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Appendix 1:
*Socioeconomic analysis of Puerto Rico's
coastal zone*

SOCIOECONOMIC ANALYSIS OF PUERTO RICO'S COASTAL ZONE

This section provides an analysis of the main demographic and socioeconomic variables in Puerto Rico's coastal zone. This analysis was performed for eight (8) coastal sectors and the values of the census variables for the totality of Puerto Rico with the purpose of establishing a comparison.

Results from the 1990 and 2000 Census on Population and Housing by the Federal Bureau of the Census were used for the analysis.

A. DEMOGRAPHIC CHARACTERISTICS

POPULATION

Over the last decade, the population of the coastal zone grew at a slightly slower rate than the rest of Puerto Rico. According to the Census, between 1990 and 2000 the population of the coastal zone grew by 5.1%, while overall population growth in Puerto Rico was 8.1% (See Table 1).

The sectors with the greatest percentage increase in population were the Southeast (21.4%) and the Northeast (13.2%). The coastal sector with the highest population was the North, which includes coastal portions of the San Juan Metropolitan Area¹ (SJMA), some of which have experienced extensive residential development in recent years (Dorado, Vega Alta and Vega Baja). Meanwhile, the South was the only sector which lost population between 1990 and 2000.

TABLE 1

Population			
Coastal sector	1990	2000	Percentage of change
Northwest	54,804	59,571	8.7%
North	199,799	207,140	3.7%
Northeast	38,237	43,266	13.2%
Southeast	26,299	28,677	9.0%
South	44,570	38,526	-13.6%
Southwest	25,569	31,051	21.4%
West	50,411	53,250	5.6%
Islands	11,391	12,385	8.7%
Coastal zone	451,080	473,866	5.1%
Puerto Rico	3,522,037	3,808,610	8.1%

Source: Population and Housing Census. 1990, 2000.

¹ The San Juan Metropolitan Region, as defined by the PRPB, is composed by the municipalities of Vega Baja, Vega Alta, Dorado, Toa Alta, Cataño, Cataño, Bayamón, Guaynabo, San Juan, Trujillo Alto, Carolina, Loíza and Canóvanas. For this study's purpose, the municipalities of Loíza and Canóvanas are part of the Northeast region while the rest of the municipalities which form part of the Metropolitan Region are included in the North region.

POPULATION DENSITY

In both the 1990 and 2000 Census, the population density for the coastal zone was lower than the average reported for the rest of Puerto Rico (See Table 2).

The North sector reported the highest population density. Another sector with a high, and rising, population density was the Northeast while the sector with the lowest population density was the Islands.

TABLE 2

Population density*		
Coastal sector	1990	2000
Norhtwest	1,040	1,130
North	1,377	1,428
Northeast	435	492
South	406	351
Southeast	251	273
Southwest	112	136
West	367	388
Islands	30	32
Coastal zone	360	378
Puerto Rico	397	429

*Inhabitants per square kilometer.

Source: Population and Housing Census, 1990, 2000.

HOMES

In recent years, the number of homes in the coastal zone has been growing at a slightly slower rate than the average for the rest of Puerto Rico. Between the 1990 and 2000 Census, the number of homes increase by 15.5% in the coastal zone while increasing by 19.6% for the rest of Puerto Rico.

The coastal sectors which reported the largest increase in the number of homes were the Southwest (35.2%), the Northeast (28.1%) and the Islands with (27.7%). The only sector which reported a decrease in homes during that decade was the South (See Table 3).

TABLE 3

Households			
Coastal sector	1990	2000	Percentage of change
Northwest	17,848	21,013	17.7%
North	71,626	80,527	12.4%
Northeast	10,750	13,767	28.1%
Southeast	7,199	8,697	20.8%
South	12,850	12,483	-2.9%
Southwest	7,825	10,579	35.2%
West	16,003	18,884	18.0%
Islands	3,589	4,583	27.7%
Coastal zone	147,690	170,533	15.5%
Puerto Rico	1,054,924	1,261,325	19.6%

Source: Population and Housing Census. 1990, 2000.

