaste	4
San Mateo and Orotiera - Puntarenas	13
San Mateo and Orotiera - Guanacaste	11
Caldera, Mata de Limon - Puntarenas	17
Puntarenas - Northern Frontier	15
Puntarenas - Guanacaste	488
Barranca - Guanacaste	108
Puntarenas - Barranca	478

Source: Dirección General de Planificación, Departamento de Estudios Basicos, Estudio de Origen y Destino Realizado en Barranca el Jueves 30 de Enero de 1975.

Table 9.19   Origin-Destination Table for the Goods
            Transported by Railroads (INCOP) in 1974

1.   Exported Goods

Product	Tonnage (ton)	Origin	Destination	Distance (km)
Sugar	4,479	San Jose	Puntarenas	116
Sugar	26,793	Ciruelas	Puntarenas	101
Sugar	34,954	Barranca	Puntarenas	14
Coffee	20,206	San Jose	Puntarenas	116
Coffee	7,314	Alajuela	Puntarenas	102
Coffee	4,086	San Antonio	Puntarenas	101
Coffee	829	Barranca	Puntarenas	14
Lumber Industry	5,560	San Jose	Puntarenas	116
Others	19,080	Barranca	Puntarenas	14
Total	123,301			

2.   Imported Goods

Product	Tonnage	Origin	Destination	Distance
Wheat	76,248	Puntarenas	Alajuela	102
Maize and others	43,203	Puntarenas	Barranca	14
Resin	7,338	Puntarenas	San Jose	116
Paper	11,849	Puntarenas	San Jose	116
Steel	41,517	Puntarenas	San Jose	116
Tin-plate	9,090	Puntarenas	San Jose	116
Parts for automobile	5,520	Puntarenas	San Jose	116
Other import goods	32,562	Puntarenas	San Jose	116
Combastible	26,894	Caldera	San Jose	93
Total	254,221			

3.   Local Cargo

Product	Tonnage	Origin	Destination	Distance
Oil	4,690	Puntarenas	San Jose	116
Other local goods	40,750	—	—	12.1
Total	45,440			

Note : Obtained from Information Statistics of INCOP.

Figure 9.19   Main Flow of Traffic in the Region around Barranca
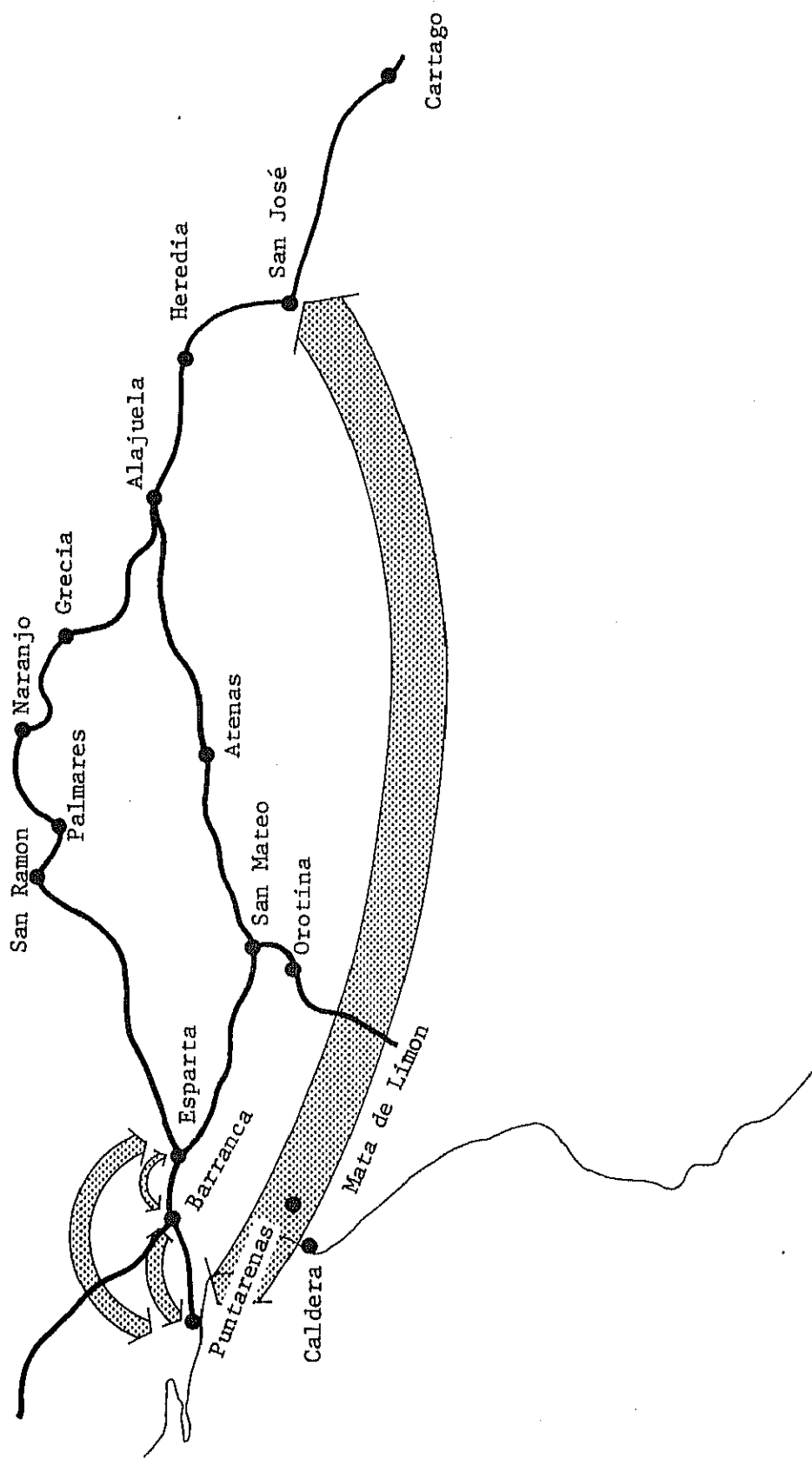
Note : Based on Table 9.22.

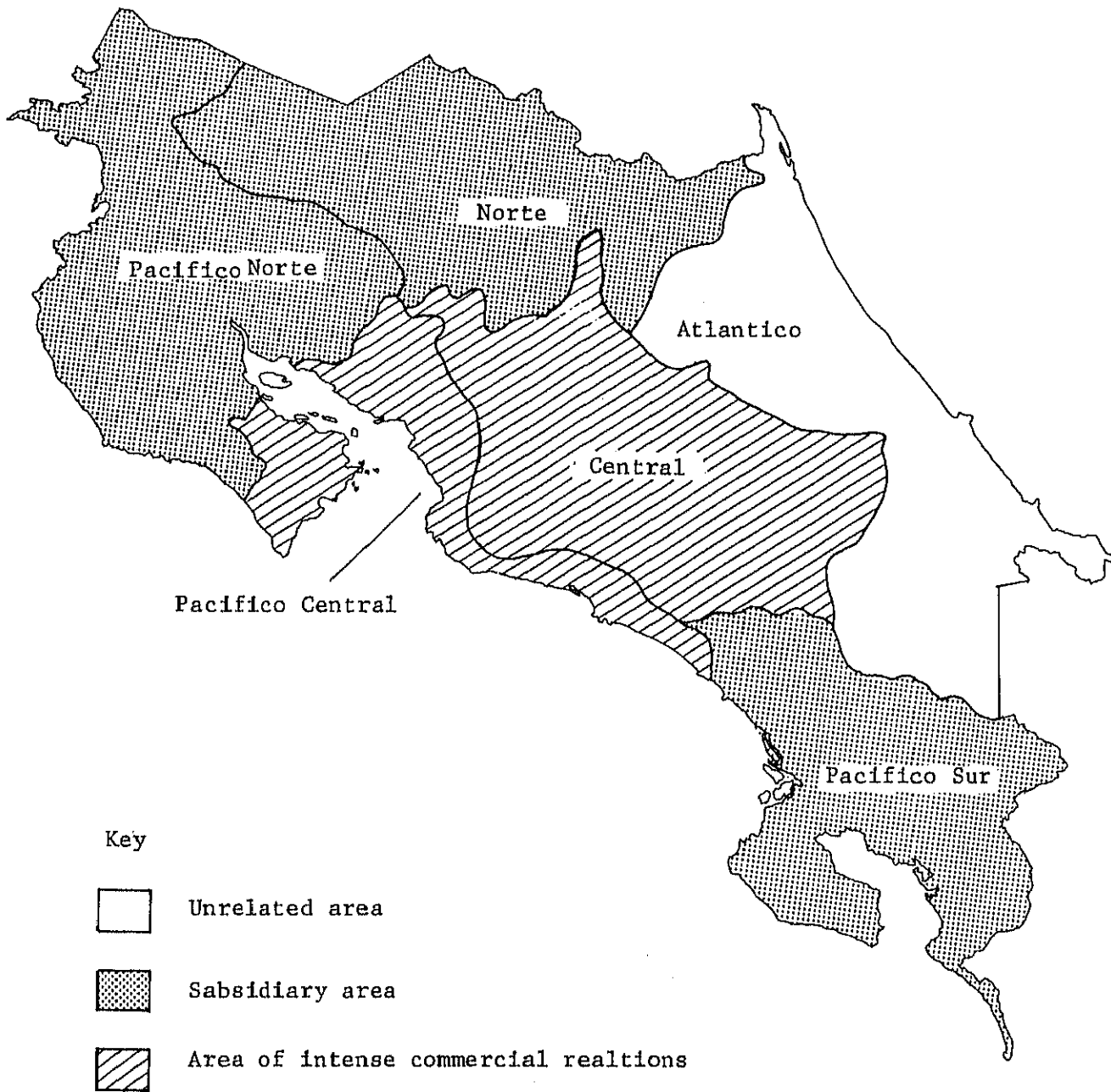Figure 9.20   Delimination of the Area in Question

Norte

Pacifico Norte

Atlantico

Central

Pacifico Central

Pacifico Sur

Key

Unrelated area

Sabsidiary area

Area of intense commercial realtions

Table 9.20   Passenger Fare and Average Freight of JAPDEVA and INCOP

(colons)

Year	JUPDEVA (San José-Limon)				INCOP (San Jose-Puntarenas)		
	Passenger Fare	Average Freight			Passenger Fare		Average Freight
		Import	Export	Local	First Class	Second Class	
1965	16.70	43.94	65.40	60.31	10.00	7.00	33.00
1966	16.70	43.94	65.40	60.31	10.00	7.00	33.00
1967	16.70	43.94	65.40	60.31	10.00	7.00	33.00
1968	16.70	43.94	65.40	60.31	10.00	7.00	34.22
1969	16.70	43.94	65.40	60.31	10.00	7.00	34.22
1970	16.70	43.94	65.40	60.31	10.00	7.00	34.22
1971	16.70	43.94	65.40	60.31	10.00	7.00	34.22
1972	16.70	43.94	65.40	60.31	10.00	7.00	34.22
1973	16.70	43.94	65.40	60.31	10.00	7.00	34.22
1974	21.00	56.42 76.42	46.60	74.94	10.00	7.00	34.22
1975	27.00	99.34	60.58	92.35	11.50		34.22
1976	27.00	99.34	60.58	92.35	11.50		34.22
1977	27.00	99.34	60.58	92.35	11.50		53.69

1) H. Nuhn, Regionalization de Costa Rica, La Planificación del Desarrollo y la Administración, 1973, pp. 92-103.

2) Dirección General de Planificación, Departamento de Estudios Basicos, Estudio de Origen y Destino Realizado en Barranca el Jueves 30 de Enero de 1975.

Moreover, as demonstrated in Table 9.24, most imports and exports are transported by ships. Therefore, the role of the port is very important for national economic development. The flow of these imports (Ms) and exports (Es) transported by ship are expressed by the following equations:

$$Ms = -165.9862 + 0.2115 \ P \qquad r = 0.967 \ (9.6.1)$$
$$Es = -90.8136 + 0.2171 \ P \qquad r = 0.895 \ (9.6.2)$$

The main ports for imports and exports are Limon and Puntarenas. At Puntarenas, wheat, fertilizer, paper, iron and steel are the main imports; sugar, coffee, and fertilizer are the main exports (see Table 9.22 and 9.23).

The flow of import and export goods will continue to increase in the future, although the quantities of import and export products decreased 1975 and 1974 respectively.[2]/

The flow of import (Mp) and export (Ep) goods at Puntarenas are expressed by the following regression lines:

$$Mp = 81.2160 + 0.0494 \ P \qquad r = 0.720$$
$$Ep = 36.0962 + 0.0206 \ P \qquad r = 0.785$$

Using the above three sets of equations, we estimate the volume of import and export goods, their volume transported by ship, and the volumes of import and export goods handled at Puntarenas in the year 2000 to be as follows:

M : 8.7 to 9.9 (million tons)
E : 8.4 to 9.6
Ms : 7.2 to 8.3
Es : 7.5 to 8.5
Mp : 1.8 to 2.1
Ep : 0.7 to 0.9

Based on these reasons, the port must be enlarged and well organized. Constructing a new port at Caldera clearly resolves the problem -- the increase of the volume of the import and export goods.

9.5.2 Development of Gran Puntarenas and Its Influence

Raabe and Bogan calculated the regional population of Pacifico Central and Region Central, as shown in Table 9.24.

When migration is considered, the population in Pacifico Central in 2000 will be 134 thousand, but if migration is not considered the population becomes 237 thousand. We can presume that, if

2/ The reason why the quantity of import and export goods decreased in 1975 and 1974 respectively is that, in 1975, imports of oil, fertilizer, paper, and automobiles drastically decreased, and, in 1974, the exports of bananas and sugar decreased. Because bananas and sugar are exported chiefly from Limon, Puntarenas shows no decrease of export goods in 1974.

