## 7.4 EIA for Natural Resources Utilization

### 7.4.1 Impact on Marine Biological Resources

(1) Plankton

In depth studies on planktonic communities in the vicinity of the project site were not undertaken during this study. However, collections of phytoplankton and zooplankton were carried out in the coastal water columns of the adjacent area at the northern portion of Subic Bay in February 1998. The collection showed that the plankton population in Subic Bay was dominated by phytoplankton (over 99%). The zooplankton constituted the remaining less than 1%. This is normally expected since phytoplankton are considered primary producers or "grass of the sea" that form the base of the food web.

The major impact of construction on plankton would be the expected increase in turbidity created by the re-suspension of sediments during dredging operations. Turbidity would tend to limit light penetration in the water column that is essential in photosynthesis, a vital process in primary production. Increased turbidity would also lead to the irritation and clogging of gills of pelagic fish larvae and juveniles that could lead to their eventual smothering (Hirsch *et al.*, 1978). This adverse condition would slightly increase in mortality rates among pelagic fish larvae/juveniles including planktonic organisms. Additionally, the operation of the cutter suction dredge would entrain some nearshore planktonic organisms.

These impacts, while significant, are localized and temporary. Turbidity of the water column is expected to decrease to normal levels immediately following the completion of dredging operations.

(2) Soft Bottom Habitat

Baseline data for benthic fauna were obtained during the JICA Study conducted in February 1998. Silty or fine to medium/coarse sandy bottom containing rich organic substances characterizes the project area. This type of substrate provides a rich habitat for soft bottom benthic communities that contribute to high biodiversity in the area.

The data showed a mean benthos population density from 237 to 2,429 individuals/$m^2$ (Table 7.4.1-1 ). The highest was found at a depth of 1.5 m on the sandy bottom of Stn. S13 (south side of Kalaklan Point), where the nereids (Polychacta) and gammarids (Crustacea) predominate. By contrast, benthos density on areas east of the project site (Stns. S1, S2, S3 and S4 , from Cubi Point to Boton) ranged from 281 to 474 ind/$m^2$, with the station near the mouth of Boton River recording the highest. Polychaetes, belonging mostly to the free-living species that thrive well in interstices of sand grains, abound in the

project area. Of the various

**Table 7.4.1-1 Population Density and Biomass of Soft Bottom Benthic Fauna in the Vicinity of the Project Site (February 1998)**

| STATION NO. | LOCATION | Mean Density (No. ind./sq.m.) | Mean Biomass (Wet wt. g/sq.m.) |
|---|---|---|---|
| S1 | East side of Cubi Point | 429 | 1.18 |
| S2 | East side of SBIA | 281 | 9.04 |
| S3 | Nagcaban Point | 326 | 3.11 |
| S4 | Boton | 474 | 2.22 |
| S5 | Boton | 370 | 2.22 |
| S6 | POL Pier | 355 | 3.26 |
| S7 | Binictican | 237 | 4.44 |
| S8 | Marine Terminal | 1,555 | 10.36 |
| S9 | Inner Basin | 504 | 4.74 |
| S10 | East side of Rivera Pier | 415 | 5.04 |
| S11 | South side of Rivera Pier | 829 | 6.96 |
| S12 | Alava Pier | 578 | 10.07 |
| S13 | South side of Kalaklan Point | 2,429 | 5.63 |

*Note:* Density and biomass values are means of three replicate samples

polychaete families, Spionidae and Capitellidae were found in almost all the sampling stations.

The biomass of the benthic organisms ranged from 1.18 to 10.36 wet wt g/m$^2$ (see Table 7.4.1-1). Inter-station comparison showed Stn. S8 (Marine Terminal) with the highest biomass. Stn. S12 (Alava, 10.07 wet wt g/m2) Stn. S2 (east side of SBIA, 9.04 wet wt g/m2) and Stn. S11 (Rivera, 6.96 wet wt g/m$^2$) ranked second, third, and fourth, respectively. The lowest was found near Cubi Point.

One of the significant impacts of the project concerns the soft benthic communities present in the reclamation area. The dredging and reclamation activities will not only disturb the existing soft bottom benthic habitat but will completely smother all benthic organisms within the footprint of the reclamation site. This impact can not be avoided. However, benthic organisms can easily recolonize in undisturbed and unreclaimed areas. Benthic recolonization should be quite rapid and could occur within a few months after construction. Complete recovery could be attained within a year or two.

(3) Mangroves

Mangrove stands are not found in the proposed project site. The closest known mangrove stands are located in the mouth of Boton River, approximately 4 km east of Cubi

Point, or 1.5 km east of the proposed new access road. Impact of construction works on mangroves are not expected.

(4) Seagrasses

Seagrass beds are not found in the proposed project site. Seagrass habitats are mostly found around the Grande Island, Triboa Bay and along the east coast of Redondo Peninsula only. Construction works will not impact these habitats.

(5) Scattered Live Corals in Shallow Shoal Off Cubi Point

The present survey revealed the presence of scattered live coral colonies in the vicinity of the project site at Cubi Point. These scanty coral colonies were located about 300 - 1,000 m NW of Leyte Wharf. Sand and boulders covered about 55% of the bottom area at this site. Long dead coral substrates occupied about 41% of the bottom. The remaining 2 to 4% were scattered live coral. Obvious signs of disturbance were evident in this site. The eruption of Mt. Pinatubo which deposited about 5-20 cm of volcanic ash in Subic Bay (Atrigenio *et al.*, 1991) was the most likely cause of this disturbance.

The dredging and reclamation works would probably eliminate these surviving coral colonies. However, the extensive hard surface that will be provided by the revetments/armour rocks and quay wall (1,660 m in total length) may promote coral settlement and growth that may exceed the existing scanty coral. These gently sloping rubble mound structures would act like artificial reef hosting many different species of fish and invertebrates. Furthermore, these artificial hard substrates would provide food sources and shelter for marine life.

### 7.4.2 Impact on Fishery Resources and Activities

(1) Construction Impacts

The impacts of dredging and reclamation works on mobile organisms such as fish would be localized, temporary and minimal because of the inherent ability of these organisms to avoid disturbance. Increased suspended sediment levels and turbidity generated by construction activities would cause adult fish in the project site to migrate to other areas. However, smaller species unable to migrate and chronically exposed to high turbidity may suffocate as their gills site is expected to increase. The presence of hard substrates (revetments/armor rocks and quay wall), would tend to attract reef fishes. These structures will enhance the marine habitat of the area

(2) Normal Port Operation

Impacts to fisheries activities were assessed through a perception survey conducted on 9-13 February 1999 in eight fishing communities around Subic Bay. These were the following: Barangays Kalaklan, Matain, Calapacuan, Calapandayan, Wawandue, Asinan and Sitios Nagyantok and Kinabuksan in Barangay Cawag (Figure 7.4.2-1).Two survey methods were used: Focus Group Discussion (FGD) and Interviews. A total of 154 fishers participated in FGD and 120 fishers participated in the interview. The FGD participants were mostly members of Fishermen Aquatic Resources Management Cooperative (FARMC), a non-government fisher organization in the Subic Bay area. There are about 7,290 fishers in Subic Town and Olongapo City.

The FGD was used to inform the fishers about the proposed project and to know their collective views and feelings on the proposed development. It also served as a venue for sharing their experiences. On the other hand, the interview was used to collect information on individuals' specific concerns.

1) Fishing Activities in Subic Bay

Figure 7.4.2-2 shows the approximate location of fishing grounds and area restricted for municipal fishing in Subic Bay. The fishing grounds are named after the nearest identified place or area. For example, the fishing ground called Cali beach refers to the waters fronting the resort. Within Subic Bay, the fishing grounds are Castle, Quarry, Snake Island, "Pulong maliit" (Mayanga Island), Buoya A, Buoya S, La Serena, Cali Beach and Philseco. On the other hand, the fishing grounds at the mouth and outside the bay are the coastal areas south of Redondo Peninsula, Morong and San Antonio. Fishers claimed that they collected fishery products in areas as far as Mindoro, Batangas and offshore into the South China Sea (about 50 miles away from Luzon).

