6.3 Social Environment

6.3.1 Socio-Economic Environment Conditions

(1) Overview

In examining the social environment around Subic Bay, following five (5) municipalities around the SBMA area are selected. (see Figure 6.3.1-1)

Castillejos Town	(Zambales Province)
Olongapo City	(-do-)
San Antonio Town	(-do-)
Subic Town	(-do-)
Dinalupihan Town	(Bataan Province)

Although Dinalupihan Town is not facing to Subic Bay, as it sits between the Bay area and Metro Manila that a considerable impact is anticipated according to the development tendency of Subic Bay area. Castillejos Town and San Antonio Town also are not facing to Subic Bay but are included for the purpose of comparison with the direct impact area of Olongapo City and Subic Town. Especially in case of San Antonio Town, although its urbanized area is far from Subic Bay, it is included as its territory covers the western half of Redondo Peninsular. On the other hand, Morong Town in Bataan Province, which sits directly south of the SBMA area, is excluded as it has not been having much relationships with Subic Bay area both in socially and economically.

Most important and strongest impact on the social environment of these municipalities is of course the turning back of the U.S. Subic Naval Base in 1992. It caused a lot of loss of job opportunities and outflow of population especially in case of Olongapo City where the largest social and economic facilities are piled up among the area. During the Census year of 1990 and 1995, population of Olongapo City decreased by seven (7) percent from 193,327 to 179,754 which is quite contrary to the general demographic tendency of the surrounding area. However, this decreasing tendency of population seems to be recovering in recent years after several means of development in the SBMA area are conducted.

In the viewpoint of the social environment, not much difficulty is anticipated in conducting development activities around Subic Bay area as the social conditions of surrounding municipalities, i.e. Olongapo City and Subic Town, is comparatively stabilized and the SBMA area is separated and secured from neighboring population. Of course, there are some factors of disturbance inside the most urbanized area of Olongapo City and Subic Town and the eastern coast of Redondo Peninsular within the territory of Subic Town. The former factor is so called "Urban Poors" and the latter factor is fishery colonies along the shoreline facing Subic Bay. The former "Urban Poors" are not-clearly-defined group of people living

inside the urbanized area without land ownership but are not regarded as "squatters". In most cases, these "Urban Poors" are residing in wasted lands and/or cliff-sides without supply of public services such as water, gas and power mainly because they cannot afford the costs. As they are not directly invading to the public and/or private lands, they cannot be regarded as squatters or illegal occupants. According to the preliminary hearings, they are not thinking themselves as squatters and the municipalities also avoid the expression of "illegal" and "squatting". The number of these "Urban Poors" are estimated to be several hundred families (two (2) thousand people at most). At present, not much information about their characteristics, intentions and consciousness toward the development activities around Subic Bay is acquired. However, any activities to increase their job opportunities and income increase thereof would be welcomed and not much trouble from them is anticipated in developing Subic Bay area. Not much information on the another group in fishery colonies along Redondo Peninsular is acquired also. The area where they are living is under dispute among between the SBMA and Subic Town. The SBMA claims that the area had been a part of the U.S. Naval Base and it inherited the administrative right when the Base was turned back. Subic Town claims that the area came under administration of the municipality when the Base was turned back as its geographical position is adjoining to it. At present, there are seven (7) such colonies counted as the smaller administrative unit of "Sitio" under the Barangay Cawag of Subic Town. These areas are not supplied any public services neither from the SBMA nor Subic Town. There is no road connecting the area to the other part of Subic Bay, and fishing boats with which they are making their lives are the only means of their transport. To the SBMA, they are "illegal residents" squatting inside its administrative territory, while to Subic Town municipality and to themselves, they are "indigenous" to the area. This "indigenous" does not necessarily mean they are claiming themselves to be an "Indigenous Cultural Community (ICC)" which is designated by the Department of Environment and Natural Resources (DENR) in 1992. In case they claim that they are an ICC, they should apply at the same time the recognition of "Ancestral Land/Domain" for their exclusive use. At the time of field survey, it seemed not likely for them to prepare such procedures.

In both cases, disturbing factors on the development activities around Subic Bay area may not be so serious as the "Urban Poors" issue can be solved by creation of new job opportunities and the "Indigenous Fishermen" issue which of course needs continuous and careful measures to attend by concerned local authorities is existing rather a separated place from the exact field of development activities. Furthermore, both groups are not claiming any disputes on the development around Subic Bay area. There will not be any problems of relocation and/or resettlement of them in the course of development if the actual development projects are taken place carefully avoiding such areas where they are existing.

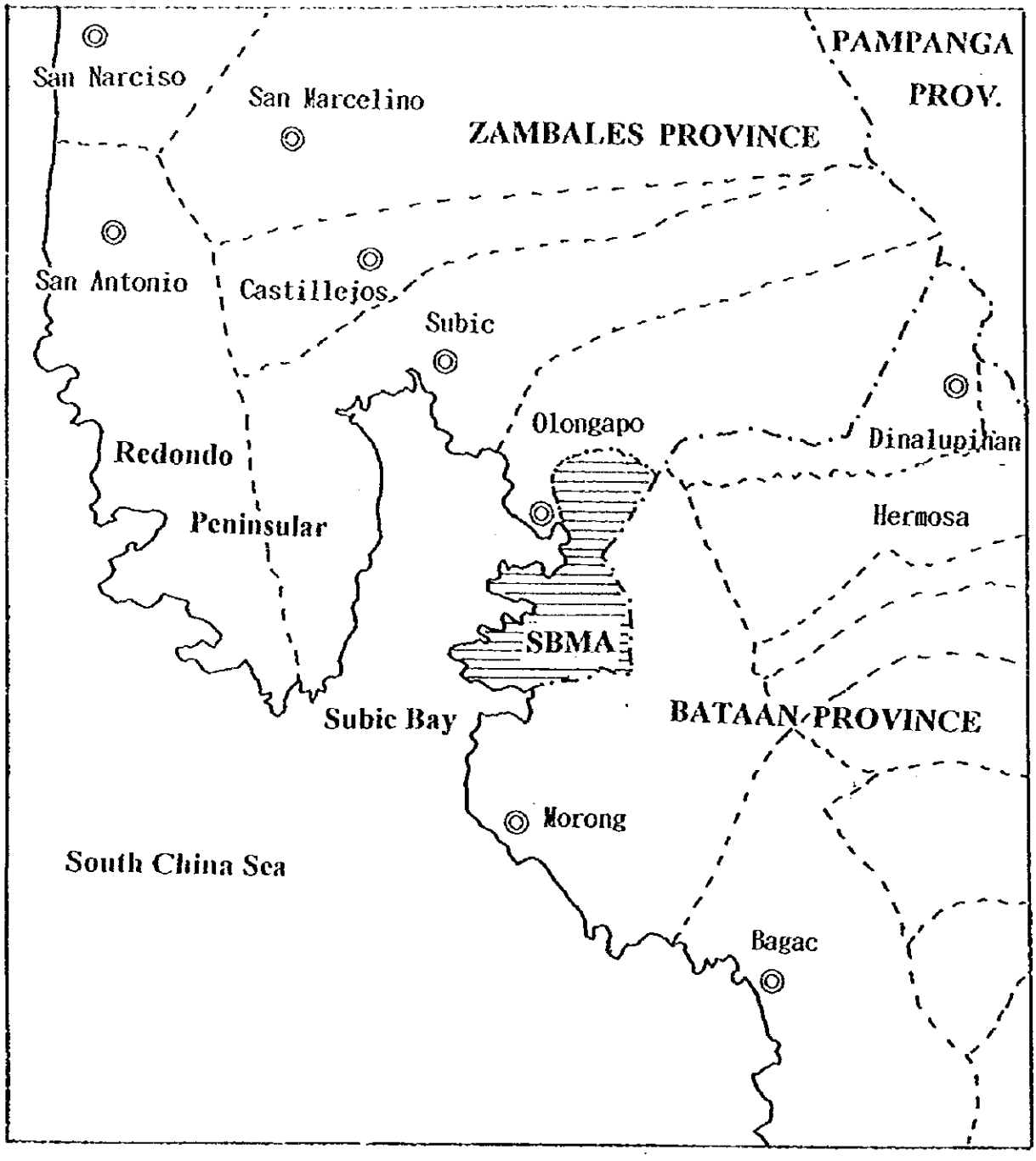


Figure 6.3.1-1 Administrative Boundary around Subic Bay

Legend Provincial Boundary ——·——·——

Municipality Boundary - - - - - - - -

(2) Socio-Economic Environment Conditions

1) Population Trends

Population and number of households in recent Census years of subjected municipalities are summarized in Table 6.3.1-1. As described already, Olongapo City shows a considerable decrease in both of population and number of households during 1990 and 1995 causing increase of average number of household members. In cases of Castillejos, Subic and Dinalupihan Towns, there seemed not much impact was appeared by the turning back of the U.S. Subic Naval Base. In case of San Antonio Town, the reason of slight decrease of population during the period may be explained by other factors such as general tendency of urbanization in Zambales Province especially the outflow to the Metro Manila area. This tendency is much serious at the adjoining municipality of San Marcelino Town where almost one-thirds of total population is lost during the same period.

Looking into the detail in Barangay level, twelve (12) Barangays out of total seventeen (17) in Olongapo City are showing decrease of population (see Table 6.3.1-2). Especially in Banicain, Kalaklan, New Kalalake, Old Cabalan, Pag-asa, Santa Rita, West Bajac-bajac and West Tapinac where most densely inhabited Barangays are severely affected. Even in Subic Town, where the total population showed a favorable increase, Barangays adjoining to Olongapo City show decrease or stagnancy of population (see Table 6.3.1-3).

However, according to the hearings from both municipalities, recovery of population in these Barangays is recognized in recent years especially after the development activities and measures are taken place within the SBMA area.

Table 6.3.1-1 Current Trends of Population, Household and Population Density by Selected Municipality

MUNICIPALITY	POPULATION						
	NUMBERS				GROWTH RATE		
	1975	1980	1990	1995	75/80	80/90	90/95
Castillejos (Z)	17,999	19,154	26,753	28,357	1.3	4.0	1.2
Dinalupihan (B)	36,302	41,415	58,172	65,159	2.8	4.0	2.4
Olongapo (Z)	147,109	156,430	193,327	179,754	1.3	2.4	-1.4
San Antonio (Z)	21,099	22,382	26,944	25,766	1.2	2.0	-0,9
Subic (Z)	28,139	30,340	46,929	57,099	1.6	5.5	4.3
5 Municipalities	250,648	269,721	352,125	356,135	1.5	3.1	0.2
Bataan Province	263,269	323,254	425,803	491,459	4.6	3.2	3.1
Zambales Province	416,280	444,037	562,992	569,266	1.3	2.7	0.2
Bataan + Zambales	679,549	767,291	988,795	1,060,725	2.6	2.9	1.5

MUNICIPALITY	HOUSEHOLD							
	NUMBERS				AVERAGE PP/HH			
	1975	1980	1990	1995	1975	1980	1990	1995
Castillejos (Z)	3,125	3,622	5,453	6,024	5.76	5.29	4.91	4.71
Dinalupihan (B)	5,690	6,590	10,355	12,163	6.38	6.28	5.62	5.36
Olongapo (Z)	28,330	32,641	42,623	38,983	5.19	4.79	4.54	4.61
San Antonio (Z)	3,887	4,516	5,800	5,789	5.43	4.96	4.65	4.45
Subic (Z)	4,931	5,701	9,499	12,040	5.71	5.32	4.94	4.74
5 Municipalities	45,936	53,070	73,730	74,999	5.46	5.08	4.78	4.75
Bataan Province	42,366	56,946	81.343	98,499	6.21	5.68	5.23	4.99
Zambales Province	74,311	86,434	115,643	119,901	5.60	5.14	4.87	4.75
Bataan + Zambales	116,677	143,380	196,986	218,400	5.82	5.35	5.02	4.86

MUNICIPALITY	AREA (hectares)	DENSITY 1995 (pp/ha.)
Castillejos (Z)	17,744	1.6
Dinalupihan (B)	9,253	7.0
Olongapo (Z)	18,500	9.7
San Antonio (Z)	1,292	0.9
Subic (Z)	27,920	2.0
5 Municipalities	74,709	4.8

(B) indicates Bataan Province
(Z) indicates Zambales Province

Table 6.3.1-2 Current Trendof Population, Household and Population Density by Barangay (Olongapo City)

Barangay Name	POPULATION							HOUSEHOLD								AREA	DENSITY
	NUMBERS				GROWTH RATE			NUMBERS				AVERAGE PP/HH					1995
	1975	1980	1990	1995	75/80	80/90	90/95	1975	1980	1990	1995	1975	1980	1990	1995	(hectares)	(pp/ha.)
Asinan	4,610	3,972	3,073	**3,204**	-2.8	-2.3	**0.9**	1,004	920	758	**806**	4.59	4.32	4.05	3.97	**23.98**	**133.6**
Banicain	8,425	8,066	8,038	**6,273**	-0.9	0.0	**-4.4**	1,686	1,762	1,953	**1,459**	4.95	4.56	4.24	4.30	**13.20**	**475.2**
Barretto	7,350	8,759	12,213	**12,095**	3.8	3.9	**-0.2**	1,222	1,735	2,677	**2,747**	6.01	5.05	4.56	4.40	**495.79**	**24.4**
East Bajac-bajac	18,534	20,217	19,071	**19,098**	1.8	-0.6	**0.0**	3,651	4,280	4,164	**4,012**	5.08	4.72	4.58	4.76	**93.50**	**204.3**
East Tapinac	14,803	14,518	12,252	**11,134**	-0.4	-1.6	**-1.8**	3,212	3,502	3,101	**2,630**	4.61	4.15	3.95	4.23	**42.88**	**259.7**
Gordon Heights	8,947	10,624	19,677	**19,068**	3.7	8.5	**-0.6**	1,548	1,971	4,056	**3,900**	5.78	5.39	4.85	4.89	**861.53**	**22.1**
Kalaklan	5,373	7,329	11,789	**9,245**	7.3	6.1	**-4.3**	995	1,472	2,685	**2,076**	5.40	4.98	4.39	4.45	**750.32**	**12.3**
New Kalalake	9,965	10,370	10,081	**9,062**	0.8	-0.3	**-2.0**	2,015	2,215	2,405	**2,093**	4.95	4.68	4.19	4.33	**26.44**	**342.7**
Mabayuan	8,232	7,735	9,760	**9,987**	-1.2	2.6	**0.5**	1,537	1,555	2,102	**2,082**	5.36	4.97	4.64	4.80	**273.26**	**36.5**
New Catalan	5,947	7,845	13,009	**14,352**	6.4	6.6	**2.1**	1,079	1,482	2,515	**2,895**	5.51	5.29	5.17	4.96	**1,955.57**	**7.3**
New Ilalim	1,942	2,019	1,493	**1,656**	0.8	-2.6	**2.2**	399	433	361	**360**	4.87	4.66	4.14	4.60	**7.71**	**214.8**
New Kababae	2,397	2,197	2,185	**2,147**	-1.7	-0.1	**-0.3**	459	457	487	**458**	5.22	4.81	4.49	4.69	**11.15**	**192.6**
Old Cabalan	-	-	10,167	**9,354**	-	-	**-1.6**	-	-	2,122	**1,962**	-	-	4.79	4.77	**1,200.00**	**7.8**
Pag-asa	6,379	6,187	7,045	**5,698**	-0.6	1.4	**-3.8**	1,296	1,349	1,656	**1,281**	4.92	4.59	4.25	4.45	**26.60**	**214.2**
Santa Rita	26,100	27,781	34,856	**30,580**	1.3	2.5	**-2.5**	4,745	5,374	7,321	**6,366**	5.50	5.17	4.76	4.80	**1,529.18**	**20.0**
West Bajac-bajac	8,530	9,979	10,214	**9,155**	3.4	0.2	**-2.1**	1,453	2,087	2,180	**1,964**	5.87	4.78	4.69	4.61	**64.56**	**141.8**
West Tapinac	9,575	8,832	8,404	**7,646**	-1.6	-0.5	**-1.8**	2,209	2,047	2,080	**1,870**	4.33	4.31	4.04	4.09	**15.06**	**507.7**
Olongapo Total	147,109	156,430	193,327	**179,754**	1.3	2.4	**-1.4**	28,330	32,641	42,623	**38,983**	5.19	4.79	4.54	4.61	**18,500 ****	**1.6 ****

** Area of Olongapo City is 18,500 hectares, while the cummulated total area of above 17 Barangays are 7,391.63 hectares.
Average population density in 1995 of total barangays in Olongapo City is calculated to be 24.2 pp/ha. in this case.

indicate Barangays of which population decreased during 1990 and 1995.

Table 6.3.1-3 Current Trend of Population, Household and Population Density by Barangay
(Subic Town)

Barangay	POPULATION							HOUSEHOLD								AREA	DENSITY
	NUMBERS				GROWTH RATE			NUMBERS				AVERAGE PP/HH					1995
	1975	1980	1990	1995	75/80	80/90	90/95	1975	1980	1990	1995	1975	1980	1990	1995	(hectares)	(pp/ha.)
Aningway-Sacatihan	880	1,018	1,728	**2,964**	3.1	7.0	14.3	158	195	358	**642**	5.57	5.22	4.83	4.62	**777.07**	**3.8**
Asinan Poblacion	879	701	700	**702**	-4.1	0.0	0.1	136	124	127	**156**	6.46	5.65	5.51	4.50	**11.81**	**59.4**
Asinan Proper	825	741	1,539	**2,760**	-2.0	10.8	15.9	136	141	317	**590**	6.07	5.26	4.85	4.68	**402.90**	**6.9**
Baraca-Camachile (Pob.)	1,761	1,624	3,082	**2,774**	-1.6	9.0	-2.0	307	317	612	**566**	5.74	5.12	5.04	4.90	**70.22**	**39.5**
Batiawan	348	381	430	**685**	1.9	1.3	11.9	65	75	86	**144**	5.35	5.08	5.00	4.76	**11,260.19**	**0.1**
Calapacuan	5,177	5,952	8,403	**9,944**	3.0	4.1	3.7	918	1,111	1,786	**2,015**	5.64	5.36	4.70	4.93	**230.62**	**43.1**
Calapandayan (Pob.)	3,997	4,031	5,293	**6,448**	0.2	3.1	4.4	888	741	975	**1,358**	4.50	5.44	5.43	4.75	**117.68**	**54.8**
Cawag-Cabitaogan	1,101	1,372	3,310	**5,110**	4.9	14.1	10.9	306	279	703	**1,130**	3.60	4.92	4.71	4.52	**6,365.64**	**0.8**
Ilwas (Pob.)	1,925	2,182	2,750	**3,089**	2.7	2.6	2.5	331	397	528	**638**	5.82	5.50	5.21	4.84	**14.81**	**208.6**
Mangan-Vaca	1,431	1,618	3,051	**3,598**	2.6	8.9	3.6	254	307	595	**779**	5.63	5.27	5.13	4.62	**928.78**	**3.9**
Matain	4,112	4,373	5,876	**5,910**	1.3	3.4	0.1	818	821	1,163	**1,219**	5.03	5.33	5.05	4.85	**41.98**	**140.8**
Naugsol	452	461	783	**1,183**	0.4	7.0	10.2	58	86	158	**243**	7.79	5.36	4.96	4.87	**369.51**	**3.2**
Pamatawan	1,110	1,194	2,295	**2,282**	1.5	9.2	-0.1	201	240	474	**493**	5.52	4.98	4.84	4.63	**7,043.13**	**0.3**
San Isidro	1,341	1,487	2,420	**3,229**	2.2	6.3	6.7	332	266	483	**680**	4.04	5.59	5.01	4.75	**184.41**	**17.5**
Sto. Thomas	1,506	1,923	3,258	**4,050**	5.5	6.9	4.9	253	360	738	**872**	5.95	5.34	4.41	4.64	**82.68**	**49.0**
Wawandue (Pob.)	1,294	1,282	2,011	**2,371**	-0.2	5.7	3.6	220	241	396	**515**	5.88	5.32	5.08	4.60	**18.57**	**127.7**
Subic Town Total	28,139	30,340	46,929	**57,099**	1.6	5.5	4.3	4,931	5,701	9,499	**12,040**	5.71	5.32	4.94	4.74	**27,920.00**	**2.0**

indicate Barangays showing decrease or stagnancy of population durig 1990 and 1995.

2) Age Structure

Age structures of subjected five (5) municipalities are summarized in Table 6.3.1-4 and Figures 6.3.1-2 (A) & (B) and 6.3.1-3 (A) & (B). Compared with the average figure of five (5) municipalities, Olongapo City shows a characteristic of smaller share in "10 to 14" age group especially among female residents. In other municipalities, Castillejos and San Antonio Towns are indicating slight tendency of "dome" structure with "5 to 9" age groups having larger share than those of "o to 4" age groups. While Dinalupihan Town is showing typical "pyramid" type age structure which is most similar to the average structure but with much more "younger" image. Subic Town is showing also a pattern of "pyramid" but characterized feature of slightly smaller share in "20 to 24" age group especially among male residents.

Age structures by Barangays are also analyzed as is shown in Table 6.3.1-5 (A) & (B) for the case of Olongapo City as an example. However, as the size and characteristic of individual Barangays differ one by one that not much useful information was obtained other than those data conveyed for the purpose of conceptual zoning for the Master Plan.