Table 9.21   Means of Transport for Foreign Trade According to Location

(metric ton)

Means of Transport	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
I M P O R T S												
Total	607,628	803,899	711,308	744,590	888,833	1,004,118	1,260,861	1,324,015	1,347,299	1,547,868	1,611,778	1,548,870
Ship	604,714	800,815	655,685	659,342	776,372	870,966	1,033,162	1,113,558	1,117,865	1,317,568	1,377,200	1,306,190
Limon	255,030	233,830	224,657	293,119	443,300	497,778	559,615	599,439	649,236	838,200	844,343	876,004
Puntarenas	280,844	495,057	361,079	307,540	255,912	307,166	390,173	446,968	392,113	406,458	457,967	386,958
Golfito	68,840	71,928	69,949	58,683	77,160	66,022	83,374	67,151	76,516	72,910	74,890	43,228
Road			51,979	77,401	107,788	128,139	220,761	203,736	223,706	223,422	225,016	233,429
Northern Frontier			51,979	77,401	104,020	123,725	211,325	191,719	209,430	205,811	198,617	205,804
Southern Frontier			-	-	3,768	4,414	9,436	12,017	14,276	17,611	26,399	27,625
Airline	2,914	3,084	3,644	7,847	4,673	5,013	6,938	6,721	5,728	6,878	9,562	9,251
Custom House	263	271	252	203	206	225	294	232	161	159	163	163
Airport of Coco	2,651	2,813	3,392	7,644	4,467	4,788	6,644	6,489	5,567	6,719		9,088
E X P O R T S												
Total	532,593	511,902	603,147	629,446	898,395	1,029,363	1,197,674	1,355,417	1,498,539	1,639,191	1,494,673	1,525,886
Ship	531,090	511,275	562,429	571,561	816,636	951,196	1,120,205	1,267,832	1,389,035	1,506,268	1,348,884	1,388,063
Limon	182,185	194,818	250,593	242,687	366,922	491,253	615,857	703,970	826,911	953,770	843,797	929,676
Puntarenas	123,763	100,421	82,371	87,847	119,758	127,487	152,539	185,983	164,471	178,347	190,250	166,182
Golfito	225,142	216,036	229,465	241,027	329,956	332,456	351,809	377,879	397,653	374,151	314,837	292,205
Road			40,277	56,441	80,133	76,485	75,291	84,498	106,241	128,482	141,493	130,287
Northern Frontier			40,277	56,441	75,170	71,646	69,594	76,184	84,522	103,866	109,876	101,219
Southern Frontier			-	-	4,963	4,839	5,697	8,314	21,719	24,616	31,617	29,068
Airline	1,503	627	441	1,444	1,626	1,688	2,178	3,087	3,263	4,443	4,296	7,536
Custom House	9	10	12	7	6	4	4	7	2	5	5	90
Airport of Coco	1,494	617	429	1,437	1,620	1,678	2,174	3,080	3,261	4,438	4,291	7,446

Source: Ministerio de Obras Públicos y Transportes, op. cit.
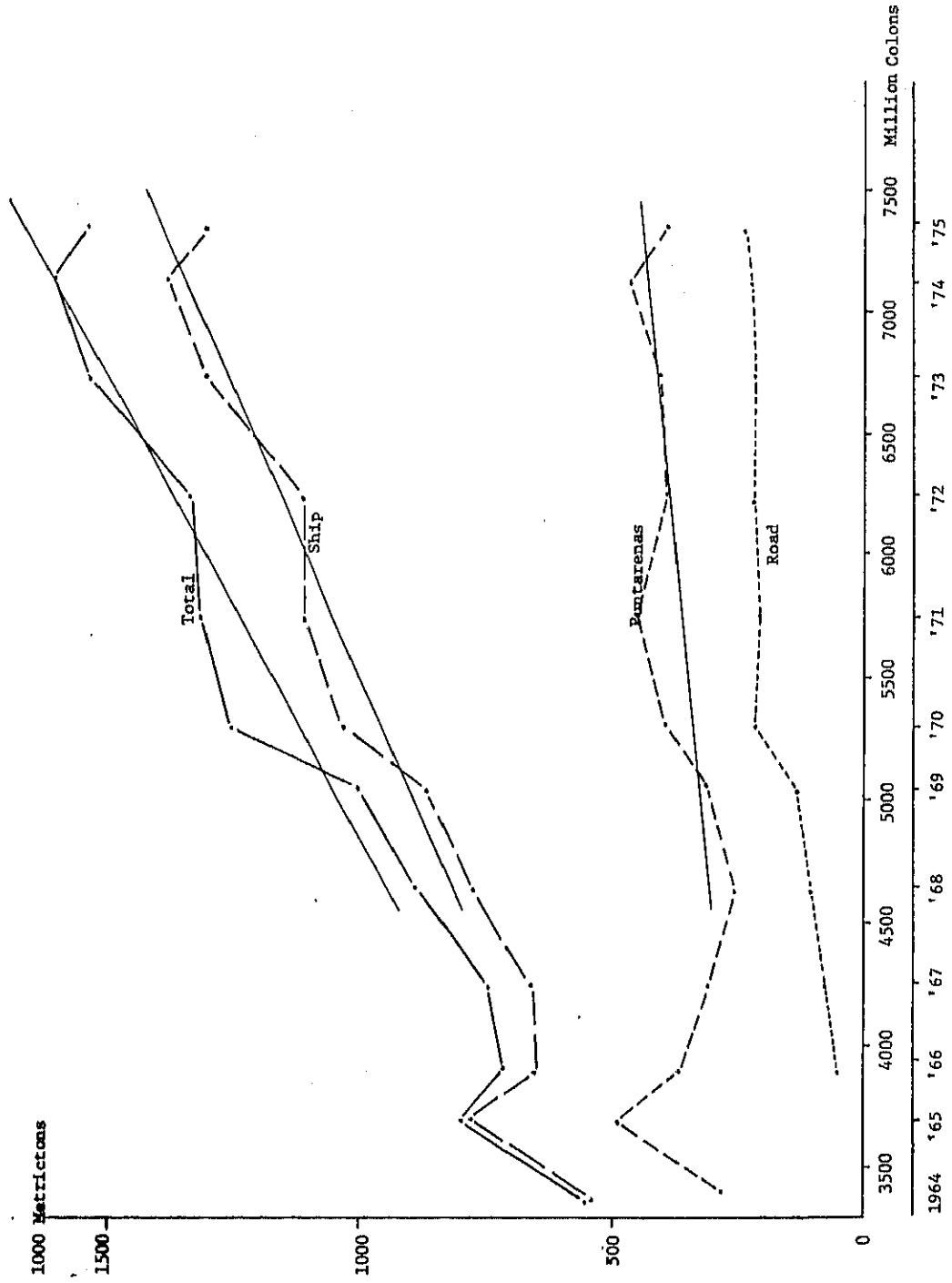
Figure 9.21 Volume and Value of Import Products
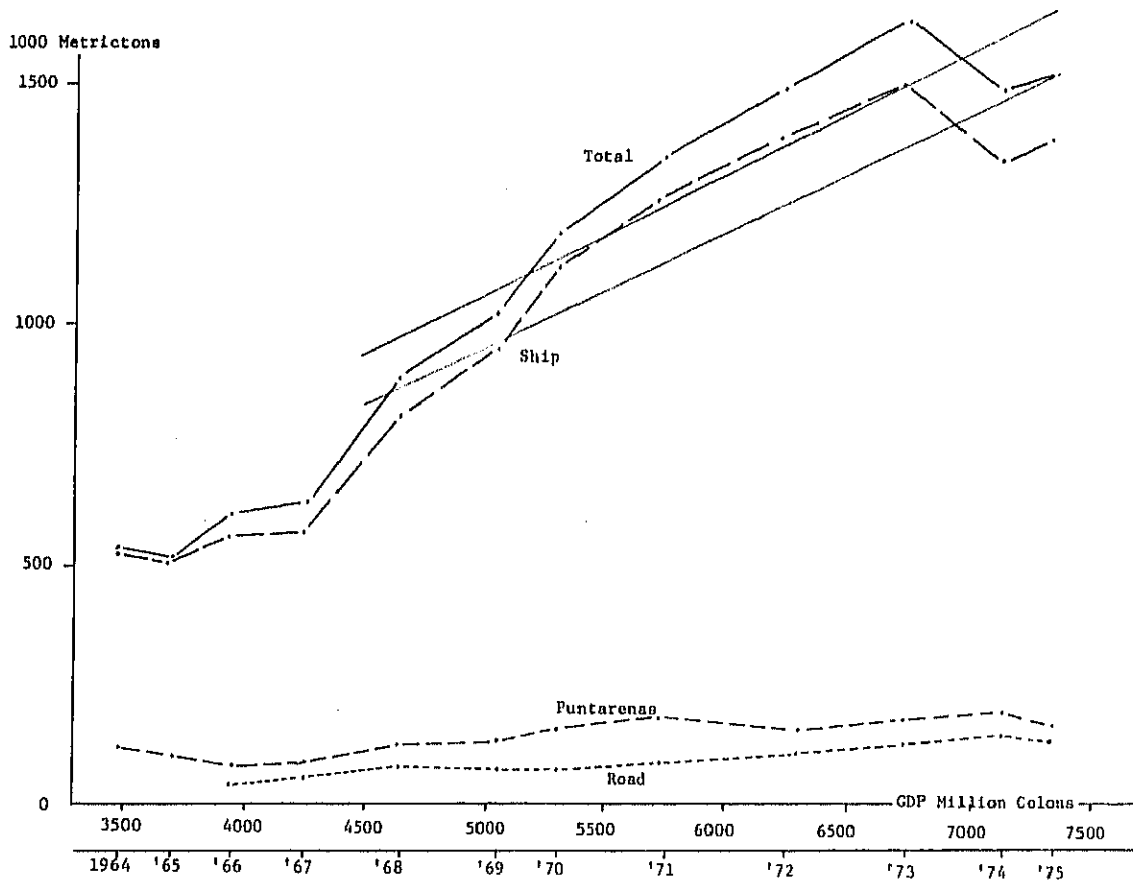
Figure 9.22   Volume and Value of Export Products

IX-53

Table 9.22　Annual Imports at Port of Entry by Import Product

(metric ton)

Products	1969		1970		1971		1972		1973		1974		1975	
	Limón	Puntarenas	Limón	Puntarenas	Limón	Puntarenas	Limón	Puntarenas	Limón	Puntarenas	Limón	Puntarenas	Limón	Puntarenas
Total	497,778	307,166	559,615	390,163	599,439	446,968	649,236	392,115	688,761	378,312	844,343	457,967	876,004	386,958
Wheat	-	77,977	-	68,006	-	58,565	-	66,483	-	74,753	-	64,566	-	82,717
Rice	79	1	104	60	107	7,962	129	45	10	9	91	-	46	9
Flour	289	220	148	273	146	32	138	56	33	-	78	-	83	-
Oil	547	3,827	359	5,661	3,768	6,204	3,678	1,488	3,587	1,745	6,868	922	5,052	177
Livestock feed	1,074	322	1,199	812	1,691	1,654	1,614	11,059	871	-	-	-	-	-
Combustibles and lubricating oil	334,421	29,469	351,922	76,606	410,903	78,013	428,195	22,285	445,487	37,543	513,914	41,893	602,890	-
Natural gas	6	3,775	6	3,287	710	2,313	2,446	188	3,667	1,516	6,076	1,316	7,183	2
Coconut oil	1,538	-	2	1	679	3	687	-	251	-	-	-	-	-
Inorganic chemicals	2,432	3,051	2,868	5,805	3,264	6,616	3,512	6,197	4,982	5,778	7,326	4,594	4,339	3,743
Miscellaneous compounds chemicals	1,039	1,242	1,152	1,230	1,576	1,905	1,926	1,251	2,276	1,248	3,690	1,224	2,301	630
Fertilizer	39,863	70,192	51,904	66,756	47,678	131,097	47,533	89,660	47,438	98,424	50,595	101,960	60,177	86,920
Plastics	5,728	3,391	6,047	6,645	6,481	12,787	5,225	7,855	10,443	6,924	4,084	6,108	8,866	6,649
Insecticide	1,937	2,005	2,115	2,286	2,869	2,221	6,855	8,904	4,151	1,738	4,881	1,899	3,432	1,098
Paper (cartons and other products)	45,464	12,054	64,031	16,475	61,234	13,811	69,980	11,306	78,726	12,998	82,774	10,960	97,657	6,667
Cotton textiles	126	339	67	571	34	111	49	40	82	28	102	16	182	22
Cement	1,041	1,952	2,513	2,370	5	2,864	865	1,804	1,287	2,982	5,115	1,856	1,870	1,882
Glass bottles	375	2,146	597	2,013	883	1,460	533	177	824	379	1,305	410	1,420	256
Iron and steel	35,687	38,748	40,892	45,023	22,006	49,543	17,119	45,263	35,612	40,983	55,389	55,316	43,553	43,625
Construction equipment	683	556	1,316	1,600	2,726	710	2,829	214	2,158	312	3,205	835	3,479	975
Machine and repairs	986	1,777	668	1,624	1,716	806	1,129	780	1,640	753	3,691	705	1,954	1,816
Passenger automobile	523	3,747	522	2,945	629	4,405	352	3,996	782	3,586	1,819	4,692	1,493	2,630
Automobile and truck	385	1,883	588	2,522	2,555	2,869	497	1,080	945	1,838	2,737	3,043	3,674	4,663
Others	23,555	48,492	30,595	77,592	27,779	60,984	63,945	111,984	43,609	84,775	90,603	155,652	26,353	146,077

Source:　Dirección General de Estadística y Censos.
　　　　　Ministerio de Obras Públicas y Transportes: op. cit.