The restricted area was designated during the U.S. Navy period for security reasons. This restriction is still being enforced by the SBMA up to the present. To determine legal basis for this restriction, the following offices were consulted: (a) Harbor Operations Division, Seaport Department; (b) Philippine Coast Guard; ( c ) Law Enforcement Department; (d) Office of the Chief Operations Officer; and e) Protected Areas Division, Ecology Center. Based on these consultations, only one ordinance has been issued by SBMA regarding fishing activities in its jurisdiction. It is known as the Seaport Instruction No. 94-002 dated 5 April 1994 . This ordinance only regulates recreational fishing or game fishing in the bay.

According to the Ecology Center, the SBMA Chairman recently issued instructions to prepare a guideline that will cover commercial and municipal fishing

activities.

According to the Philippine Coast Guard, the area between Grande Island and Camayan Point has been restricted to fishermen for more than 20 years. The restriction took effect when the port was still under the jurisdiction of the U.S. Navy. However, this restriction is still imposed by SBMA for security reasons. Inspection of fishers passing through this route is regularly conducted.

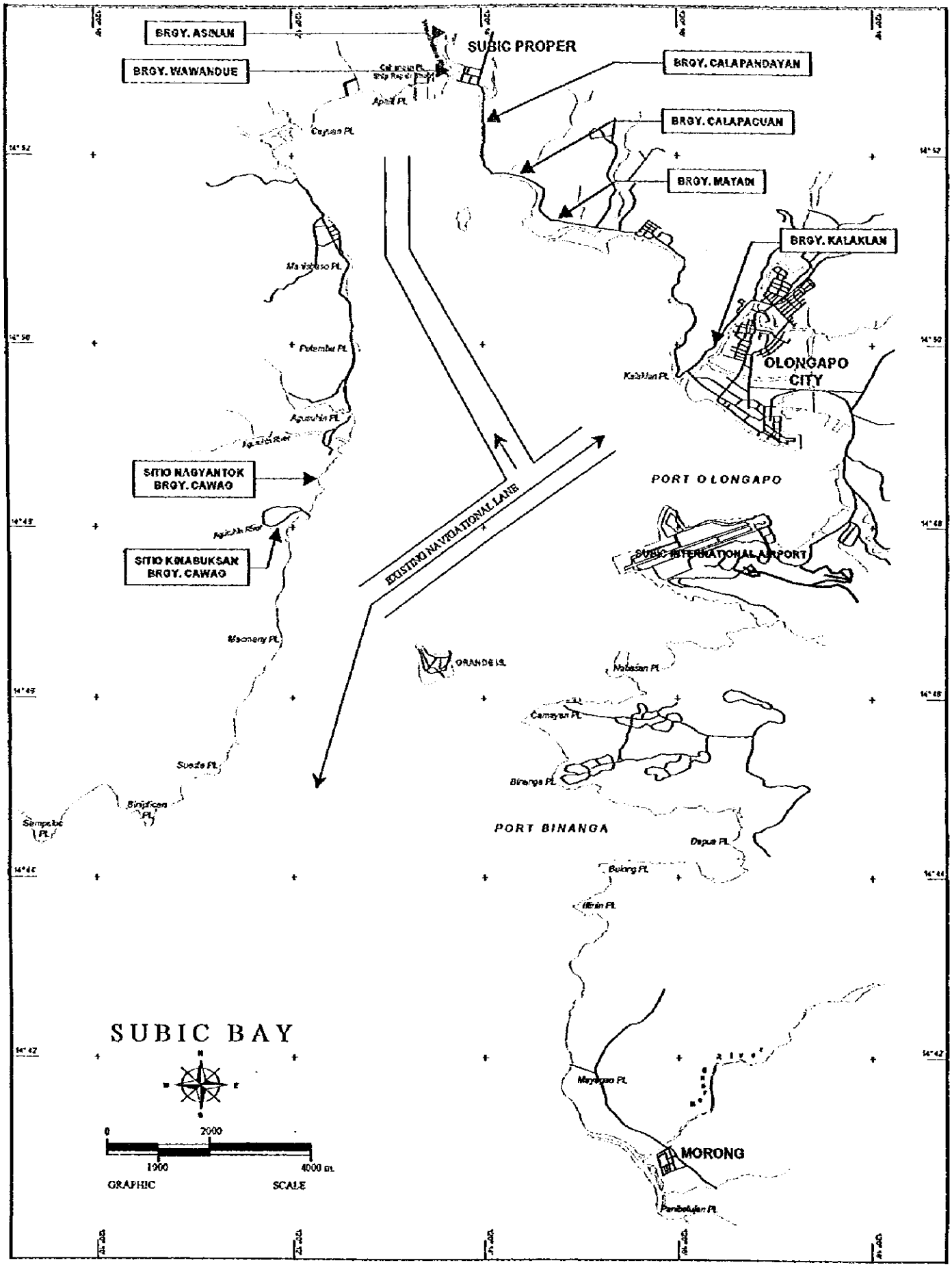


**Figure 7.4.2-1 Locations of Study Barangays**

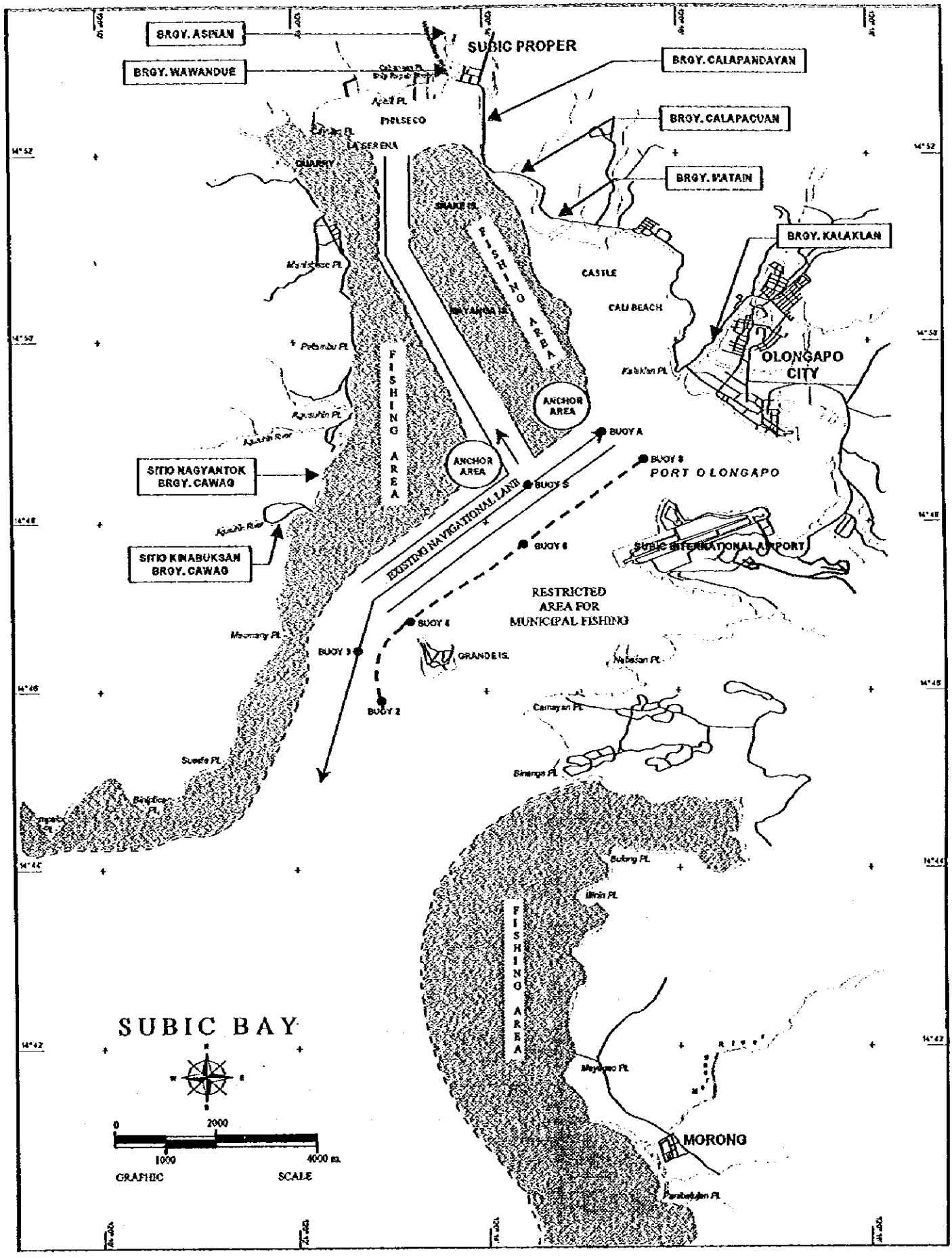


**Figure 7.4.2-2 Locations of Fishing Grounds and Area Restricted for Municipal Fishing in Subic Bay**

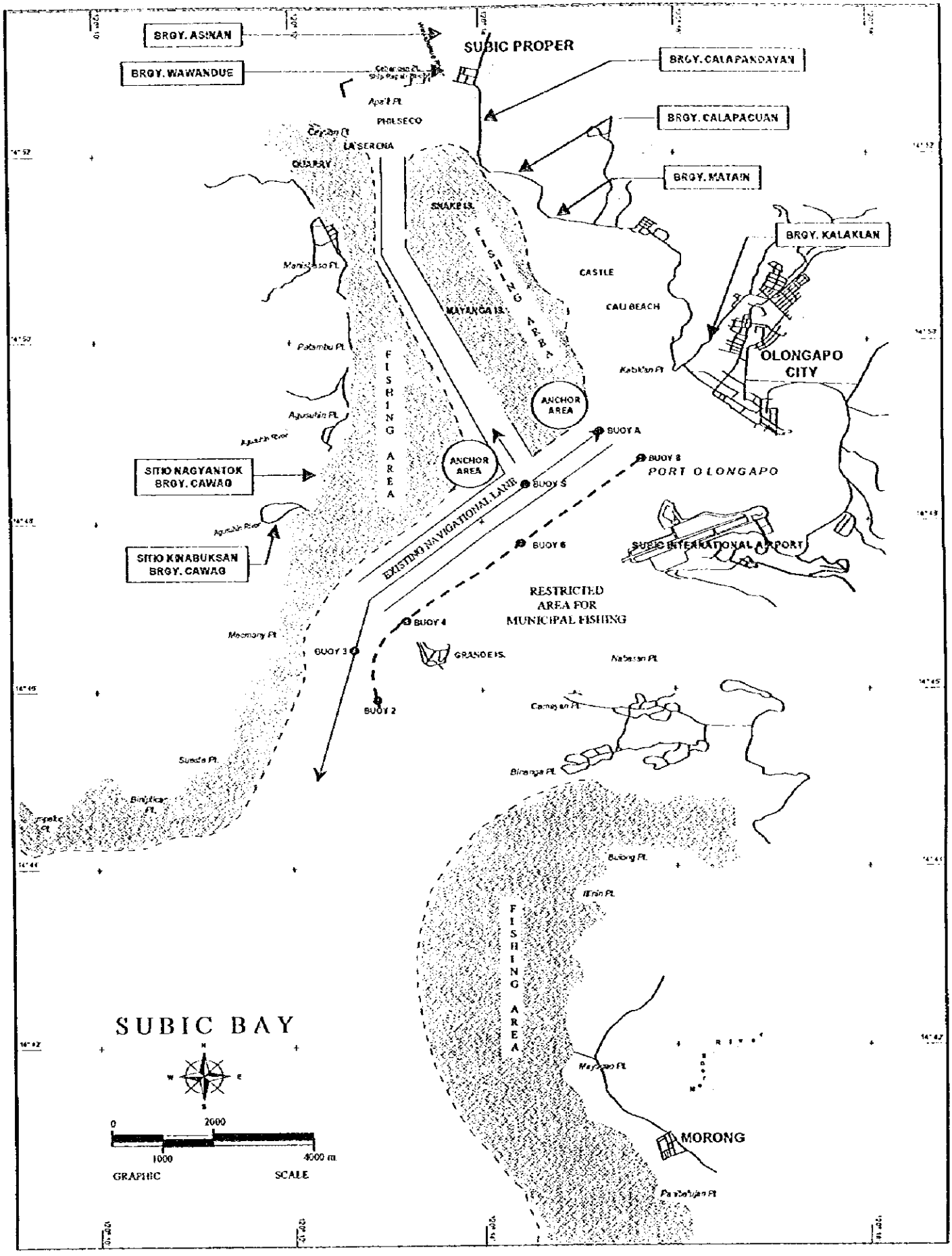


**Figure 7.4.2-2 Locations of Fishing Grounds and Area Restricted for Municipal Fishing in Subic Bay**

The Ecology Center also stated that certain areas in the bay are restricted to fishing since these are being eyed as natural protected areas. However, no official declaration has been issued regarding this.