Table 6.3.1-4 Household Population by Sex and by Age Grous by Municipality (1995)

	Municipality	by SEX	Household Population (PP)	by AGE GROUP														
				0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 and over
Actual Numbers (pp)	CASTILLEJOS	Total	28,316	3,429	3,501	3,100	2,734	2,590	2,568	2,115	1,887	1,544	1,404	923	789	601	416	715
		Male	14,402	1,753	1,802	1,588	1,416	1,361	1,315	1,071	961	765	716	470	395	279	202	308
		Female	13,914	1,676	1,699	1,512	1,318	1,229	1,253	1,044	926	779	688	453	394	322	214	407
	DINALUPIHAN	Total	62,452	8,819	8,080	7,418	6,768	5,486	5,276	4,519	3,965	3,183	2,617	1,728	1,539	1,159	799	1,096
		Male	31,748	4,381	4,228	3,866	3,486	2,867	2,651	2,342	2,001	1,611	1,314	824	789	573	368	447
		Female	30,704	4438	3852	3552	3,282	2,619	2,625	2,177	1,964	1572	1,303	904	750	586	431	649
	OLONGAPO	Total	179,349	22,981	21,333	18,373	18,491	17,539	16,714	14,193	12,390	10,181	9,004	5,679	4,508	3,077	2,125	2,761
		Male	88,237	11864	11,059	9,406	8,998	8,642	7,863	6,858	5,967	4,840	4,286	2,724	2,185	1,466	968	1,111
		Female	91,112	11,117	10274	8,967	9,493	8,897	8,851	7,335	6,423	5,341	4,718	2,955	2,323	1611	1157	1650
	SAN ANTONIO	Total	25,677	2,852	2,925	2,700	2,357	2,247	2,300	2,052	1,894	1,486	1,299	909	822	572	431	831
		Male	12,968	1,474	1,511	1,378	1,223	1,121	1,141	1,049	1,011	763	630	445	413	264	201	344
		Female	12,709	1,378	1,414	1,322	1,134	1,126	1,159	1,003	883	723	669	464	409	308	230	487
	SUBIC	Total	56,987	7,795	7,470	6,426	5,513	5,036	5,067	4,519	4,040	3,123	2,528	1,603	1,350	918	664	935
		Male	28,789	3,940	3,867	3,236	2,771	2,542	2,616	2,281	2,070	1,580	1,290	800	663	437	316	380
		Female	28,198	3855	3,603	3190	2,742	2,494	2,451	2,238	1,970	1,543	1,238	803	687	481	348	555
	MUNICIPALITY TOTAL	Total	352,781	45,876	43,309	38,017	35,863	32,898	31,925	27,398	24,176	19,517	16,852	10,842	9,008	6,327	4,435	6,338
		Male	176,144	23,412	22,467	19,474	17,894	16,533	15,586	13,601	12,010	9,559	8,236	5,263	4,445	3,019	2.055	2,590
		Female	176,637	22,464	20,842	18,543	17,969	16,365	16,339	13,797	12,166	9,958	8,616	5,579	4,563	3,308	2,380	3,748
persent distribu-tion	CASTILLEJOS	Total	100.0	12.1	12.4	10.9	9.7	9.1	9.1	7.5	6.7	5.5	5.0	3.3	2.8	2.1	1.5	2.5
		Male	100.0	12.7	12.5	11.0	9.8	9.5	9.1	7.4	6.7	5.3	5.0	3.3	2.7	1.9	1.4	2.1
		Female	100.0	12.0	12.2	10.9	9.5	8.8	9.0	7.5	6.7	5.6	4.9	3.3	2.8	2.3	1.5	2.9
	DINALUPIHAN	Total	100.0	14.1	12.9	11.9	10.8	8.8	8.4	7.2	6.3	5.1	4.2	2.8	2.5	1.9	1.3	1.8
		Male	100.0	13.8	13.3	12.2	11.0	9.0	8.4	7.4	6.3	5.1	4.1	2.6	2.5	1.8	1.2	1.4
		Female	100.0	14.5	12.5	11.6	10.7	8.5	8.5	7.1	6.4	5.1	4.2	2.9	2.4	1.9	1.4	2.1
	OLONGAPO	Total	100.0	12.8	11.9	10.2	10.3	9.8	9.3	7.9	6.9	5.7	5.0	3.2	2.5	1.7	1.2	1.5
		Male	100.0	13.4	12.5	10.7	10.2	9.8	8.9	7.8	6.8	5.5	4.9	3.1	2.5	1.7	1.1	1.3
		Female	100.0	12.2	11.3	9.8	10.4	9.8	9.7	8.1	7.0	5.9	5.2	3.2	2.5	1.8	1.3	1.8
	SAN ANTONIO	Total	100.0	11.1	11.4	10.5	9.2	8.8	9.0	8.0	7.4	5.8	5.1	3.5	3.2	2.2	1.7	3.2
		Male	100.0	11.4	11.7	10.6	9.4	8.6	8.8	8.1	7.8	4.9	4.9	3.4	3.2	2.0	1.5	2.7
		Female	100.0	10.8	11.1	10.4	8.9	8.9	9.1	7.9	6.9	5.7	5.3	3.7	3.2	2.4	1.8	3.8
	SUBIC	Total	100.0	13.7	13.1	11.3	9.7	8.8	6.9	7.9	7.1	5.5	4.4	2.8	2.4	1.6	1.2	1.6
		Male	100.0	13.7	13.4	11.2	9.6	8.8	9.1	7.9	7.2	5.5	4.5	2.8	2.3	1.5	1.1	1.3
		Female	100.0	13.7	12.8	11.3	9.7	8.8	8.7	7.9	7.0	5.5	4.4	2,8	2.4	1.7	1.2	2.0
	MUNICIPALITY TOTAL	Total	100.0	13.0	12.3	10.8	10.2	9.3	9.0	7.8	6.9	5.5	4.8	3.1	2.6	1.8	1.3	1.8
		Male	100.0	13.3	12.8	11.1	10.2	9.4	8.8	7.7	6.8	5.4	4.7	3.0	2.5	1.7	1.2	1.5
		Female	100.0	12.7	11.8	10.5	10.2	9.3	9.3	7.8	6.9	5.6	4.9	3.2	2.6	1.9	1.3	2.1

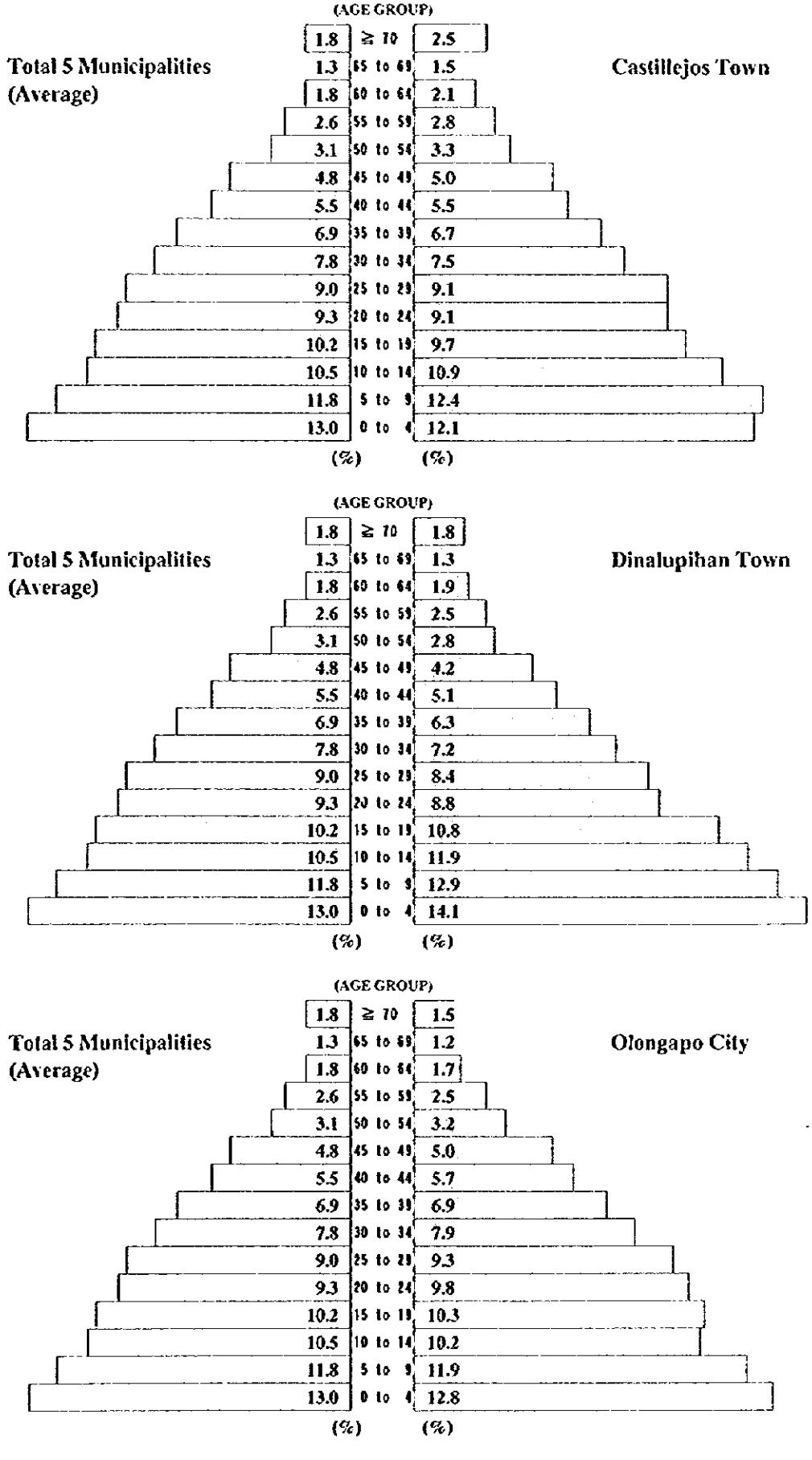


Figure 6.3.1-2 (A) Comparison of Age Group Structure

(Total Population : Total 5 Municipalities as the Average)

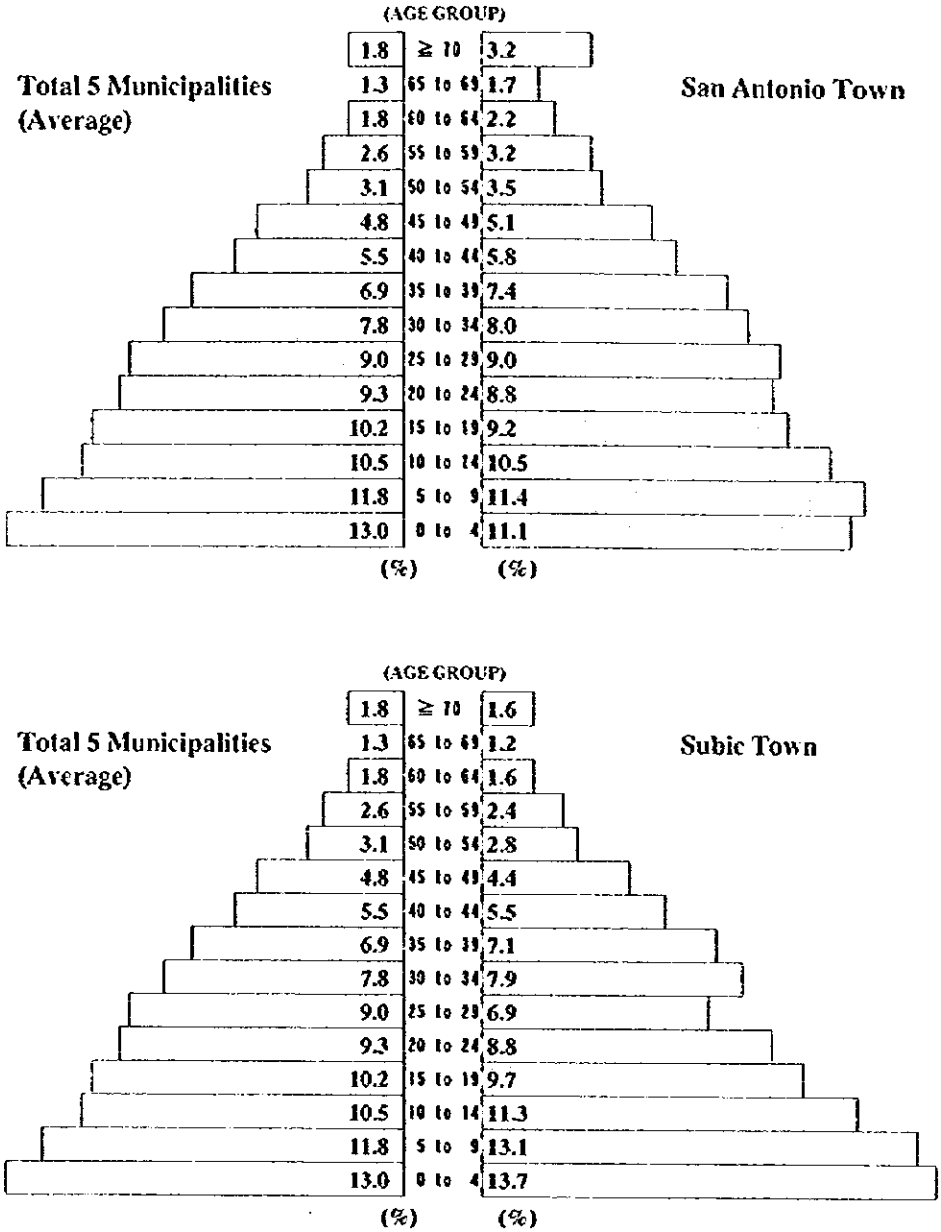


Figure 6.3.1-2 (B) **Comparison of Age Group Structure**
(Total Population : Total 5 Municipalities as the Average)

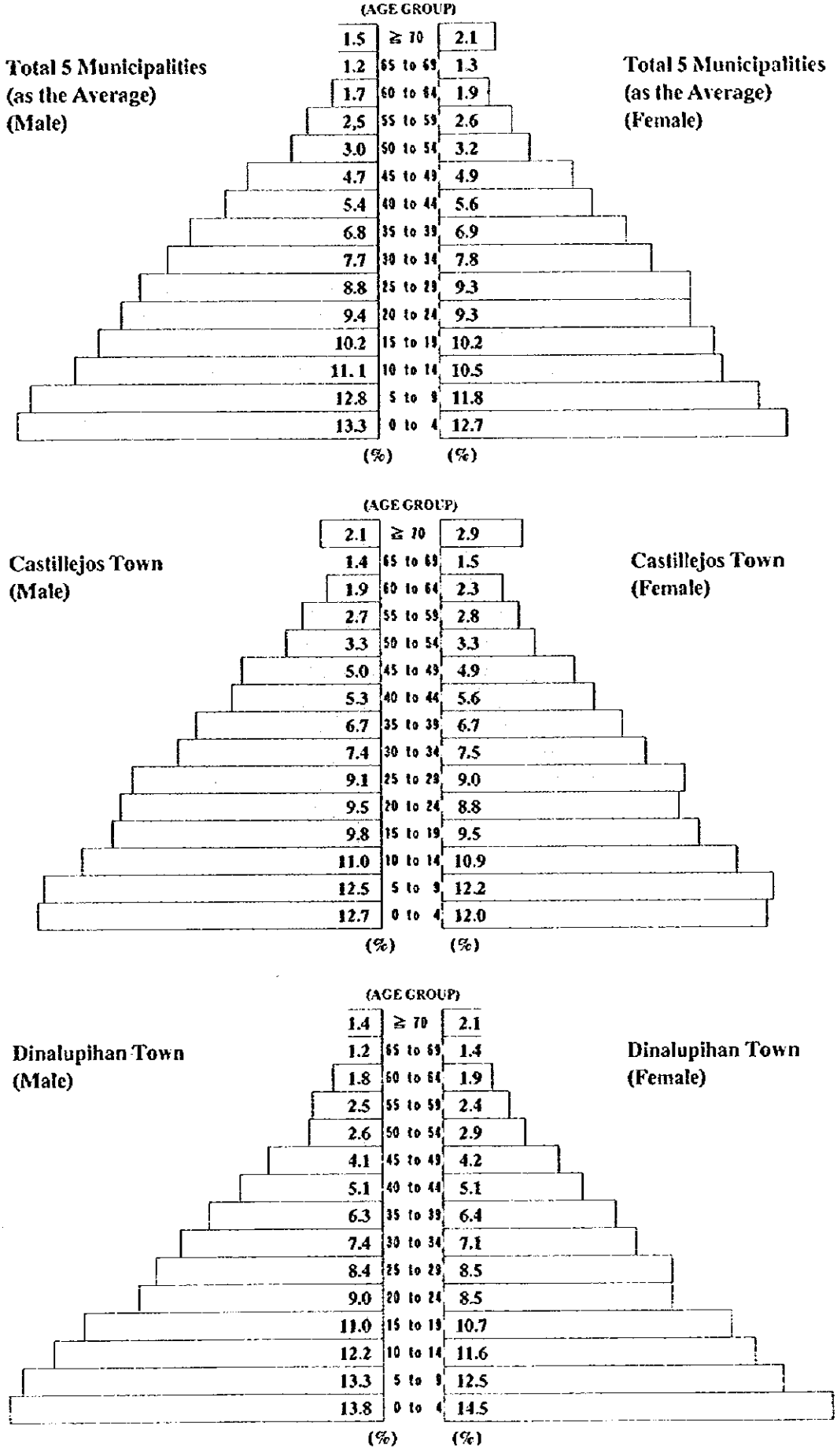


Figure 6.3.1-3 (A) Comparison of Age Group Structure by Sex

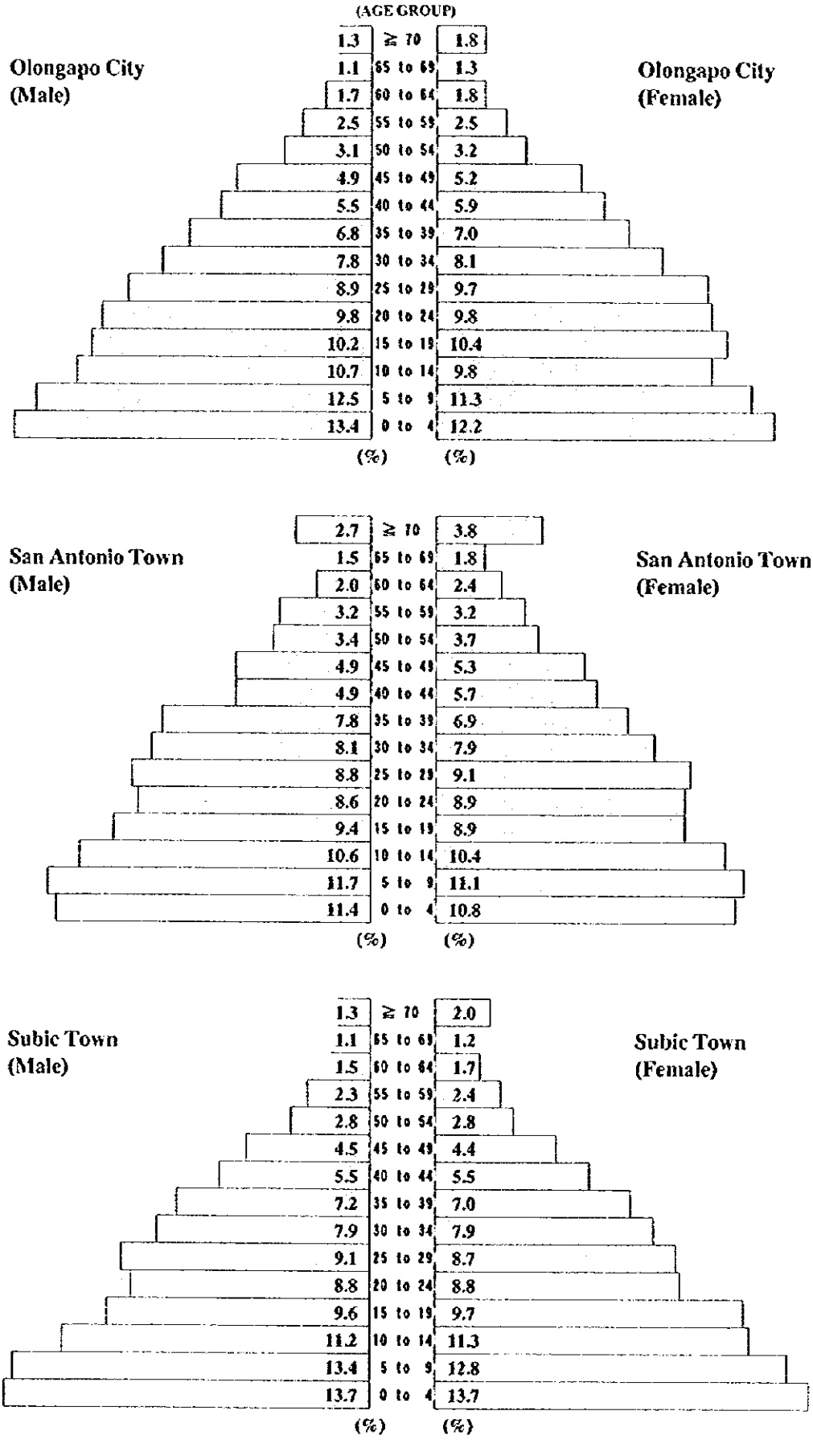


Figure 6.3.1-3 (B) Comparion of Age Group Structure by Sex

Table 6.3.1-5 (A) Household Population by Sex and Age Groups by Barangay (Olongapo City -1/2-)

Barangay	by SEX	Household Population (PP)	by AGE GROUP														
			0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 and over
Asinan	Total	3,198	367	304	255	303	311	340	306	254	215	173	112	87	60	47	64
	Male	1,554	174	165	131	147	149	148	152	133	104	88	59	33	28	20	23
	Female	1,644	193	139	124	156	162	192	154	121	111	85	53	54	32	27	41
Banicain	Total	6,263	780	750	646	604	610	625	532	500	341	303	186	138	104	65	79
	Male	3,003	379	390	311	300	282	286	272	235	158	144	87	64	44	25	26
	Female	3,260	401	360	335	304	328	339	260	265	183	159	99	74	60	40	53
Barretto	Total	12,095	1,568	1,468	1,260	1,216	1,195	1,139	915	844	679	583	415	300	191	145	177
	Male	6,018	820	762	653	610	598	508	432	408	331	288	220	141	91	74	82
	Female	6,077	748	706	607	606	597	631	483	436	348	295	195	159	100	71	95
East	Total	19,042	2,386	2,153	1,903	1,922	1,874	1,755	1,553	1,431	1,070	955	583	485	345	263	364
Bajac-bajac	Male	9,165	1,204	1,121	991	887	887	817	706	686	511	434	275	230	155	120	141
	Female	9,877	1,182	1,032	912	1,035	987	938	847	745	559	521	308	255	190	143	223
East Tapinac	Total	11,126	1,303	1,157	1,028	1,162	1,167	1,147	994	825	666	540	321	272	199	139	206
	Male	5,261	680	606	523	527	515	509	432	387	307	271	149	125	89	57	84
	Female	5,865	623	551	505	635	652	638	562	438	359	269	172	147	110	82	122
Gordon	Total	19,052	2,504	2,319	2,000	2,045	1,870	1,716	1,403	1,173	1,070	988	669	515	346	186	248
Heights	Male	9,556	1,310	1,154	1,064	1,038	928	854	696	578	515	465	333	270	164	91	96
	Female	9,496	1,194	1,165	936	1,007	942	862	707	595	555	523	336	245	182	95	152
Kalaklan	Total	9,245	1,276	1,161	949	920	892	961	719	610	479	423	258	202	147	120	128
	Male	4,712	699	611	483	471	451	476	376	295	237	204	125	105	69	59	51
	Female	4,533	577	550	466	449	441	485	343	315	242	219	133	97	78	61	77
New Kalalake	Total	9,062	1,127	1,015	852	943	878	869	793	636	542	457	291	254	154	110	141
	Male	4,428	608	533	438	472	412	398	382	303	249	219	136	113	74	47	44
	Female	4,634	519	482	414	471	466	471	411	333	293	238	155	141	80	63	97
Mabayuan	Total	9,935	1,286	1,157	1,067	973	922	898	840	682	573	505	316	259	164	128	165
	Male	4,846	632	613	570	470	455	396	400	336	279	229	153	130	73	53	57
	Female	5,089	654	544	497	503	467	502	440	346	294	276	163	129	91	75	108
New Cabalan	Total	14,322	2,008	1,997	1,675	1,504	1,279	1,204	969	881	789	628	457	340	229	164	198
	Male	7,193	1,044	987	853	752	671	593	491	438	394	296	219	170	114	79	92
	Female	7,129	964	1,010	822	752	608	611	478	443	395	332	238	170	115	85	106

Table 6.3.1-5 (B) Household Population by Sex and Age Groups by Barangay (Ologapo City -2/2-)

Barangay	by SEX	Household Population (PP)	by AGE GROUP														
			0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 and over
Old Cabalan	Total	9,324	1,340	1,254	1,010	965	859	795	706	544	487	489	314	221	143	91	106
	Male	4,751	679	670	517	500	454	400	351	261	237	255	145	116	83	41	42
	Female	4,573	661	584	493	465	405	395	355	283	250	234	169	105	60	50	64
New Ilalim	Total	1,656	205	179	144	164	194	154	131	121	96	101	53	41	32	16	25
	Male	794	108	89	63	76	89	75	60	67	42	50	26	23	12	7	7
	Female	862	97	90	81	88	105	79	71	54	54	51	27	18	20	9	18
New Kababae	Total	2,147	267	256	252	199	195	193	180	172	120	111	51	52	37	30	32
	Male	1,057	134	133	135	88	88	100	86	81	62	55	22	26	20	12	15
	Female	1,090	133	123	117	111	107	93	94	91	58	56	29	26	17	18	17
Pag-asa	Total	5,605	764	663	554	585	616	530	439	393	316	248	156	134	84	54	69
	Male	2,740	387	345	279	292	297	252	200	194	146	121	77	59	40	23	28
	Female	2,865	377	318	275	293	319	278	239	199	170	127	79	75	44	31	41
Santa Rita	Total	30,580	3,878	3,706	3,203	3,219	2,983	2,773	2,318	2,084	1,724	1,599	994	801	527	353	418
	Male	15,317	2,045	1,969	1,610	1,584	1,549	1,347	1,146	991	804	759	480	398	272	166	197
	Female	15,263	1,833	1,737	1,593	1,635	1,434	1,426	1,172	1,093	920	840	514	403	255	187	221
West Bajac-bajac	Total	9,051	1,079	982	849	1,013	887	844	763	656	534	472	271	225	178	109	189
	Male	4,279	521	504	419	481	442	364	372	312	240	206	116	101	79	48	74
	Female	4,772	558	478	430	532	445	480	391	344	294	266	155	124	99	61	115
West Tapinac	Total	7,646	843	812	726	754	807	771	632	584	480	429	232	182	137	105	152
	Male	3,563	440	407	366	303	375	340	304	262	224	202	102	81	59	46	52
	Female	4,083	403	405	360	451	432	431	328	322	256	227	130	101	78	59	100
OLONGAPO TOTAL	Total	179,349	22,981	21,333	18,373	18,491	17,539	16,714	14,193	12,390	10,181	9,004	5,679	4,508	3,077	2,125	2,761
	Male	88,237	11,864	11,059	9,406	8,998	8,642	7,863	6,858	5,967	4,840	4,286	2,724	2,185	1,466	968	1,111
	Female	91,112	11,117	10,274	8,967	9,493	8,897	8,851	7,335	6,423	5,341	4,718	2,955	2,323	1,611	1,157	1,650
% in Total POPULATION	Total	(100.0)	12.8	11.9	10.2	10.3	9.8	9.3	7.9	6.9	5.7	5.0	3.2	2.5	1.7	1.2	1.5
	Male	(100.0)	13.4	12.5	10.7	10.2	9.8	8.9	7.8	6.8	5.5	4.9	3.1	2.5	1.7	1.1	1.3
	Female	(100.0)	12.2	11.3	9.8	10.4	9.8	9.7	8.1	7.0	5.9	5.2	3.2	2.5	1.8	1.3	1.8

3) Employment Conditions

Employment conditions in the subjected five (5) municipalities are summarized as shown in Table 6.3.1-6 and Figure 6.3.1-4.