Table 9.23   Annual Exports at Port of Shipment Export Products

(metric ton)

Products	1969 Limón	1969 Puntarenas	1970 Limón	1970 Puntarenas	1971 Limón	1971 Puntarenas	1972 Limón	1972 Puntarenas	1973 Limón	1973 Puntarenas	1974 Limón	1974 Puntarenas	1975 Limón	1975 Puntarenas
Total	491,253	127,487	615,757	152,539	703,970	185,983	826,118	159,618	953,770	178,347	896,257	190,247	929,676	166,182
Livestock		59		1,100		1,100		2,901		1,878				3,729
Meat	1,273	13,068	483	11,798	890	12,080	540	13,735	8,104	7,688	1,510	8,561	15,600	6,738
Bananas	372,824	-	515,650		562,448		698,652		817,208		762,583		845,196	
Other fresh fruits	11,238	7,600			2,176		338		158		103		326	
Sugar	34,643	28,176	18,804	50,651	24,278	62,734	26,207	42,704	43,965	66,205		69,165		70,048
Coffee	37,300	29,356	21,698	42,693	26,486	34,361	47,023	21,210	47,871	24,069	52,834	32,598	49,798	22,133
Cocoa	7,384	1,532	2,181	903	114	10	5,045	994	3,791	880			2,239	1,972
Wood	3,372	1,573	2,115	206	1,408				474	822	2,485	270	1,333	10
Cotton		3,110		545		241				119				123
Fertilizer		33,694	1,415	26,001		53,681	45	55,795		64,439		44,717		52,200
Lumber	2,833	1,981	1,241	622	1,197	153					548		12	
Others	20,386	14,938	19,120	44,570	21,623	84,973	48,268	22,279	32,199	12,247	76,194	34,936	15,172	9,229

Source: Dirección General de Estadísticas y Censos.
       Ministerio de Obras Públicas y Transportes: op. cit.

Pacifico Central could be an attractive place to live and work, the population of this region could reach 237 thousand or more.

Table 9.24   Regional Populations in 2000

(1,000 persons)

		Region Pacifico Central	Region Central
1973		127	1,175
2000	(a)	237	1,804
	(b)	134	1,925

Note: (a) migration is not taken into account.
        (b) migration is taken into account.

Therefore, if factories would be built, people would be attracted to employment in those industries of Pacifico Central region, especially when the port at Caldera is constructed. The population of Pacifico Central would increase rapidly.

On the other hand, if no factories are built, the population will not increase. However, as already stated, economic activity of this country will be enlarged by increased investment. Therefore, in future industrial activities should be encouraged, especially the construction of factories Region Pacifico Central or Region Central. Factories should be constructed in Pacifico Central because materials can easily be obtained and commodities are easily transported to or from the port at Caldera. A sufficient labor force can be drawn from the existing population in Valle Central. In any event, the economic activity in these regions will be enlarged, if the traffic between these regions is increased and a new port is constructed. An enlarged road network must be planned. The San Jose-Caldera Highway will naturally convey traffic between San Jose and Caldera; the Costanera Sur Highway will act as a "leading investment" in the southern part of the east coast (see Figure 9.23). Playa Jaco can serve as a good place for recreation. The Costanera Sur Highway can be also used as an access road to Playa Jaco. By providing access roads to areas in Pacifico Seco and Region Norte, which are not far from the port at Puntarenas, Caldera will also benefit from development of Gran Puntarenas.

We can calculate tentative estimates of the amount of passenger traffic and transport of goods using the gravity model.

According to the gravity model, the number of passengers (P_{ij}) between the i th region and j th region will be given by the formula:

$$P_{ij} = a \frac{P_i \, P_j}{P \, D_{ij}^b} \, , \qquad (9.5.5)$$

Figure 9.23   New Highways Planned in the Gran Puntarenas Region:
              San Jose – Caldera and Costanera Sur
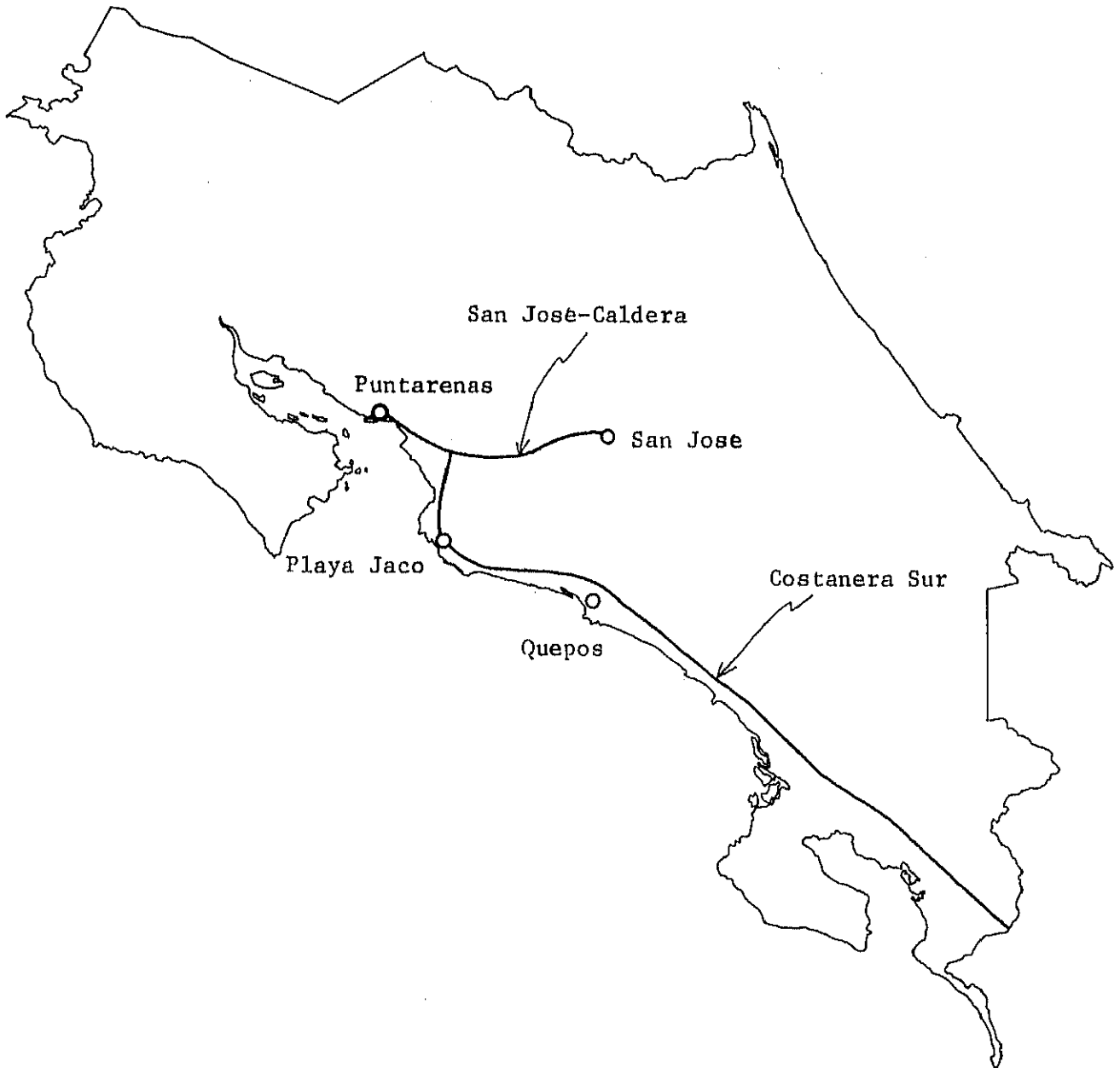
where P_i and P_j are the populations of the i th and j th region, respectively; P is the total population; D_{ij} is the distance ("social" distance) between the i th and the j th regions; a and b are parameters.[3]

When we insert the 1973 populations of Region Pacifico Central (P_p), Region Central (P_c) and Costa Rica (P) in P_i, P_j and P, respectively, we obtain the following equation:

$$P_{pc} = a \frac{P_p \; P_c}{P \; D_{pc}^{\;b}} , \qquad (9.5.6)$$

where P_{pc} is the number of the passengers travelling between Region Pacifico Central and Region Central and D_{pc} the distance between the two regions.

Assume the equation was valid in 1973. If the attraction of the population toward Pacifico Central is very strong, if the population of this area would reach 237 thousand and if the population of Valle Central would reach be 1,804 million in 2000, the population of these regions (P_p' and P_c') in 2000 could be calculated to be 1.87 P_p and 1.53 P_c. On the other hand, the total population of Cost Rica in 2000 would become 1.66 P, because according to Raabe and Bogan's estimate the total population would 1.66 times larger than that of 1973.

Using these estimates, we can calculate the volume of passengers between Region Pacifico Central and Region Central in 2000 to be P_{pc}'. The P_{pc}' is expressed by the following equation, provided that the social distance has not changed:

$$P_{pc}' = a \frac{P_p' \; P_c'}{P' \; D_{pc}^{\;b}} = 1.72 \; P_{pc} \qquad (9.5.7)[4]$$

3/ The gravity model is usually expressed by the formula:

$$P_{ij} = a \frac{P_i \; P_j}{D_{ij}^{\;b}}$$

But, this function is a homogeneous function of the second degree. Therefore, we can find the total population in the denominator of the right hand side of the equation (9.5.5).

4/ We have the equation:

$$P_{pc}' = a \frac{P_p' \; P_c'}{P' \; D_{pc}^{\;b}} ,$$

On the other hand, according to our assumptions;
$$P' = 1.66 \; P,$$
$$P_p' = 1.87 \; P_p, \text{ and}$$
$$P_c' = 1.53 \; P_c.$$

This shows that, even if we suppose the social distance is not changed (in fact, it will be shortened by construction of the new roads and improvement of railroads), the number of passengers travelling between Region Pacifico Central and Region Central in 2000 will approximately double that of 1973. Therefore, if transportation facilities are adequately supplied and the social distance (time and cost for transportation) between these regions is shortened, the number will be larger than this estimate.

However, if we use the number of motorcars M instead of population P for estimation of the P_{pc}, the number of passenger travelling between Pacifico Central and Valle Central in 2000 will be about eight times larger than that in 1973 (see Appendix B).

We can also calculate by the same procedure the future volume of goods transported.

Let us again suppose the following relationship held in 1973.

$$W_{pc} = \frac{a \, W_p \, W_c}{W \, D_{pc}{}^b} \, , \qquad\qquad (9.5.8)$$

where W_{pc} is the volume of goods transported between Pacifico Central and Valle Central and W the total volume of goods transported in Costa Rica.

If we substitute the volumes of the goods transported W_p', W_c' and W' in 2000 for W_p, W_c and W of equation (9.5.8), respectively, we can estimate the volume of goods transported between the Regions Pacifico Central and Central to be W_{pc}'.

We must estimate, therefore, the volumes of W_p', W_c' and W'. If we suppose that future volumes will be proportionate to the present total amounts of these regions, by these volumes we can estimate the future G.D.P. of these regions.

4/ (continued)

Therefore,
$$P_{pc}' = \frac{a \, 1.87 P_p \, 1.53 P_c}{1.66 \, P \, D_{pc}{}^b} = 1.72 \, \frac{a \, P_p \, P_c}{P \, D_{pc}{}^b} \, .$$

From equation (9.5.6),
$$P_{pc} = \frac{a \, P_p \, P_c}{P \, D_{pc}{}^b} \, .$$

Therefore,
$$P_{pc}' = 1.72 \, P_{pc} \, .$$

Using the G.D.P. estimates given in Section 9.2.3 and population estimates in 2000, we can derive the per capita G.D.P. in 2000. As shown in Table 9.28, the per capita G.D.P. of Costa Rica in 2000 will be 3.63 or 3.16 times larger than that in 1973. If we therefore suppose that the per capita G.D.P. of Costa Rica in 2000 will be approximately 3.4 times larger than that in 1973, the total volume of products in Costa Rica, Region Pacifico Central and Region Central in 2000, expressed by Y', Y_p' and Y_c', respectively, are as follows.

$$\text{(per capita G.D.P.)} \quad \times \quad \text{(population)}$$

$$Y' \quad = \quad 3.4\ y \quad \times \quad 1.66\ P, \quad (9.5.9)$$

$$Y_p' \quad = \quad 3.4\ y \quad \times \quad 1.87\ P_p, \quad (9.5.10)$$

$$Y_c' \quad = \quad 3.4\ y \quad \times \quad 1.53\ P_c, \quad (9.5.11)$$

where y is the per capita G.D.P. of Costa Rica in 1973.