The issuance of ordinances related to municipal fishing in areas outside of SBMA is under the jurisdiction of the local governments of the Municipality of Subic, Olongapo City, and the Municipality of Morong. They are guided by the Republic Act 7160, known as the 1991 Local Government Code. Under this code, the territorial waters of the municipal governments have been extended from three nautical miles (5.56 km) to 15 km from the shore. Fishing within the bay is, thus, limited to municipal fishing. In other words, commercial fishing operations are prohibited in Subic Bay.

Figure 7.4.2-3 shows approximately the traditional routes used by fishers from their respective communities to the fishing grounds inside or outside of the bay. About 40% of the respondents stated that they go fishing daily. Some (26%) engage in fishing activities once or twice a week. Almost half of the respondents said that they go fishing in the morning and in the afternoon. Actual fishing time varied among respondents. About 43% reported that they normally go fishing for about 7-12 hours per trip.

There are 2,223 (1,988 motorized and 235 non-motorized) boats based in Subic Bay. The boats of less than 3 gross tons, which are common in the area, are capable of fishing in the offshore waters of the South China Sea.

Commercial fishing boats from other municipalities also enter the bay. Although they do not catch fishes in the bay area, they either trade their catch in Subic Fishport, procure their supplies (fuel, ice, etc.) in the community or dock within the bay to avoid bad weather conditions.

2) Results of Focus Group Discussion

Fishers in the Subic Bay are accustomed to the presence of ships in the bay area and they have correspondingly adjusted their fishing activities to this situation. Commercial ships started operation in the port following the conversion of the U.S. Naval Base into an economic zone in 1992. Until now, the fishers are cognizant of the restrictions imposed by the U.S. navy and which are continuously being implemented by the present administration. They have full knowledge of the restricted areas for municipal fishing, navigational regulations, and permitted activities.