Out of "Economically Active Population (i.e. age groups of "15 to 65")", slightly less than half of people are considering that they are engaging to some type of "employment". By sex, over 60 % of male and around 30 % of female of economically active population name a type of employment. By municipality, Castillejos Town shows highest percentage of "employment" and San Antonio Town the lowest. In Olongapo City, male show the lowest percentage of engagement while female the highest, compared with the other municipalities. By type of "employment", "Private Business" always have the highest share seconded by "Self-Employment". Out of total employment in five (5) municipalities, 52.9 % is engaging "Private Business". This figure varies by municipality. It can be said that the largest share of 56.7 % in Olongapo City influenced the general tendency of total five (5) municipalities as the former has the largest population and employment in the latter.

"Government" is the third largest employment source in every municipality usually sharing 10 to 12 % of total employment with only exception in Subic Town where only 6.5 % is engaging to "Government" employment.

"Domestic Service" absorbs nearly 10 % of total employment of course mainly engaged by female.

Table 6.3.1-6 Household Population, Economically Active Population and Employment by Sex (by Municipality)

	Municipality	by SEX	Houschold Population (PP)	Economically Active Population (% to HH PP)	by EMPLOYMENT								Total Answered	
					Domestic Service	Private Business	Govern-ment	Self-employed	Employer	W/pay own bus.	W/o pay own bus.	Not Stated	Number (pp)	% to E. A. PP
Actual Numbers (pp.)	CASTILLEJOS	Total	28,316	17,179 (60.7)	883	4,108	1,020	2,306	305	28	217	24	8,891	51.8
		Male	14,402	8,747 (60.7)	341	3,324	610	1,556	229	22	136	16	6,234	71.3
		Female	13,914	8,432 (60.6)	542	784	410	750	76	6	81	8	2,657	31.5
	DINALUPIHAN	Total	62,031	36,235 (58.4)	1,230	8,275	1,850	3,916	1,012	20	255	45	16,603	45.8
		Male	31,748	18,458 (58.1)	477	6,878	1,039	2,727	728	18	195	27	12,089	65.5
		Female	30,283	17,777 (58.7)	753	1,397	811	1,189	284	2	60	18	4,514	25.4
	OLONGAPO	Total	179,349	111,826 (62.4)	4,186	28,670	5,965	8,969	1,911	118	571	159	50,549	45.2
		Male	88,257	53,879 (61.0)	1,250	20,039	3,500	5,127	1,207	50	295	92	31,560	58.6
		Female	91,092	57,947 (63.6)	2,936	8,631	2,465	3,842	704	68	276	67	18,989	32.8
	SAN ANTONIO	Total	25,677	15,937 (62.1)	695	2,750	836	1,626	447	23	209	19	6,605	41.4
		Male	12,976	8,060 (62.1)	133	2,262	562	1,222	377	18	173	15	4,762	59.1
		Female	12,701	7,877 (62.0)	562	488	274	404	70	5	36	4	1,843	23.4
	SUBIC	Total	56,987	33,697 (59.1)	960	8,657	1,079	4,302	832	91	528	29	16,478	48.9
		Male	28,789	17,048 (59.2)	257	6,747	594	3,025	579	56	372	19	11,649	68.3
		Female	28,198	16,649 (59.0)	703	1,910	485	1,277	253	35	156	10	4,829	29.0
	MUNICIPALITY TOTAL	Total	352,360	214,874 (61.0)	7,954	52,460	10,750	21,119	4,507	280	1,780	276	99,126	46.1
		Male	176,172	106,192 (60.3)	2,458	39,250	6,305	13,657	3,120	164	1,171	169	66,294	62.4
		Female	176,188	108,682 (61.7)	5,496	13,210	4,445	7,462	1,387	116	609	107	32,832	30.2
% (percent) distributio	CASTILLEJOS	Total	28,316	17,179 (60.7)	9.9	46.2	11.5	25.9	3.4	0.3	2.4	0.3	(100.0)	
		Male	14,402	8,747 (60.7)	5.5	53.3	9.8	25.0	3.7	0.4	2.2	0.3	(100.0)	
		Female	13,914	8,432 (60.6)	20.4	29.5	15.4	28.2	2.9	0.2	3.0	0.3	(100.0)	
	DINALUPIHAN	Total	62,031	36,235 (58.4)	7.4	49.8	11.1	23.6	6.1	0.1	1.5	0.3	(100.0)	
		Male	31,748	18,458 (58.1)	3.9	56.9	8.6	22.6	6.0	0.1	1.6	0.2	(100.0)	
		Female	30,283	17,777 (58.7)	16.7	30.9	18.0	26.3	6.3	0.0	1.3	0.4	(100.0)	
	OLONGAPO	Total	179,349	111,826 (62.4)	8.3	56.7	11.8	17.7	3.8	0.2	1.1	0.3	(100.0)	
		Male	88,257	53,879 (61.0)	4.0	63.5	11.1	16.2	3.8	0.2	0.9	0.3	(100.0)	
		Female	91,092	57,947 (63.6)	15.5	45.5	13.0	20.2	3.7	0.4	1.5	0.4	(100.0)	
	SAN ANTONIO	Total	25,677	15,937 (62.1)	10.5	41.6	12.7	24.6	6.8	0.3	3.2	0.3	(100.0)	
		Male	12,976	8,060 (62.1)	2.8	47.5	11.8	25.7	7.9	0.4	3.6	0.3	(100.0)	
		Female	12,701	7,877 (62.0)	30.5	26.5	14.9	21.9	3.8	0.3	2.0	0.2	(100.0)	
	SUBIC	Total	56,987	33,697 (59.1)	5.8	52.5	6.5	26.1	5.0	0.6	3.2	0.2	(100.0)	
		Male	28,789	17,048 (59.2)	2.2	57.9	5.1	26.0	5.0	0.5	3.2	0.2	(100.0)	
		Female	28,198	16,649 (59.0)	14.6	39.6	10.0	26.4	5.2	0.7	3.2	0.2	(100.0)	
	MUNICIPALITY TOTAL	Total	352,360	214,874 (61.0)	8.0	52.9	10.8	21.3	4.6	0.3	1.8	0.3	(100.0)	
		Male	176,172	106,192 (60.3)	3.7	59.2	9.5	20.6	4.7	0.2	1.8	0.3	(100.0)	
		Female	176,188	108,682 (61.7)	16.7	40.2	13.5	22.7	4.2	0.4	1.9	0.3	(100.0)	

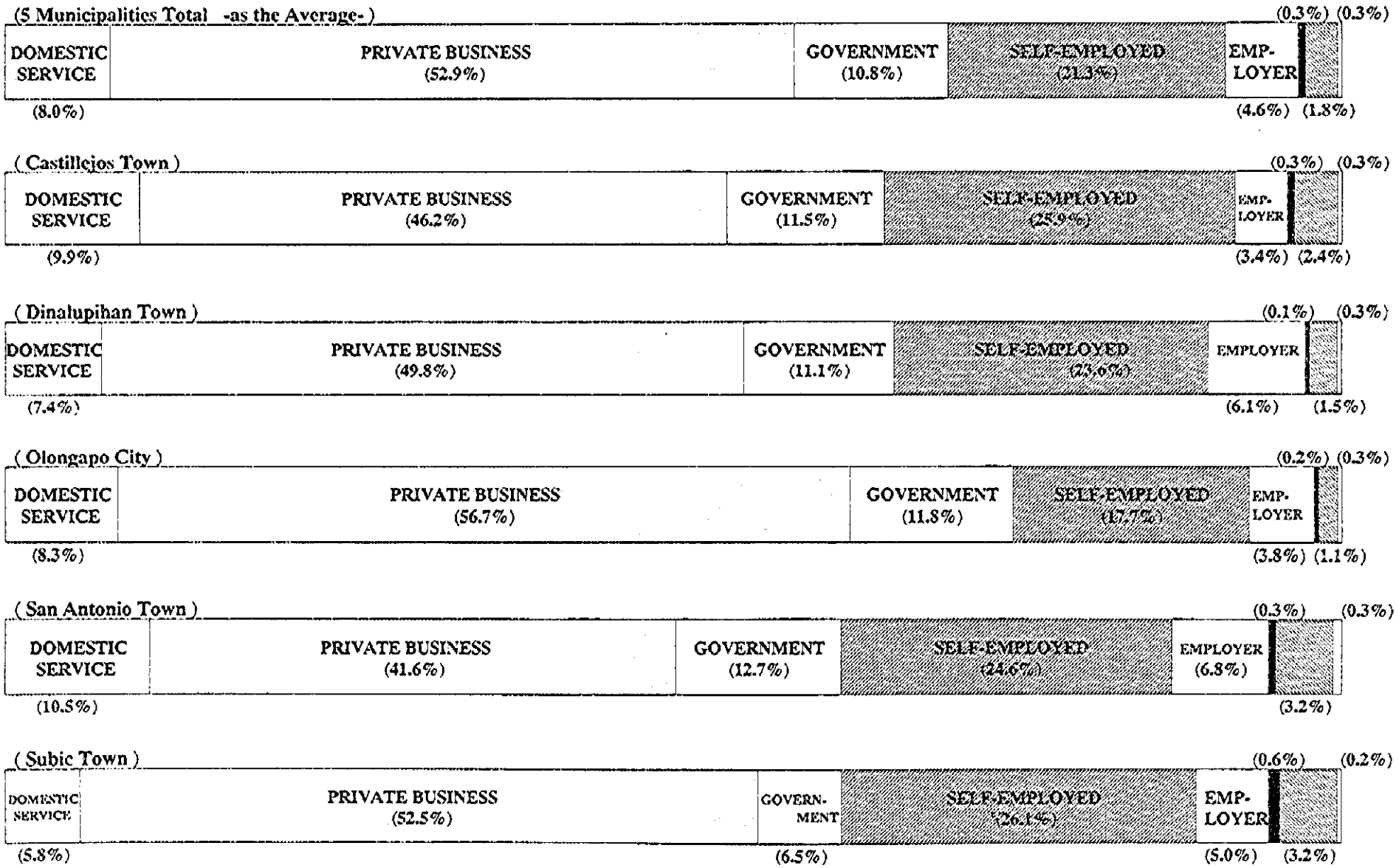


Figure 6.3.1-4 Employment Distribution By Municipality

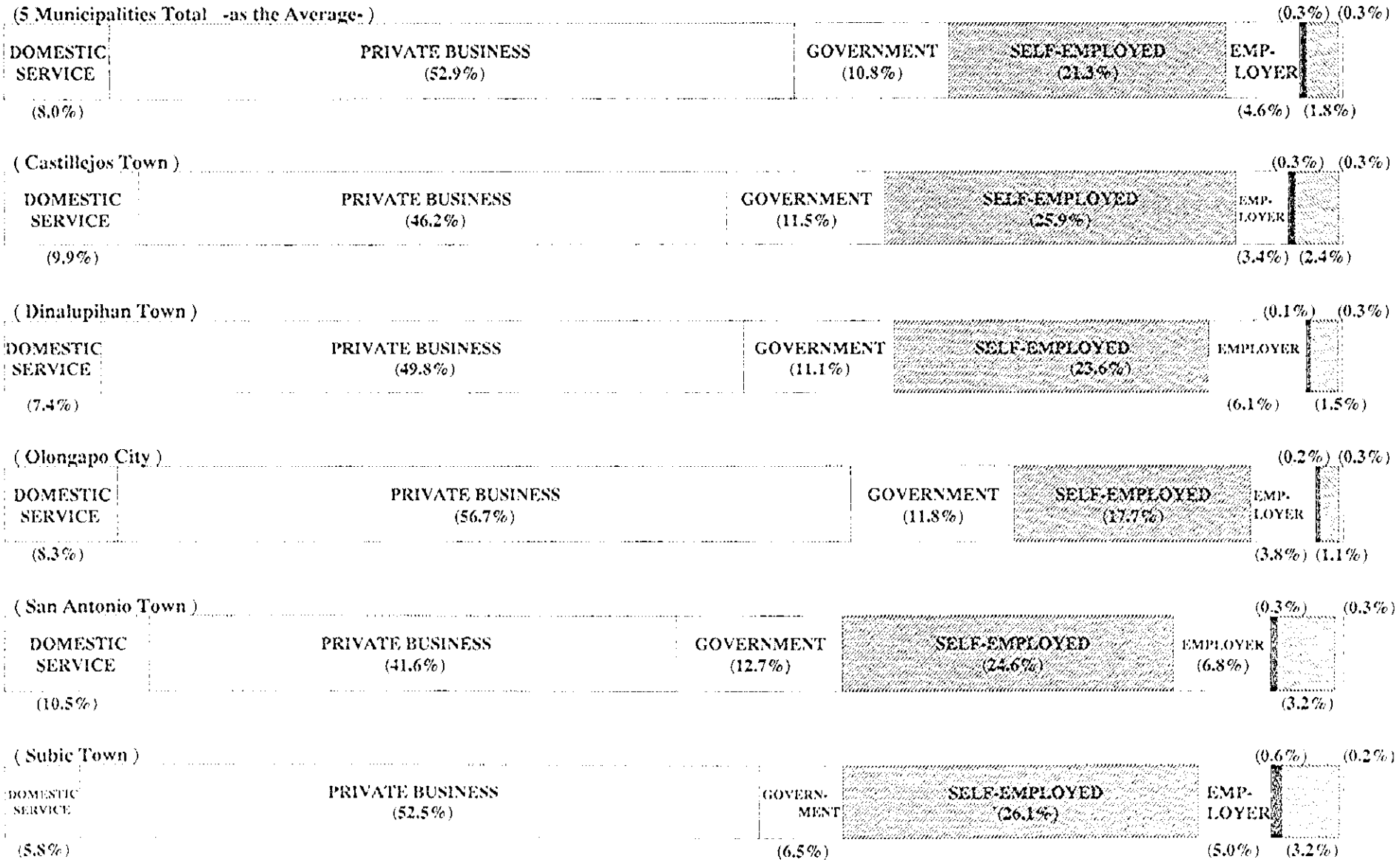


Figure 6.3.1-4 Employment Distribution By Municipality

4) Occupation Conditions

In total five (5) municipalities, nearly half of occupation is shared by "Service". "Trade" comes next sharing 14.1 % followed by "Construction" (13.3 %). "Manufacturing" and "Agriculture" are in the 4th and 5th position sharing 8.8 % and 8.5 % respectively. Share of "Fishing" is only 3.7 % of the total occupation and "Electricity/Gas/Water" is as small as 1.3 % followed only by "Quarrying and Mining" with a nominal figure of 0.1 %. In other words, there are only 148 people engaging in "Quarrying and Mining" out of 214,874 occupation. Looking into municipality-base, there are considerable difference as shown in Table 6.3.1-7 and Figure 6.3.1-5. In Castillejos, Dinalupihan and San Antonio Towns, "Agriculture" comes the 2nd largest position nearing to 20 % of total occupation. In Olongapo City with the largest urban facilities, "Service" has the far largest share of 57.6 % followed by "Trade" (16.3 % of municipality total), "Construction" (11.8 %) and "Manufacturing" (9.6 %). Although the share of "Manufacturing" in Olongapo City is less than 10 %, actual number of people engaging the "Manufacturing" counts 4,869 out of total 8,750 in five subjected municipalities, which means 55.6 % of "Manufacturing" occupants are concentrated in Olongapo City. "Fishing" is one of the major occupations in San Antonio and Subic Towns. Out of 3,649 fishers in five (5) municipalities, 2,360 (64.7 %) are concentrated in Subic Town and 642 (17.6 %) are in San Antonio Town. There are 516 (14.1 %) fishers in Olongapo City that is the third largest group in "Fishing" occupants, but this group is literally absorbed in the far larger volume of total occupation holders (111,826) and is only showing 1.0 % of occupation share in the municipality. Subic Town is characterized with its comparatively smaller share of "Service" and comparatively larger share of "Trade", "Manufacturing" and "Construction". It is estimated that Subic Town is behaving like a satellite town to the largest urbanized municipality of Olongapo City.

Barangay based occupation conditions are also analyzed for conceptual zoning. Although processed data are not shown in this Report, they reveal an interesting pattern of occupation especially in the case of "Fishing".

Table 6.3.1-7 Household Population, Economically Active Population and Occupation by Sex (by Municipality)

	Municipality	by SEX	Household Population (PP)	Economically Active Population (% to HH PP)	by OCCUPATION									Total Answered	
					Agri-culture	Fishing	Mining & Quarrying	Manufac-turing	Electric./ Gas/Wate	Const-ruction	Trade	Services	Not Stated	Number (pp)	% to E. A. PP
Actual Number (pp.)	CASTILLEJOS	Total	28,316	17,179 (60.7)	1,654	99	8	730	123	1,462	969	3,839	7	8,891	51.8
		Male	14,402	8,747 (60.7)	1,574	90	8	516	111	1,431	262	2,237	5	6,234	71.3
		Female	13,914	8,432 (60.6)	80	9	-	214	12	31	707	1,602	2	2,657	31.5
	DINALUPIHAN	Total	62,031	36,235 (58.4)	3,286	42	34	1,197	197	2,700	1,817	7,306	25	16,604	45.8
		Male	31,748	18,458 (58.1)	2,941	40	34	773	188	2,654	592	4,860	17	12,099	65.5
		Female	30,283	17,777 (58.7)	345	2	-	424	9	46	1,225	2,446	8	4,505	25.3
	OLONGAPO	Total	179,349	111,826 (62.4)	941	516	33	4,869	758	5,955	8,238	29,119	120	50,549	45.2
		Male	88,257	53,879 (61.0)	784	498	26	2,630	687	5,751	3,574	17,543	65	31,558	58.6
		Female	91,092	57,947 (63.6)	157	18	7	2,239	71	204	4,664	11,576	55	18,991	32.8
	SAN ANTONIO	Total	25,677	15,937 (62.1)	1,132	632	14	248	55	741	620	3,157	6	6,605	41.3
		Male	12,976	8,060 (62.1)	1,088	620	10	171	53	727	185	1,905	4	4,763	58.7
		Female	12,701	7,877 (62.0)	44	12	4	77	2	14	435	1,252	2	1,842	23.4
	SUBIC	Total	56,987	33,697 (59.1)	1,401	2,360	59	1,706	190	2,312	2,345	6,079	27	16,479	48.9
		Male	28,789	17,048 (59.2)	1,167	2,289	51	1,247	181	2,265	1,098	3,598	14	11,910	69.9
		Female	28,198	16,649 (59.0)	234	71	8	459	9	47	1,247	2,481	13	4,569	27.4
	Municipalities Total	Total	352,360	214,874 (61.0)	8,414	3,649	148	8,750	1,323	13,170	13,989	49,500	185	99,128	46.1
		Male	176,172	106,192 (60.3)	7,554	3,537	129	5,337	1,220	12,828	5,711	30,143	105	66,564	62.7
		Female	176,188	108,682 (61.7)	860	112	19	3,413	103	342	8,278	19,357	80	32,564	30.0
% (percent) distributio	CASTILLEJOS	Total	28,316	17,179 (60.7)	18.6	1.1	0.1	8.2	1.4	16.4	10.9	43.2	0.1	(100.0)	
		Male	14,402	8,747 (60.7)	25.2	1.4	0.1	8.3	1.8	23.0	4.2	35.9	0.1	(100.0)	
		Female	13,914	8,432 (60.6)	3.0	0.3	-	8.1	0.5	1.2	26.6	60.3	0.1	(100.0)	
	DINALUPIHAN	Total	62,031	36,235 (58.4)	19.8	0.3	0.2	7.2	1.2	16.3	10.9	44.0	0.2	(100.0)	
		Male	31,748	18,458 (58.1)	24.3	0.3	0.3	6.4	1.6	21.9	4.9	40.2	0.2	(100.0)	
		Female	30,283	17,777 (58.7)	7.7	0.0	-	9.4	0.2	1.0	27.2	54.3	0.2	(100.0)	
	OLONGAPO	Total	179,349	111,826 (62.4)	1.9	1.0	0.1	9.6	1.5	11.8	16.3	57.6	0.2	(100.0)	
		Male	88,257	53,879 (61.0)	2.5	1.6	0.1	8.3	2.2	18.2	11.3	55.6	0.2	(100.0)	
		Female	91,092	57,947 (63.6)	0.8	0.1	0.0	11.8	0.4	1.1	24.6	61.0	0.3	(100.0)	
	SAN ANTONIO	Total	25,677	15,937 (62.1)	17.1	9.6	0.2	3.8	0.8	11.2	9.4	47.8	0.1	(100.0)	
		Male	12,976	8,060 (62.1)	23.0	13.1	0.2	3.6	1.1	15.4	3.9	40.2	0.1	(100.0)	
		Female	12,701	7,877 (62.0)	2.4	0.7	0.2	4.2	0.1	0.8	23.6	68.0	0.1	(100.0)	
	SUBIC	Total	56,987	33,697 (59.1)	8.5	14.3	0.4	10.4	1.2	14.0	14.2	36.9	0.2	(100.0)	
		Male	28,789	17,048 (59.2)	9.8	19.2	0.4	10.5	1.5	19.0	9.2	30.2	0.1	(100.0)	
		Female	28,198	16,649 (59.0)	5.1	1.6	0.4	10.0	0.2	1.0	27.3	54.3	0.3	(100.0)	
	Municipalities Total	Total	352,360	214,874 (61.0)	8.5	3.7	0.1	8.8	1.3	13.3	14.1	49.9	0.2	(100.0)	
		Male	176,172	106,192 (60.3)	11.3	5.3	0.2	8.0	1.8	19.3	8.6	45.3	0.2	(100.0)	
		Female	176,188	108,682 (61.7)	2.6	0.3	0.1	10.5	0.3	1.1	25.4	59.4	0.2	(100.0)	

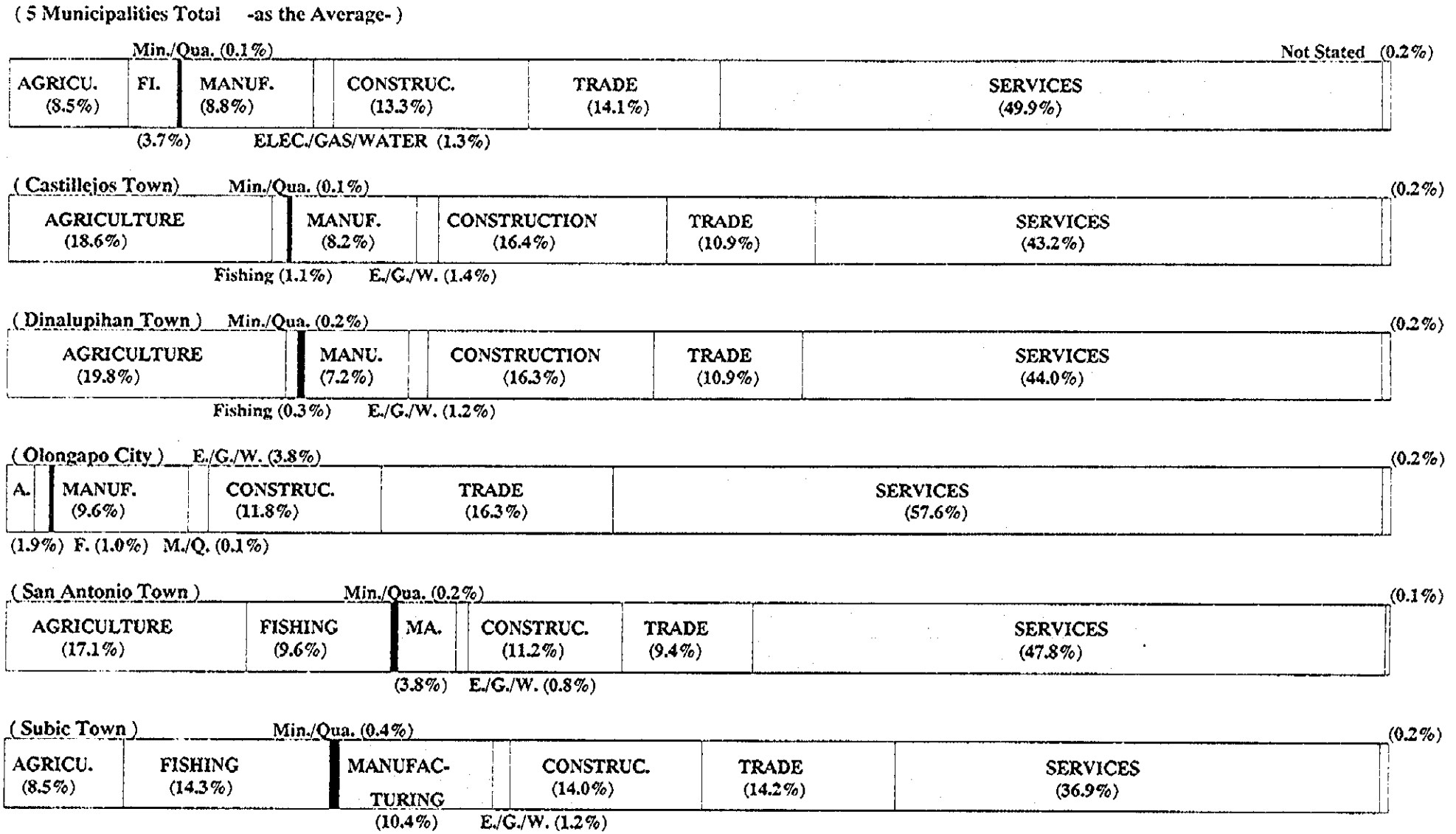


Figure 6.3.1-5 Distribution of Occupation by Municipality

6.3.2 Present Infrastructure around Subic Bay

In this section, infrastructure/facilities are studied only for Olongapo City and Subic Town. There is of course Morong Town directly south to the SBMA area facing Subic Bay. But it is excluded as it is separated physically by the Reserved area and socio-economically from the activities in Subic Bay.