The volume of goods transported in 2000 (W', W_p' and W_c') can be expressed by $k(3.4\ y \times 1.66\ P)$, $k(3.4\ y \times 1.87\ P_p)$ and $k(3.4\ y \times 1.53\ P_c)$, where k is the proportional coefficient for changing the volume of product to the volume of goods transported. The volume of goods transported between Pacifico Central and Valle Central in 2000 (W_{pc}') can thus be expressed by the following equation:

$$W_{pc}' \quad = \quad \frac{a^{\ W_p'\ \ W_c'}}{W'\ \ D_{pc}^{\ b}} \qquad (9.5.12)$$

Using the above assumptions, we can obtain the following result:

$$W_{pc}' \quad = 5.33\ W_{pc} \qquad (9.5.13)^{[5]}$$

---

[5] According to our assumption,

$$W' \quad = \quad k(3.4\ y \times 1.66\ P),$$
$$W_p' \quad = \quad k(3.4\ y \times 1.87\ P_p),\ \text{ and}$$
$$W_c' \quad = \quad k(3.4\ y \times 1.53\ P_c).$$

Therefore,

$$W_{pc}' \quad = \quad \frac{a^{\ W_p'\ \ W_c'}}{W'\ \ D_{pc}^{\ b}}$$

$$= \quad \frac{a^{\ k(3.4\ y \times 1.87\ P_p)\ \times\ k(3.4\ y \times 1.53\ P_c)}}{k(3.4\ y \times 1.66\ P)\ \times\ D_{pc}^{\ \ b}}$$

$$= \quad 3.4 \times \frac{1.87 \times 1.53}{1.66} \times \frac{a^{\ ky\ P_p^{\ kyP_c}}}{KyP\ D_{pc}^{\ \ b}}$$

Here, kyP, kyP_p and kyP_c are regarded as the quantities W, W_p and W_c respectively, because yP, yP_p and yP_c are the total products of Costa Rica, Region Pacifico Central and Region Central in 1973 (Y, Y_p and Y_c). And k is the proportional coefficient for changing

This means that the volume of goods transported in 2000 will at least be about five times larger than that in 1973, even if we suppose that the social distance will not change.

We can say that the volume of goods transported between Region Central and Pacifico Central will be also about six times larger than that in 1973. Therefore, the volume of transported goods in 2000 will be six times larger than that in 1973. It thus behooves us to prepare a sufficient supply of facilities, roads and railroads between Region Central and Region Pacifico Central.

In 2000, we will have to provide an additional highway between San Jose and Caldera, because traffic will be generated by the increased number of passengers and quantity of goods transported as estimated above. At the stage where economic activity is expanded and the amount of traffic of passengers and transport becomes large, we must assure safety on the road. On national roads, locations and directions must be adequately posted. On regional and local roads, signal lights for drivers and pedestrians should be installed. These are also helpful for tourists.

In conclusion, we can say that, in the future, the flow of goods caused by foreign trade will sustain economic development in Costa Rica, wherever factories are built and consumers live. To realize the flow of the goods and passenger traffic, the construction of port and transportation facilities, especially roads, should be encouraged. If we are serious about economic progress in this country we must construct transportation facilities as one means to encourage development. The supply of transportation facilities will also contribute to the expansion of tourism.

5/ (continued)

the volume of product to the volume of goods transported. Therefore, the equation written above becomes:

$$W_{pc}' = 5.86 \frac{a \quad W_p \quad W_c}{W \quad D_{pc}^{\ b}}$$

$$= 5.86 \ W_{pc} \ .$$

9.6 Fact Finding and Recommendations

In this chapter we observed not only the situation in Gran Puntarenas but also that throughout the whole country based on the statistical data. In analyzing a field such as transportation, we must observe the phenomena as a whole. We can conclude the following results:

(1) The natural conditions of this country are favorable for transportation facilities. The climate is conducive to road construction and maintenance and ocean shipping, although heavy rain falls in rainy season.

(2) The population is concentrated on the plateau in the middle of the country. Nevertheless, commercial relations between densely inhabited districts are normal. This fact was affirmed by using the Zipt's rank-size rule. Highways or railroads have been sufficiently but mainly located in relation to densely inhabited districts.

(3) If the satisfactory investment is undertaken, favorable economic growth can be expected. As the economic activity expands, transportation, i.e., the number of vehicles, the quantity transported, etc. steadily increases. Therefore, when this country reaches a high level of economic activity, a considerable amount transportation facilities will be needed.

(4) The heterogeneity of regional industrial composition has been demonstrated. But, we can further confirm this heterogeneity statistically by calculating the quotient of localization. The interregional flow of goods between regions will appear in order to satisfy deficient commodities in other regions.

(5) In the future, the flow of goods heightened by foreign trade will increase steadily, as the level of economic activity rises. Therefore, the construction of roads -- paving, widening and lengthening -- is currently needed.

(6) Population and the amount of economic activity in Region Pacifico Central and Region Central will increase. In 2000, the number of passengers will approximately double and the volume of goods transported will quintuple that in 1973.

(7) Both presently existing and new roads will benefit both tourism and transportation of persons and goods.

Therefore, we recommend the following:

1) In general, facilities of transportation must be sufficiently supplied not only to sustain national developed state but also to induce regional development.

2) Investment in transportation facilities can be regarded as a strategy of development. Therefore, the construction of the

Costanera Sur Highway, for example, should be encouraged. This
highway will not only encourage traffic to recreation places, such
as Playa Jaco, but also to agricultural areas in the southern
Pacific-coastal area of Costa Rica.

3) Traffic will increase between San Jose and Caldera. Therefore, a
new highway, the San Jose - Caldera Highway should be utilized to
absorb this new demand between these regions effectively. The
number of passengers is expected to double the 1973 amount and the
quantity of goods transported quintuple between Region Pacifico
Central and Region Central.

4) In the neighborhood of Puntarenas and San Jose, truck terminals
should be built. Puntarenas especially needs a truck to absorb
transported cargo coming from San Jose, Guanacaste, Puntarenas,
Caldera and the southern part of the Pacific coast.

5) The railway is also important for transporting bulky cargo in
the future. The shape of the present route is too winding present-
ly. If the route is made more direct, the distance will be short-
ened and costs reduced, especially between San Jose and Caldera.

6) Railway lines limited to the owner's exclusive use should be
allowed. If the firms in the vicinity of railway line have them
for their exclusive use, the rationalization of transportation in
these firms will be achieved.

7) For smoothing the operation of railroad transport, yards should
be maintained near Caldera and other adequate spots.

8) As traffic on national highways or regional and local roads
increases, the statistical data like that written in OD Table 9.9,
9.10 and 9.18 will be needed for scientificly choosing construction
of transportation networks. We can find, also, some partial patterns
of commercial traffic in this country.

9) Bus services for commuters in the Gran Puntarenas region must be
supplied in consideration of the present frequency of use, speed,
and safety factors.

10) Direction signs are needed not only for increasing economic acti-
vity but also for tourism.

11) Traffic signals are also needed at urban intersections, as traffic
increases. "Safety first" should always be kept in mind.

These are the recommendations which we have drawn to assume the
beauty of this country.

Appendix A. Railroads in Costa Rica

We have now two independently operated railways, Ferrocarriles de Costa Rica and Compañía Bananera de Costa Rica. The former consisted of two railways, INCOP and JAPDEVA, and the latter is owned by a private company for use on its banana plantations.

(a) INCOP (Pacific) Railway

In Costa Rica, coffee was first planted in the seventeenth century. Around 1840, coffee became an important agricultural product. At that time, it was transported from Barranca to the port at Puntarenas by wagons.

In 1857, Burrocarril was constructed between Barranca and Puntarenas. This was not what it today known as a railway, but a carriage on rails (ferrocarril) hauled by a burro. The name of the facility "Burrocarril" was formed by combining burro and ferrocarril which means "burro drawn railway."

H. Lynn planned to construct a railway from San Jose to Puntarenas in 1895, but, the plan was never realized because the Rio Grande valley was too deep. Miliken Brothers successfully constructed a bridge across the valley in 1902. Finally, in 1910 the railway between San Jose and Puntarenas was completed.

In 1930, this railway became electric powered by A.E.G. company, a German company. This railway became the Pacific Railway which was managed by Instituto Costarricense de Puertos del Pacifico (INCOP), an automonous government agency.

(b) JAPDEVA (Atlantic) Railway

JAPDEVA (Junta de Administration Portuaria y de Desarrollo Económico de la Vertiente Atlantica) Railway connects San Jose and Limon. Its history begins around the mid-nineteenth century. From 1854 to 1871, many plans for the construction of a railway which would connect Costa Rica's eastern and western coasts were proposed. Among them, a plan proposed by Francisco Kuctz was noteworthy. According to this plan, a railway would be constructed between Limon and Caldera.

In 1871, the construction of the railway began from the two endpoints, Limon and Alajuela, and worked inward. Alajuela and San Jose were connected in 1872. But, the western section could not develop farther than Cartago.

On the other hand, the construction of the section extending from Limon was suspended at Matina – only 21.5 miles from Limon – because of financial difficulties. Minor Cooper Keith finally developed the

eastern section from Matina to Carrillo in 1879. At last in 1890, San Jose and Limon were connected after construction of a railway between Junta and Cartago. This railway was then operated by the Northern Railway. In 1972 this railway was taken over by the Costa Rican government.

(c) Ferrocarriles de Costa Rica

In recent years, the INCOP and JAPDEVA railways have had financial difficulties, as noted in 9.3.2 (b) and Table 9.14. A plan to merge these two railway companies was proposed to snatch them from financial ruin. On Jan. 13, 1977, they merged to form a new railway system called Ferrocarriles:

Appendix B.

If we use the number of motorcars M instead of population P
for the variables of the gravity model, the model will be written by
the following expression:

$$P_{pc} = a \frac{M_p M_c}{M D_{pc}^b} \qquad (1)$$

where M_p, M_c and M are the numbers of motorcars in Region Pacifico
Central, Region Central and Costa Rica, respectively. Assuming that
the equation written above was valid in 1973, we can express the volume
of the passengers between Region Pacifico Central and Region Central
in 2000 P_{pc}' by the equation:

$$P_{pc}' = a \frac{M_p' M_c'}{M D_{pc}^b} \qquad (2)$$

where M_p', M_c' and M' are the number of M_p M_c and M in 2000.

Here, we must calculate the numbers of motorcars M in Region
Pacifico Central, Region Central and Costa Rica. But it is very dif-
ficult to obtain the numbers for Region Pacifico Central and Region
Central. Therefore, we must make some device to avoid the difficulty.
If we express the number of motorcars by using the average number of
motorcars per person m, the M will be expressed by the equation:

$$M = mP \qquad (3)$$

Using this relationship, we can rewrite the gravity model
as follows:

$$P_{pc} = a \frac{mP_p \ mP_c}{mP \ D_{pc}^b} \qquad (4)$$

and

$$P_{pc}' = a \frac{m'P_p' \ m'P_c'}{m'P' \ D_{pc}^b} \qquad (5)$$

where m and m' are the average number of motorcars per person for 1973
and 2000, respectively. The values of m for Region Pacifico Central,
Region Central and Costa Rica are, in this case, assumed to be equal to
each other, and the values of m' for these regions are also assumed to
be equal to each other. Then, the equations of the gravity model (4)
and (5) are expressed by the following equations:

$$P_{pc} = am \frac{P_p \, P_c}{P \, D_{pc}^{\ b}} \qquad (6)$$

and

$$P_{pc}' = am' \frac{P_p' \, P_c'}{P' \, D_{pc}^{\ b}} \qquad (7)$$

From these equations, we can say that we must only obtain the m and m' to find the P_{pc}'.

According to the estimate of Section 9.3.3, the number of motorcars -- the total number of automobiles, jeeps and station wagons -- in 2000 will be 351.16 or 404.16 thousands, while the number in 1973 was 49,182 (49.18 thousand). Therefore, the m $(= M/P)$ was 26.0 (per 1000 persons) and m' will be 117.7 or 128.5 (see Table B in Appendix C).

From these figures, we can find that

$$m' = 4.30 \, m \quad \text{or} \quad 4.94 \, m \qquad (8)$$

If we assume that m' is approximately $4.6 \, m$, the equation (7) will become

$$P_{pc}' = 4.6 \, ma \frac{P_p' \, P_c'}{P' \, D_{pc}^{\ b}} \qquad (9)$$

According to equation (9.5.7),

$$a \frac{P_p' \, P_c'}{P' \, D_{pc}^{\ b}} = 1.72 \, a \frac{P_p \, P_c}{P \, D_{pc}^{\ b}} \qquad (10)$$

Therefore, equation (9) is expressed by

$$P_{pc}' = 4.6 \, m \times 1.72 \, a \frac{P_p \, P_c}{P \, D_{pc}^{\ b}}$$

$$= 4.6 \times 1.72 \, P_{pc}$$

$$= 7.9 \, P_{pc} \qquad (11)$$

This means that the number of passengers between Region Pacifico Central and Region Central in 2000 will certainly be about eight times larger than that in 1972.

Here, we wish to certify the increase of motorcars in the future with the data obtained from the main countries in the world in 1970, and the historical record of Japan. The results are written in Appendix C.

Appendix C

(a) The Change of the Number of Motorcars and Business Cars
and Per Capita Product in Costa Rica

In this place, motorcars are defined as the cars for personal
trips, and they contain automobiles, taxies, jeeps, and station wagons,
while the business cars are defined as the cars for business and they
contain tracks, buses, special equipments, etc.

In Table A, we can find the number of cars in Costa Rica and
population. From this table, we can calculate per capita number of
cars (m), which is shown in Table C.

The per capita product in Table C was calculated by the follow-
ing procedure. Firstly, the product expressed by the real price in
1970 was obtained from Table B. And, secondly, the value of the G.D.P.
expressed in colons are changed into that in dollars. (1 dollar was
evaluated as 8.5 colons.)

Figure A is the graph showing the process of changing of the
per capita product and per capita number of cars.

(b) The Relationship Between National Income and Number of
Cars in the Countries in the World

The numbers of motorcars and business cars in the countries
in the world in 1970 are shown in Table D. From this table, we can
obtain the per capita numbers of cars. These numbers are shown in
Table D. On the other hand, we can also find the per capita income of
the countries in Table C. From these figures, we can observe the
relationships between the per capita income and per capita number of
cars. As shown in Figures B and C, the relationships are expressed by
the following equations:

$$\log M = -2.377 + 1.4013 \quad \log Y \qquad (1)$$
$$r = 0.9765$$
$$\log B = -2.930 + 1.4013 \quad \log Y \qquad (2)$$
$$r = 0.8776$$

where M is per capita number of motorcars, B per capita number of
business cars, Y per capita income and r the correlation coefficient.