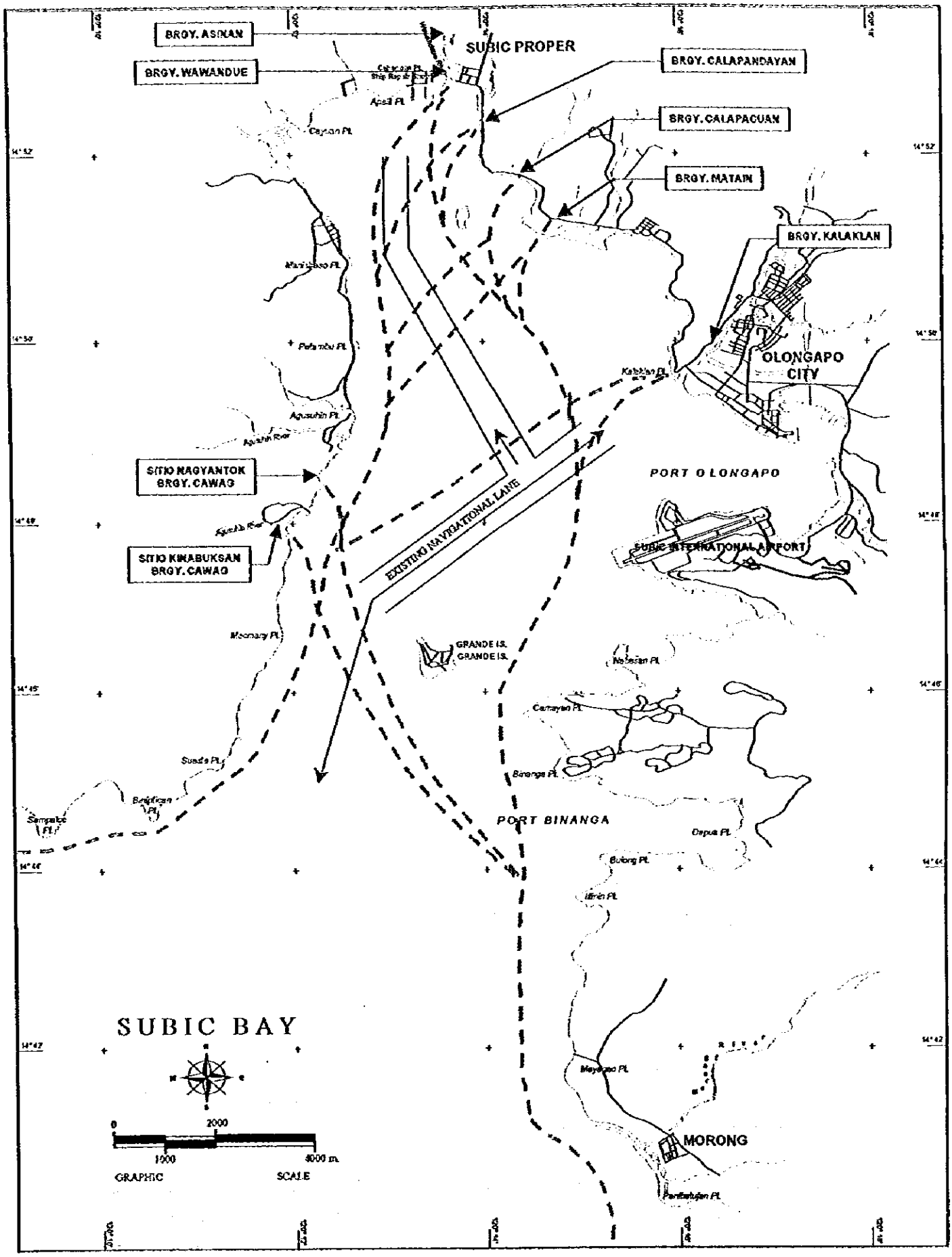


**Figure 7.4.2-3 Approximate Routes Taken by Fishermen to Fishing Grounds from their Respective Communities**

Fishers had noted violations committed by commercial ships operating in the bay area, which they said, were unheard of in the past. The violations according to the fishers include:

(a) *Non-compliance with the existing navigational lane by commercial ships.* Fishers said that among the violators were the Taiwanese vessels. They described these ships to be 50-m long, steel-hulled, fast moving, and sailing with no navigational lights. These ships cruised closely along the coast of Sampaloc Point, Biniptican Point and Sueste Point in Redondo Peninsula when entering and leaving the port. Also reported violators were cargo ships (of various sizes) from the south. They, too, traveled closely along the coasts of Mayagao Point and Ilinin Point in Bataan. These coastal areas are fishing grounds, especially for drift gill net fishers. Damages to nets had been reported. When asked if there related incidents inside the bay, the fishers noted one case in 1995. According to them a commercial vessel leaving the port overshot the navigational lane and hit drift gill nets located along the coast of Sitio Kinabuksan, Barangay Cawag. Except for this lone incident, fishers said they could not recall of any similar case that happened in the bay. They said that normally ships run slowly before reaching Grande Island. On their part, wherever they meet big vessels near this channel they also lessen their speed and cruise closely along the coast of Redondo Peninsula. In this manner, they could avoid collision and the waves generated by the wakes of these ships.

(b) *Anchoring in fishing grounds.* Fishers said that dragging of bottom set gill nets by ship's anchor happened in the past inside the bay area. These incidents started occurring when commercial vessels started operating in the bay in 1992. According to them some commercial vessels were unaware of the proper anchoring area. They added further that anchoring areas were designated during the time of the U.S. Navy. They said that some commercial ships do not anchor in designated anchoring areas.

*(c) Dumping of Waste.* Fishers claimed that commercial vessels dumped used oil, sewage and garbage in the bay since the opening of the port to commercial operation in 1992. This practice created pollution in the water column and discoloration of the surface. According to them this affected their fishing gear (nets) and their catch. Fishers believe that oily water drives away fishes thereby decreasing their catch and making their netting materials slimy and slippery.

In the FGD, fishers also identified potential impacts/key issues and disclosed their impressions/opinions about the proposed port development project (Table 7.4.2-2). They perceived that the project would result in the following:

*(a) Possible increase in pollution.* Fishers said that the project would attract numerous ships during its operation. They further stated that the increase in the number of vessels would correspond to the increase in the level of pollution in the bay since the

commercial vessels are known to dump waste into the sea. They said that pollution would decrease the fish population and catch, contaminate fishes (will taste and smell oily), and damage their nets.

*(b) Possible increase in competition for space.* With the planned port expansion, fishers said that the area devoted to anchorage would increase in size. This they perceived would decrease the area for fishing.

(c) *Possible denial of access between Camayan Point and Grande Island.* Fishers feared that they might be prohibited to pass through the channel between Camayan Point and Grande Island when the proposed port is developed. Ever since, they use this route for traveling to and from Bataan during fishing trips. In addition, it is also a preferred route for navigation during bad weather conditions because it is relatively concealed and close to the mainland.

(d) *Increase in the number of net damages due to non-observance of the existing navigational lane.* Fishers said that there were increasing number of net damages due to non-observance of the existing navigational lane by some commercial ships. With the proposed port development, they perceived that further increase would likely occur if the trend continues. They claimed that it rarely happened in the past with the U.S. naval vessels.

(e) *Generation of employment opportunities.* The fishers believed that the proposed project would generate employment opportunities.

3) Results of Interviews

Majority of the 120 respondents were males (95%), married (78%) and between 25-54
years old (87%). About 80% of the respondents were residents of the their respective communities for more than 10 years (Table 7.4.2-3).

Majority of the respondents (95%) stated that fishing was their main source of income. Majority (90%) have been fishing in the bay for more than 6 years (Table 7.4.2-4). About 70% were boat owners (Table 7.4.2-5). Most of the boats were outfitted with motor engines and 16 HP Briggs & Stratton and 4DR5 Fuzo engines were the most commonly used.

Table 7.4.2-6 provides data on the types of municipal fishing gear used in Subic Bay. The drift and bottom set gill nets are the most commonly used in catching fishes along the coastal
areas while the handlines are utilized outside of the bay into the deeper offshore waters of the South China Sea. Other fishing gears, such as long-line for scads and squid jig are also relatively abundant.

The municipal fishing's peak season is October to December. The lean period is from January to March. The concessionaires (middlemen), Subic Municipal Fishport and neighbours are the markets for their fish caught.

About 93% of the respondents stated that they encountered large vessels inside the bay (Table 7.4.2-7). More than half of them (52%) claimed that coming across with ships occurred occasionally. On the other hand, 42% of them said they come across large ship everyday or every fishing trip.