(1) Water Supply

Water supply in the Philippines is regulated and controlled by the Local Water Utilities Administration (LWUA) which is the national government agency in charge of the financing of improvement and regulation of Local Water District (LWD) all over the Philippines.

Under the LWUA, both municipalities subjected in this section have their own local water district for the management of water as follows;

Olongapo City	Olongapo City Water District (OCWD)
Subic Town	Subic Water District (SWD)

1) Olongapo City Water District (OCWD)

The OCWD practically services to the whole of the city area except for areas with very high elevations where the water pressure is not sufficient to reach. It has one (1) spring, one (1) deep-well and pump station and two (2) diversion dams for water resources, two (2) storage tanks and one (1) treatment plant, and 160 kilometers of pipeline with diameters ranging from 50 to 600 mm.

Its capacity of water supply is not enough for local demands and present water resources are barely sufficient during wet season and there frequently occur water deficit in dry season. Additional water resources and supplying pipelines are needed to meet the present deficiency and future demands.

2) Subic Town Water District (SWD)

The SWD also practically covers the whole municipality other than the areas of eastern shoreline of Redondo Peninsular where fishery colonies are existing sporadically. It has four (4) deep-well and pump stations and two (2) dams for water resources and 26 kilometers of pipeline with diameters ranging from 50 to 250 mm. As the servicing area and population are far smaller than the OCWD, water resources problem is not so serious at present. However the water supply service is suffering from aging of distribution system especially the pipelines at the poblacion (central urbanized area of several Barangays) area.

3) Future Improvement Plan

There are recommended ground water resources in San Marcelino-Castillejos and Dinalupihan area to supply the future water demands of Subic Bay area especially for Olongapo City and Subic Town. A recommendation to form a single Local Water District including all those municipalities - The Metro Olongapo Water District or the SBMA Water District - was proposed by the "Subic Bay Area Urban Development Project" which was studied under the Asian Development Bank (ADB) Technical Assistance (Feb., 1993).

(2) Sanitation and Drainage

There is no systematic sewerage system neither in Olongapo City nor in Subic Town. In both municipalities, commercial and industrial establishments use septic tanks for sewage disposal and some thirty (30) percent or so individual housings also use septic tanks. The other residences have pit privies or no toilet. In any cases, effluent discharged into drainage canals along the roadways and finally into the rivers without any treatment.

Condition of drainage is similar to the above. In Olongapo City, drainage network consists mainly of side-ditches and open canals emptying into the natural stream channel and finally into the rivers, again without any treatment. In Subic Town, with less man-made ditches and canals, and proximity to sea-shores, rainfall run-off is the largest sources of conveying drainage to the rivers and sea waters.

The present status of sanitation and drainage is desperately inadequate and insufficient even to sustain the existing population. In every wet season, the most densely inhabited areas become flood-prone with debris of sewage and it needs several days for the flooding to recede. An urgent measure is needed if the areas to participate into the development of Subic Bay Port area.

(3) Housing

The existing state of housing and housing-related infrastructures and amenities are observed to be very poor. Most of them are constructed without proper planning and rational provision of basic infrastructure. Together with the lack or shortage of adequate maintenance measures and hard weather conditions, most of them are deteriorating fast.

In 1993, when just after the turning back of the U.S. Subic Naval Base, there were 41,841 housing units in Olongapo City. At the time, there were 42,632 households leaving 782 doubled-up households. In Subic Town, there were 9,155 occupied housing units with 10,839 households leaving 1,684 doubled-up households. According to the 1995 Census, number of

households in Olongapo City decreased to 38,983 while those in Subic Town increased to 12,040. This decrease of households in Olongapo City does not necessarily mean the improvement of housing conditions as there were many unacceptable housing units (1,608 units) already in 1993. Condition in Subic Town may be worsened with the steady growth of population within its territory.

Recent tendency reveals that once decreased population of Olongapo City is recovering quickly due to development measures taken place in the SBMA area and creation new job opportunities thereof. If the growth rate of population in the future is as large as the time when the U.S. Subic Naval Base was not turned back, there will be annual needs of new housing units of 2,000 to 2,300 in Olongapo City and 800 to 900 in Subic Town. Present supply may not be able to cope with such a large demand without proper housing-related infrastructures,

It is not the purpose of this study to propose or recommend any infrastructural development activities concerning the area around Subic Bay, but, from the viewpoint of the social environment, a comprehensive improvement and development program concentrated on the housings and housing-related infrastructure should be taken place immediately at least to sustain and smoothly implement the Subic Bay Port Improvement Program as the area is the hinterland of such development activities.

6.3.3 Present Ownership, Rights and Utilization of Land and Water Area around Subic Bay

At present, only limited information is available concerning the ownership, rights and utilization of land and water area. Several land-use map with different timings and different classification are collected from different authorities such as municipalities, the PENRO (Provincial Environment and Natural Resources Office) and the CENRO (Community Environment and Natural Resources Office). Based on such information, a data map on land area was processed for the purpose of conceptual zoning of Subic Bay area according to the geographical zone and the information was conveyed to the Master Plan (see 7.2 Conceptual Zoning). There seemed to be not much regulation or definition on rights and utilization of water area at present. Other than the regulation to secure the safety passage of vessels to and from the Subic Bay Port and prohibition of commercial fishing within the Bay area, fishermen are freely utilizing water area including domestic consumption of catches.

6.3.4 Remains and Cultural Assets

At present, there is no designated remains and cultural assets within the study area. However, there is a possibility of anthropological remains along the western coast of Redondo Peninsular where the most part is conceded to public and/or private enterprises, and

Natural Reservation Area directly south of the SBMA area if a comprehensive cultural and anthropological survey is conducted.

Other than the so called "Indigenous Fishermen" along the eastern coast of Redondo Peninsular, there is a group of indigenous people within the SBMA area and the Natural Reservation Area called "Aytas (Ay-Itas). They could be regarded as an Indigenous Cultural Community (ICC) who have been maintained somewhat traditional and self-sufficient life-style. Unfortunately, their own culture and life-style are already influenced and changed by the surrounding common Filipino cultures and they leave no tangible cultural assets. Preservation and protection of such intangible cultures and the members of the ICC should be considered at a different scheme but at least some measures for improving their income level can be considered within the framework of this Study.

6.3.5 Local Residence

As is already described in 6.3.2 (3), there are several hundreds of doubled-up households in Olongapo City and Subic Town. The "Subic Bay Area Urban Development Project" regards these households as "squatters" together with the residents who are living in unacceptable dwelling units. Total number of households of these so-called "squatters" counted 4,724 in Olongapo City and 1,049 in Subic Town at the time of the said study (1993). After five(5) years of the said study, it is anticipated the increase of such households. If simply adopting the average members per household in 1995, it is calculated that there are more than 26,000 "squatters" in two (2) municipalities. This figure indicates that more than 10 % of the residents of both municipalities are "squatters". It is ridiculous to believe so.

As is mentioned in 6.3.1 (1) Overview, those "Urban Poors" who are not regarded as "squatters" by the municipalities concerned, with a total figure of around 2,000, may be the actual number of somewhat illegally residing population in Olongapo City. Those counted as "squatters" in Subic Town by the said study may be the fishermen and their families residing along the eastern coast of Redondo Peninsular without any social/public services from the municipality. They are supposed to be "indigenous" to the area even if it is difficult to prove.

There are several hundreds of "Aytas" within the SBMA area and adjoining Natural Reservation Area making their lives with collection of natural resources, under-working for local residents and guiding of ecology tourists. They are actually "indigenous" to their residing area and are not "illegal" occupants. In case the development activities take place inside the SBMA area, they could be the direct beneficiary during and after the implementation of such projects.

Conclusion at this stage is as already mentioned in 6.3.1 (1) Overview that, there are about 2,000 "Urban Poors" who are residing in very much unacceptable housing units in Olongapo City and about 2,000 "Indigenous Fishermen" in Subic Town. There can be

anticipated not much disturbance from them when the Subic Bay Port Improvement activities are taken place because such activities may not adversely influence them but will contribute for job opportunity to get out from the poverty that keeps them in the present status. About the "Indigenous Fishermen" along the eastern coast of Redondo Peninsular, again as mentioned in the Overview, not much friction is anticipated as they are out of direct impact area of development activities. However, there is a possibility of quarrying and collection of soils and sands for the project site take place at their living area, i.e. the eastern coast of Redondo Peninsular. Such activity may not contribute to them and change of natural environment may brought out. A questionnaire survey concerning their opinions towards development and developmental activities and consciousness on natural environment will be conducted at the next phase of this Study.

6.3.6 Vehicular Traffic

In the SBF secured area there are 5 gates controlled by SBMA: Main Gate, Kalaklan Gate, Tipo Gate, Kalayaan Gate and Morong Gate. Among these gates cargo trucks can pass through only 2 gates (Kalaklan Gate and Tipo Gate) .

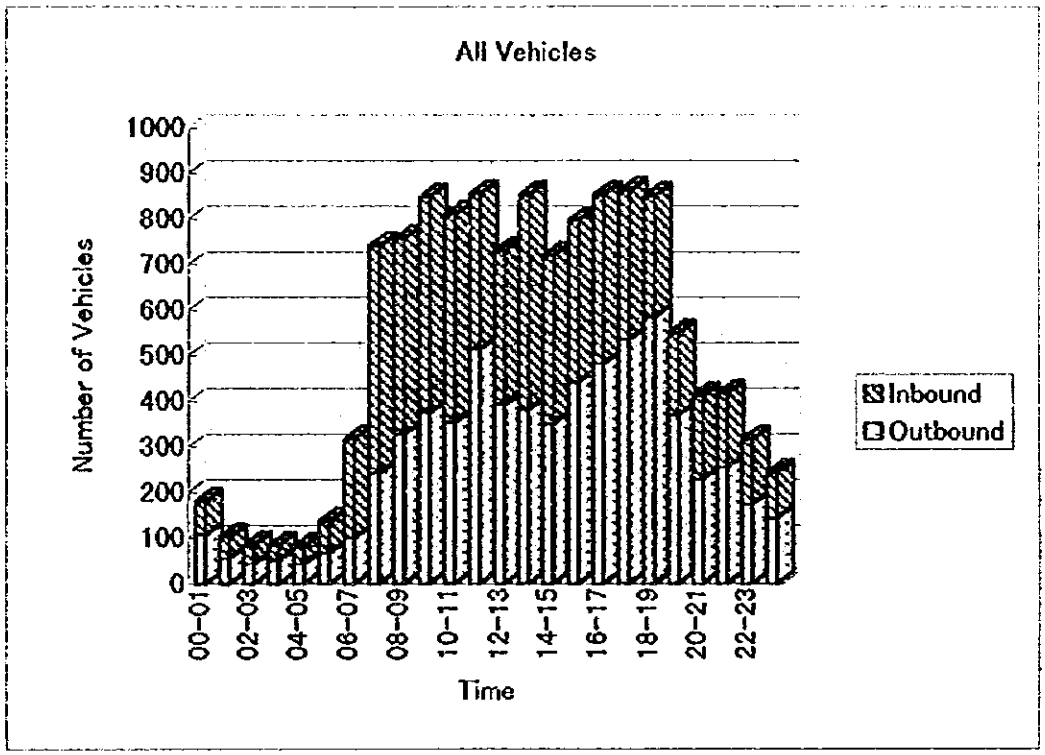
The Study Team selected two days, Jan.29(weekday) and Feb.1(weekend), randomly in order to grasp the normal traffic condition in the SBF Secured Area. The 13 categorized vehicles mentioned below were surveyed along the in-out directions at the 5 gates.

i) cars (sedan)
ii) jeepney (public small bus)
iii) pick-up truck
iv) truck
v) bus
vi) small type of van truck
vii) open type jeep
viii) personnel small bus
ix) motor bike
x) container trailer
   ①40feet loaded
   ②40feet empty
   ③20feet loaded
   ④20feet empty

The weekday and weekend traffic situations are shown in Figure 6.3.6-1 and 6.3.6-2 respectively. Since cargo trucks carrying shipping cargo are only allowed to go through Kalaklan gate and Tipo gate, trucks and trailers at these 2 gates were counted, while all other vehicles at all gates were counted.

There seems to be little difference in traffic patterns between weekdays and weekends for all types of vehicles. Traffic is most active around noon and least active around midnight. In-coming vehicles represent the majority during A.M. hours while the opposite flow is seen during P.M. hours. The traffic is concentrated from 07:00 to 19:00 on weekdays, but on weekends the concentration is lower because there are no commuters.

While the number of all vehicles on the weekend (9,500) is about 75 % of the number during weekdays (12,600), the number of trucks and trailers on the weekend (240) is 36 % of the number on weekdays (660). Therefore daily number of trucks and trailers is about 2.5 % (weekend) and 5 % (weekday) of the total traffic number.



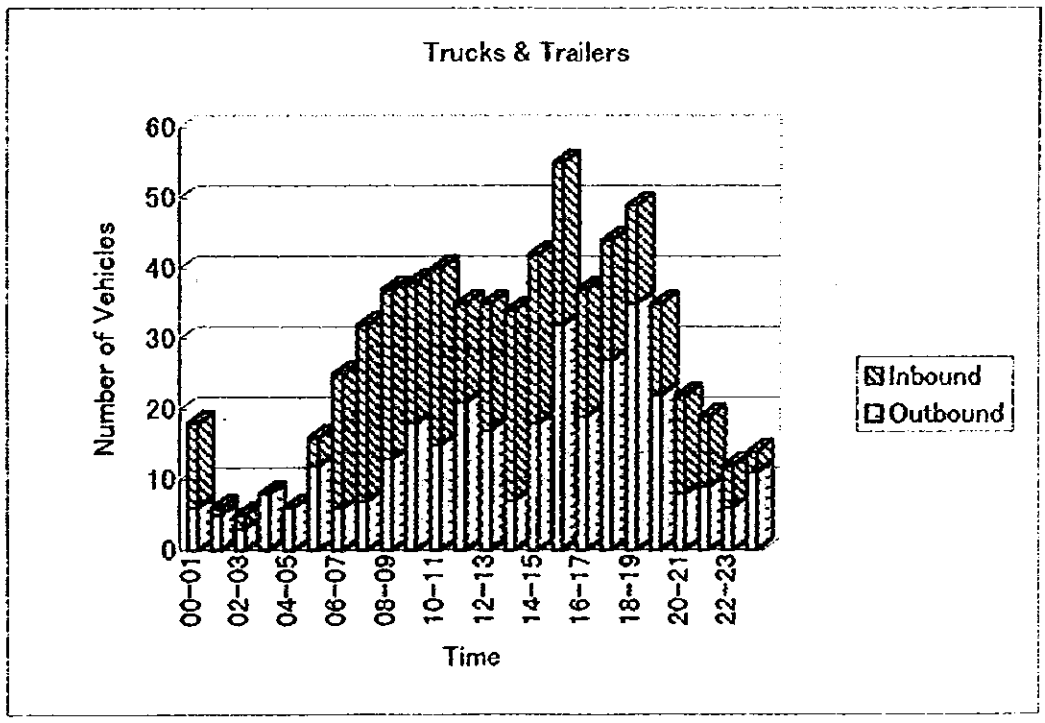
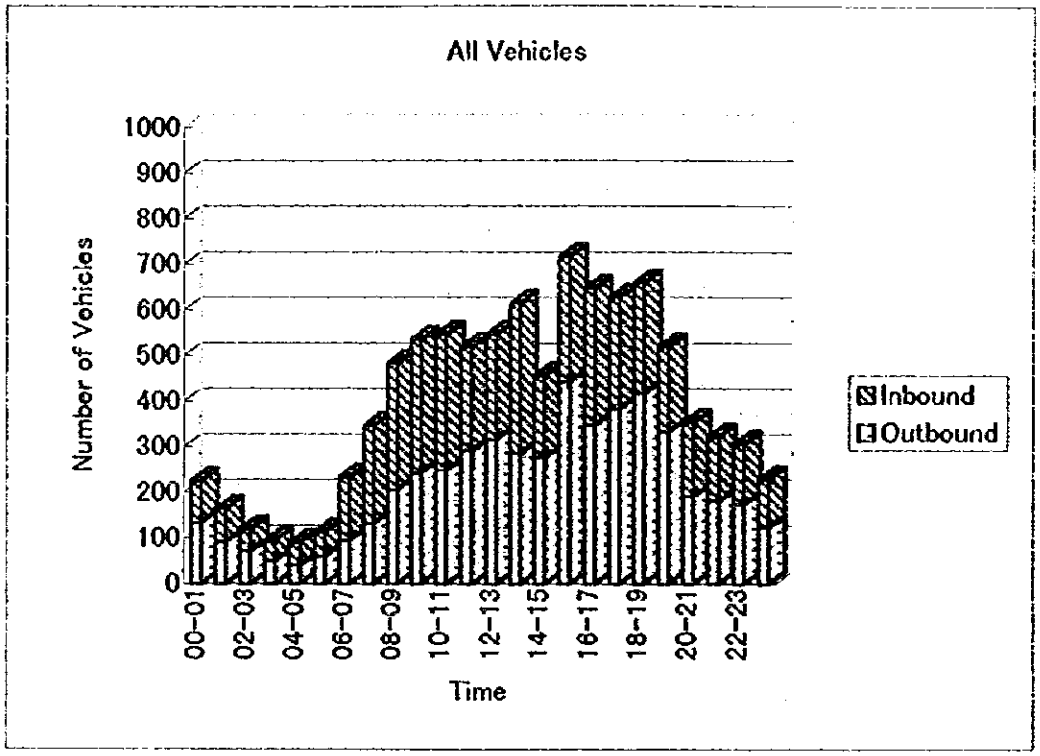


Figure 6.3.6-1 Road Traffic (Weekday:Jan.29)



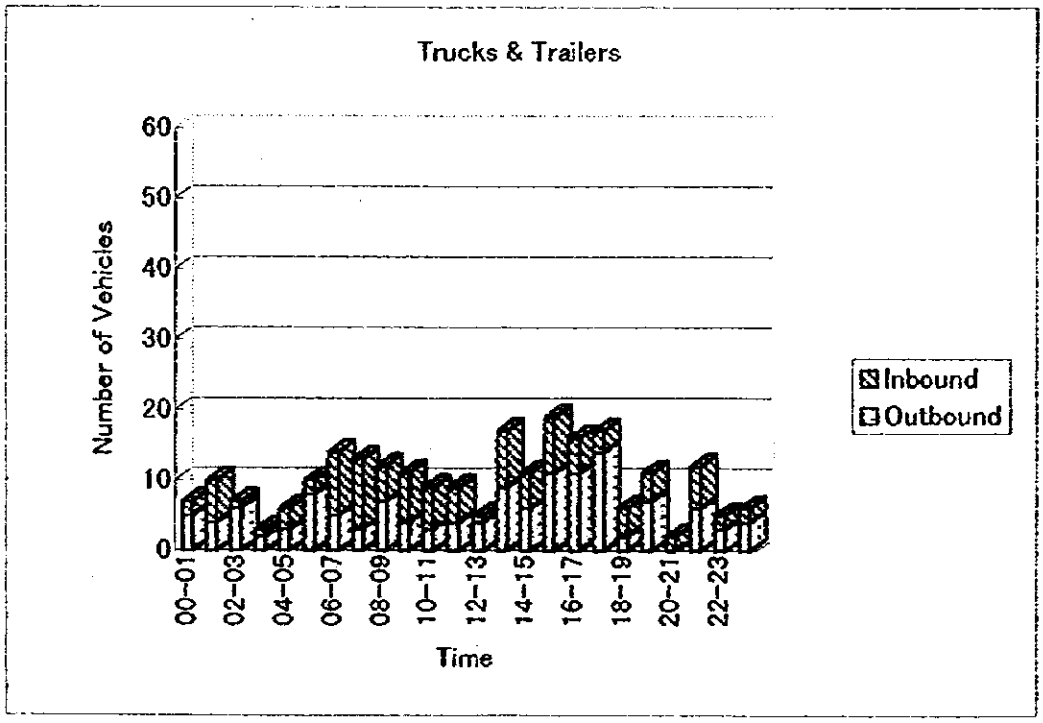


Figure 6.3.6-2 Road Traffic (Weekend:February 1)

7 Master Plan

7.1 Development Policy and Strategy for Subic Bay Freeport Development

7.1.1 Surrounding Conditions of Subic Bay Freeport

In 1992, Republic Act No. 7227, otherwise known as the Bases Conversion and Development Act, was enacted and the conversion of the former Subic Naval Base to the Subic Bay Freeport Zone began.