The M of Costa Rica in 1970 is on the curve showing the
relationship between Y and M, and that in 2000 is near the curve. This
means that the number of motorcars will increase as largely as we
calculated in Section 9.5., because the relationship is very clear and
the future number of motorcars in Costa Rica is not inconsistent to the
value calculated from the relationship between Y and M which is obtained

from the data of the countries in the world, as shown in Figure B. (In this case, we negrected the difference between national income and G.D.P.).

On the other hand, the relationship between B and y is not so clear (Figure C). The reason why the relationship is not so clear will be that the number of business cars will be determined by many factors, the kinds of goods produced, the distances between locations of productions, between producers and consumers and between the locations of materials and producers, and the area of the land of a country as well as per capita income.

The level of the per capita number of business cars in Costa Rica in 2000 is very high comparing that obtained by the line showing the relationship between per capita number of business cars and per capita income. But, it will not be said that the level of Costa Rica is not true because the level is determined by many factors as stated above and even in 1970, the level of Costa Rica is already very high. However, the high level of the number of business cars may be mitigated, if some efforts to save the number of business cars are done. For example, the locations of production, system of roads etc. will influence the number of the cars.

(c) The Relationship Between National Income and Number of Cars Found in the Historical Record in Japan

Our experience also shows that the income is the important factor of the determination of the level of the per capita number of cars.

Table E is the table of the time series of per capita numbers of motorcars and business cars and per capita income in Japan, while Table E was the cross-sectional data of them in the countries in the world.

The relationships between per capita numbers of motorcars M_J and business cars B_J and per capita income Y_J are expressed by the following equations:

$$\log M_J = -4.199 + 1.9091 \log Y_J \qquad (3)$$
$$r = 0.9969$$

$$\log B_J = -2.466 + 1.3609 \log Y_J \qquad (4)$$
$$r = 0.9652$$

In this case, we can also find the fact that the relationship between Y_J and B_J is not clear when we assume that the relatioship should be expressed by the equation:

$$\log B_J = a + b \log Y_J \qquad \log Y \qquad (5)$$

where a and b are parameters (see Figure D).

Table A   The Number of Cars and Population
in Costa Rica

Year	Auto-mobiles	Jeeps	Station wagons	Total (Motor-cars)	Others (Business cars)	Grand total	Population
1965	14,004	5,829	2,900	22,733	22,621	45,354	1,468,000
1966	16,526	6,919	3,709	27,154	25,342	52,496	1,515,000
1967	17,850	7,468	3,788	29,106	26,798	55,904	1,564,000
1968	19,384	8,091	3,853	31,328	28,710	60,038	1,614,000
1969	21,019	8,916	4,158	34,093	31,471	65,564	1,666,000
1970	23,834	10,037	4,358	38,229	35,166	73,395	1,719,000
1971	25,969	11,179	4,985	42,133	39,582	81,715	1,774,000
1972	28,411	12,284	5,198	45,893	44,924	90,817	1,831,000
1973	31,286	13,500	5,396	49,182	54,114	103,296	1,889,000
1974	34,270	15,249	5,626	55,145	59,696	114,841	1,950,000
1975	36,350	17,200	6,290	59,840	68,397	128,237	2,012,000
	thou-sand	thou-sand	thou-sand	thou-sand	thou-sand	thou-sand	
2000	212.44 or	110.87	27.85	351.16	517.36	868.52	3,145,000
	244.39	127.97	31.80	404.16	599.21	1,003.37	

Notes : Number of cars for 1965 - 1975

Number of cars for 2000 : Calculated by the
equations in Section 9.3.3.

Population : Estimated based on the population
in 1963 and 1973.

Table B   G.D.P. of Costa Rica by Current and Real Prices

(million colones)

Year	Current Price		Real price	
			Base year 1962	Base year 1966
1960	2,767 [1/]		2,914 [3/]	
1961	2,920		2,971	
1962	3,174		3,174	
1963	3,464		3,384	
1964	3,600		3,380	
1965	3,950		3,697	
1966	4,243	4,288 [2/]	3,947	4,288 [5/]
1967	4,959	4,634	4,252	4,531
1968	5,060	5,127	4,639	4,915
1969	5,654	5,655	5,051	5,185
1970	6,269	6,525	5,430 [4/]	5,574
1971		7,137	5,797	5,951
1972		8,216	6,272	6,438
1973		10,162	6,755	6,934
1974		13,178	7,118	7,307
1975		16,507	7,361	7,556 *

1/ and 3/ :   Cifras de Cuentas Nacionales de Costa Rica
               (Banco Central and OTCA 1973 Report)

2/ and 5/ :   Banco Centoral de Costa Rica, Departmento
               de Investigaciones y Estadistica, Cifras de
               Cuentas Nacionales de Costa Rica,
               Serie 1961-1974, Estimacion 1975.

4/   :   Calculated by 5/.

*   :   Preliminary.

Table C Per Capita Number of Cars and Per Capita
         Product in Costa Rica

Year	Motorcars (cars/1000 persons)		Business cars (cars/1000 persons)		Product (dollars/person)	
1965	15.5		15.4		356	
1966	17.9		16.7		368	
1967	18.6		17.1		384	
1968	19.4		17.8		406	
1969	20.5		18.9		429	
1970	22.2		20.5		447	
1971	23.8		22.3		462	
1972	25.1		24.5		487	
1973	26.0	(1.00)	28.6	(1.00)	506	(1.00)
1974	28.3		30.6		516	
1975	29.7		34.0		517	
2000	111.7	(4.30)	164.5	(5.75)	1,597	(3.16)
	or					
	128.5	(4.94)	190.5	(6.66)	1,838	(3.63)

Notes : Per capita product is measured by the current price
        in 1970 and this is calculated from the series of
        the G.D.P. of Costa Rica by real price in 1962
        written in Table B. The rate of one dollar to one
        colon is regarded as 1 to 8.5.
        The number of ( ) is the magnification of the
        values compared to that of 1973.

Figure A   The Changing of the Per Capita Product and
           Per Capita Number of Cars in Costa Rica

. Figure B   The Relationship between Per Capita Income
and Per Capita Number of Motor-Cars
in the Countries in the World (1970)

M

cars/1000 persons
(Number of Motor-Cars)

500 —

$\log M=-2.377+1.4013 \log Y$
$r=0.9765$

23
•

400 —

16   2   5
•   •   •
300 —   21
•

10•

•8
24   •7
200 —   •   •4
15 •17
• 13

•3

•9
• 12   •14(1973)
○Costa Rica(2000)

○Costa Rica(2000)

100 —
•14(1970)

20
•   (Per capita product
19   •1   or Per capita income)
•
6
• Costa Rica(1970)
22
11 • 18
0   Y
1000   2000   3000   4000   dollars/person

Note: The number is the number of a country in Figures C and D.

cars/1000 persons
(Number of Business Cars)
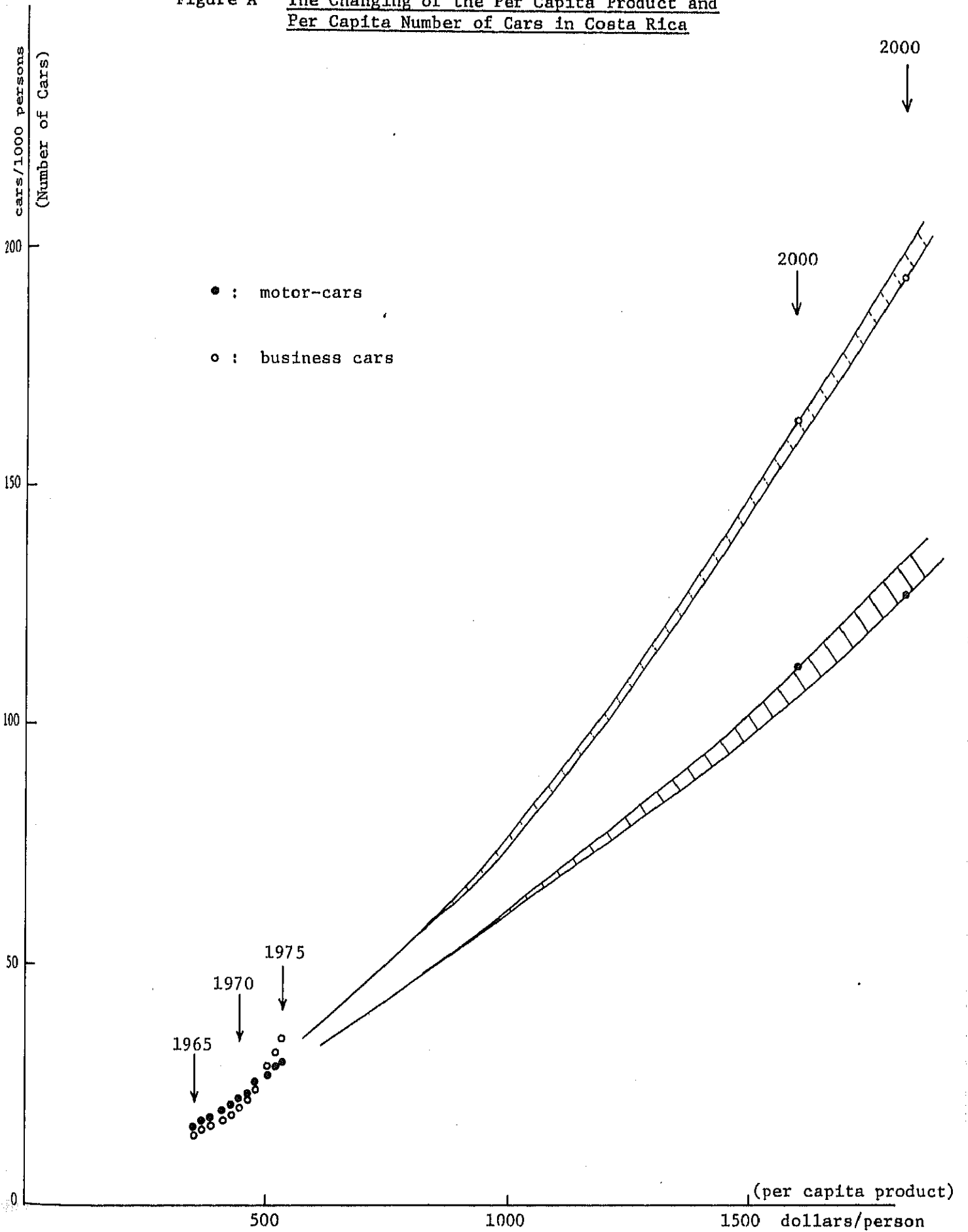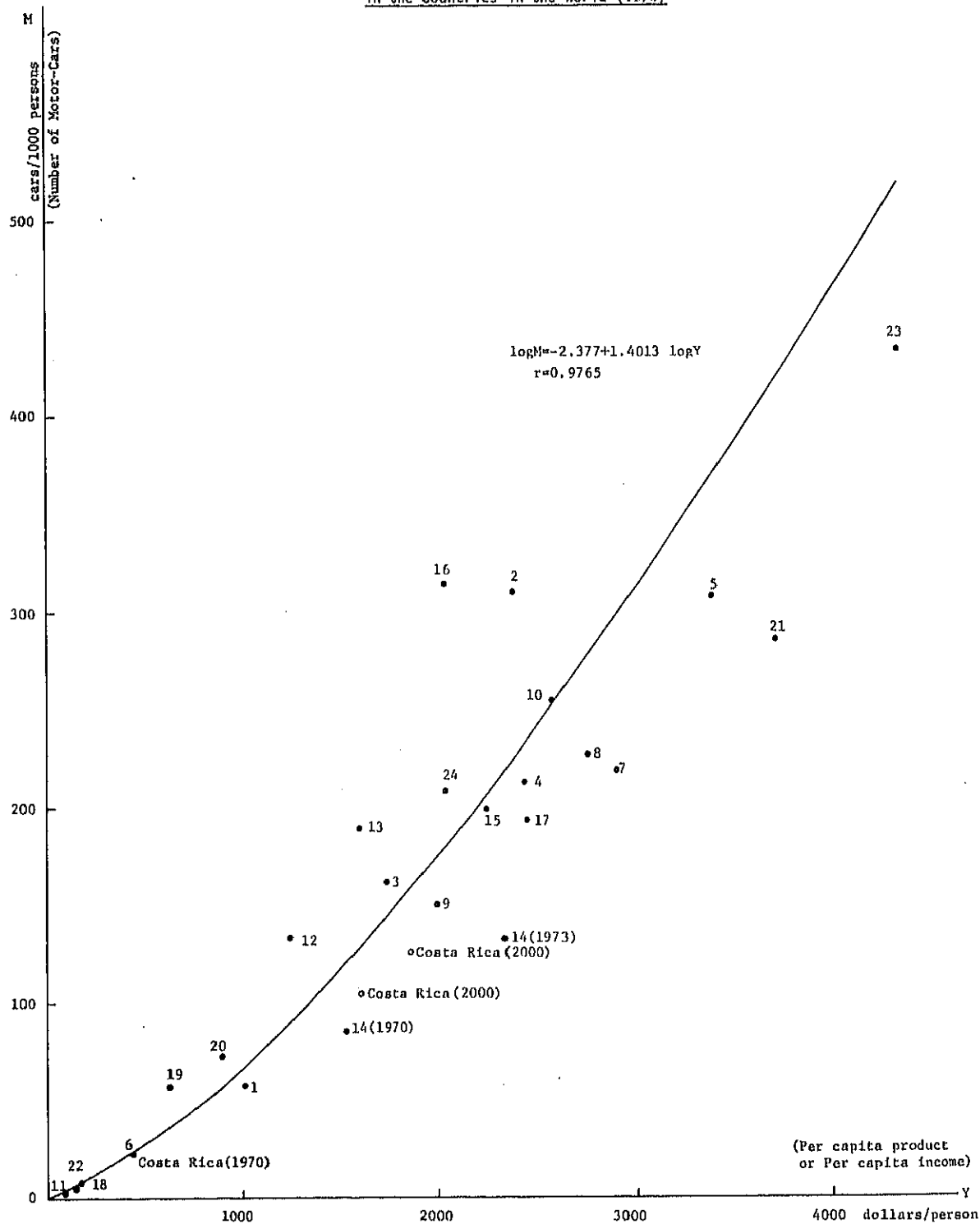
Figure C   The Relationship between Per Capita Income
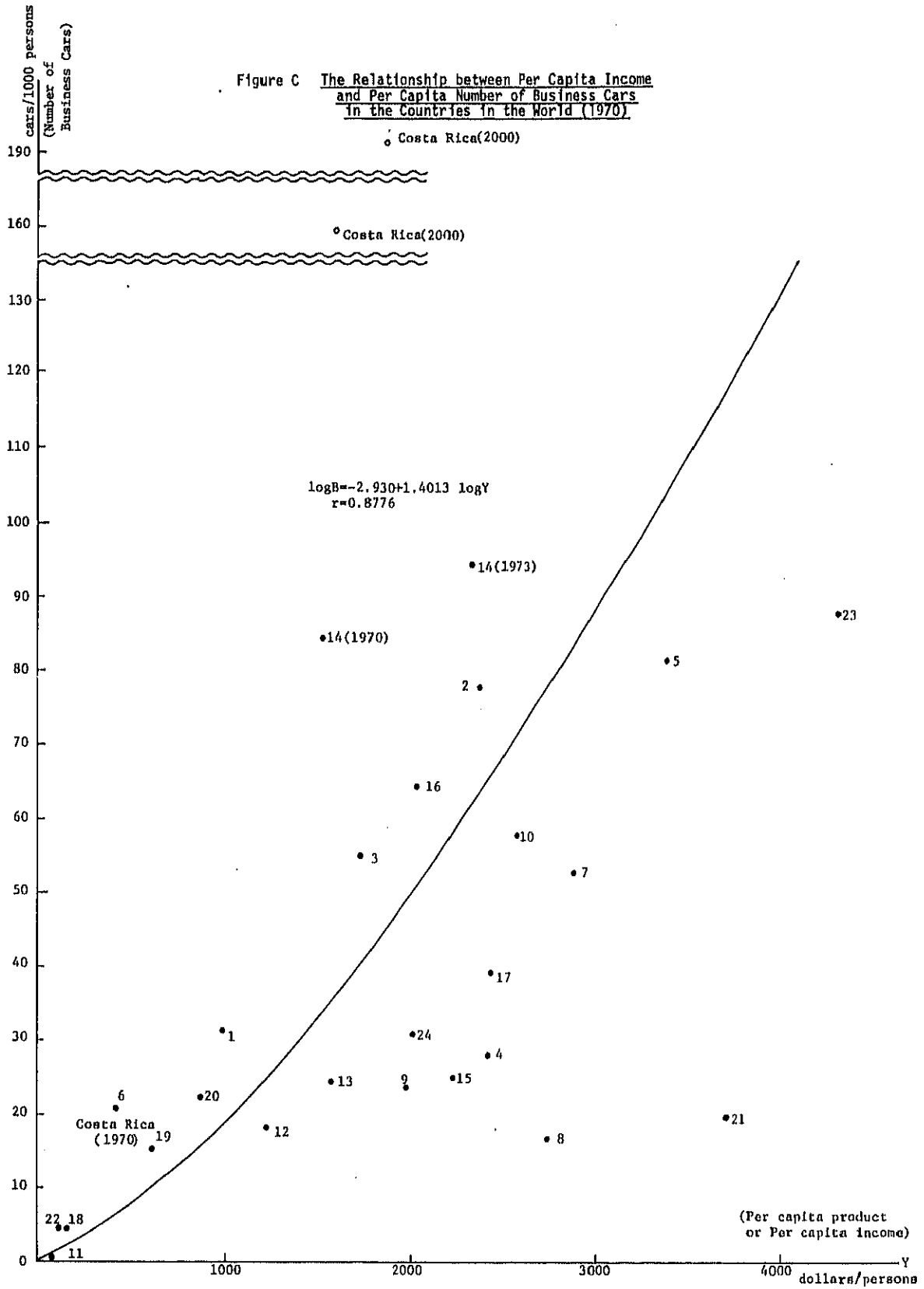and Per Capita Number of Business Cars
in the Countries in the World (1970)