**Table 7.4.2-2 Perceived Impacts and Respondents' Opinions related to the planned port development**

| Impacts/Concerns | Respondents' Opinions |
|---|---|
| 1. Possible increase in water pollution due to increased number of ships | a. Prohibit dumping of waste into the water<br>b. Ship operators must be aware of leakage and oil spill<br>c. An oilspill control plan should be prepared and equipment for control should be made available. |
| 2. Possible increase in competition for space (fishing ground vs. anchor area) | a. Anchor area should be placed away from fishing grounds<br>b. Establish anchor area in Bataan and south of Grande Island<br>c. Schedule entry of ships to avoid congestion<br>d. Do not prohibit boats from getting close to ships anchored in fishing ground |
| 3. Possible denial of access between Camayan Point and Grande Island | a. Do not prohibit fishers from passing this route |
| 4. Further increase in the number of incidence of collision and net damages due to non-observance of navigational lane | a. Commercial ships should religiously follow the existing navigational lane.<br>b. Short cuts along the coastal areas of Bataan and Redondo Peninsula should be avoided.<br>c. Increase the number of navigational buoy and extend southwards<br>d. Repair those with damages (unlighted buoys)<br>e. Ships should be required to have navigational lights and entry and exit from bay should be preceded by siren blast |
| 5. Employment opportunities will be generated | a. Priority be given to Subic residents |
| | Other recommendations:<br>a. Port management should establish clear-cut policy that will govern navigation, anchoring, and waste disposal.<br>b. Port management should conduct information campaigns regarding port policy and regulations to the affected communities and major port users (commercial ship operators).<br>c. An office should be set-up to settle disputes between commercial ship operators and fishers in case of accident and other damages. This office should also take care of processing claims, settlements and impounded boats (that violate regulations). |

## Table 7.4.2-3 Demographic Profile of Respondents

| Responses | Total | |
|---|---|---|
| | Freq. | % |
| **Sex** | | |
| Male | 114 | 95.5 |
| Female | 6 | 5.0 |
| **TOTAL** | **120** | **100.0** |
| **Civil Status** | | |
| Married | 93 | 77.5 |
| Single | 20 | 16.7 |
| Separated/Widowed | 7 | 5.8 |
| **TOTAL** | **120** | **100.0** |
| **Age** | | |
| 15-24 | 3 | 2.5 |
| 25-34 | 28 | 23.3 |
| 35-44 | 50 | 41.7 |
| 45-54 | 26 | 21.7 |
| 55-60 above | 12 | 10.8 |
| Not Specified | 1 | 0.8 |
| **TOTAL** | **120** | **100.0** |
| **Length of stay in the barangay** | | |
| Since birth | 43 | 35.8 |
| 11-20 years and over | 53 | 44.2 |
| Less than 1-10 years | 24 | 20.0 |
| **TOTAL** | **120** | **100.0** |
| **Educational Attainment** | | |
| Elementary/Elementary graduate | 56 | 46.7 |
| High School/High School Graduate | 51 | 42.5 |
| College | 7 | 5.8 |
| Vocational | 6 | 5.0 |
| **TOTAL** | **120** | **100.0** |

**Table 7.4.2-4 Employment Status, Number of Years as Fishers and Family Involvement**

| Responses | Total | |
|---|---|---|
| | Freq. | % |
| **Fishing as a main source of income** | | |
| Yes | 114 | 95.0 |
| No (Small business / Sari-sari store, Carpentry) | 6 | 5.0 |
| **TOTAL** | **120** | **100.0** |
| **Family members involved in fishing** | | |
| Siblings | 60 | |
| Son / daughter | 41 | |
| Cousins | 22 | |
| Father | 12 | |
| Nephews / nieces | 12 | |
| In-laws | 10 | |
| Husband / wife | 5 | |
| Uncle | 3 | |
| **Number of years fishing in Subic bay** | | |
| 1-5 | 13 | 10.8 |
| 6-10 | 21 | 17.5 |
| 11-15 | 21 | 17.5 |
| 16-20 | 30 | 25.0 |
| 21-25 | 6 | 5.0 |
| 26-30 | 13 | 10.8 |
| 31-35 | 4 | 3.3 |
| 36-40 | 9 | 7.5 |
| 40 above | 3 | 2.5 |
| **TOTAL** | **120** | **100.0** |

Table 7.4.2-5 Respondents' Status of Boat Ownership and Engine Types of Boats

| Responses | Total | |
|---|---|---|
| | Freq. | % |
| **Boat owners** | | |
| Yes | 83 | 69.2 |
| No | 37 | 30.8 |
| **TOTAL** | **120** | **100.0** |
| **Number of boats owned** | | |
| 1 | 60 | 72.3 |
| 2-3 | 23 | 27.7 |
| **TOTAL** | **83** | **100.0** |
| **Types of boats owned** | | |
| Motorized | 73 | 86.9 |
| Non-motorized | 11 | 13.1 |
| **TOTAL** | **84** | **100.0** |
| **Types of engines used / owned** | | |
| 16 Hp | 61 | 76.3 |
| 4DR5 | 9 | 11.3 |
| 5 HP | 3 | 3.8 |
| 8 HP | 3 | 3.8 |
| 9 Hp | 2 | 2.5 |
| 2.5 Hp/3 Hp | 2 | 2.6 |
| **TOTAL** | **80** | **100.0** |
| **Source of boat used by non-owners** | | |
| Borrowed / shared | 36 | 97.3 |
| Rented | 1 | 2.7 |
| **TOTAL** | **37** | **100.0** |
| **Kinds of boats borrowed by non-owners** | | |
| Motorized | 33 | 89.2 |
| Non-motorized | 4 | 10.8 |
| **TOTAL** | **37** | **100.0** |
| **Types of motor engines used by non-owners** | | |
| 16 Hp | 26 | 78.8 |
| 4K | 5 | 15.2 |
| 4DR5 | 2 | 6.0 |
| **TOTAL** | **33** | **100.0** |

Table 7.4.2-6 Types of Fishing Gear and Preferred Fishing Ground

| Responses | Total | |
|---|---|---|
| | Freq. | % |
| Type of fishing gears used | | |
| Handline | | |
| Kawil (hook and line) | 49 | |
| Kitang (tuna long line) | 40 | |
| Pamilpil (long line for scads) | 17 | |
| Pamusit (squid jig) | 19 | |
| Gill net | | |
| Pangalabaw (surface drift gill net for offshore use) | 16 | |
| Largarete (surface drift gill net for use inside bay) | 24 | |
| Panteng Lubog (bottom set gill net) | 32 | |
| Tawtaw | 31 | |
| Singgapong | 3 | |
| Speargun | 2 | |
| Compressor (for collecting aquarium fishes) | 1 | |
| **Single / Multiple users of fishing gear** | | |
| Single users | 64 | 53.3 |
| Multiple users | 56 | 46.7 |
| **TOTAL** | **120** | **100.0** |
| **Fishing ground** | | |
| Both inside and outside of Subic Bay | 48 | 40.0 |
| Outside only | 48 | 40.0 |
| Inside only | 23 | 19.2 |
| Not specified | 1 | 0.8 |
| **TOTAL** | **120** | **100.0** |

Table 7.4.2-7 Respondents' number of encounters with ships

| Responses | Total | |
|---|---|---|
| | Freq. | % |
| **Do you encounter large ships inside Subic Bay?** | | |
| Yes | 112 | 93.3 |
| No | 6 | 5.0 |
| Not specified | 2 | 1.7 |
| **TOTAL** | **120** | **100.0** |
| **Frequency of encounters with large ships** | | |
| Occasional (weekly / monthly) | 58 | 51.8 |
| Most of the time / daily / every departure | 47 | 42.0 |
| Not specified | 7 | 6.2 |
| **TOTAL** | **112** | **100.0** |

About 66% of the respondents agreed that there have been instances that large ships disturbed them (Table 7.4.2-8). The disturbances generated were :

(a) The generation of big waves (caused swaying of and water entering boats).

(b) Non-observance of regular route.
(c) Encroaching to fishing grounds.