B. SOCIOECONOMIC CHARACTERISTICS

EDUCATIONAL LEVEL

The educational level reported by the residents of the coastal zone who were 25 years or older was lower in the 2000 Census than in the 1990 Census (See Table 4).

According to the 1990 Census, 49.5% of these persons had completed high school or had some post-secondary education, compared to 30.0% in 2000.

For the 1990 Census, 14.5% of the residents of the coastal zone had completed a Bachelor's Degree or a higher academic level versus 9.5% in 2000 (See Table 4).

TABLE 4

Educational level							
1990							
	9th or less	10th to 12th no diploma	Graduated High School	Some college no degree	Associate degree	Bachelor's degree	Graduate Sch. or professional
Northwest	43.5%	8.2%	21.0%	8.9%	3.8%	10.6%	3.9%
North	36.7%	9.7%	19.5%	9.2%	6.6%	12.5%	5.7%
Northeast	32.5%	10.2%	26.1%	11.0%	7.8%	9.3%	3.1%
Southwest	46.6%	10.4%	22.7%	7.3%	4.2%	6.8%	2.0%
South	40.1%	10.9%	21.5%	11.4%	5.5%	7.9%	2.7%
Southeast	52.7%	8.4%	20.9%	6.4%	3.3%	6.9%	1.4%
West	49.6%	10.1%	19.6%	6.8%	3.1%	8.3%	2.5%
Islands	42.7%	16.6%	23.1%	5.5%	5.1%	5.3%	1.8%
Coastal zone	40.7%	9.8%	20.8%	8.7%	5.5%	10.4%	4.1%
Puerto Rico	41.1%	9.2%	21.0%	8.8%	5.6%	10.7%	3.6%
2000							
	9th or less	10th to 12th no diploma	Graduated High School	Some college no degree	Associate's degree	Bachelor's degree	Graduate Sch. or professional
Northwest	66.0%	4.7%	10.3%	6.6%	2.8%	7.0%	2.6%
North	63.4%	4.8%	10.0%	6.6%	3.6%	7.5%	4.1%
Northeast	63.4%	5.2%	11.7%	6.7%	4.3%	6.7%	2.0%
Southwest	66.0%	5.1%	13.1%	5.7%	3.2%	5.4%	1.5%
South	64.5%	4.0%	11.3%	7.4%	4.4%	6.5%	2.0%
Southeast	69.5%	5.3%	12.0%	4.7%	2.9%	4.4%	1.2%
West	68.7%	5.4%	10.8%	5.3%	2.5%	5.4%	1.9%
Islands	66.9%	6.4%	14.0%	4.9%	2.4%	4.0%	1.4%
Coastal zone	65.1%	4.9%	10.8%	6.3%	3.4%	6.6%	2.9%
Puerto Rico	25.4%	14.6%	22.3%	12.2%	7.2%	13.6%	4.7%

Source: Population and Housing Census, 1990, 2000.

HOUSEHOLD INCOME LEVELS

Household income levels in the coastal zone increased between the 1990 and 2000 Census. For the 1990 Census, more than half (57.3%) of the households in the coastal zone reported incomes of less than \$10,000 in comparison to 54.4% of the households in Puerto Rico. Meanwhile, 6.0% of coastal zone households had incomes of \$40,000 or more compared to 5.6% in the rest of Puerto Rico (See Table 5).

For 2000, the proportion of coastal zone households with incomes of \$10,000 or less had decreased to 38.8%. However, this proportion was larger than the rest of Puerto Rico (37.1%). As far as households with higher income levels, in 2000, 15.8% of the coastal zone households had incomes of \$40,000 or higher compared to 15.2% for the rest of Puerto Rico.