(1) The World Bank's Master Plan

The baselands cover an area of more than 15,000 ha., 6,658 ha. of which consist of the base complex, with the remainder consisting of mountainous virgin forest of significant ecological value. The World Bank proposed the land use plan for the long-term development of the Subic Bay Freeport. The proposed land use plan is based upon the development of an inter-connected freeport complex, with the Central Area as the core of the proposed activities. The land use plan consists of the following proposed land uses:①allocation of 284 ha. for light, non-polluting industry ; ②100 ha. for commercial and mixed-use ; ③2,277 ha. for tourism and recreation uses; ④358 ha. of land for housing ; ⑤325 ha. of land for transport facilities ; ⑥maintenance of the 263 ha. comprised of various community facilities; ⑦allocation of almost 200 ha. of land for the POL complex and seminar/campsite;⑧68 ha. for upgrading of utilities facilities and location of plants; ⑨designation of 146 ha. as a land reserve to provide flexibility in accommodating future land uses.

(2) Kenzo Tange's Master Plan of the Central Area

The Central Area Master Plan of the Subic Bay Freeport was designed by Kenzo Tange Associates and " The Subic Bay Freeport Development Urban Design Guidelines" was codified in 1996. According to the Central Area Master Plan, the following are the concepts of the waterfront development (See Figure 7.1.1-1) :

①A series of waterfront spaces will accommodate many urban attractions inviting participation of all citizens with extraordinary natural amenity. The waterfront is a precious amenity and will act as a draw to development and an amenity to the citizens of Olongapo.

②The area of the "Waterfront Plaza" (Alava Wharf) is designed to serve as the central terminal for non-cargo related water borne traffic.

③Along the edge of the existing Rivera Pier and Bravo Pier, two esplanades have been created; the "Commercial" esplanade and the "Convention" esplanade. The commercial esplanade connects the Marina to the convention center located south of the destination retail area. This esplanade includes two piers where ocean going ships can temporarily dock and where commercial and entertainment kiosks will provide the opportunity to shop and enjoy the local culture of the area. The esplanades shall present a lively festive atmosphere adjacent to the destination retail area and form a connecting pathway to the Convention Center Area.

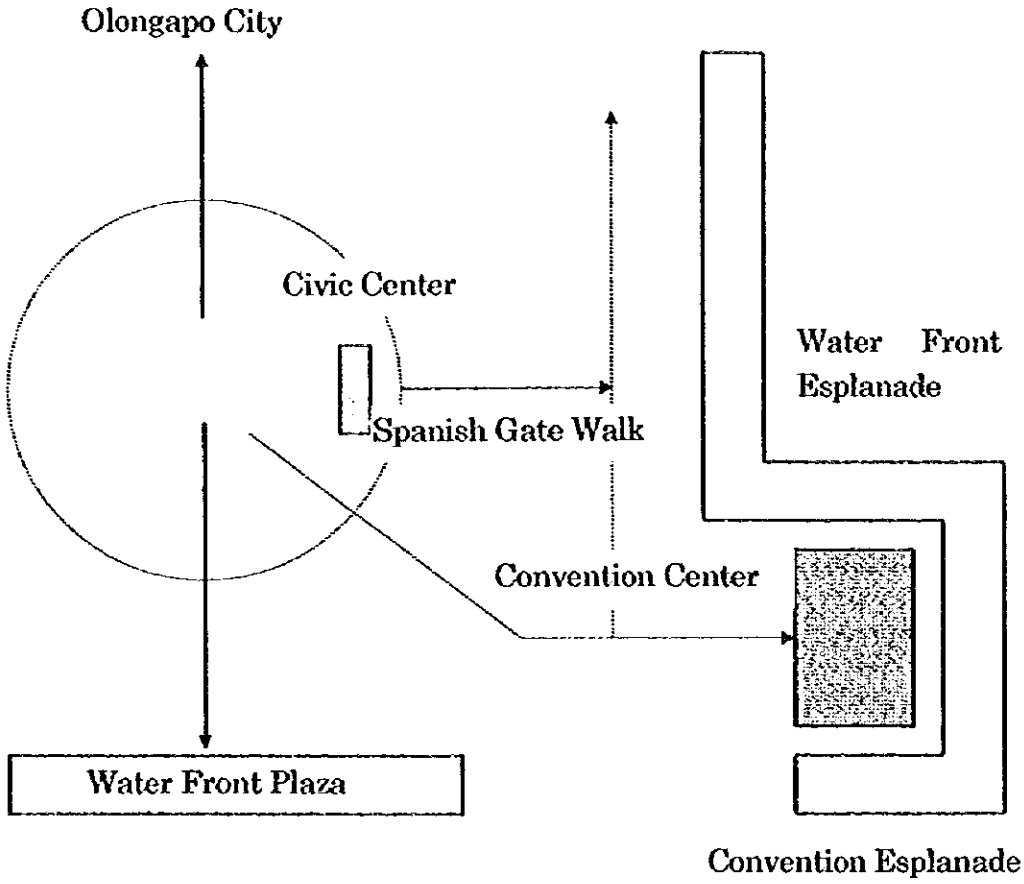


Figure 7.1.1-1 Conceptual Diagram of Waterfront Development (Kenzo Tange's Master Plan)

The SBMA is regenerating the former base area using a strategy based on the World Bank's Master Plan and the Kenzo Tange's Master Plan. Therefore the port development concepts should be harmonized with these Master Plans.

(3) Constraints of Manila Port

The north side of San Fernando City is virtually equidistant to both Subic and Manila Ports. Therefore, cargo may divert to Subic depending on the condition of Manila Port as well as development of Subic Port.

1) Truck Ban and Road Congestion in Metro Manila

Metro Manila Development Authority allows trucks carrying shipping cargo to enter/leave Manila Port from Monday to Saturday only during the following times:

AM9:00- PM5:00 8hours
PM9:00-AM6:00 9hours

It takes about 2 hours during peak time for trucks to go through Metro Manila at day time due to the traffic congestion of roads compared to about 45minutes during off-peak time.

2) Berth Congestion

The berth congestion of Manila Port from 1993 to 1996 is shown in Table 7.1.1-1. In 1996, 11,594 vessels entered Manila Port (7,089 domestic vessels, 4,505 foreign vessels). The

average waiting time of a foreign vessel for berthing was 14.51 hours/vessel and a maximum waiting time of 18.6 hours/vessel was recorded in South Harbor. The reason for such a long waiting time was the expansion project of pier 5 of South Harbor in 1996.

Even excluding 1996, waiting time at South Harbor has tended to increase. Waiting time at MICT dropped from 8.51 hours in 1993 to 4.28 hours in 1994, but it started rising from 1994, such that in 1996 the waiting time of MICT was about 5 hours, which affected the costs and schedule of shipping lines.

Table 7.1.1-1 Berth Waiting Times in Manila Port

		Number of Vessel		Cargo Throughput (1,000MT)		Waiting Time (Hours)		Average Waiting Time (Hours/Vessel)	
		Domestic	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1993	North Harbor	5,545	0	10,658	0	2,830	0	0.51	0
	South Harbor	9	2,170	5	6,662	0	2,024	0	0.93
	MICT	129	1,113	593	5,205	884	9,477	6.85	8.51
	Total	5,683	3,283	11,256	11,867	3,714	11,501	0.65	3.50
1994	North Harbor	5,998	0	12,994	0	2,772	0	0.46	0
	South Harbor	0	2,508	0	7,708	0	883	0	0.35
	MICT	63	1,232	269	5,500	271	5,275	4.3	4.28
	Total	6,061	3,740	13,263	13,208	3,043	6,158	0.50	1.65
1995	North Harbor	6,582	0	14,178	0	1,021	0	0.16	0
	South Harbor	0	2,533	0	8,942	0	8,770	0	3.46
	MICT	34	1,324	30	5,612	75	5,696	2.2	4.30
	Total	6,616	3,857	14,208	14,554	1,096	14,466	0.17	3.75
1996	North Harbor	7,089	0	14,574	0	1,093	0	0.15	0
	South Harbor	0	3,157	0	11,212	0	58,670	0	18.58
	MICT	0	1,348	0	9,158	0	6,696	0	4.97
	Total	7,089	4,505	14,574	20,370	1,093	65,366	0.15	14.51

(PPA: Annual Statistic Report)

3) Shallow Depth in Manila Port

Based on the existing natural conditions, one of Manila Port's biggest problems is its shallow water depth. The present water depth of North Harbor Channel is 10 meters. MICT has quays ranging from 12.5 m to 14.0 m, but the channel at MICT is only 12 m.

In this regard, the Philippine Port Authority is planning a dredging project at North

Harbor Channel to deepen the North Harbor Channel and the MICT Channel to 12 m and 14 m respectively. Until the completion of the dredging in the channel, the largest vessels (full draft) which can enter to Manila Port are approximately 15,000 DWT(general cargo vessel) for North Harbor Channel and 25,000 DWT(container vessel) for MICT Channel.

Considering the above conditions in Manila Port, Subic Port may be able to claim some advantages over Manila Port.

7.1.2 Port Development Concepts

Subic Bay Freeport is being utilized for various functions and fields such as port activity, marine recreation, marine industries and airport activities. To further develop the SSEFZ, SBMA has the following strategy:

< SBMA Strategy>

①SBMA's Vision

a) Major Regional (East and Southeast Asia) Hub

b) Model Metropolis of the Future

c) Example to the Philippines and the World of the "New Filipino"

②Target Industry

a) Information-rich Activities

b) Printing and Publishing

c) Regional Headquarters

d) Financial Services

e) Transport Related Services

It is necessary to formulate the concepts of development and preservation of Subic Bay Freeport in order to make full use of the potential of the Freeport aiming at the realization of SBMA's vision.

As such, the objectives of the development and preservation of Subic Bay Freeport are defined as follows:

① Suitable utilization of the Freeport, considering the harmonization with environment and present sea-water usage, in order to construct infra-structures such as modern port facilities and a model hub/cyber city for the next millennium in accordance with SBMA's vision.

②Preservation of the precious natural heritage.

③Development of an amenity-rich water front.

(1) Present Issues of the Port

The present issues of Subic Bay Freeport are as follows:

① Subic Bay Freeport handles cargo such as container, rice, soya, cement, fertilizer and heavy equipment, but there are inadequate port facilities, especially for container handling (container quay crane, container yard, container freight station, piers, transit sheds).

②Since the present piers were constructed from 1955 to 1979, almost all of them are superannuated. And also, the width of the piers are too narrow to handle cargo, particularly container.

③The National Highway (Route 7) between Olongapo and San Fernando was destroyed by Lahar (Mt. Pinatubo volcanic mud flow) in June, 1991. Since the road is now under restoration works, the bridges built on this road are temporary. And the load on the bridges is limited to 14 tons, which means this road cannot accommodate large trucks with bigger loads.

Rizal Highway connects with the National Highway through the Tipo road in the Subic Bay Freeport Secured Area (SBFSA), and these routes are capable of accommodating a lot of traffic. The Central Luzon Area can thus be accessed easily from the east or south area of the Naval Supply Depot (NSD) site.

However, traffic must pass through Olongapo city or Subic town from outside of SBFSA site to the west. It is therefore necessary to improve the existing road drastically (construction of the by-pass road) for the development outside of SBFSA.

Special attention should also be given to the development of Redondo Peninsula. It is necessary to formulate an integrated development plan of Redondo Peninsula including the construction of a road in the peninsula as well as the construction of a by-pass road from the existing road.

(2) Port Development Concepts

In order to realize the SBMA's vision and to resolve the present issues, the following 4 concepts are defined.

①To form trading and communication functions appropriate to the Freeport Zone
② To develop the waterfront in harmony with urban redevelopment
③To accommodate non-container cargo traffic after conversion of existing wharves
④To preserve the natural environment and to create environment-friendly marine recreational facilities

1) To form trading and communication functions appropriate to the Freeport Zone

Subic Special Economic and Freeport Zone (SSEFZ) requests international trading and communication function in Subic Bay Freeport. The following policies are planned to develop the port in order to promote its trading and communication functions.

a) To construct an adequate container terminal

In Subic Bay Freeport Secured Area, there are two industrial estates as follows:

Subic Bay Industrial Park : 1st Phase Plan-105 ha, June 1995-Dec. 1996
2nd Phase Plan-55 ha, Oct.1996-Dec.1998
3rd Phase Plan-140 ha,

Subic Techno Park :1st Phase Plan-60 ha,May 1996-Jan.1998

About 45 companies including a famous Taiwaneese computer maker(Acer Inc.) are located.

Business logistics, comprising the procurement of production materials, production control and marketing strategy, is indispensable for modern industrial companies. And this logistics is supported by containerized cargoes carried by scheduled flights and shipping lines.

To achieve economic growth of SSEFZ, the factories in industrial estates must have recourse to convenient and economical container service. Therefore Subic Bay Freeport should construct a new container terminal with an adequate container crane and make an effort to attract more shipping lines.

The development of a new road from Subic to Clark is in progress, thus the

development of a container terminal would be of benefit not only to factories in SSEFZ but also to those in Clark, Baguio, Luisita, Angeles and Bataan. When shipping charges and calling frequency in Subic Bay Freeport become convenient to customers (consignors and consignees) in these industrial estates, they will select SBF to load or discharge their cargo, since they can reduce their shipping cost and can avoid port congestion of container ships at Manila port.

As Subic Bay Freeport becomes a gateway port for increasing container cargo from/to Central Luzon, one of the possible effects is that traffic congestion and air pollution in Metro Manila would be reduced.

At present, the actual volume of container cargo is not large in SBF, but when factories locate in SSEFZ and other Economic Zones according to the plans, the container cargo volume would increase abruptly. When the container cargo volume is expected to exceed the capacity of the new container terminal, it would be necessary to investigate the development of a new site, including the Redondo peninsula, for possible construction of new port facilities. A comprehensive development study including not only port development but also other developments (new roads, industrial estates, residential estates, commercial facilities, recreational facilities) should be done in the Redondo Peninsula.

b) To create a comprehensive international trading and communication zone

It can be considered that in order to make full use of the Freeport Zone, importing goods and installation of physical distribution/processing industries and exhibition/sale industries would increase.

In order to serve to such a demand, it is necessary to create a comprehensive foreign trading and communication zone in the Central Business Area, where international trade fairs and international conventions will be held.

Since the quick/precise information and just-in-time delivery is getting more important in the distribution industry, it is required to create a systematic trading and communication zone which links sea-transportation, air-transportation and telecommunications. These three activities would be operated in SSEFZ as a triple port (sea-port, air-port, tele-port).

In front of the Central Business Area, the Alava Wharf will be changed to a new passenger wharf and a communication zone will be formed in connection with the Civic Center and the Convention Center located at the back area of the Alava Wharf.

2) To develop the waterfront in harmony with urban redevelopment

The Central Business Area will be redeveloped drastically according to the Urban Design Guidelines codified by Kenzo Tange Associates.

The Alava, Rivera and Bravo wharfs will be refurbished and an esplanade, a small green-belt and nice amenities will be added where the citizens of Olongapo city can enjoy the atmosphere of the sea-waterfront.

3) To accommodate non-container cargo traffic after conversion of existing wharves

Alava, Rivera, Bravo and Marine Terminal wharves handled about 400 thousand

tons of non-container cargo in 1997. If these wharves have other functions, it is necessary to take measures to cope with the demand of non-container cargo.

4) To preserve the natural environment and to create environment-friendly marine recreational facilities

There are abundant and precious natural resources in Subic Bay Freeport especially in the Naval Magazine Area and sea water area. This natural heritage is a good resource for tourism and it is thus necessary to create environment-friendly marine recreational facilities.

Since the Naval Magazine Area is a virgin forest, a prudent approach to development is required. Under the World Bank funded Master Plan, the Naval Magazine Area was designated for recreational and tourism uses. Sufficient environmental impact assessment will be requested in order not to affect the natural environment of the forest and the sea, when Camayan and Nabasan wharves are utilized as cargo handling facilities.

A marina was constructed in OSIR Basin by Subic Bay Waterfront Development Corporation. And another two marinas are planned to be developed in nearby Apalit Point and in the Pequeña Island.

In the future it is worth considering a beach resort and a marina in the Redondo Peninsula if the above two marinas prove popular.

7.1.3 Roles and Functions of Subic Bay Freeport

(1) Advantages and disadvantages of Subic Bay Freeport

The advantages and disadvantages of Subic Bay Freeport in terms of competing ports are summarized in Table 7.1.3-1.

The distance between Subic and San Fernando is about 60km which is equal to the distance between Manila and San Fernando. There is a possibility that the cargo from/to the north of San Fernando would pass through Subic Bay Freeport considering the port and traffic congestion in Metro Manila, when the road connecting to San Fernando is restored and the shipping service is convenient to port users.

But the improvement of shipping service will only be achieved by the effort of SBMA.

Table 7.1.3-1 Advantages and Disadvantages of Subic Bay Freeport

	Advantages	Disadvantages
1. Natural Conditions	1. The sea is deep enough for a large vessel. 2. Entering waves are not so high and it is relatively calm.	1. There are many hills and few flat land areas. 2. The depth of water drops sharply and possible reclamation areas are limited.
2. Social Conditions	1. Since there are no inhabitants except for SBMA's staffs and investors, and the property is owned by SBMA, consensus on development is easy to obtain in the SBFSA.	1. Since the coastal areas from Olongapo to Subic were developed for resort and recreational usage, and the National Highway is not suitable for cargo traffic, development along this area is difficult. 2. Since the SBMA has various usage plans and Master Plans in SBFSA, a suitable development site for a port is limited. 3. Although the Redondo Peninsula has a lot of development space, it is hilly and no road is available.
3. Environmental Conditions	1. The natural environment is not polluted and will not be adversely affected by the development.	1. Coral reef, mangrove and a virgin forest are found and environmental consideration is necessary.
4.Road Network to the Hinterland	1. There are road construction projects and in the future the road network to the hinterland will become superb: 1) Manila North Tollways(SBMA-Dinalupihan-Guagua-San Simon) 2) Rainbow Highway (Dinalupihan-Clark-Tarlac-Cabanatuan) 3) Manila-Subic Expressway (Tipo-Dinalupihan)	1. The road between Olongapo and San Fernando is under restoration works due to destruction by Lahar (Mt. Pinatubo volcanic mud flow) and the load of bridges is limited to 14 tons. It has not been specified when restoration works will be completed.
5. Others	1. There is no port congestion as well as no traffic congestion.	1. The height limitation caused by the Subic International Airport must be taken into account. 2. The frequency of liner vessel is not high and the destination of regular line is limited concerning the shipping service.

(2) Usage of each wharf

The usage of each wharf at present and a proposed usage plan in the future is shown in Tables 7.1.3-2(1), (2), (3) according to the Port Development Concepts described in 7.1.2 (2).

Table 7.1.3-2(1) Usage of Each Wharf at present and in the future (Plan-1)

	Size (m)		Usage of the Wharf	
	Length	Depth	At Present (1997)	In the Future
ALAVA			Berthing of non-cargo vessels	
3 to 8	520	12.0	Breakbulk, heavy equipment and container cargo operation / Berthing of non-cargo vessels	To be changed to a basin for ferry boats
Extension	181	12.0	Breakbulk and heavy equipment cargo operation / Berthing of non-cargo vessels	Non-container cargo operation
RIVERA				Non-container cargo operation
South	126	10.0	Breakbulk, heavy equipment, feeder cattle and container cargo operation	
East	300	6.1 (9.0)	Same as South	
North	289	7.0	Berthing of non-cargo vessels	
BRAVO	327	7.0	Heavy equipment cargo handling /Berthing of non-cargo vessels	Berthing of port service ships
SATTLER				
East	180	12.0	Container cargo handling	
West	180	12.0	Berthing of small foreign ships	To be changed to a container terminal
MARINE TERMINAL				
East	221	12.2	Breakbulk, heavy equipment and container cargo operation	
West	221	12.2	Breakbulk, bulk, heavy equipment and container cargo operation	
East Bulk	93	6.0	Fuel discharging by Enron Subic Power Corp.	
West Bulk	117	6.0	Same as East	
POL PIER	248	12.0	Fuel discharging and loading by Coastal Corp.	Same as at present
LOWER MAU			Heavy equipment operation	Same as at present
BOTON	411	9.4	Feeder cattle cargo operation	Non-container cargo operation
LEYTE	300	13.0	Non operation	Needs reinforcement Non-container cargo operation
NABASAN	180	14.0	Maritime training area	Cargo operation of small impact to environment
CAMAYAN	135	10.0	Tourist point	Berthing of small ferry boats Cargo operation of small impact to environment

Notes: The figures described in parentheses indicate the original depth of the wharves.

Table 7.1.3-2(2) Usage of Each Wharf at present and in the future (Plan-2)

	Size (m)		Usage of the Wharf	
	Length	Depth	At Present (1997)	In the Future
ALAVA			Berthing of non-cargo vessels	
3 to 8	520	12.0	Breakbulk, heavy equipment and container cargo operation / Berthing of non-cargo vessels	To be changed to a basin for ferry boats
Extension	181	12.0	Breakbulk and heavy equipment cargo operation / Berthing of non-cargo vessels	Berthing of ocean going passenger vessels
RIVERA				To be changed to waterfront Berthing of non-cargo vessels
South	126	10.0	Breakbulk, heavy equipment, feeder cattle and container cargo operation	
East	300	6.1 (9.0)	Same as South Berthing of non-cargo vessels	
North	289	7.0		
BRAVO	327	7.0	Heavy equipment cargo handling /Berthing of non-cargo vessels	Berthing of port service ships
SATTLER				
East	180	12.0	Container cargo handling	
West	180	12.0	Berthing of small foreign ships	To be changed to a container terminal
MARINE TERMINAL				
East	221	12.2	Breakbulk, heavy equipment and container cargo operation	
West	221	12.2	Breakbulk, bulk, heavy equipment and container cargo operation	
East Bulk	93	6.0	Fuel discharging by Enron Subic Power Corp.	
West Bulk	117	6.0	Same as East	
POL PIER	248	12.0	Fuel discharging and loading by Coastal Corp.	Same as at present
LOWER MAU			Heavy equipment operation	Same as at present
BOTON	411	9.4	Feeder cattle cargo operation	Non-container cargo operation
LEYTE	300	13.0	Non operation	Needs reinforcement Non-container cargo operation
NABASAN	180	14.0	Maritime training area	Cargo operation of small impact to environment
CAMAYAN	135	10.0	Tourist point	Berthing of small ferry boats Cargo operation of small impact to environment

Notes: The figures described in parentheses indicate the original depth of the wharves.

Table 7.1.3-2(3) Usage of Each Wharf at present and in the future (Plan-3)

	Size (m)		Usage of the Wharf	
	Length	Depth	At Present (1997)	In the Future
ALAVA			Berthing of non-cargo vessels	
3 to 8	520	12.0	Breakbulk, heavy equipment and container cargo operation / Berthing of non-cargo vessels	To be changed to a basin for ferry boats
Extension	181	12.0	Breakbulk and heavy equipment cargo operation / Berthing of non-cargo vessels	Berthing of ocean going passenger vessels
RIVERA				To be changed to waterfront
South	126	10.0	Breakbulk, heavy equipment, feeder cattle and container cargo operation	Berthing of non-cargo vessels
East	300	6.1 (9.0)	Same as South Berthing of non-cargo vessels	
North	289	7.0		
BRAVO	327	7.0	Heavy equipment cargo handling /Berthing of non-cargo vessels	Berthing of port service ships
SATTLER				
East	180	12.0	Container cargo handling	
West	180	12.0	Berthing of small foreign ships	Non-container cargo operation
MARINE TERMINAL				
East	221	12.2	Breakbulk, heavy equipment and container cargo operation	
West	221	12.2	Breakbulk, bulk, heavy equipment and container cargo operation	
East Bulk	93	6.0	Fuel discharging by Enron Subic Power Corp.	
West Bulk	117	6.0	Same as East	
POL PIER	248	12.0	Fuel discharging and loading by Coastal Corp.	Same as at present
LOWER MAU			Heavy equipment operation	Same as at present
BOTON	411	9.4	Feeder cattle cargo operation	Non-container cargo operation
LEYTE	300	13.0	Non operation	Needs reinforcement Non-container cargo operation
NABASAN	180	14.0	Maritime training area	Cargo operation of small impact to environment
CAMAYAN	135	10.0	Tourist point	Berthing of small ferry boats Cargo operation of small impact to environment

Notes: The figures described in parentheses indicate the original depth of the wharves.