Majority of the respondents (98%) have never witnessed any collision between a fishing boat and a large vessel inside the bay. The two collision incidents happened during the time of the U.S. Navy. The boats were heavily damaged during those incidents but the fishermen were escaped serious injuries. Collisions that were recalled by some of the respondents were accidents that happened in offshore areas far from Subic Bay.

**Table 7.4.2-8 Disturbances created by ships.**

| Responses | Total | |
|---|---|---|
| | Freq. | % |
| **Are there instances of disturbance from larger ships?** | | |
| Yes | 79 | 65.8 |
| No | 40 | 33.4 |
| Not specified | 1 | 0.8 |
| **TOTAL** | **120** | **100.0** |
| **Nature of disturbance from large ships** | | |
| Creates big waves (swaying of and watering entering boats) | 33 | |
| Ships have no regular route | 26 | |
| Causes damage to fishing gear | 19 | |
| Disturbs / draws fishes away | 6 | |
| Not specified | 6 | |
| Ships anchors / occupies fishing grounds | 4 | |
| None | 118 | 98.3 |
| Yes | 2 | 1.7 |
| **TOTAL** | **120** | **100.0** |
| **Other problems caused by large ships** | | |
| None | 39 | |
| No answer | 37 | |
| Water pollution (oil and solid waste) | 34 | |
| I don't know | 7 | |
| Not specified | 3 | |

Majority (83%) of the respondents believed that the proposed project would pollute the bay. They said that pollutants would be in the form of oil and chemicals from ships. Other perceived pollutants were solid waste dumped and smoke emitted by ships.

More than half (52%) of the respondents were aware of the proposed port development project Majority of those who were aware (79%) said that the JICA Study Team that conducted FGD informed then of the project.

**Table 7.4.2-9 Respondents' opinions on pollution and recommendations**

| Responses | Total | |
|---|---|---|
| | Freq. | % |
| **Will the port development pollute Subic Bay?** | | |
| Yes | 99 | 82.5 |
| I don't know | 15 | 12.5 |
| No | 6 | 5.0 |
| **TOTAL** | **120** | **100.0** |
| **Perceived ways of polluting Subic Bay** | | |
| Pollution caused by oil (during cleaning and repair of ship) | 78 | |
| Pollution caused by solid waste from ship | 28 | |
| Air pollution caused by exhausts from ships | 3 | |
| Not specified | 3 | |
| **Will pollution affects fishes inside the bay** | | |
| Yes | 88 | 73.3 |
| I don't know | 18 | 15.0 |
| No | 10 | 8.3 |
| Not specified | 4 | 3.3 |
| **TOTAL** | **120** | **100.0** |
| **Perceived effects on fishes** | | |
| Poisoning of fish | 48 | |
| Caught fish will taste / smell like oil | 16 | |
| Fish will not enter the bay / driven away | 15 | |
| Red tide | 11 | |
| Not specified | 6 | |
| **Suggested solutions to mitigate effects on fishes** | | |
| Ships should treat its waste / have proper waste disposal facility | 36 | |
| Enforce stricter laws on proper waste disposal | 31 | |
| Not specified | 14 | |
| Don't develop the port | 5 | |
| Designate patrol or coast guards | 3 | |
| I don't know | 3 | |
| There is no solution | 1 | |
| Proper / communication / scheduling / traffic of the movement of ships | 1 | |

About 41% of the respondents were in favor of the project, while some18% were against it. The rest of those surveyed either had no answer to this query (8%) or simply did not know (33%). Table 7.4.2-9 shows the details on this query.

In summary, the main reason for not favoring the project was because of the belief that the proposed undertaking will result in loss in fishery income due to marine pollution and decrease in effective fishing ground. The reasons for favoring the proposed project were the generation of job employment opportunities for the local residents and increase in revenue for the local government units.

Table 7.4.2-10 Respondent's acceptability of the project and perceived impacts

| Responses | Total | |
|---|---|---|
| | Freq. | % |
| **Acceptance of the port development project** | | |
| Yes | 49 | 40.8 |
| I don't know | 39 | 32.5 |
| No | 22 | 18.3 |
| No answer | 10 | 8.4 |
| **TOTAL** | **120** | **100.0** |
| **If Yes, reasons for approval (multiple answers)** | | |
| It will provide employment opportunities | 22 | |
| It will improve the city / municipality thru increased revenues | 23 | |
| As long as the port will not affect the bay and livelihood | 9 | |
| **If No, reasons for disapproval** | | |
| It will pollute the bay | 5 | |
| Will cause loss of fishes/ drive away fishes / affects fishers' livelihood | 14 | |
| Hazardous to fishes and people | 6 | |
| | | |
| **Perceived Impacts of the Project (Multiple answers)** | | |
| **Positive** | | |
| It will provide employment | 36 | |
| It will improve the city / municipality / increase revenue | 24 | |
| Improve transportation / trade | 7 | |
| I don't know | 7 | |
| **Negative** | | |
| It will pollute the water / air | 54 | |
| Negative effects to fishers' livelihood | 25 | |
| Fishing ground will decrease / loss of fishes | 19 | |
| I don't know | 8 | |

(3) Recommended Mitigation Measures

(a) A series of documented dialogues/ consultations with concerned barangays will actually prove beneficial to all. It would therefore augur well for the Proponent to dispatch a team of knowledgeable personnel and implement an information, education and communication (IEC) drive regarding the proposed project. The local radio network and newspapers should be tapped for this activity.

(b) All waste discharges from ships must strictly comply with the guidelines of the Philippine Coast Guard (PCG MC 01-94 and MC 02-94) and Annexes IV and V of MARPOL for domestic waste discharges to the marine environment. Oily bilge water will have to be treated on board the ship to MARPOL standards.

(c) Proper collection, storage, and disposal of sludge on board vessels should be the

responsibility of the shipping company. This waste should be transported to an onshore treatment facility for recycling or disposal.

(d) The SBMA should be mandated to oversee the strict enforcement of environmental laws and regulations. It should design and implement a compliance monitoring program for the port facility including all vessels calling at the port.

(e) The port should be provided with ample navigational lights and markers for safety. A new lighthouse in Grande Island should be installed to aid navigation.

(f) Fishers should be allowed to transit across the channel between Camayan Point and Grande Island and be provided with ample area to maneuver to avoid the turning area for ships calling at the port.

(g) Subic Bay residents should be given priority in employment when the project is implemented.

## 7.5 EIA for Socioeconomic Environment

### 7.5.1 Target Group of EIA for Socioeconomic Environment

(1) Tourists and Employers/Employees of the Project Site

As has been mentioned, the project will take place within the SBMA area and there is no resident at and around the project site, i.e. Cubi Point. That means there is very few influences of Socioeconomic Environmental Impact by the project. However, as there are two beaches at Cubi Point where a good tourism point for tourists visiting the Subic Freeport Zone, and several facilities catering for these tourists, a considerable socioeconomic impact is anticipated by the implementation of the project, when and if one of the beaches is closed and/or reduced its present scale, both to the tourists and the employers/employees of the facilities. It is considered useful to know, in one hand, the opinion of tourists visiting the area, and in the other hand, the opinion and the intention of employers/employees of the facilities for a harmonious implementation of the project.

In this regard, "Tourists Visiting the Beaches at Cubi Point" and "Employer/ Employees Those Who are Having Jobs at the Project Site" are selected for target groups of Socioeconomic Environmental Impact Assessment study by way of questionnairing their characteristics and opinions for "Development" in general, for the "Present Project" and for supposed impact by the implementation of the project.

(2) Socioeconomic Activities in Redondo Peninsula

Although the project will take places within the SBMA area and the developmental activities may not give any socioeconomic impact to the outside remote area of Subic Bay, a possibility of some quarrying and filling material collection for reclamation works of the project from the opposite part of Redondo Peninsula is suggested. In that case, those fishermen colonies along the eastern coast of Redondo Peninsula may receive some sort of impact.

In this regard, residents along the eastern coast of Redondo Peninsula are considered to be included in the target group of the socioeconomic survey.