TABLE 5

Household income level									
1990									
	Less than \$10,000	\$10,000 - \$14,999	\$15,000 - \$19,999	\$20,000 - \$24,999	\$25,000 - \$29,999	\$30,000 - \$34,999	\$35,000 - \$39,999	\$40,000 - \$49,999	\$50,000 or more
Northwest	60.9%	14.3%	7.9%	5.5%	3.8%	2.3%	1.7%	1.7%	1.8%
North	53.4%	13.3%	8.4%	5.8%	4.0%	3.5%	2.4%	2.9%	6.1%
Northeast	49.7%	17.8%	10.5%	7.3%	5.1%	3.2%	1.9%	2.4%	2.0%
South	65.8%	13.5%	8.5%	4.9%	3.0%	1.8%	0.7%	0.7%	1.2%
Southeast	55.3%	14.4%	7.8%	6.9%	5.8%	2.4%	1.6%	2.3%	3.5%
Southwest	66.5%	15.8%	7.7%	3.6%	2.7%	1.6%	0.2%	0.7%	1.0%
West	64.4%	14.5%	7.9%	5.1%	2.5%	1.6%	0.9%	1.1%	1.9%
Islands	61.4%	17.1%	9.2%	5.0%	3.1%	1.8%	0.9%	0.4%	1.0%
Coastal zone	57.3%	14.2%	8.4%	5.7%	3.8%	2.8%	1.8%	2.1%	3.9%
Puerto Rico	54.4%	15.3%	9.4%	6.5%	4.1%	2.8%	1.9%	3.6%	2.0%
2000									
	Less than \$10,000	\$10,000 - \$14,999	\$15,000 - \$19,999	\$20,000 - \$24,999	\$25,000 - \$29,999	\$30,000 - \$34,999	\$35,000 - \$39,999	\$40,000 - \$49,999	\$50,000 or more
Northwest	42.8%	14.3%	9.3%	6.8%	5.9%	4.3%	2.9%	4.7%	8.9%
North	35.1%	12.5%	9.6%	7.7%	5.3%	4.8%	4.2%	5.7%	15.0%
Northeast	37.8%	13.1%	9.4%	9.1%	5.8%	5.3%	3.5%	6.0%	10.0%
South	42.7%	16.0%	10.7%	8.2%	5.7%	4.7%	3.1%	3.6%	5.3%
Southeast	33.5%	16.9%	8.8%	9.4%	8.0%	6.1%	3.7%	3.7%	10.0%
Southwest	46.1%	14.7%	10.5%	8.3%	5.3%	4.5%	2.3%	2.5%	5.9%
West	44.3%	15.6%	9.5%	8.6%	5.5%	4.6%	2.4%	3.5%	6.0%
Islands	46.1%	14.6%	9.8%	8.3%	5.4%	4.4%	4.1%	3.6%	3.6%
Coastal zone	38.8%	13.8%	9.7%	8.0%	5.6%	4.8%	3.6%	4.8%	11.0%
Puerto Rico	37.1%	14.3%	10.2%	8.4%	6.0%	4.9%	3.8%	5.1%	10.1%

Source: Population and Housing Census. 1990, 2000.

HOUSEHOLDS UNDER POVERTY LEVELS

The proportion of coastal zone households living under the poverty level decreased between 1990 and 2000. According to the 1990 Census, 50.5% of coastal zone households had incomes below the poverty level compared to 56.9% for the rest of Puerto Rico (See Table 6).

For 2000, the proportion of coastal zone households living under the poverty level was reduced to 46.8%, less than the rest of Puerto Rico which reported 47.3%.

TABLE 6

Households under poverty levels		
	1990	2000
Northwest	54.2%	51.4%
North	43.9%	41.2%
Northeast	49.7%	47.9%
South	62.2%	55.0%
Southeast	54.0%	44.1%
Southwest	62.3%	55.3%
West	57.3%	54.3%
Islands	62.9%	53.9%
Coastal zone	50.5%	46.8%
Puerto Rico	56.9%	47.3%

Source: Population and Housing Census. 1990, 2000.