○ Costa Rica(2000)

190 —

160 — ○ Costa Rica(2000)

130 —

120 —

110 —

logB=-2.930+1.4013 logY
r=0.8776

100 —

90 —   ●14(1973)

                                                    ●23

80 —   ●14(1970)   ●5
                        2 ●

70 —

60 —   ● 16

                                    ●10
50 —   ● 3   ● 7

40 —   ●17

30 —   ●1   ●24
                            ● 4
20 —   6   ●20   ● 13   9   ●15   ●21
        ●   Costa Rica   ● 8
        (1970) 19   ● 12
10 —   ●

    22 18
0 — ● ● 11

        1000   2000   3000   4000
                                        (Per capita product
                                        or Per capita income)

                                        dollars/persons
                                        Y

IX-75

Figure D   Relationship between Per Capita Income
and Per Capita Number of Cars in Japan

$\log M_J = -4.199 + 1.9091 \log Y_J$
r = 0.9969
(Motor-Cars)

$\log B_J = -2.466 + 1.3609 \log Y_J$
r = 0.9652
(Business Cars)

1973

1972

1971

1970

1965

1960

1955

(Number of Cars)

M_J B_J

cars/1000 persons

150

100

50

0

500   1000   1500   2000

(Income)   dollars/person Y_J

IX-76
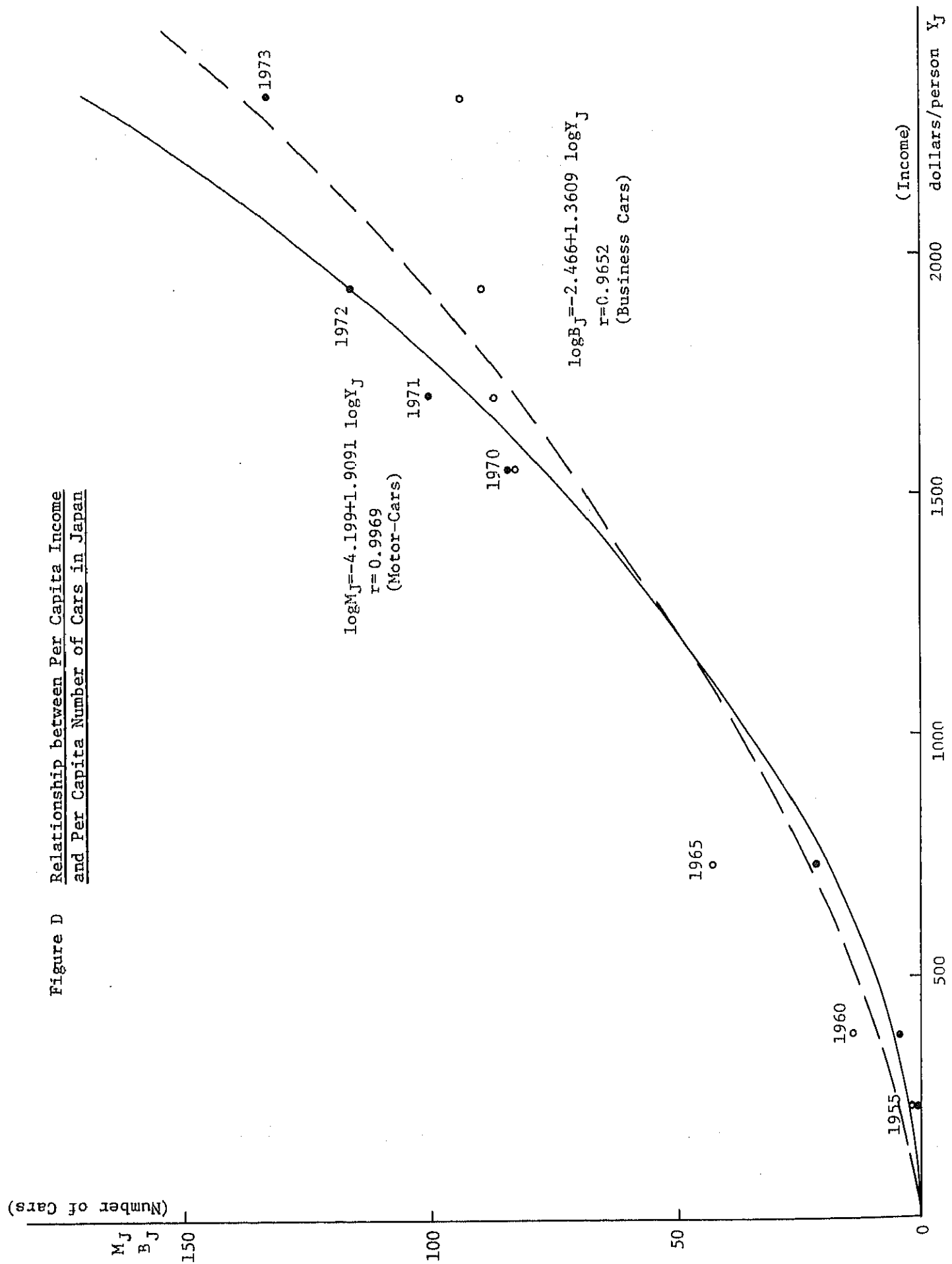
Incidentally, the other possible models for the relationship between Y_J and B_J can be built. For example, the logistic curve expressed by

$$B_J = \frac{a}{1 + me^{-rt}} \qquad (6)$$

or exponential function:

$$B_J = a\,e^{k\,Y_J} \qquad (7)$$

or

$$\log B_J = a' + k\,Y_J \qquad (8)$$

or linear function applied to a certain section of Y_J, which is expressed by

$$B_J = a + b\,Y_J \quad (Y_J^* \leq Y_J \leq Y_J^{**}) \qquad (9)$$

can be proposed, where a, m, r, k, a', b are parameters, t is time, and Y_J^* and Y_J^{**} are certain values of Y_J determining the certain section of Y_J.

In fact, the model expressed by equation (7) or (8) was applied to the data, and the following result was got·

$$\log B_J = 0.837 + 0.0005954\,Y_J \qquad (10)$$
$$r = 0.8689$$

But, as shown by the value of the correlation coefficient, it cannot be said that this model was successfully applied to the data. In concequence, it may be said that we must have larger size of data to build the model for M_J.

Table D   The Number of Motorcars and Business Cars, Population, and Per Capita Income in the Countries in the World (1970)

Number of country	Country	Motorcars (thousand cars)	Business cars (thousand cars)	Population	Per capita income (dollars)
1	Argentine	1,439.6	754.8	24.35	1,000
2	Australia	3,898.5	971.5	12.55	2,392
3	Austria	1,196.6	408.3	7.42	1,730
4	Belgium	2,059.6	267.6	9.68	2,420
5	Canada	6,602.2	1,737.8	21.41	3,394
6	Costa Rica	38.2	35.2	1.72	447 *
7	Denmark	1,078.7	257.2	4.92	2,901
8	Federal Republic of Germany	13,513.6	1,002.0	59.55	2,746
9	Finland	712.0	111.0	4.70	1,998
10	France	12,900.0	2,904.0	50.77	2,569
11	India	627.7	413.9	550.38	91
12	Ireland	393.5	52.8	2.94	1,245
13	Italy	10,181.2	1,306.7	53.67	1,591
14	Japan	8,779.0	8,706.0	103.54	1,543
15	Netherlands	2,600.0	326.0	13.02	2,232
16	New Zealand	891.2	181.7	2.82	2,022
17	Norway	747.2	152.2	3.88	2,445
18	Philippines	279.2	179.4	38.49	164
19	Portugal	551.0	146.8	9.63	602
20	Spain	2,377.7	741.0	33.29	883
21	Sweden	2,289.0	158.8	8.05	3,736
22	Thailand	184.7	162.8	35.81	168
23	U.S.A.	88,840.5	17,978.4	205.40	4,343
24	United Kingdom	11,665.8	1,709.9	55.81	1,012

Notes : Number of cars : Ministry of Transportation, Japan : Unyu

Table E   Per Capita Number of Cars in the
Countries in the World

(cars/1000 persons)

Number of country	Country	Motorcars	Business cars
1	Argentine	59.1	31.0
2	Australia	310.6	77.4
3	Austria	161.3	55.0
4	Belgium	212.8	27.6
5	Canada	308.4	81.2
6	Costa Rica	22.2	20.5
7	Denmark	219.2	52.3
8	Federal Republic of Germany	226.9	16.8
9	Finland	151.5	23.6
10	France	254.1	57.2
11	India	1.1	0.8
12	Ireland	133.8	18.0
13	Italy	189.7	24.3
14	Japan	84.8	84.1
15	Netherlands	199.7	25.0
16	New Zealand	316.0	64.4
17	Norway	192.6	39.2
18	Phillippines	7.3	4.7
19	Portugal	57.2	15.2
20	Spain	71.4	22.3
21	Sweden	284.3	19.7
22	Thaialnd	5.2	4.5
23	U.S.A.	432.5	87.5
24	United Kingdom	209.4	30.7

Keizai Tōkei Yōran, 1975, (Summary of Statistics of
Transportation Economy, 1975), Tokyo, 1976. pp. 208-209.

Population : United Nations: Demographic Yearbook 1970.
          New York, 1971, pp. 126-135.