(3) Port Workers and Stevedores mainly from Olongapo City

During and after the implementation of the project, some local labor force may be needed for the construction and reclamation works and handling/operation of the constructed facilities. In addition to this condition, after the completion of the construction works, number of vessel and handling of cargo would be increased and the work shifts may be needed to

increase from twice a day to thrice. In other words, the project will give a considerable socioeconomic impact to the present and future labor force within the SBMA area, in one hand providing job opportunities but in the other hand bringing out commuting problems. In most cases, such local labor forces commuting to the SBMA area are from the neighboring municipalities mainly from Olongapo City and Subic Town.

In this regard, "Port Workers and Stevedores (mainly from Olongapo City)" are selected to be one of the target groups of the Socioeconomic Impact study.

### 7.5.2 Questionnaires and General Information

As is mentioned in the above, following target groups are selected to the subject of a questionnaire survey.

1. Tourists Visiting Beaches of Cubi Point
2. Employers/Employees who are Having Jobs at the Project Site
3. Residents along the Eastern Coast of Redondo Peninsula
4. Port Workers and Stevedores mainly from Olongapo City

As the characterictities of above target groups are somewhat different from each other, different questions are prepared for each group in addition to common questions of "face sheet", perception of "Development" in general and perception of the "Present Project" Samples of the Questionnaires are shown in Appendix.

As for the numbers of samples in each target group, one hundred (100) "1. Tourists" are targeted covering fair portion of tourists at the time of questioning, while thirty (30) "2. Employers/Employees at the Project Site" covering nearly full of the group and fifty (50) "4. Port Workers and Stevedores" also covering a fair part of the group are targeted. one (1) Sitio in Redondo Peninsula is visited and twenty-two (22) " samples are collected. However, the visited Sitio is presently the project site of a large scale earthworks of the Shell Project for construction of a floating rig for Liquid Natural Gas and the residents seemed to be under a considerable socio-economic impact of the said project that a unique answers are collected compared with other target groups.

All in all, a total of two hundred and four (204) samples are collected and analyzed as is described in general in below.

(1) Sex and Age Group Distribution

Out of total 204 samples, sex distribution is even figure of 102 and 102. Age group of "30th" is the largest group sharing 34.0 % of the total followed by "20th"(29.0 %) and "40th"(18.5%). Average age of male is 36.8 years old, which is slightly higher than that of female (34.3 years old) making the total average of 35.5 years old.

By target groups, "Tourists" shows the youngest average age of 34.4 years old with an only group having teenagers, while "Residents of Redondo Peninsula" shows the highest of 37.5 years old mainly caused by higher age distribution of male samples. In the latter group, average age of female shows the youngest of 32.6 years old as more than half of them are belonging to "20th" age group, while that of male is the eldest of 41.2 years old only proceeding 40 years. (Refer to Table 7.5.2-1)

**Table 7.5.2-1 Age Group Distribution by Target Group and by Sex (%)**

| Target Group | Age Group | 1 <20 | 2 20th | 3 30th | 4 40th | 5 50th | 6 60< | Actual Number | Average Age |
|---|---|---|---|---|---|---|---|---|---|
| Tourists | male | 6.4 | 29.8 | 36.2 | 19.1 | 6.4 | 2.1 | 48* | 34.9 |
| | female | 11.5 | 25 | 34.6 | 17.3 | 11.5 | 0.0 | 52 | 33.9 |
| | sub-total | 9.1 | 27.3 | 35.4 | 18.2 | 9.1 | 1.0 | 100* | 34.4 |
| Employers/ Employees | male | 0.0 | 16.7 | 58.3 | 16.7 | 8.3 | 0.0 | 12 | 34.1 |
| | female | 0.0 | 44.4 | 22.2 | 11.1 | 11.1 | 0.0 | 19* | 35.3 |
| | sub- total | 0.0 | 33.3 | 36.7 | 13.3 | 13.3 | 0.0 | 31* | 34.8 |
| Redondo Peninsula Fishermen | male | 0.0 | 16.7 | 33.3 | 16.7 | 33.3 | 0.0 | 13* | 41.2 |
| | female | 0.0 | 55.6 | 22.2 | 11.1 | 11.1 | 0.0 | 9 | 32.6 |
| | sub-total | 0.0 | 33.3 | 28.6 | 14.3 | 23.8 | 0.0 | 22* | 37.5 |
| Workers/ Stevedores | male | 0.0 | 21.4 | 28.6 | 28.6 | 17.9 | 3.6 | 29* | 39.1 |
| | female | 0.0 | 36.4 | 36.4 | 18.2 | 9.1 | 0.0 | 22 | 35.0 |
| | sub-total | 0.0 | 28.0 | 32.0 | 24.0 | 14.0 | 2.0 | 51* | 37.3 |
| Total | male | 3.0 | 24.2 | 36.4 | 21.2 | 13.1 | 2.0 | 102* | 36.8 |
| | female | 5.9 | 57.4 | 31.7 | 15.8 | 11.9 | 1.0 | 102* | 34.3 |
| | total | 4.5 | 29.0 | 34.0 | 18.5 | 12.5 | 1.5 | 204* | 35.5 |

(2) Residence by Target Group

Residential place of samples varies by target groups and it may be meaningless to analyze by using total numbers. Some comments may be added in the later section to explain the characteristics of target groups.

Among the target groups, "Tourists" shows fur wider range of residential places including Metro Manila and foreign countries. There are total of 13 nationalities counted including 3 Americans, 1 Bangladeshi, 1 Hongkonese, 4 Indian, 1 Indonesian, 3 Japanese, 2 Korean, 1 Mymmarian, 1 Pakistani, 1 Papua New Guinean, 1 Polish, 2 Solomon Islanders 2 Sri Lankan and 2 Taiwanese.

**Table 7.5.2-2 Place of Residence by Target Group and by Sex (%)**

| Target Group | | 1 within SBMA | 2 Olongapo City | 3 Subic Town | 4 Other Municipality | 5 METRO MANILA | 6 Foreign Country* | n.a. | TOTAL (100.0) |
|---|---|---|---|---|---|---|---|---|---|
| Tourists | male | 2.1 | 18.8 | 2.1 | 6.3 | 41.7 | 29.2 | 0 | 48 |
| | female | 0.0 | 42.0 | 2.0 | 2.0 | 32.0 | 22.0 | 2 | 52 |
| | Total | 1.0 | 30.6 | 2.0 | 4.1 | 36.7 | 25.5 | 2 | 100 |
| Employers/ Employees | male | 0.0 | 75.0 | 8.3 | 8.3 | 8.3 | 0.0 | 0 | 12 |
| | female | 0.0 | 84.2 | 10.5 | 5.3 | 0.0 | 0.0 | 0 | 19 |
| | Total | 0.0 | 80.5 | 9.7 | 6.5 | 3.2 | 0.0 | 0 | 31 |
| Redondo Peninsula Fishermen | male | 0.0 | 0.0 | 92.3 | 7.7 | 0.0 | 0.0 | 0 | 13 |
| | female | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | 0 | 9 |
| | Total | 0.0 | 0.0 | 95.5 | 4.5 | 0.0 | 0.0 | 0 | 22 |
| Workers/ Stevedores | male | 0.0 | 55.2 | 10.3 | 34.5 | 0.0 | 0.0 | 0 | 29 |
| | female | 0.0 | 68.2 | 18.2 | 13.6 | 0.0 | 0.0 | 0 | 22 |
| | Total | 0.0 | 60.8 | 13.7 | 25.5 | 0.0 | 0.0 | 0 | 51 |
| Total | male | 1.0 | 33.3 | 16.7 | 14.7 | 20.6 | 13.7 | 0 | 102 |
| | female | 0.0 | 52.0 | 16.0 | 5.0 | 16.0 | 11.0 | 2 | 102 |
| | Total | 0.5 | 42.6 | 16.3 | 9.8 | 18.3 | 12.4 | 2 | 204 |

(3) Occupation and Employment

Although samples' occupational status and employment status is questioned, the results vary from one target group to the another and it may be useless to analyze in total figures. Tables 7.5.2-3 and 7.5.2-4 show the results by target groups for the reference of later analysis.