PARTICIPATION IN THE WORK FORCE

The rate of participation in the work force decreased between 1990 and 2000 in both the coastal zone and the rest of Puerto Rico. According to data from 1990, 47.3% of persons 16 years or older in the coastal zone was participating in the work force. That proportion was reduced to 41.7% by the year 2000. For the rest of Puerto Rico, the participation rate was reduced from 47.3 percent in 1990 to 40.7% in 2000 (See Table 7).

TABLE 7

Labor force participation				
1990				
	In the labor force		Out of the labor force	
	Number	Percentage	Number	Percentage
Northwest	17,565	43.4%	22,915	56.6%
North	73,331	48.7%	77,178	51.3%
Northeast	13,685	52.6%	12,348	47.4%
South	13,231	44.1%	16,796	55.9%
Southeast	8,697	48.0%	9,413	52.0%
Southwest	7,839	43.6%	10,137	56.4%
West	16,760	45.4%	20,168	54.6%
Islands	4,020	48.9%	4,202	51.1%
Coastal zone	155,128	47.3%	173,157	52.7%
Puerto Rico	1,180,162	47.3%	1,316,916	52.7%
2000				
	In the labor force		Out of the labor force	
	Number	Percentage	Number	Percentage
Northwest	17,570	38.5%	28,067	61.5%
North	71,813	44.8%	88,639	55.2%
Northeast	17,570	38.5%	28,067	61.5%
South	11,043	40.3%	16,369	59.7%
Southeast	8,656	41.9%	11,998	58.1%
Southwest	8,939	38.3%	14,373	61.7%
West	16,235	40.5%	23,845	59.5%
Islands	3,569	38.4%	5,717	61.6%
Coastal zone	155,395	41.7%	217,075	58.3%
Puerto Rico	1,156,532	40.7%	1,686,344	59.3%

Source: Population and Housing Census. 1990, 2000.

LABOR SITUATION

The proportion of unemployed persons was reduced during the decade under study. According to 1990 Census data, the unemployment rate in the coastal zone was 21.4% while in 2000 the unemployment rate was reduced to 19.9% (See Table 8).

Although unemployment rates vary from coastal sector to coastal sector, in the majority of the cases, unemployed rates were reduced between 1990 and 2000. Among the eight coastal sectors, the only ones which reported an increase in unemployment were the Islands (from 21.1% to 24.0%) and the West (from 24.2% to 24.6%).

TABLE 8

Employment status				
1990				
	Employed		Unemployed	
	Number	Percentage	Number	Percentage
Northwest	13,296	75.7%	4,269	24.3%
North	60,947	83.1%	12,384	16.9%
Northeast	10,338	75.5%	3,347	24.5%
South	9,311	70.4%	3,920	29.6%
Southeast	6,731	77.4%	1,966	22.6%
Southwest	5,460	69.7%	2,379	30.3%
West	12,699	75.8%	4,061	24.2%
Islands	3,170	78.9%	850	21.1%
Coastal zone	121,952	78.6%	33,176	21.4%
Puerto Rico	940,222	79.7%	239,940	20.3%
2000				
	Employed		Unemployed	
	Number	Percentage	Number	Percentage
Northwest	13,576	77.3%	3,994	22.7%
North	60,793	84.7%	11,019	15.3%
Northeast	9,490	76.8%	2,866	23.2%
South	8,030	72.7%	3,013	27.3%
Southeast	7,086	81.9%	1,570	18.1%
Southwest	6,431	71.9%	2,508	28.1%
West	12,238	75.4%	3,997	24.6%
Islands	2,713	76.0%	856	24.0%
Coastal zone	120,357	80.1%	29,823	19.9%
Puerto Rico	935,534	80.9%	220,998	19.1%

Source: Population and Housing Census. 1990, 2000.

C. HOUSING CHARACTERISTICS

UNITS OF HOUSING

The majority of the housing units included in the Census, in both the coastal zone and the rest of Puerto Rico, were reported as occupied. Both surveys showed that eight out of every 10 housing units were reported as occupied.