National income or per capita income : Ministry of Transporta-
          tion : op. cit., pp. 199.

* : Per capita product (G.D.P./ population) calculated by
    the data in Tables A and B.

Motorcars contain automobiles, taxies, jeeps and station
wagons. Business cars contain trucks, buses, special
equipments, etc.

Table F Per Capita Number of Motorcars and Business
Cars and Per Capita Income in Japan

(cars/1000 persons)

Year	Motorcars	Business cars	Income
1955	1.7	3.2	216 dollars
1960	4.9	14.8	379
1965	22.2	43.6	729
1970	84.8	84.1	1,543
1971	100.7	86.6	1,695
1972	116.8	89.4	1,926
1973	133.1	93.4	2,313

Notes : These values are calculated by the data
from Ministry of Transportation, Japan :
Unyu Keizai Tōki Yōran, 1975 (Summary of
Statistics of Transportation Economy, 1975).
Tokyo, 1976. pp.208-209, and
United Nations : Demographic Yearbook 1970.
New York, 1971, pp.126-135.

CHAPTER X

TOURISM AND RECREATION DEVELOPMENT

X

CHAPTER X

TOURISM AND RECREATION DEVELOPMENT

10.1 Tourism Sector in the National Economy

10.1.1 Definitions

        Tourism and recreation are different concepts and are defined respectively as follows.

        Tourism is defined as "travelling for pleasure," recreation is defined as "the action of recreating oneself or others by some pleasant occupation, pastime or amusement," but "recreating" means "to invest with fresh vigor or strength." However, in this chapter, we will use the term tourism as that includes the concept of recreation.

        Tourism is further subdivided according to the destination into "international tourism" and "domestic tourism."

        As for "international tourism" we treat in this chapter only the aspects of incoming foreign tourists and the issues arising there-from. Incoming foreign tourists are defined according to the OAS study* as follows:

        Foreign tourists are those who, proceeding from any point
        outside the boundaries of Costa Rica, pass the boundaries,
        and those whose motivation is not to participate in the
        national labor market but to stay more than 24 hours, but
        less than six months.

        In regard to "domestic tourism," we consider that the leveling of the welfare of Costa Ricans should receive first priority. For this purpose, provision of the proper wherewithal for Costa Ricans to enjoy domestic tourism and recreation will be of vital importance.

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* O.E.A. División de Desarrollo Turístico, "Estrategia Nacional de
   Desarrollo Turístico para Costa Rica : 1977-1984," preliminary
   version, 1977.

In this respect, it is worth noting that the concept of "social tourism" is introduced by the Government of Costa Rica in working out a framework for the Tourism Development Programme in the National Development Plan for 1978 to 1982. Social tourism is defined according to the OAS study as follows:

> Social tourism is the flow of travelers whose income does not permit them to utilize normal service at commercial prices and under conditions established by domestic tourism, ...

The above definitions would be the prerequisites for the development of international as well as domestic tourism in the Pacifico Central Region with its center in Gran Puntarenas.

10.1.2 Tourism Sector in the National Economy

The most important factor of international tourism in the national economy is its capability to earn foreign exchange.

In 1975, the number of foreign tourists entering the country was 299,037. They generated foreign exchange earnings equivalent to US$49.2 million, out of which US$13.5 million (27.50%) was generated by North Americans and US$26.7 million (54.38%) by Central Americans. (See Table 10.2)

Table 10.1 Tourism Balance

	No. of tourists	Foreign currency earnings (million US dollars)
Incoming Foreign Tourists	299,037	49.2
Outgoing Costa Ricans	143,733	28.2
Balance	155,304	20.5

Source: Anuario Costarricense de Turismo, 1975

It is worth mentioning that the ratio of earnings generated by Nicaraguan tourists was very high, not only in terms of the number of visitors (as shown in Table 10.5, Nicaraguans number 83,572 or 65 percent of all Central Americans visiting Costa Rica in 1973), but also in terms of foreign currency earnings. As shown in Table 10.2, this accounts for 34.3 percent of total foreign currency earnings.

Table 10.2 Foreign Exchange Earnings Generated
by Tourism by Region (1975)

Region from Which Earnings Were Generated	Foreign Currency Earnings	
	Amount	%
Total	49,220.985	100.00
North America	13,532,628	27.50
Canada	782,457	1.59
U.S.A.	12,750,171	25.91
Central America	26,765,396	54.38
Guatemala	2,023,931	4.11
El Salvador	2,295,314	4.66
Honduras	1,263,334	2.57
Nicaragua	16,899,698	34.34
Panama	4,283,119	8.70
South America	5,771,173	11.72
Europe	2,468,693	5.01
Others *	683,095	1.39

Note: * Including Asia, Africa, Oceania.

Source: Anuario Costarricence de Turismo, 1975.

Moreover, we can understand the importance of tourism in
Costa Rica's economy, if we check the following figures. (All figures
are from the Anuario Costarricence de Turismo, 1975.)

(a) Income from Tourists/Total Exports

Year	1970	1971	1972	1973	1974	1975
a. Income from Tourists	20.9	23.3	27.6	33.6	46.3	49.2
b. Total Exports (FOB) ($ Million)	231.0	224.6	278.9	344.3	440.1	487.6
a/b (%)	9.0	10.4	9.9	9.8	10.5	10.1

(b) Income from Tourists/Total Imports

Year	1970	1971	1972	1973	1974	1975
a. Income from Tourists	20.9	23.3	27.6	33.6	46.3	49.2
b. Imports (CIF) ($ Million)	308.4	335.0	363.8	444.2	733.1	715.6
a/b (%)	6.8	7.0	7.6	7.6	6.3	6.9

(c) Comparison with Other Export Items

Bananas	134.6	(US million dollars)
Coffee	97.0	
Tourism	49.2	
Sugar	48.2	
Meat	32.1	
Cacao	5.3	

We can safely conclude from the above explanation, that further internationally related development is one of the vital factors in developing the national economy and that various methods to attract foreign visitors should be devised.

However, it is often claimed that tourism is labor-intensive, but direct employment is relatively small. It is pointed out that indirect employment generated by internaitonal as well as domestic tourism will be fairly large, though the exact number of jobs created cannot be exactly determined.

10.2 Tourim Potential in the Pacifico Central Region

10.2.1 Tourism Resources

The definition of tourism resources, in general, is not clear. However, it is internationally known that Costa Rica has three advantages in physical and non-physical tourism resources, that is, amistad (friendliness) of the Costa Ricans, sol y arena (sun and sand – natural attractions) and estabilidad (stability) of Costa Rican society. Moreover, Costa Rica has several other tourist attractions. For example, the Central Plateau has a temperate climate throughout the year and the countryside is rich in scenic landscapes, colonial charm and visitable active volcanoes. In the Guanacaste region or the Pacific northwestern coast, a series of still untouched beaches attract the sun-and-sand tourists.

From the aspect of domestic tourism, the people in Meseta Central generally imagine the Pacific Central and Guanacaste as sunny and close-by. This is very important to consider when working out future development programs of the Pacifico Central Region.

As to the physical resources of the Pacifico Central Region, two tourist zones are included in this region as indicated in Figure 10.1. Zonal characteristics are explained according to the OAS study as follows.

(a) Zone 5: "Gulf of Nicoya"

This zone stretches into the Gulf of Nicoya and encompasses both Puntarenas city as its center and islands dotting the Gulf such as San Lucas, Chira, Gitana, Jesuita, Tortugas etc. It also includes both the coastal area of Nicoya Peninsula extending from Naranjo to the Reserva Cabo Blanco and the coast encompassing Tiveves, Mata de Limon, Caldera, Doña Ana and Cocal.

The main functions in this zone are considered to be the following.

(1) The area in Puntarenas that is already developed for domestic tourism on weekends and vacations is noted for an average length of stay, varing from one-half to two days.

(2) For foreign tourists such as those who come only to see the place and who eventually stay one night at Hotel Colonial, it is necessary to create adequate services for visiting the islands by boat.

(3) For foreign tourists staying on islands and the coast of Nicoya Peninsula, the length of stay fluctuates between two and four nights.

(4) Foreign tourists who originated from Central America stay on the islands as well as in Puntarenas. Their average stay varies between one-half and four days.

This zone has an heterogeneous image and, therefore, it is possible to work out a mixed image for tourism development. This zone attracts mainly domestic tourists. The sea front of Puntarenas is ideal for lower income classes within the country.

(b) Zone 6: "Pacifico Sur"

Unlike zone 5, this zone is homogeneous; thus, there is no need to subdivide it.

This is no urban center in this zone which could perform the functions of the system's center. Expected functions for this zone are:

(1) To be used as another route for foreign tourists entering from San Jose.

(2) To be used as a stopover place for tourists arriving by road from Panama.

Figure 10.1   Tourist Zones in Pacific Central Region

Zone 5

Zone 6

Touristic Zones

Touristic Resources
Outside the Zones
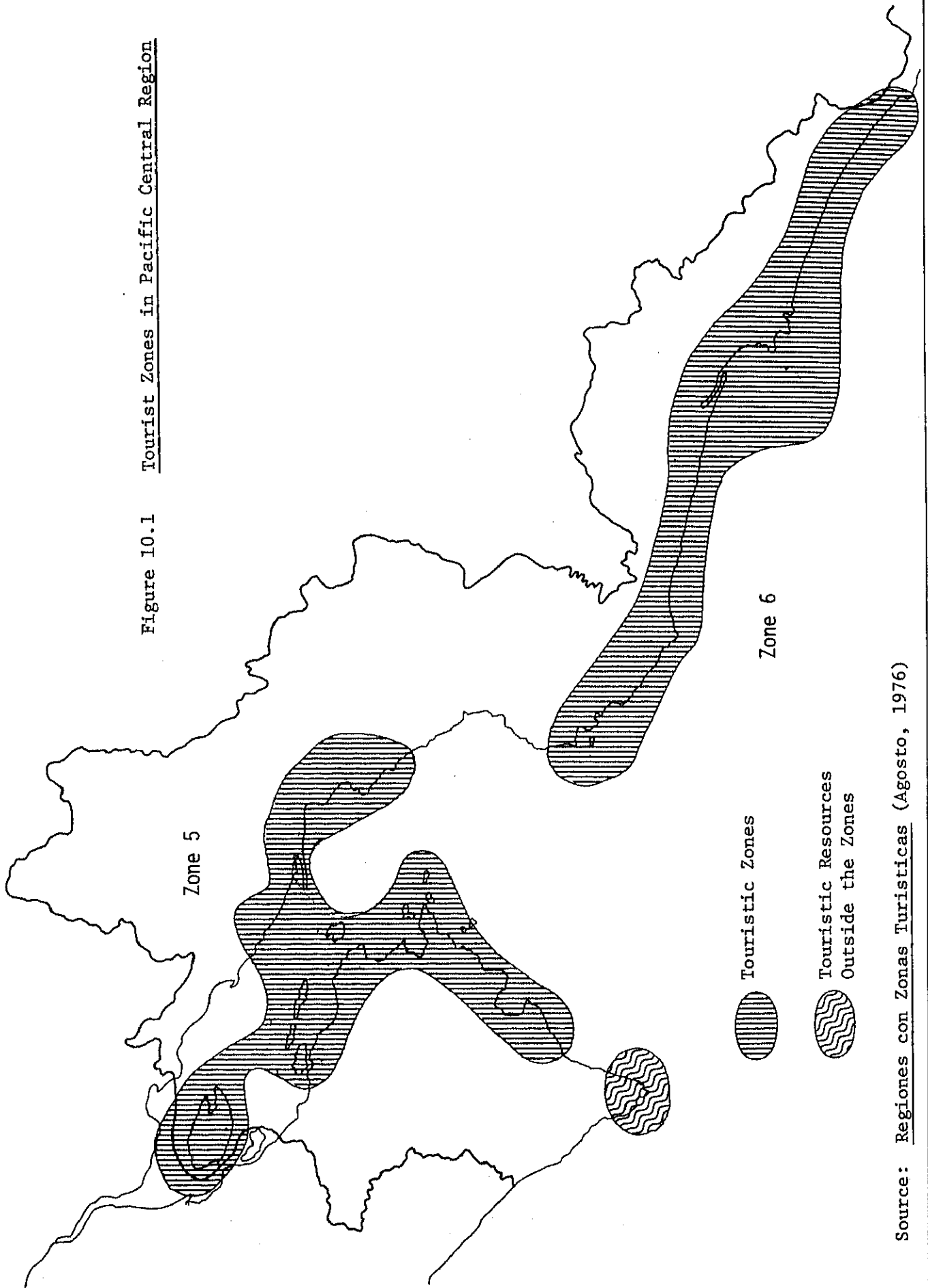
Source: Regiones con Zonas Turísticas (Agosto, 1976)

(3) To be used as a destination for domestic tourists on week-
ends and vacations.

In the image of this zone, first there is reflected the fact
that this zone includes a coastal area linked with the Parque Nacional
Manual Antonio which, together Cahuila, Conchal and Flamigo, is one of
the four most beautiful areas in the country.

Moreover this place could offer sun and favorable climate for
tourists from San Jose during the winter season. Also the estero
could offer a fishing location for tourists.

10.2.2 Access to Tourism Zones

Among the modes of transportaiton utilized by incoming foreign
tourists, overland transportation by roads ranked first and air trans-
portation followed (Table 10.3). Main roads are well paved so far,
however, proper access to places having tourist attraction was lacking.