Concerning Table 7.1.3-2(1),(2),(3), Plan-1 (Table (1)) means that non-container cargo will continue to be handled at Alava and Rivera wharves, and it is not necessary to construct a new wharf for non-container cargo, but Kenzo Tange's urban redevelopment master plan will be postponed. Plan-2 (Table (2)) means that Kenzo Tange's Master Plan will be able to be realized, while it will be necessary to construct a new non-container cargo wharf. Plan-3 (Table

(3)) means that Kenzo Tange's Master Plan will be realized but non-container cargo will be handled at Sattler Pier and Marine Terminal which implies a cancellation of the concession contract. A new container terminal will be constructed in a different and more suitable site.

3) Role and function of Subic Bay Freeport

The SBMA is the operating and implementing arm of the Base Conversion Development Authority (BCDA) in developing the Subic Bay Freeport Zone (SBFZ) into a self-sustaining industrial, commercial, financial, and investment center for generating employment opportunities in and around the SBFZ.

SBMA administrates and operates Subic Bay Freeport independently from the Department of Transportation and Communications which is responsible for the Philippine Transportation Strategy.

Therefore, the Subic Bay Freeport was not referred to in the "Philippine Transport Strategy and Study" prepared by Halcrow Fox in 1997, funded by the Asian Development Bank.

This report included implementation priority of the following port sector projects until 2004:

a) The projects have been judged to be committed- Manila South Harbor Expansion, MICT, Batangas Phases 1 and 2, Nationwide Feeder Ports Program(36 ports)
b) Priority 1- priority established - Cebu, Iloilo, Manila Grains, Ro/Ro Programme
c) Priority 2-the traffic potential is strong and the project is prima facie desirable- Tacloban, Davao, Cagayan de Oro, Tagbilaran, General Santos
d) Others-where the traffic potential is not proved, and / or cost is very high.

And concerning ports strategy for the Greater Capital Region, additional capacity is likely to be required and Batangas may be the best project to resolve this issue.

Initially, the facts mentioned above suggest two alternatives for the role and function of Subic Bay Freeport (See Table 7.1.3-3).

Plan-A means that Subic Bay Freeport will become a specialized port to support the development of SBFZ; handling cargo will be limited to ensure easy operations and maximize the productivity of the wharf.

Plan-B means that Subic Bay Freeport will become a general public port not only for the SBFZ but also for the whole Central Luzon area.

It is proposed that Plan-A would be appropriate for Subic Bay Freeport since it is perfectly consistent with SBMA's vision and "Philippine Transport Strategy and Study". The role and function of Subic Bay Freeport is not as a public commercial port to support the economic growth in Central Luzon and Metro Manila, but rather a supporting infra-structure for SSEFZ and adjacent Special Economic Zones as an specialized port. Therefore, SBMA should be responsible for the handling of cargo which is indispensable for the development of

SSEFZ and other Special Economic Zones, while other cargo handling, for example, the handling of bulk cargo, should be completely left to a private company in SBF. The private company would also be responsible for infra-structure construction.

Consequently, according to the clarification of the role and function of SBF as mentioned above, the sea-port, the air-port and the new business center will be able to combine their functions and to complement one another in the limited area.

(4) Expected Future Handling Commodities

It is proposed that in SBF, SBMA should be responsible for handling the limited commodities mentioned in Table 7.1.3-4.

The Master Plan (target year 2020) is drawn up based on handling of container, cement and heavy cargo. The purpose of handling cement and heavy cargo is to make it convenient for factories in SSEFZ.

From 2005 (target year of short term development plan) to 2020, the port can handle other cargoes if the wharf has space to accommodate them.

However, it should be emphasized that the above development concept does not preclude the possibility of a private company owing and operating its own bulk terminal.

Table 7.1.3-3 Plan of Role and Function of Subic Bay Freeport

	Plan-A	Plan-B
1. Role and Function	1) Nucleus of development among Subic-Clark-Manila Triangle 2) Specialized port for Subic Special Economic and Freeport Zone, and adjacent Special Economic Zone (Clark),Economic Processing Zones(Baguio, Luisita, Angeles, Bataan) 3) To support tourism in SSEFZ	1) Same as Plan-A 2)General Distribution Port not only for SSEFZ, SEZ and EPZ, but also for whole Central Luzon area 3) Same as Plan-A
2.Commodity of Handling Cargo	1) Container cargo related to SSEFZ, SEZ, EPZ 2) Other cargo generated in SSEFZ (heavy equipment, construction materials, manufacturing equipment) 3) Logistics Cargo related to the particular company which distributes the cargo to Asian countries 4) Proposed commodity: container, construction machine, cement, plant, vehicles	1)Same as Plan-A 2) Other cargo generated in Central Luzon (agricultural products, construction materials, chemical products, etc.) 4) Proposed commodity: container, soya, rice, fertilizer, cement, construction machine, plant, vehicles, other necessary goods in Central Luzon
3.Major Port Facilities	1) Wharfs Container Wharf, RO/RO Wharf(including LO/LO cargo), Passenger Terminal 2) Other Facilities Open Storage Yard, Transit Shed, Warehouse, Passenger Terminal Building	1) Wharfs Container Wharf, RO/RO Wharf, LO/LO Wharf(bulk, break-bulk and other cargo), Passenger Terminal 2) Other Facilities Same as Plan-A
4.Merit	1) It is possible to utilize the port facilities thoroughly in order to realize the SBMA's vision. And it does not require a surplus cost for SBMA. 2) It is possible to handle the specific cargo with a high degree of efficiency.	1) Shippers and consignees can use the most suitable port for their cargo transportation plan.
5. Demerit		1) The cargo handling efficiency is limited because various commodities must be accommodated. 2) Handling of general cargo produces low revenue compared to the construction cost.

Table 7.1.3-4 Commodities under SBMA Responsibility in Future

		2005	2010	2015	2020	Remarks
Container		○	○	○	○	
Break-bulk						
	Rice	△	△	△	×	
	Cement	○	○	○	○	Especially for the demand in SSEFZ
	Fertilizer	△	△	△	×	
Dry-bulk						
	Soya	△	△	△	×	
Heavy Cargo		○	○	○	○	Especially for the demand in SSEFZ
Feeder Cattle		△	△	△	×	

(Notes) ○: Priority 1 (The commodity is necessary and suitable for Subic Bay Freeport.)
△: Priority 2 (The commodity is handled if the wharf has sufficient space.)
×: Priority 3 (The commodity is not necessary for Subic Bay Freeport.)

7.2 Conceptual Zoning

7.2.1 Conceptual Zoning of the Whole Subic Bay Area

(1) Establishment of Zones and Analysis Items

Along Subic Bay and the west coast of the Redondo Peninsula, 33 zones with radiuses of 500m or 1,000 m have been set up. Twenty-one zones are in Subic Bay (A1-A21), seven zones are in the Inner Harbor (B1-B7) and five zones are on the west coast of the Redondo Peninsula(C1-C5). (All 33 zones are shown in Figure 7.2.1-1.) The following items were analyzed in each zone.

"Social Environment"

1) Population
Each zone is classified according to population data obtained by survey (see Figure 7.2.1-2).

2) Housing
The number of houses or dwellings in each zone is estimated (see Figure 7.2.1-3).

3) Fishing port
The number of ports with fishing port facilities and places where fishing boats are found on the beach are identified (see Figure 7.2.1-4).

4) Present land use
Land use of each zone is classified in terms of agriculture-forest/hills-wasteland, industrial-commercial-business and residential areas (see Figure 7.2.1-5).

5) Land ownership
The ratio between public and private land ownership for each zone is identified (see Figure 7.2.1-6).

6) Access road
Roads in each zone are classified according to number of lanes, pavement and distance to existing road when no roads exist (see Figure 7.2.1-7).

"Natural Conditions"

7) Land slope
Average slope from the coastline to land for each zone is estimated (see Figure 7.2.1- 8).

8) Distance to -10m. water depth line

Distance from the coastline to -10m. water depth line is identified (see Figure 7.2.1-9).

"Natural Environment"

9) Natural reserves

Area of each zone which is characterized as a natural reserve is identified (see Figure 7.2.1-10).

10) Mangrove

Mangrove areas are identified (see Figure 7.2.1-11).

11) Live coral

Live coral distribution for each zone is identified (see Figure 7.2.1-12).

12) Wave calmness

Wave calmness at possible development sites is estimated (see Figure 7.2.1-13).

(2) Results of Analysis

Eight zones with similar characteristics are grouped together in Figure 7.2.1-14. Characteristics of each group are analyzed as follows.

1) Social Environment

- There are almost no access roads in the Redondo Peninsula. (Zone⑤⑥⑦⑧)
- Fishing ports and fishing villages exist along the coast in Olongapo to Subic and the east side of the Redondo Peninsula. (Zone④⑤⑥⑦)
- Population and housing are concentrated from Olongapo to Subic; there are few people or residences on the east part of the Redondo Peninsula. (Zone④⑤⑥⑦)
- The public land can be developed comparatively easy on the south side from the Inner Harbor and on the Redondo Peninsula . (Zone①②③⑥⑦⑧)

2) Natural Conditions

- There is little flat land in the Redondo Peninsula because a mountain range passes through the center. Especially around the tip the land is sloping. (Zone⑦⑧)
- Distance to -10m. water depth line is short in the Inner Harbor and around the Redondo Peninsula. This means that the water becomes deep comparatively soon. (Zone③⑥⑦⑧)
- At all possible development sites, waves are calm enough to allow for operation more than 97.5% of the time.

3) Natural Environment

・Live coral and mangrove exist around the Naval Magazine Area, which is designated as a natural reserve. (Zone①)

・Live coral is also found around the tip and the west side of the Redondo Peninsula. (Zone⑦⑧)

(3) Precondition of Conceptual Zoning

Preconditions to drawing up Conceptual Zoning of Subic Bay are as follows:

①To analyze the conditions and determine the most suitable utilization.
② To incorporation existing plans and facilities.
③ To set up buffer zones where necessary.
④ To minimize the impact to natural environment.
⑤ To identify the development potential of the Redondo Peninsula .
⑥ To develop the Redondo Peninsula on the assumption that a high grade road in the peninsula and a bypass to the existing coastal town will be constructed.

(4) Drawing up of Conceptual Zoning

Finally, considering the results of analysis, preconditions, the existing plans and facilities, etc. the following eight zones are drawn up (see Table 7.2.1-1).

1) Sea & Air Port Zone

The existing sea and air port facilities will be expanded in this zone.

2) Future Expansion Zone

This zone is a candidate site for a new port and so forth in the Redondo Peninsula.

3) Residential Zone

This zone comprises the area from Olongapo to Subic.

4) Recreation & Fishery Zone

This zone contains existing recreation facilities such as resort beach, marina and resort hotels, and includes a new area in the mouth of Subic Bay and the Redondo Peninsula.

5) Industrial Zone

This zones contains industrial estates which are located around existing facilities and behind the port zone.

6) Commercial & Business Zone

This zone includes the Central Business Area, where commercial and business establishments are found.

7) Buffer Zone

This zone is mainly a green tract set up to blunt the effect of one zone on another.

8) Natural Preservation & Eco-tourism Zone

This zone is the former Naval Magazine Area, where the main focus is now eco-tourism.