It is important to point out that, according to what was reported in both cases, the coastal zone has had a higher rate of vacant housing units than the rest of Puerto Rico (see Table 9).

The proportion of vacant housing units varies by coastal sector. In both 1990 and 2000, the Islands, Southwest and Northeast sectors reported the highest vacant housing rates.

TABLE 9

Dwellings occupancy						
1990						
	Occupied		Vacancies		Total dwelling units	
	Number	Percentage	Number	Percentage	Number	Percentage
Northwest	17,700	88.1%	2,395	11.9%	20,095	100.0%
North	71,362	82.9%	14,717	17.1%	86,079	100.0%
Northeast	10,603	74.3%	3,665	25.7%	14,268	100.0%
Southeast	7,250	78.8%	1,953	21.2%	9,203	100.0%
South	12,748	83.6%	2,498	16.4%	15,246	100.0%
Southwest	7,806	70.8%	3,227	29.2%	11,033	100.0%
West	15,896	82.6%	3,343	17.4%	19,239	100.0%
Islands	3,538	70.5%	1,477	29.5%	5,015	100.0%
Coastal zone	146,903	81.5%	33,275	18.5%	180,178	100.0%
Puerto Rico	1,054,924	88.7%	134,061	11.3%	1,188,985	100.0%
2000						
	Occupied		Vacancies		Total dwelling units	
	Number	Percentage	Number	Percentage	Number	Percentage
Northwest	21,025	87.3%	3,061	12.7%	24,086	100.0%
North	80,378	84.2%	15,029	15.8%	95,407	100.0%
Northeast	13,831	72.8%	5,179	27.2%	19,010	100.0%
Southeast	8,682	76.3%	2,704	23.7%	11,386	100.0%
South	12,474	85.6%	2,091	14.4%	14,565	100.0%
Southwest	10,635	68.1%	4,985	31.9%	15,620	100.0%
West	18,958	80.2%	4,677	19.8%	23,635	100.0%
Islands	4,853	68.6%	2,218	31.4%	7,071	100.0%
Coastal zone	170,836	81.0%	39,944	19.0%	210,780	100.0%
Puerto Rico	1,261,325	88.9%	157,151	11.1%	1,418,476	100.0%

Source: Population and Housing Census. 1990, 2000.

VACANT HOUSING CONDITIONS

Between 1990 and 2000, the coastal zone reflected a significant increase in the development of second homes judging from the number of vacant housing units dedicated to seasonal, recreational or occasional use.

According to data from the 1990 Census, these types of housing units constituted 25.4% of all housing units, proportion which rose to 47.2% in the 2000 Census (See Table 10).

After examining data for the coastal sectors, it is observed that the North reported the highest ratio of housing units used for seasonal, recreation or occasional use in both 1990 and 2000 (40.4% and 67.5%, respectively). Other sectors with a high rate of vacant housing units dedicated to these purposes were the Southwest (66.5%) and the Islands (60.4%).