Table 10.3 Incoming Foreign Tourists by Mode of Transportation (1973)

Mode of Transportation (Port of Entry)	Entering Tourist	
	No.	%
Total	246,825	100.00
by air	116,110	47.04
Santa Maria	116,110	47.04
by sea	249	0.11
Golfito	6	0.01
Limon	90	0.04
Puntarenas	153	0.06
by road	130,466	52.85
Paso Canoas	29,880	12.10
Penas Blancas	100,523	40.72
Puerto Gonzalez	8	0.01
Sixaola	55	0.02

Source: Estadística de Turismo, 1973 - I.C.T.

Upon completion of a new transport infrastructure in the
Pacifico Central Region, new dimensions will be opened to the access of
tourism zones. They are:

(1) San Jose-Caldera Highway: upon completion of this highway,
the time distance between Caldera and San Jose will be shorten-
ed to one hour from the present one hour and a half; as a
result Gran Puntarenas will be within range of a day trip
from San Jose.

Moreover, via ferry from Puntarenas, travel to the islands
dotting the Gulf of Nicoya and to tourist spots in Nicoya
Peninsula will be shortened.

(2) Costanera Sur Road: with the opening of this road, the sea
shore between Caldera and Quepos along this road becomes a
new tourist spot.

10.3 Trends of Tourist Inflow

10.3.1 Trends of Incoming Foreign Tourists

In regard to recent trends of international tourism in Costa
Rica, it is possible for us to have an overall picture from the documents
published by Instituto Costarricense de Turismo (ICT).

The number of foreign tourists who entered Costa Rica in 1973
are shown in Table 10.4.

It is interesting to note that Central Americans comprise
51.3 percent of the tourists and are ranked first, while North Americans
comprise 29.3 percent and are ranked second. Central Americans are
subdivided as shown in Table 10.5.

As for the future direction of international tourism in Costa
Rica, the OAS study forecasts the number of incoming foreign tourists
is shown in Table 10.6.

10.3.2 Trends of Domestic Tourism

As statistics both on previous trends of domestic tourism
and on the expenditure of Costa Ricans are not available, it is very
difficult for us to estimate the future growth of domestic tourism.
However, when the concept of "social tourism" becomes common and
facilities proper for that purpose are ready, the number of domestic
tourists will increase sharply. The Central Region or Metropolitan
Area will be the most domestic-tourist-generating area in Costa Rica.
Therefore, domestic tourists for the Pacifico Central Region will mainly
originate from the Central Region.

Table 10.4 Foreign Tourists Entering Costa Rica by Origin (1973)

R E G I O N

Month of Entry	Central Americans	North Americans	South Americans	Europeans	Others	Total
January	8.706	5.548	2.251	1.277	271	18.053
February	9.879	6.840	2.006	1.421	261	20.407
March	11.984	6.334	2.139	1.369	288	22.114
April	11.832	5.161	2.192 ,	1.320	220	20.725
May	8.926	4.773	2.274	1.170	218	17.361
June	8.316	6.597	2.108	1.145	303	18.469
July	10.682	7.728	2.947	1.663	331	23.351
August	10.386	6.592	2.677	1.373	257	21.285
September	13.210	4.199	2.273	1.335	287	21.304
October	9.921	4.631	2.278	1.282	241	18.353
November	9.817	5.605	2.196	1.414	394	19.426
December	13.001	8.145	2.884	1.609	338	25.977
Total	126.660	72.153	28.225	16.378	3.409	246.825
%	51.3	29.3	11.4	6.6	1.4	100.0

Source: Estadística de Turismo, 1973 - I.C.T.

Table 10.5 Tourists from Central America

	1969	1971	1973
Total	63,747	91,141	126,660
El Salvador	5,961	10,715	10,089
Guatemala	7,028	9,439	9,875
Honduras	4,677	5,222	5,647
Nicaragua	35,924	50,961	83,572
Panama	10,157	14,804	17,477

Source: Estadística de Turismo, 1973 - I.C.T.

Table 10.6 Forecast of Incoming Foreign Tourists, 1978-1982

Year	Number of foreign tourists	Annual rate of increase (%)
1978	340.4	8.8
1979	367.9	8.1
1980	395.3	7.4
1981	422.9	7.0
1982	450.2	6.5

Source: OEA, Estrategia Nacional de Desarrollo
Turístico para Costa Rica: 1977-1984, 1977.

10.4 Some Issues on Tourism Development and Recommendations

10.4.1   In regard to tourism development in the area concerned in this study, there already exists several studies done by domestic as well as foreign institutions, for example, Estudio de Desarrollo Urbano Integral de la Zona Puntarenas - Barranca - Caldera (INDECA report) in 1975, Development of Tourism in Costa Rica in 1975 by the Israeli Mission, Estudio Nacional de Desarrollo Turístico para Costa Rica: 1977 - 1984, in 1977 made by the Organization of American States.

These studies have deepened the analysis of possibile development of tourism in this region. Therefore, we, in this study, would like to recommend tourism development, based upon Japan's experience.

10.4.2 Institutional Problems

1)   In order to implement tourism development programs or projects, the existence of a governmental organization or organizations, which integrate all tourist activities of other public or private organizations, is a prerequisite.

In Japan's case, the Ministry of Transport is in charge of administrating tourism in an integrated manner. However, there are other governmental organizations which have been involved in promoting tourist activities in various fields, having the main purpose of raising the quality of life in the nation.

These Ministries and the activities they control are as follows:

(a) Environmental Agency

i) National Vacation Villages
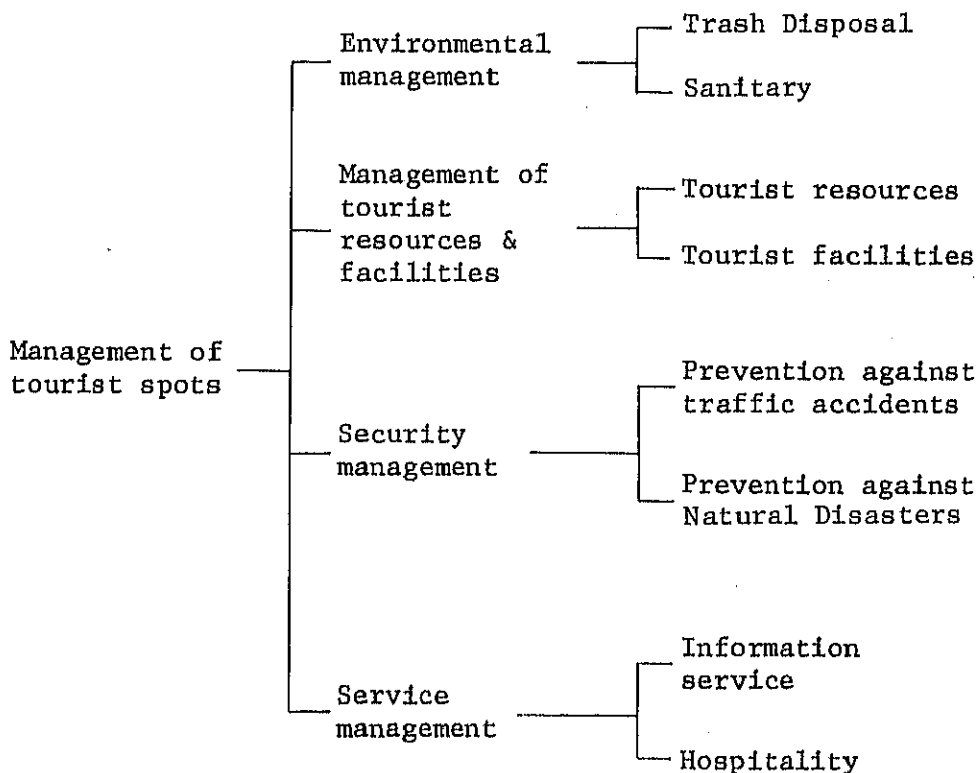ii) National Resorts
iii) National Health Spas

(b)   Ministry of Education

   i) Youth Houses
  ii) Children's Camp

(c)   Ministry of Agriculture & Forestry

   i) Recreation and Relaxation Villages
  ii) Integrated Forestry Recreation Areas

(d)   Ministry of Transport

   i) Youth Tourist Villages
  ii) Tourist Recreational Districts

(e)   Ministry of Labor

   i) Athletic Facilities and Activities

(f)   Ministry of Construction

   i) Urban Recreational Facilities
  ii) Wide Area Parks

(g)   Agency of Home Affairs

   i) Recreational Areas

2)   Another important aspect regarding institutional problems is
the management of tourist locations. An example of Japan's management
system in this field is demonstrated in Figure 10.2.

        In order for the above scheme to function well, the following
three points should be taken into consideration.

   (a) This system should be prepared for any change in the number
        of tourists. These changes may immediately affect, for
        example, related facilities, such as toilets, trash boxes
        etc. For this purpose it is vitally important to be able
        to forecast the number of tourists.

   (b) This system should be prepared to handle people of any age.
        In this regard, attention directed towards safety, environ-
        ment etc. becomes necessary.

   (c) This system should be harmonious with the particular charact-
        eristics of the region. Mountainous, hilly, or coastal
        characteristics require different management.

Figure 10.2   An Example of Management System of Tourist Locations

```
                          ┌── Environmental      ┌── Trash Disposal
                          │   management         └── Sanitary
                          │
                          │   Management of
                          │   tourist            ┌── Tourist resources
                          ├── resources &        └── Tourist facilities
                          │   facilities
  Management of ──────────┤
  tourist spots           │                      ┌── Prevention against
                          │                      │   traffic accidents
                          ├── Security           │
                          │   management         └── Prevention against
                          │                          Natural Disasters
                          │
                          │                      ┌── Information
                          └── Service            │   service
                              management         │
                                                 └── Hospitality
```

10.4.3   Environment Preservation

        Among the environmental preservation problems of tourist
sites, one of the more important in this sector is the system of trash
disposal.

        In 1973 there was an experiment on prevention of trash dis-
posal in Japan near Mt. Fuji. The contents of this experiment were:

        i) Provision of new trash boxes
       ii) Establishment of a management system of trash boxes
      iii) Distribution of polyethylene paper bags among those in
           charge of trash box management
       iv) Clean-up of the area with volunteer participation

        The Flow Chart of this experiment may be expemplified as
follows:

Figure 10.3 <u>The Flow of an Experiment on Prevention of Trash Disposal</u>
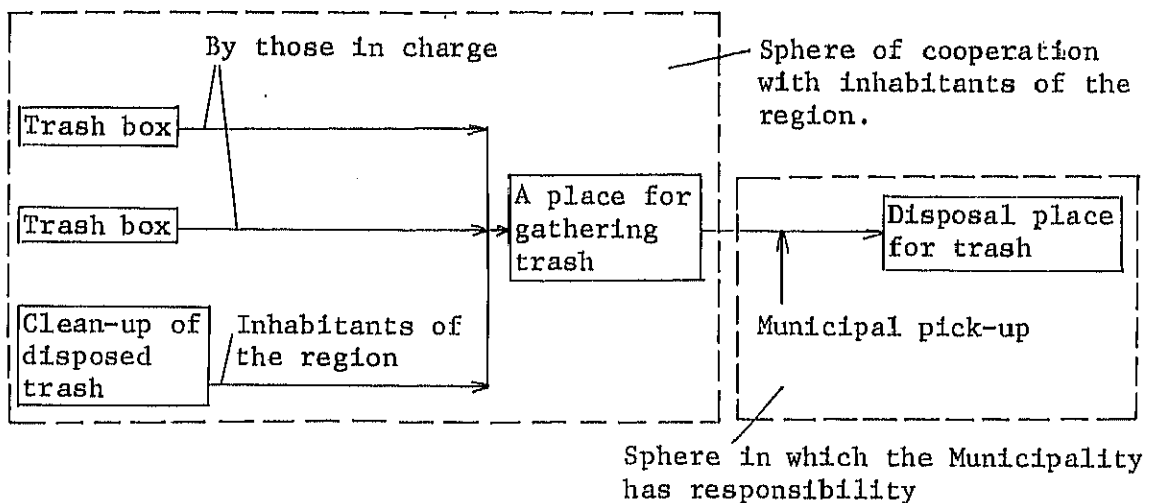
This experiment was very successful; only after about one month, the region was restored to its former state, having no trash on litter.

The reasons for the success of this system are attributed to the following three factors.

    i) The problem of trash disposal was treated not empirically but rationally or scientifically.

    ii) The responsibility of trash box management was fixed.

    iii) Polyethylene paper bags were used in trash boxes. This prompted a pick-up process.

10.4.4 Some Recommendations

1)   As mentioned in 10.4.2, for efficient tourism development of the region, the building up of a management system of tourist locations is urgently required.

2)   It is advisable that some devices for environmental preservation should be developed. One successful example of Japan is a regional system of trash disposal as explained in 10.4.3.

3)   In order to provide cheap hotel rooms for the nation in general, municipal governments of Japan operate <u>Kokumin-Shukusha</u>(National Hostel). These facilities are planned to become one of the cores of national

tourism movement. For the region of Pacifico Central, some facilities for providing cheaper hotel rooms should be constructed with the help of the Municipality and the Government of Costa Rica.

4)   It would be advisable to develop Gran Puntarenas as one of the recreational centers of this country. The development of recreational facilities should be directed, for example, toward the following items.

- botanical gardens
- aquariums
- parks
- marine land
- sport fishing
- orienteering
- sports facilities - leisure land
- camping
- yachting and marinas
- cycling

5)   It is also advisable that the idea of an international tourist circuit be taken into consideration in the following way.

(a)   First Circuit

Mexico - Guatemala $\Big\langle$ Honduras / El Salvador $\Big\rangle$ Nicaragua - Costa Rica

(b)   Second Circuit

Caribbean - Costa Rica $\Big\langle$ Venezuela / Colombia

      As to the first circuit, international tourism should be studied in the framework of the Central American Common Market; land transport would be mainly utilized for this circuit. As to the second circuit, cooperation with the caribbean countries should be sought.