Conceptual Zoning of Subic Bay is shown in Figure 7.2.1-15

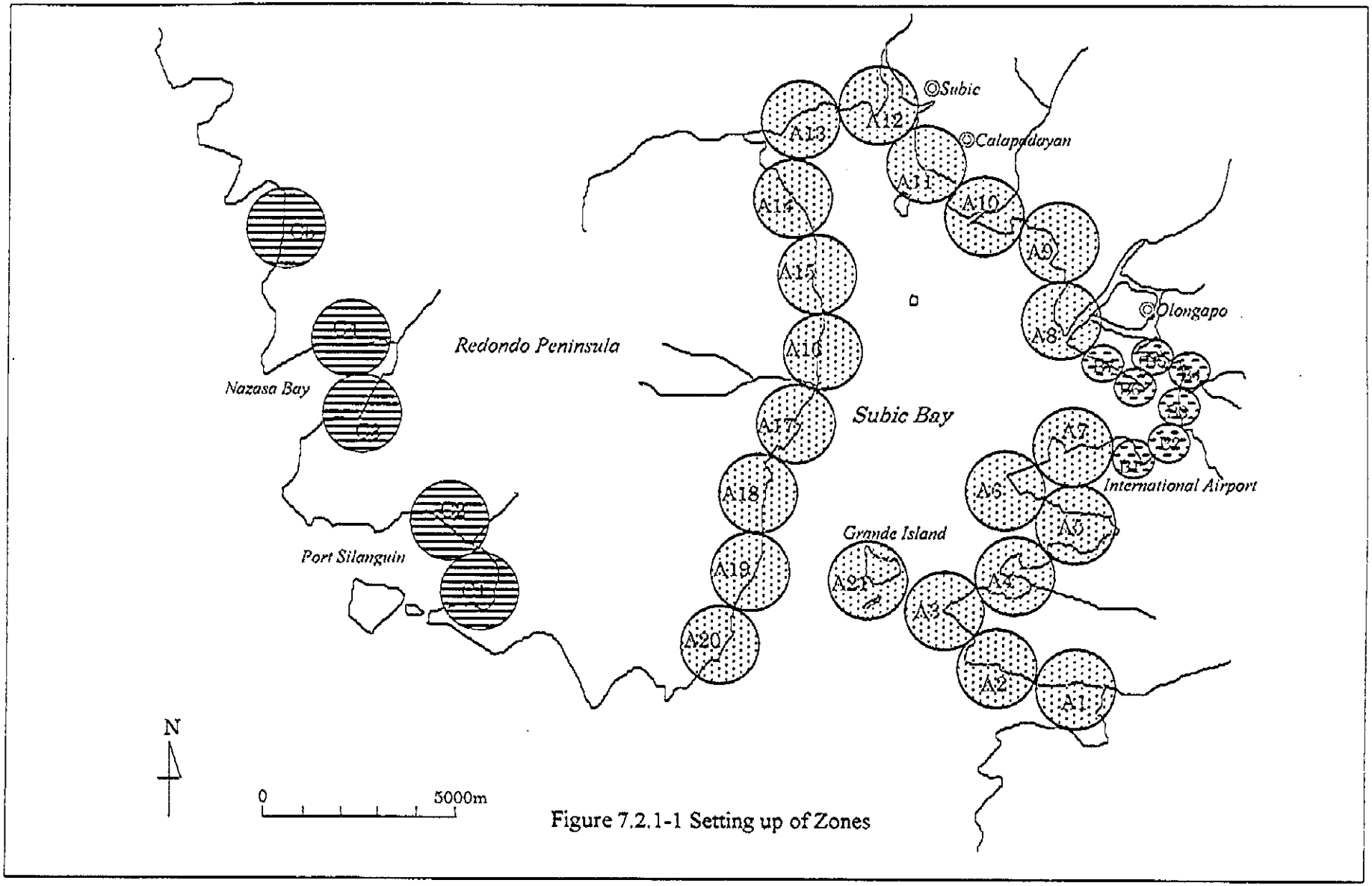


Figure 7.2.1-1 Setting up of Zones

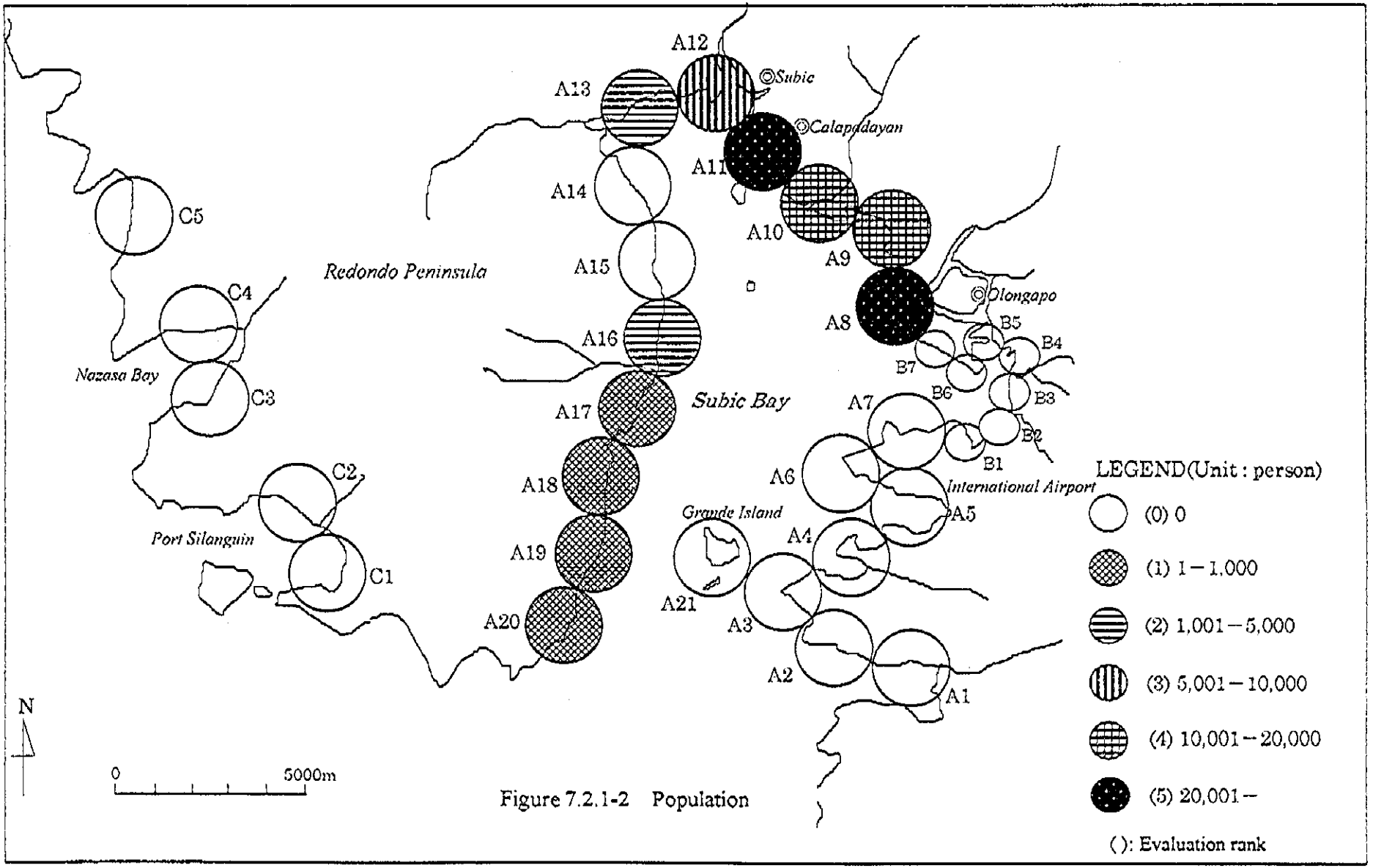


Figure 7.2.1-2 Population

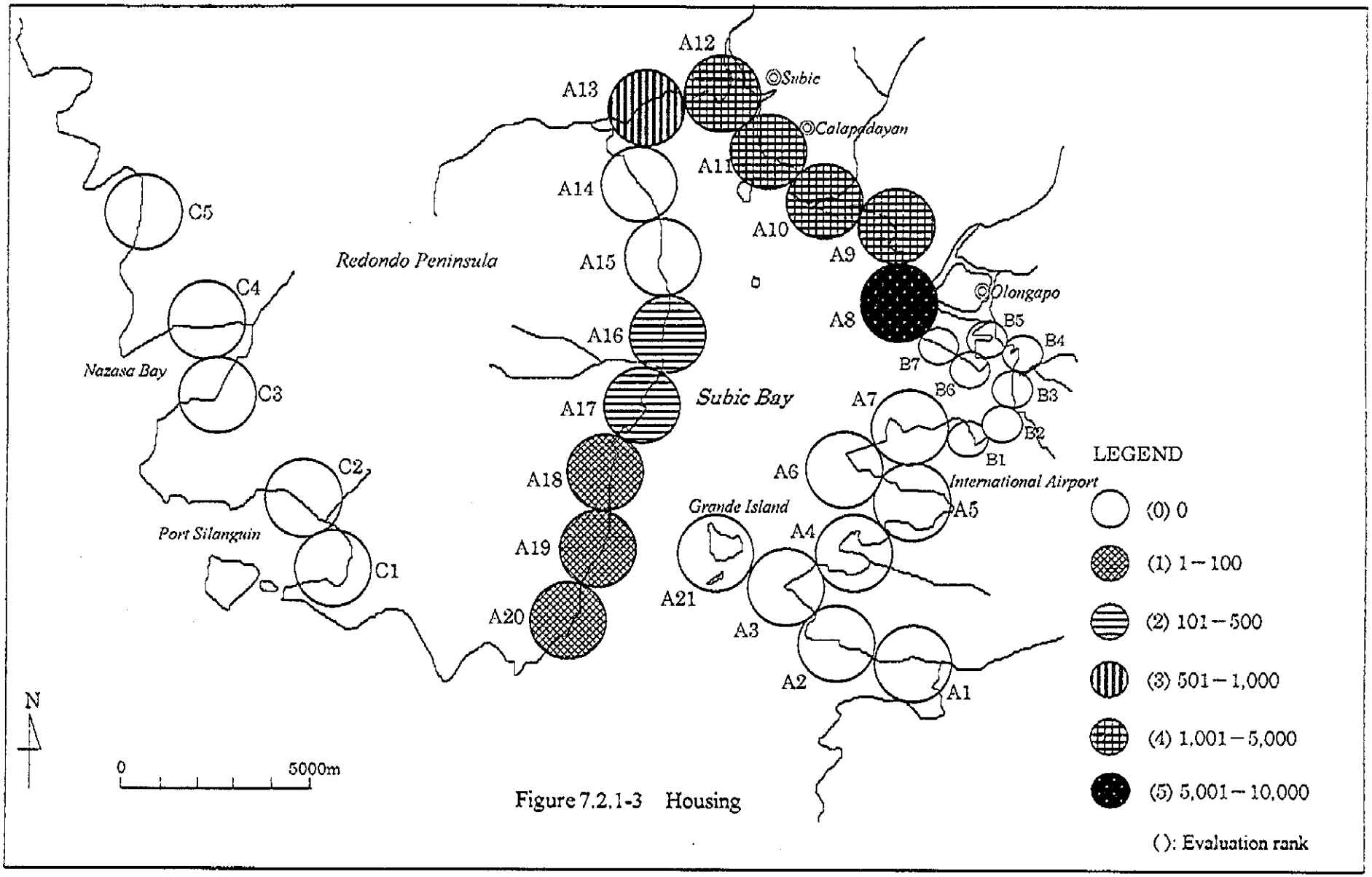


Figure 7.2.1-3 Housing

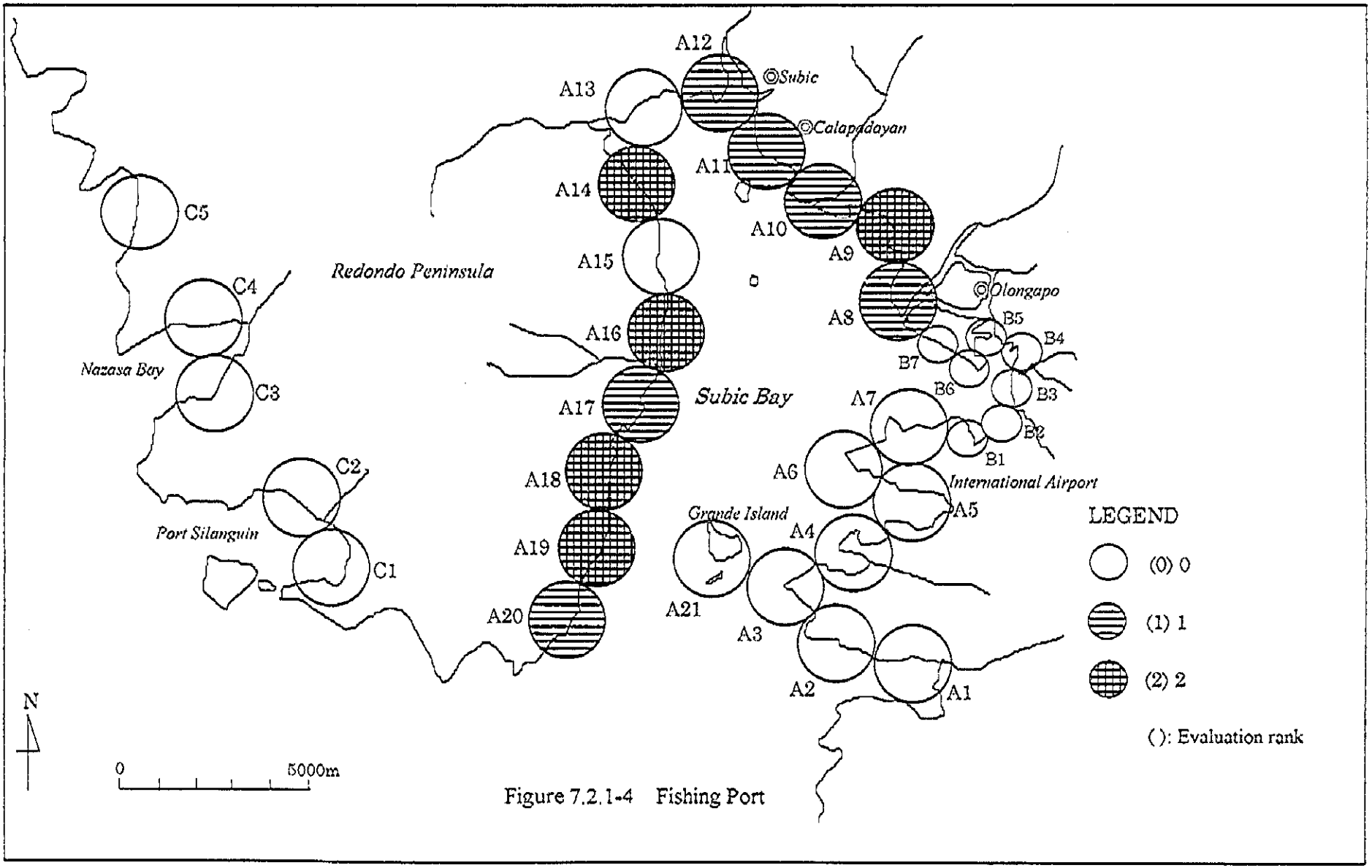


Figure 7.2.1-4 Fishing Port

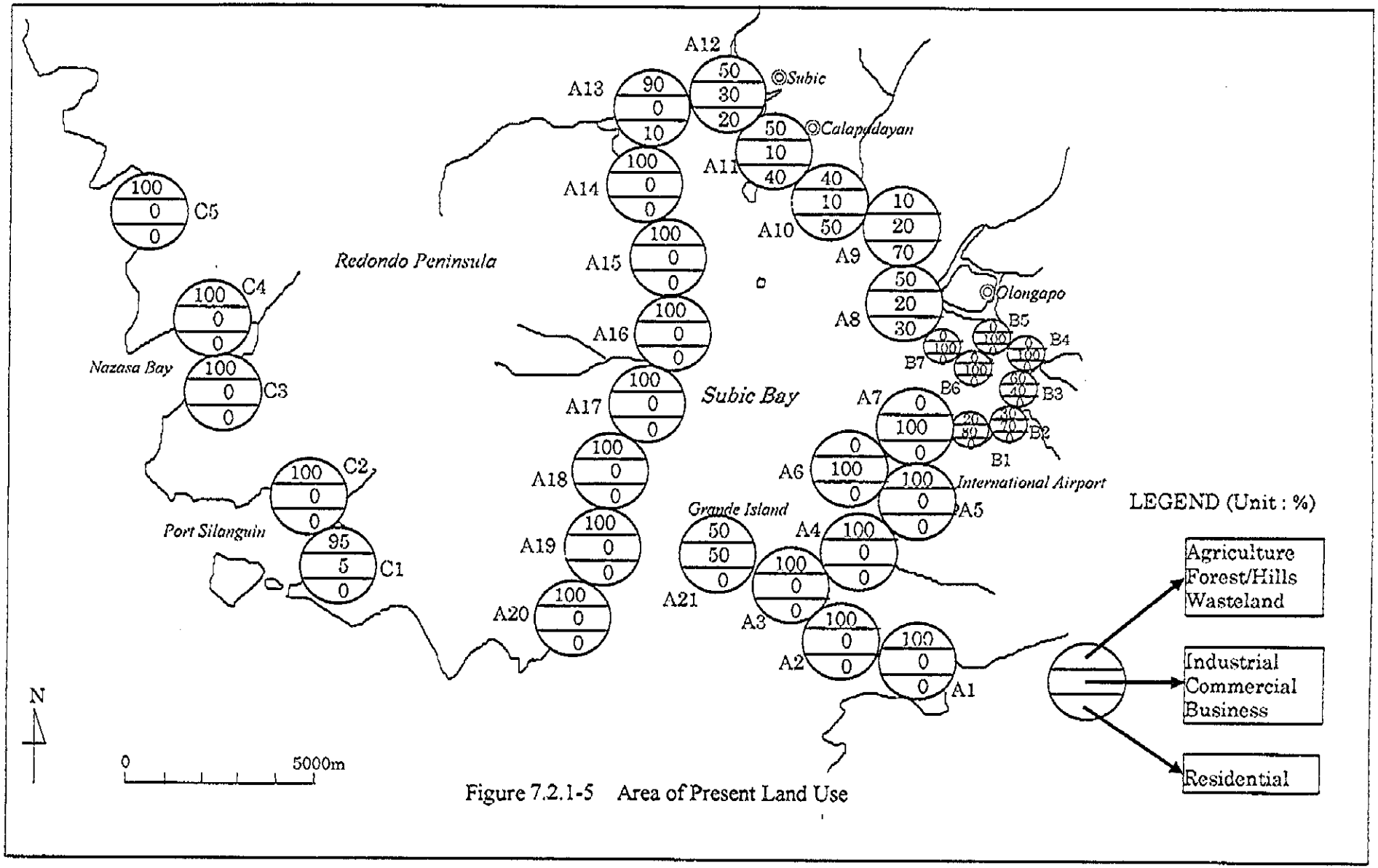


Figure 7.2.1-5 Area of Present Land Use

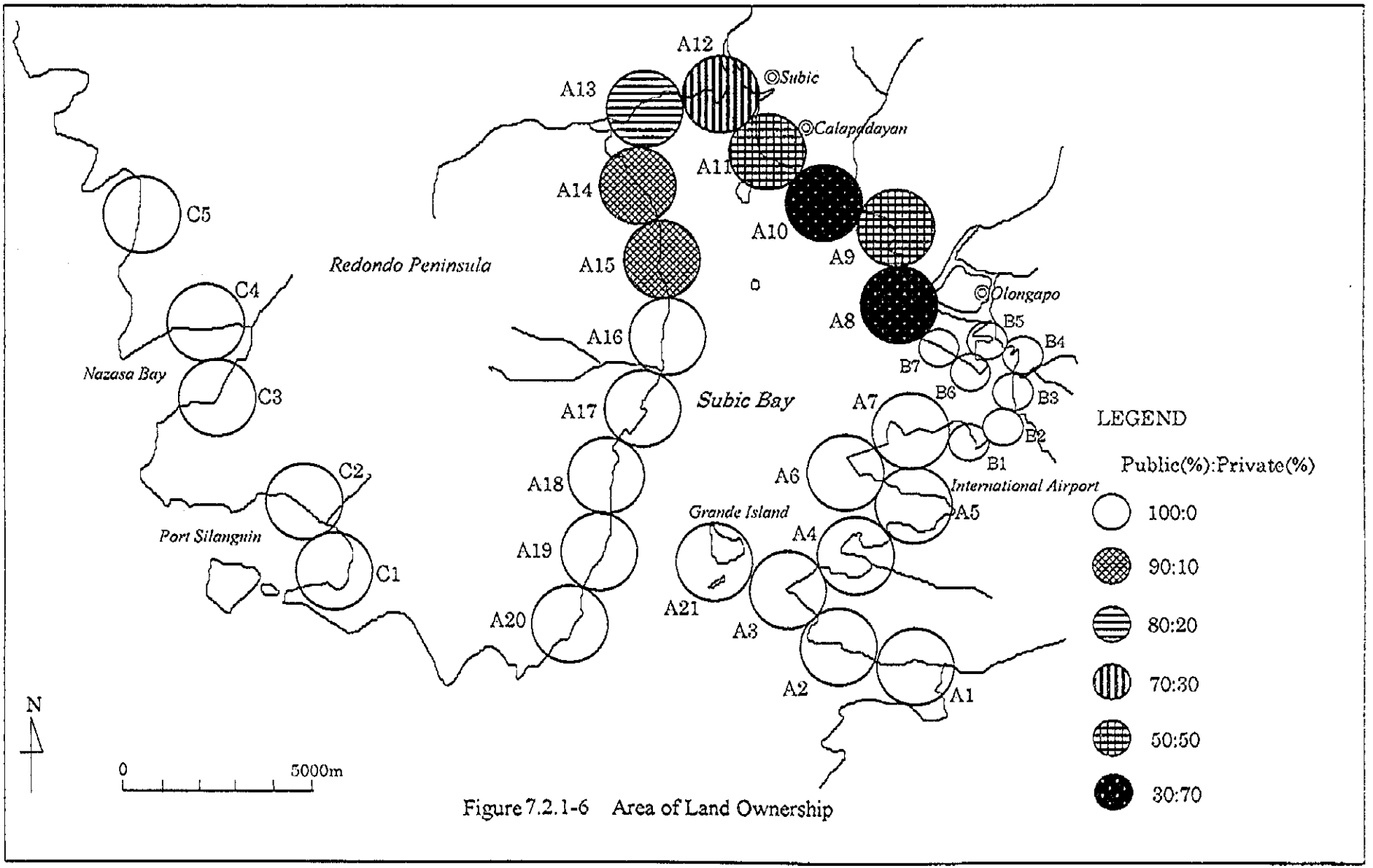


Figure 7.2.1-6 Area of Land Ownership

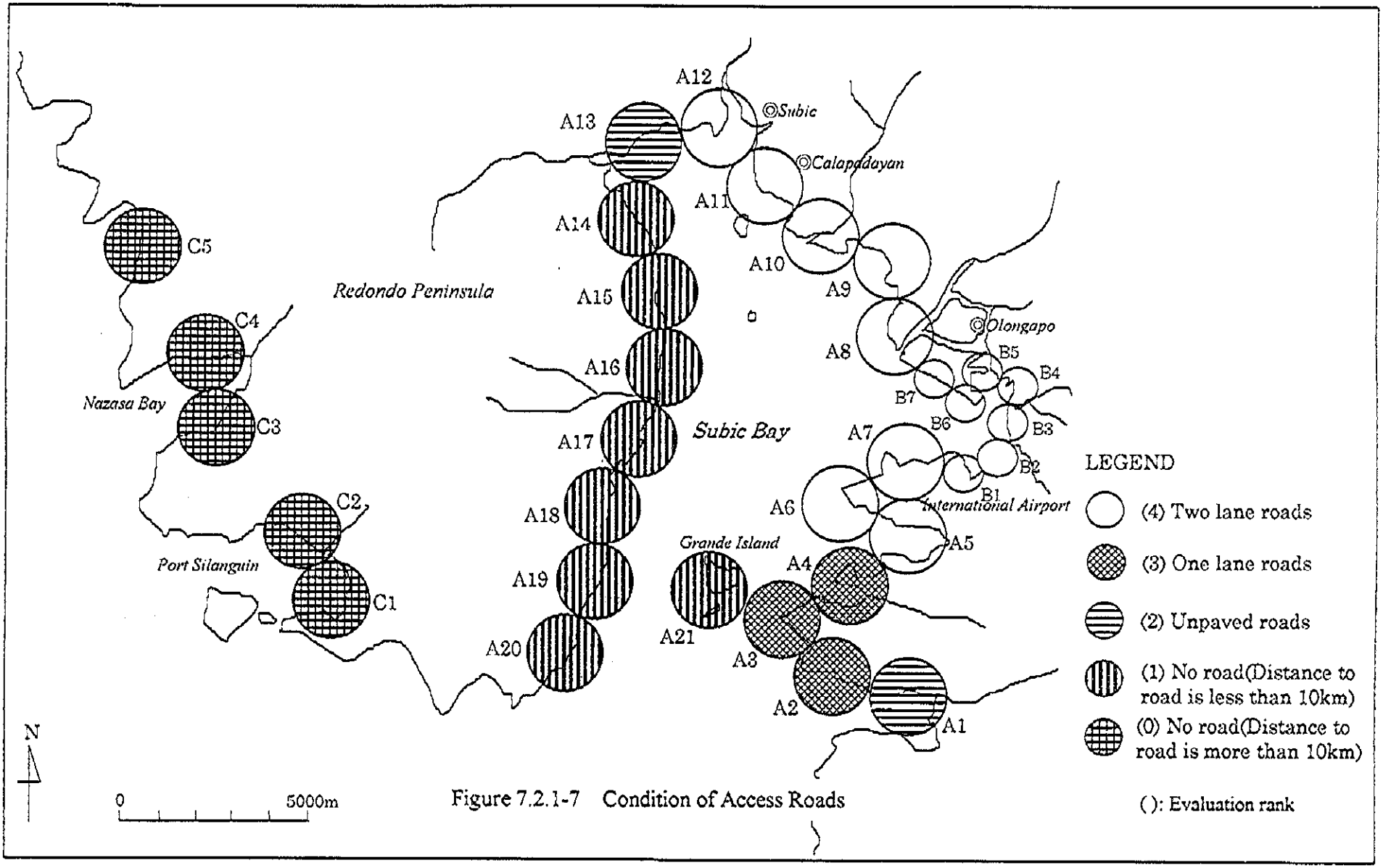


Figure 7.2.1-7 Condition of Access Roads

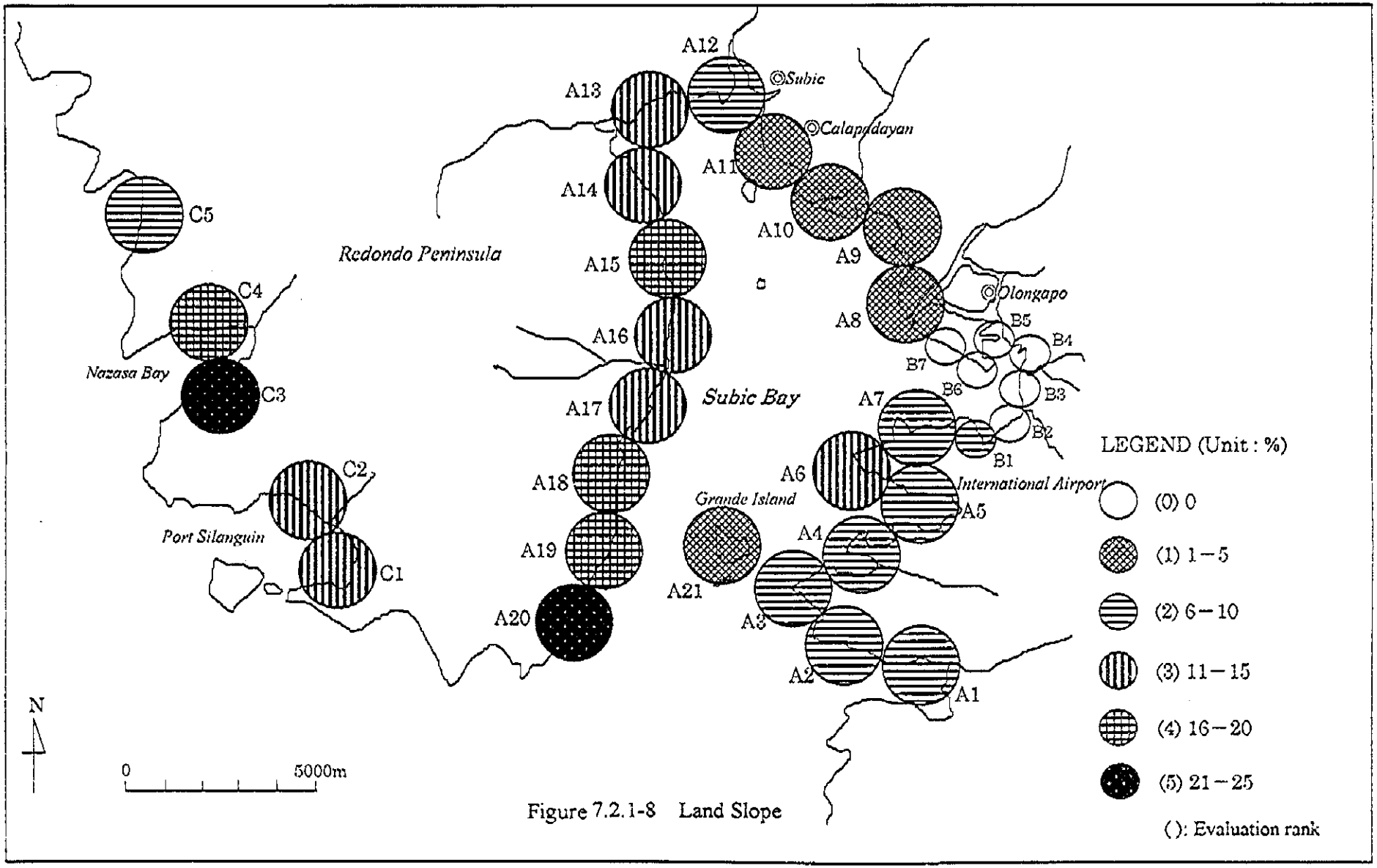


Figure 7.2.1-8 Land Slope

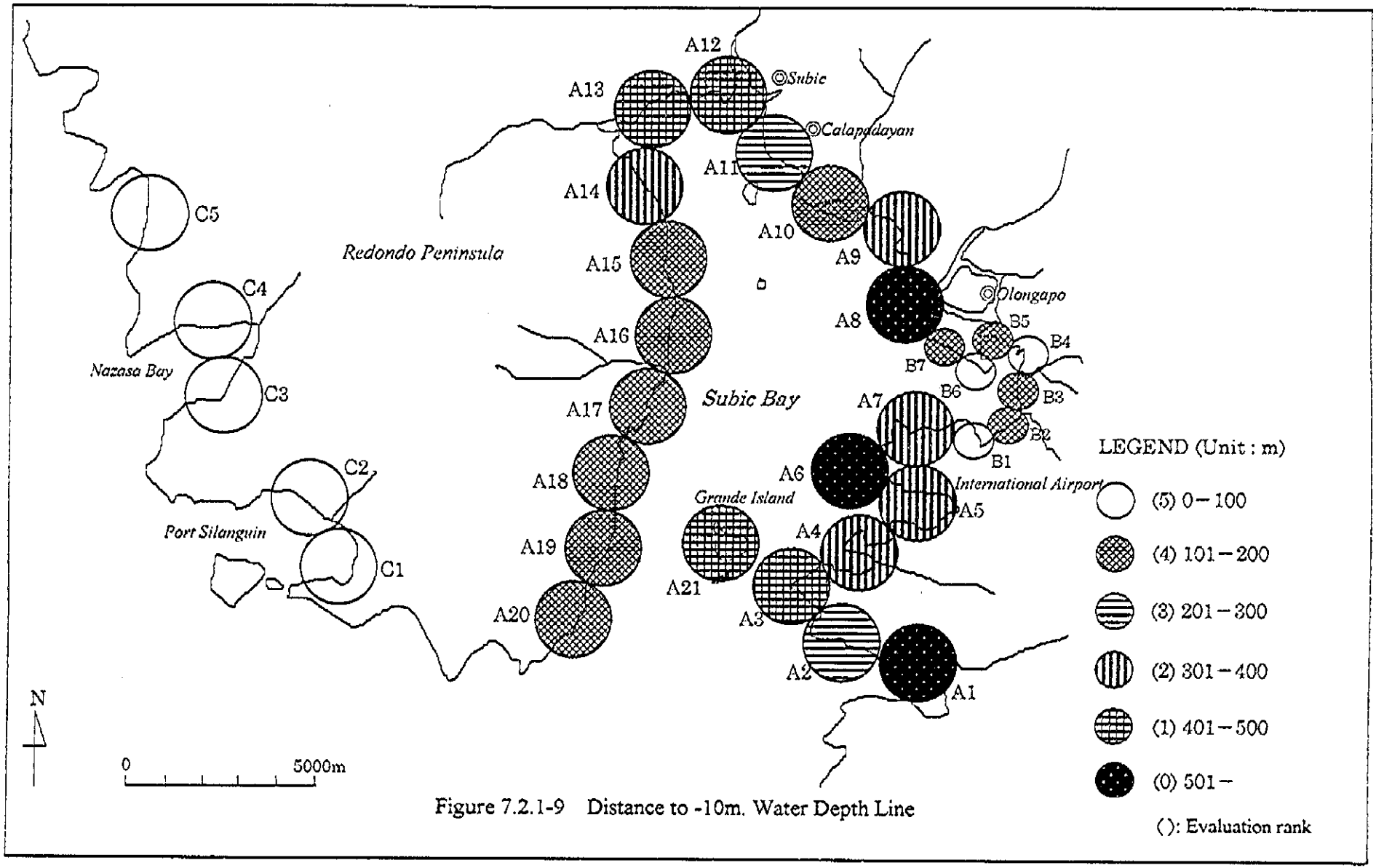


Figure 7.2.1-9 Distance to -10m. Water Depth Line

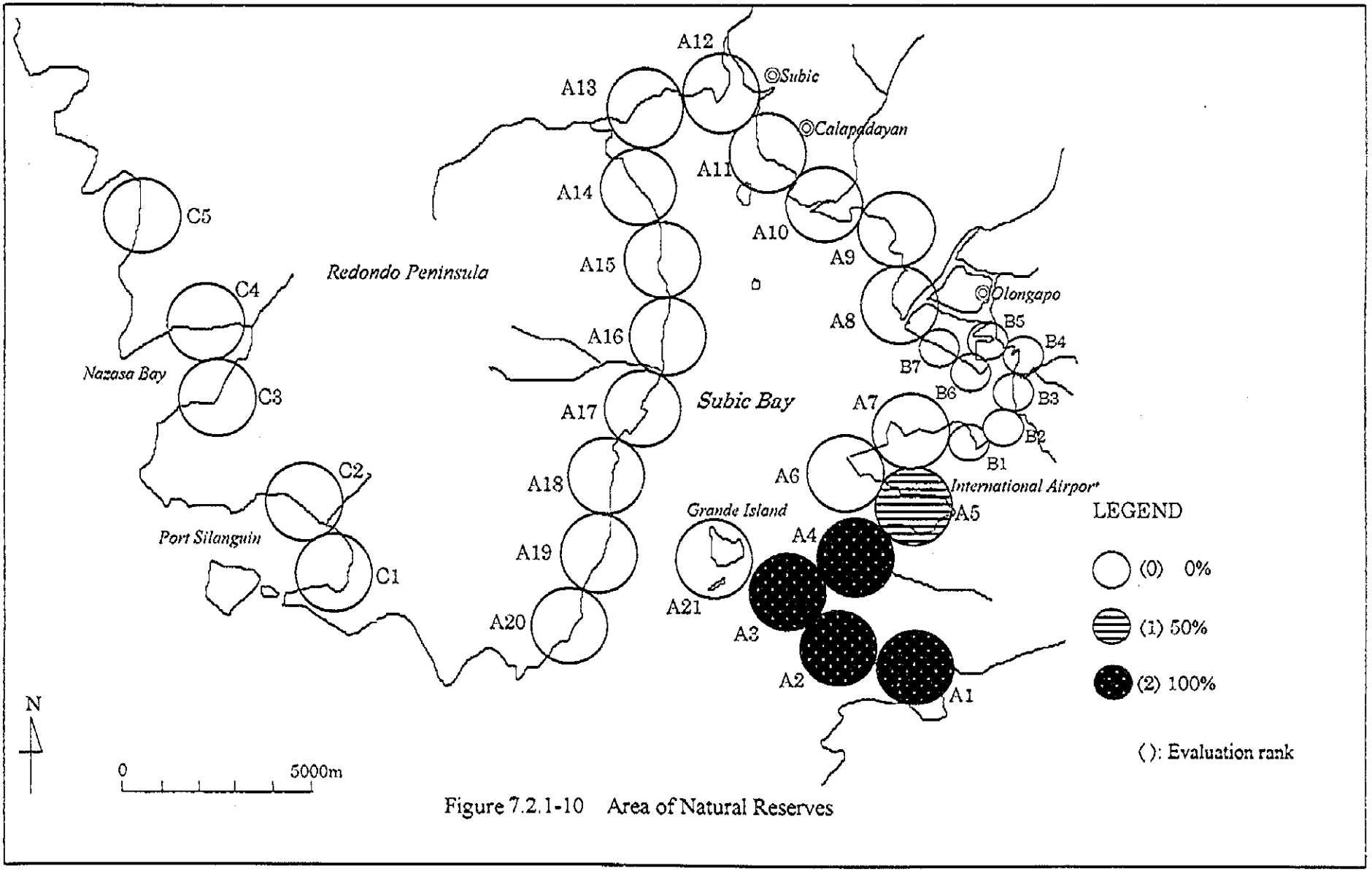


Figure 7.2.1-10 Area of Natural Reserves

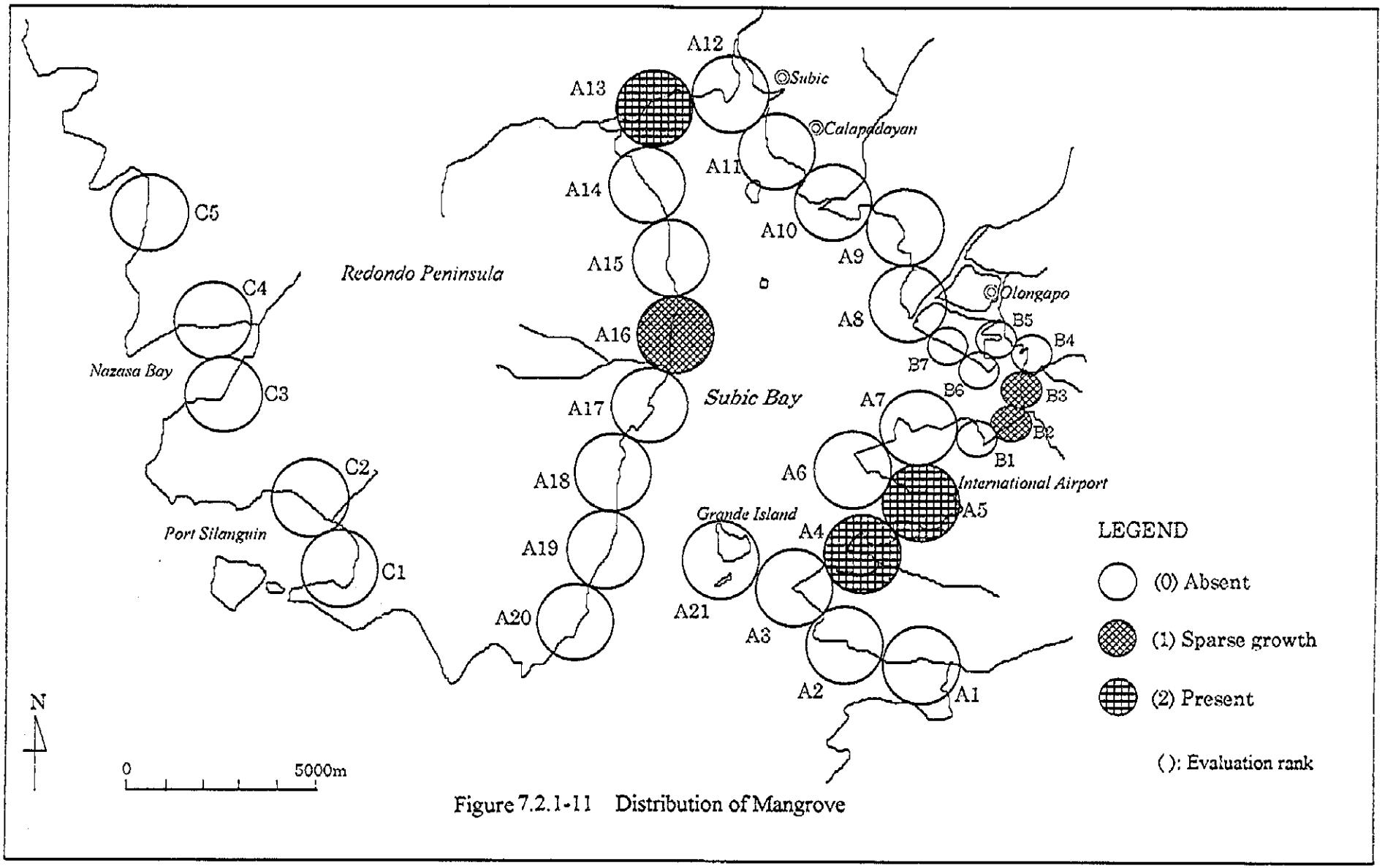


Figure 7.2.1-11 Distribution of Mangrove

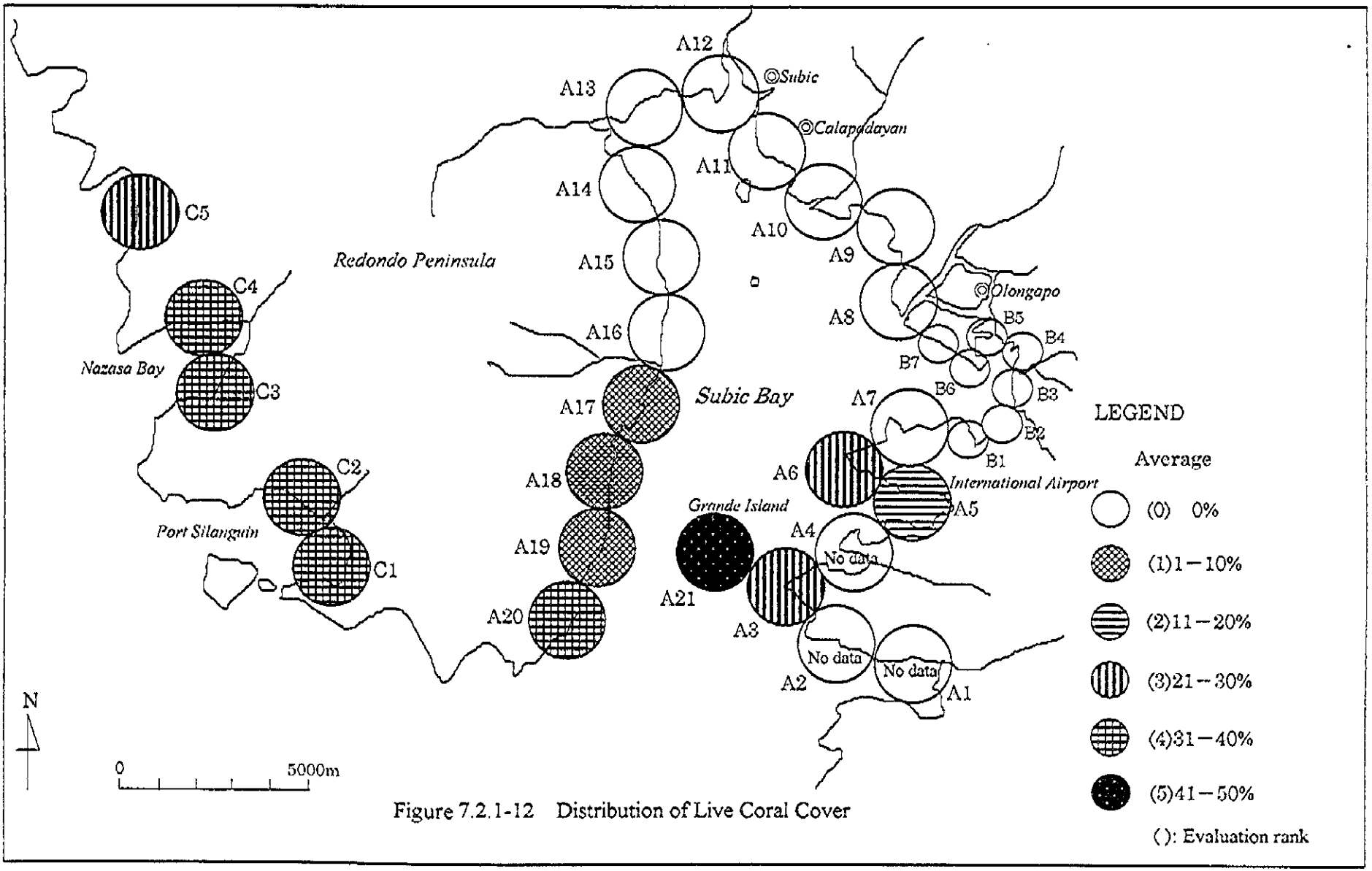


Figure 7.2.1-12 Distribution of Live Coral Cover

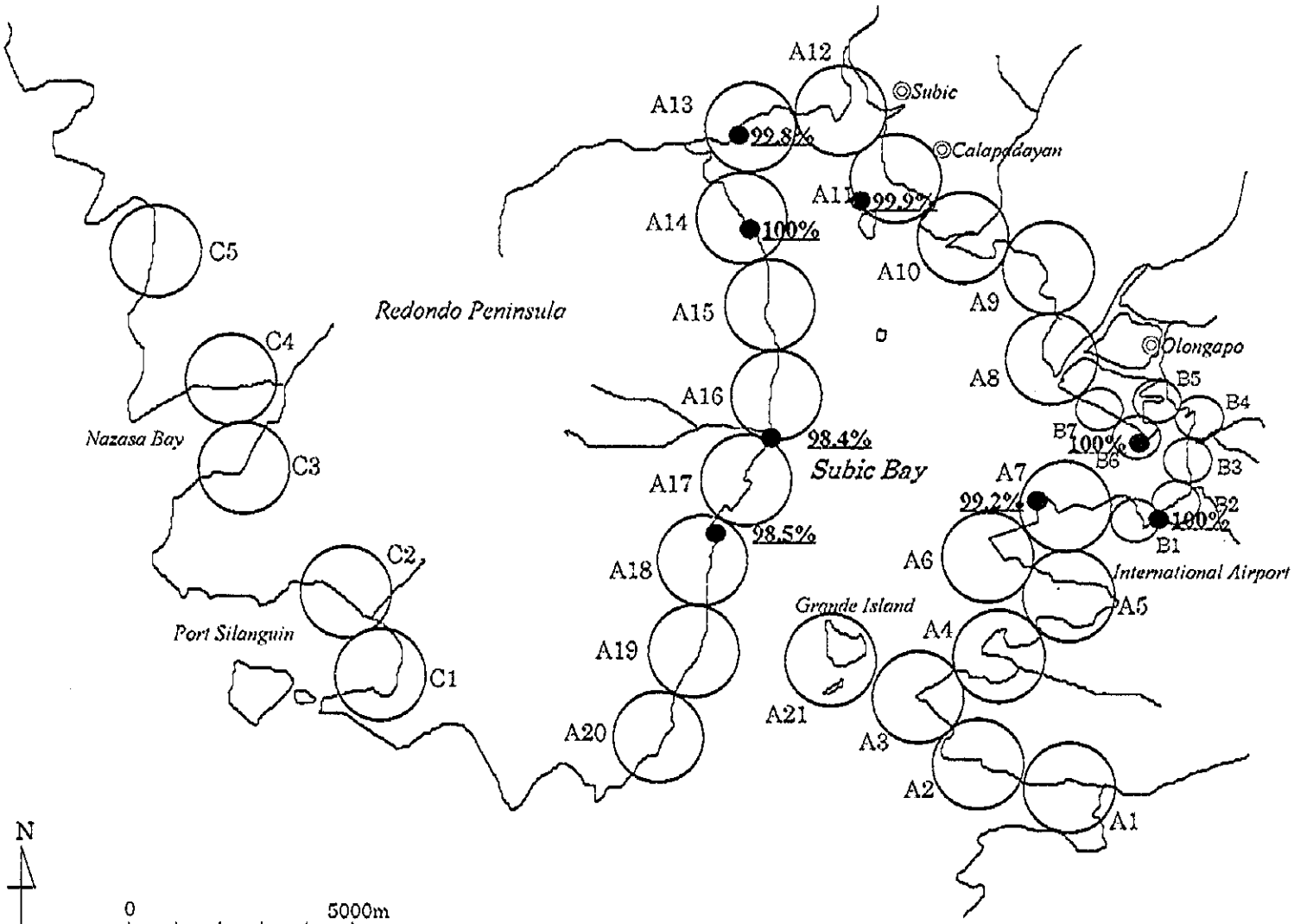


Figure 7.2.1-13 Wave Calmness of possible development sites

(Percentage of operational days when wave height is 0.5m or less)

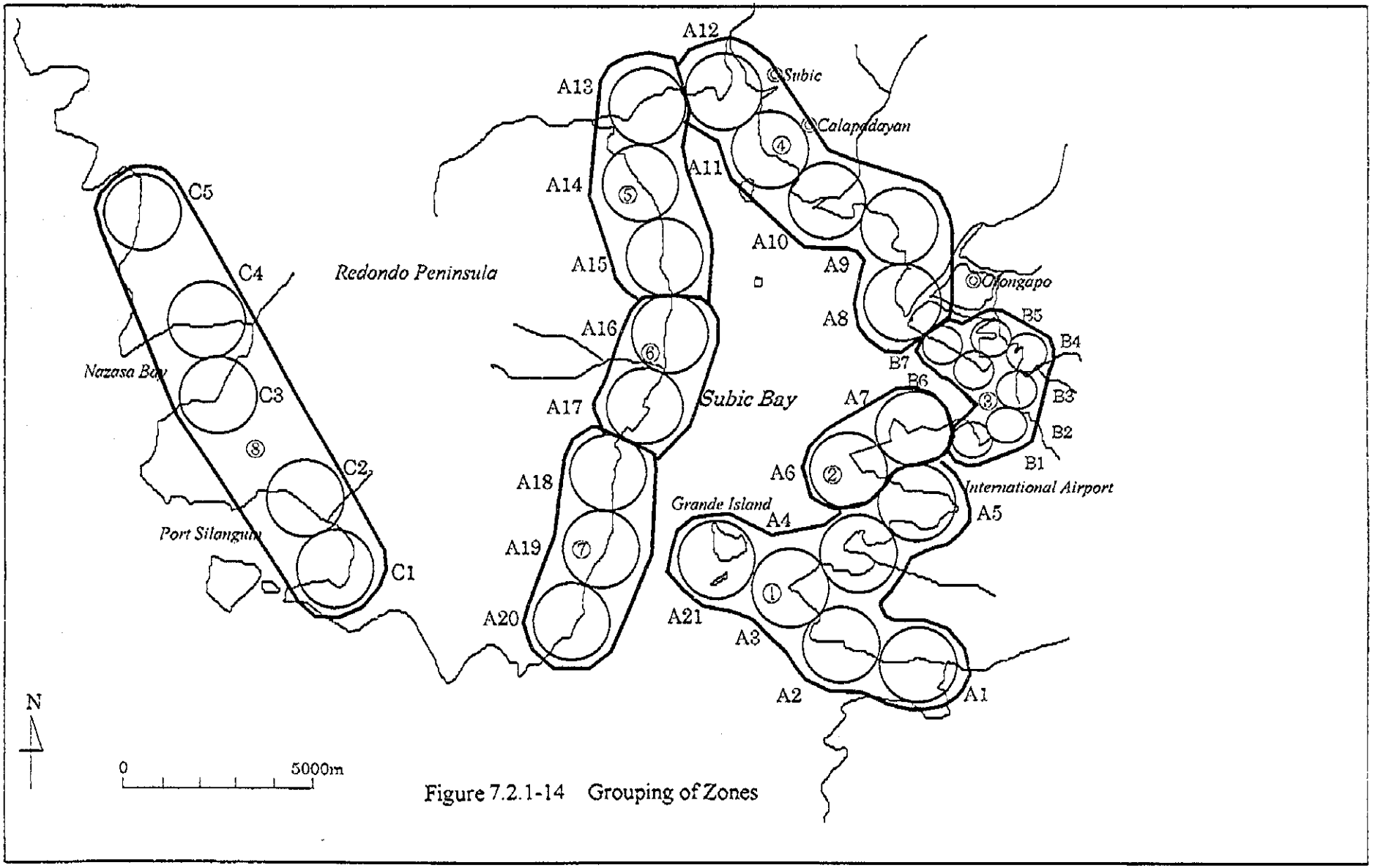
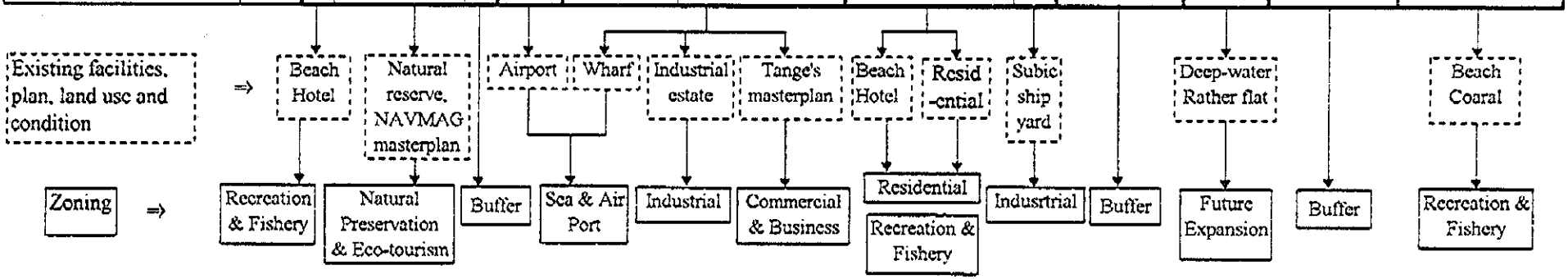


Figure 7.2.1-14 Grouping of Zones

Table 7.2.1-1 Evaluation Rank of Analyzed Item and Zoning

Gruoping No. of zone		①						②		③							④					⑤			⑥		⑦			⑧				
Analyzed item	No.of rank	A21	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	C1	C2	C3	C4	C5