TABLE 10

Classification of vacant housing											
1990											
	For rent		For sale		For seasonal, recreational or occasional use		Other vacancies		Total of vacancy units		
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	
Northwest	596	24.9%	239	10.0%	345	14.4%	1,215	50.7%	2,395	100.0%	
North	4,205	28.6%	1,078	7.3%	3,018	20.5%	6,416	43.6%	14,717	100.0%	
Northeast	1,075	29.3%	40	1.1%	1,482	40.4%	1,068	29.1%	3,665	100.0%	
Southeast	321	16.4%	88	4.5%	678	34.7%	866	44.3%	1,953	100.0%	
South	96	3.8%	127	5.1%	196	7.8%	2,079	83.2%	2,498	100.0%	
Southwest	445	13.8%	65	2.0%	1,260	39.0%	1,457	45.2%	3,227	100.0%	
West	548	16.4%	318	9.5%	1,005	30.1%	1,472	44.0%	3,343	100.0%	
Islands	211	14.3%	50	3.4%	478	32.4%	738	50.0%	1,477	100.0%	
Coastal zone	7,497	22.5%	2,005	6.0%	8,462	25.4%	15,311	46.0%	33,275	100.0%	
Puerto Rico	22,920	17.1%	12,101	9.0%	21,035	15.7%	78,005	58.2%	134,061	100.0%	
2000											
	For rent		For sale		For seasonal, recreational or occasional use		Other vacancies		Total of vacancy units		
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	
Northwest	680	22.2%	461	15.1%	781	25.5%	1,139	37.2%	3,061	100.0%	
North	3,741	24.9%	1,205	8.0%	5,200	34.6%	4,883	32.5%	15,029	100.0%	
Northeast	361	7.0%	322	6.2%	3,494	67.5%	1,002	19.3%	5,179	100.0%	
Southeast	80	3.0%	123	4.5%	1,586	58.7%	915	33.8%	2,704	100.0%	
South	179	8.6%	241	11.5%	684	32.7%	987	47.2%	2,091	100.0%	
Southwest	525	10.5%	199	4.0%	3,317	66.5%	944	18.9%	4,985	100.0%	
West	623	13.4%	329	7.1%	2,447	52.7%	1,248	26.9%	4,647	100.0%	
Islands	93	4.2%	60	2.7%	1,339	60.4%	726	32.7%	2,218	100.0%	
Coastal zone	6,282	15.7%	2,940	7.4%	18,848	47.2%	11,844	29.7%	39,914	100.0%	
Puerto Rico	27,363	17.4%	16,248	10.3%	32,041	20.4%	81,499	51.9%	157,151	100.0%	

Source: Population and Housing Census. 1990, 2000.

D. INDEX OF THE SOCIOECONOMIC SITUATION OF THE RESIDENTS OF COASTAL ZONE

As part of the analysis, an index of the socioeconomic situation of the residents of the coastal zone was constructed using the following five variables taken from the 2000 Census:

- Home ownership;
- Education levels (ratio of persons 25 years or older who graduated from high school);
- Income levels (households with annual incomes of \$10,000 or less);
- Proportion of households living under the poverty level, and
- Unemployment rates.

The comparative analysis of these variables was done parting from the data representing the smallest geographical unit in comparison to the largest. In that sense, the data for each one of the sectors was compared to the rest of Puerto Rico.

The logic behind the analysis of the first two variables supposes that the higher the proportion of the geographical sub-unit with respect to the geographical unit (i.e. region vis-à-vis Puerto Rico), it is in better position in comparison to analog geographical sub-units (the other sectors in the area of study). The value one (1) means and identity or absolute equal between the geographical sub-unit with respect to the geographical unit. Ergo, any value above 1 means that the geographical sub-unit is above the average value of the

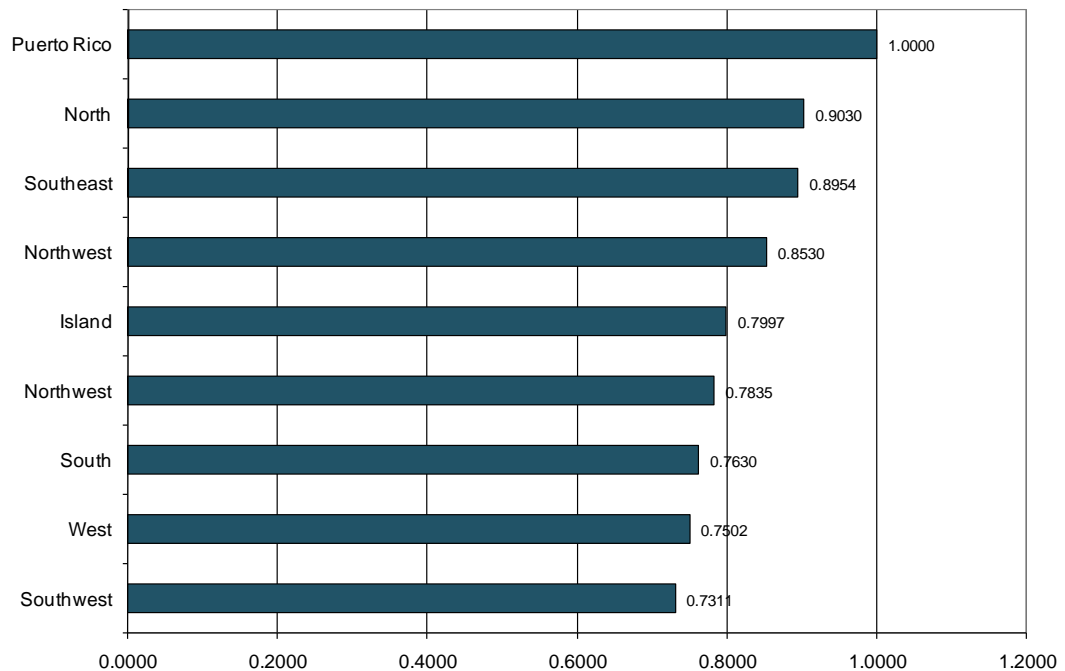
geographical unit. Any value below 1 suggests a disadvantaged socioeconomic situation in that geographical sub-unit.

This logic was not applied to the last three variables due to the fact that it would prove the contrary. For example, a high proportion would mean a worse positioning than the analog units. As can be appreciated, the higher the values for these three variables, the worse the socioeconomic situation of the geographical unit in question. In order to make this logic coherent with the others, the aggregate analysis of all the variables which represent a better socioeconomic situation, a reciprocal of these three variables ($1/x$) was used. In that manner, the usage of geometric mean will guarantee that in the calculation based on all the variables the rule of higher value-better socioeconomic situation will not be violated.

FINDINGS

The calculation of the socioeconomic index of the coastal sectors shows that, on average, all the sectors are at a disadvantage when compared to the rest of Puerto Rico (See Graphic 1). Using the value of the variables in Puerto Rico, it was found the average values for the sectors was less than one (1), which implies a socioeconomic situation at a disadvantage in comparison with the rest of Puerto Rico. The sector with the best situation was the North with an index of 0.9030 while Southwest had the worse socioeconomic situation with an index of 0.7311.

GRAPHIC 1



Graphic made by Estudios Técnicos, Inc.

While examining the variables independently, it is observed that in some sectors the values were higher than in the rest of Puerto Rico (See Table 11). This means that in those sectors, the situation is better than the average situation in Puerto Rico.

For example, the values of the indexes in the North sector for the variable regarding households with incomes less than \$10,000 (1.0577), households under the poverty level (1.1493) and unemployment rate (1.202) were below the corresponding values for the rest of Puerto Rico (1.0000).

TABLE 11

Socioeconomic index of the coastal zone's residents						
	Variable 1	Variable 2	Variable 3	Variable 4	Variable 5	
Region	Owner-occupied dwellings	Graduated from high school or higher	Households with income less than \$10,000	Households below the poverty level	Unemployment rate	Index average value
North	0.7769	0.5300	1.0557	1.1493	1.2021	0.9030
Southeast	1.0254	0.5267	1.1075	1.0714	0.8980	0.8954
Northeast	1.0724	0.5233	0.9817	0.9877	0.8300	0.8530
Islands	1.0853	0.4450	0.8039	0.8773	0.9601	0.7997
Northwest	0.9069	0.4883	0.8674	0.9200	0.8353	0.7835
South	1.0495	0.4817	0.8684	0.8595	0.6852	0.7630
West	0.8994	0.4317	0.8380	0.8719	0.8378	0.7502
Southwest	1.0796	0.4200	0.8054	0.8548	0.6689	0.7311
Puerto Rico	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Source: Estudios Técnicos, Inc.