Population	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	4	5	3	2	0	0	2	1	1	1	1	0	0	0	0	0
Housing	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	4	4	4	3	0	0	2	2	1	1	1	0	0	0	0	0
Fishing port	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	0	2	0	2	1	2	2	1	0	0	0	0	0
Agriculture and forest land use		5	10	10	10	10	10	0	0	2	3	6	0	0	0	0	5	1	4	5	5	9	10	10	10	10	10	10	10	10	10	10	10	10
Industrial and commercial land use		5	0	0	0	0	0	10	10	8	7	4	10	10	10	10	2	2	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential land use		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	7	5	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Public land		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	3	5	3	5	7	8	9	9	10	10	10	10	10	10	10	10	10	10
Private land		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	5	7	5	3	2	1	1	0	0	0	0	0	0	0	0	0	0
Access road	5	2	2	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	1	1	1	1	1	1	1	0	0	0	0	0
Land slope	6	1	2	2	2	2	2	3	2	0	0	0	0	0	0	0	1	1	1	1	2	3	3	3	3	3	4	4	5	3	3	5	4	2
Water depth	6	1	0	3	1	2	2	0	2	5	4	4	5	4	5	4	0	2	4	3	1	1	2	4	4	4	4	4	4	5	5	5	5	5
Natural reserve	3	0	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mangrove	3	0	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0
Coral cover	6	5			3		2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	4	4	4	4	4	3



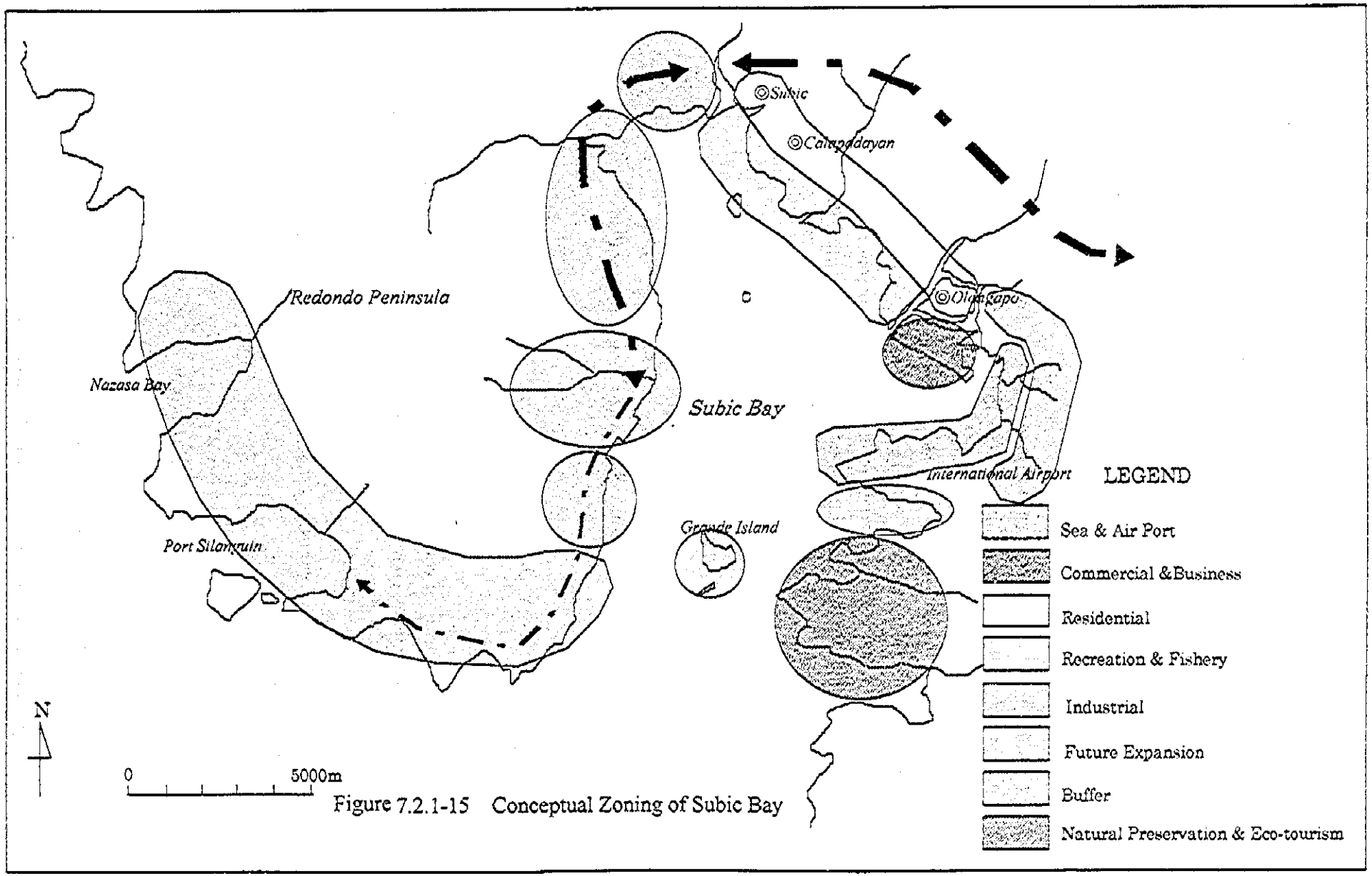


Figure 7.2.1-15 Conceptual Zoning of Subic Bay