**Table 7.5.2-3 Occupation by Target Group (%)***

| Target Group | | 1 Agri-culture | 2 Fishery | 3 Mining/ Quarrying | 4 Manufac-turing | 5 Elec./Gas /Water | 6 Const-ruction | 7 Trade | 8 Services | 9 Student | 10 None | Actual Number: no answer | Actual Number: Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tourists | male | 2.6 | 0.0 | 0.0 | 7.9 | 0.0 | 26.3 | 2.6 | 18.4 | 31.6 | 2.6 | *10* | *48* |
| | female | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 35.0 | 35.0 | 25.0 | *12* | *52* |
| | Total | 1.3 | 0.0 | 0.0 | 3.8 | 0.0 | 12.8 | 2.6 | 26.9 | 34.6 | 17.9 | *22* | *100* |
| Employers/ Employees | male | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 77.8 | 0.0 | 22.2 | *3* | *12* |
| | female | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 81.8 | 0.0 | 18.2 | *8* | *19* |
| | Total | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 80.0 | 0.0 | 20.0 | *11* | *31* |
| Redondo Peninsula Fishermen | male | 0.0 | 60.0 | 20.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20.0 | 0.0 | 0.0 | *8* | *13* |
| | female | 0.0 | 25.0 | 0.0 | 0.0 | 0.0 | 12.5 | 0.0 | 0.0 | 0.0 | 62.5 | *1* | *9* |
| | Total | 0.0 | 38.5 | 7.7 | 0.0 | 0.0 | 7.7 | 0.0 | 7.7 | 0.0 | 38.5 | *9* | *22* |
| Workers/ Stevedores | male | 0.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 90.9 | 0.0 | 4.5 | *7* | *29* |
| | female | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 89.5 | 0.0 | 10.5 | *3* | *22* |
| | Total | 0.0 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 90.2 | 0.0 | 7.3 | *10* | *51* |
| TOTAL | male | 1.4 | 5.4 | 4.1 | 4.1 | 0.0 | 13.5 | 1.4 | 47.3 | 16.2 | 9.5 | *28* | *102* |
| | female | 0.0 | 3.8 | 0.0 | 0.0 | 0.0 | 1.3 | 1.3 | 51.3 | 19.2 | 24.4 | *24* | *102* |
| | Total | 0.7 | 4.6 | 2.0 | 2.0 | 0.0 | 7.2 | 1.3 | 49.3 | 17.8 | 17.1 | *52* | *204* |

* percentage is for the total answers (i.e., excluding "no answer" samples)

**Table 7.5.2-4 Employment by Target Groups (%)***

| Target Group | | 1 Domestic Services | 2 Private Business | 3 Govern-ment | 4 Self-employed | 5 Employer | 6 Own business with pay | 7 Own business w/o pay | 8 Un-employed | Actual Number: no answer | Actual Number: Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tourists | male | 8.6 | 62.9 | 14.3 | 0.0 | 5.7 | 0.0 | 0.0 | 8.6 | 13 | 48 |
| | female | 7.5 | 22.5 | 20.0 | 7.5 | 0.0 | 2.5 | 0.0 | 40.0 | 12 | 52 |
| | Total | 8.0 | 41.3 | 17.3 | 4.0 | 2.7 | 1.3 | 0.0 | 25.3 | 25 | 100 |
| Employers/ Employees | male | 0.0 | 0.0 | 30.0 | 10.0 | 10.0 | 50.0 | 0.0 | 0.0 | 2 | 12 |
| | female | 0.0 | 57.1 | 28.6 | 7.1 | 7.1 | 0.0 | 0.0 | 0.0 | 5 | 19 |
| | Total | 0.0 | 33.3 | 29.2 | 8.3 | 8.3 | 30.8 | 0.0 | 0.0 | 7 | 31 |
| Redondo Peninsula Fishermen | male | 0.0 | 100.0 | 0.0 | 0.0 | 3.7 | 0.0 | 3.7 | 3.7 | 11 | 13 |
| | female | 16.7 | 0.0 | 16.7 | 0.0 | 5.0 | 5.0 | 0.0 | 0.0 | 3 | 9 |
| | Total | 12.5 | 25.0 | 12.5 | 0.0 | 4.3 | 2.1 | 2.1 | 2.1 | 14 | 22 |
| Workers/ Stevedores | male | 7.4 | 3.7 | 77.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2 | 29 |
| | female | 0.0 | 5.0 | 85.0 | 0.0 | 0.0 | 1.0 | 0.0 | 3.0 | 2 | 22 |
| | Total | 4.3 | 4.3 | 80.9 | 0.0 | 0.0 | 1.0 | 0.0 | 3.0 | 4 | 51 |
| TOTAL | male | 6.8 | 33.8 | 39.2 | 1.4 | 5.4 | 6.8 | 1.4 | 5.4 | 28 | 102 |
| | female | 5.0 | 22.5 | 37.5 | 5.0 | 2.5 | 3.8 | 0.0 | 23.8 | 22 | 102 |
| | Total | 5.8 | 27.9 | 38.3 | 3.2 | 3.9 | 5.2 | 0.6 | 14.9 | 50 | 204 |

* percentage is for the total answers (i.e., excluding "no answer" samples)

(4) Working Place

As the target groups are selected in consideration with their socio-economic relations with the SBMA area, their working place is concentrated in the SBMA area and/or within Subic Bay area, excluding the case of "Tourists". "Employers/Employees" at Cubi Point are of course working inside the SBMA area. "Residents along the eastern coast of Redondo Peninsula" are working outside the SBMA area but within Subic Bay. Most of "Workers/Stevedores" are also working within the SBMA area with a marginal part outside of it but inside Subic Bay area. Even a quarter of "Tourists" are working within either the SBMA area or Subic Bay area. Although a considerable part of samples give "no answer", these results seems to be a matter of course. (refer to Table 7.5.2-5)

**Table 7.5.2-5 Working Place By Target Group (%)***

| Target Group | | 1 within the SBMA | 2 within Subic Bay | 3 outside of Subic Bay | Actual Number no answer | Total |
|---|---|---|---|---|---|---|
| Tourists | male | 19.4 | 9.7 | 74.2 | 17 | 48 |
| | female | 6.9 | 17.2 | 75.9 | 23 | 52 |
| | Total | 11.7 | 13.3 | 75.0 | 40 | 100 |
| Employers/ Employees | male | 100.0 | 0.0 | 0.0 | 0 | 12 |
| | female | 100.0 | 0.0 | 0.0 | 2 | 19 |
| | Total | 100.0 | 0.0 | 0.0 | 2 | 31 |
| Redondo Peninsula Fishermen | male | 0.0 | 100.0 | 0.0 | 11 | 13 |
| | female | 0.0 | 100.0 | 0.0 | 7 | 9 |
| | Total | 0.0 | 100.0 | 0.0 | 18 | 22 |
| Workers/ Stevedores | male | 95.8 | 4.2 | 0.0 | 5 | 29 |
| | female | 94.4 | 5.6 | 0.0 | 4 | 22 |
| | Total | 95.2 | 4.8 | 0.0 | 9 | 51 |
| Total | male | 58.0 | 8.7 | 33.3 | 33 | 102 |
| | female | 54.5 | 12.1 | 33.3 | 36 | 102 |
| | Total | 56.3 | 10.4 | 33.3 | 69 | 204 |

* percentage is for the total answers (i.e., excluding "no answer" samples)

(5) Income Level

Although nearly a half of samples does not answer this question, income level of "Tourists" and other local people show a quite difference. Estimated average income of the former is around 650 thousand Pesos while that of the latter stays only around 100 thousand Pesos or less. Supposing that the latter figure is the average income of local Filipino people, "Tourists" who can enjoy tourism are having more than six (6) times higher level of income. As is shown in Table 7.5.2-6, no sample from "Residents along the eastern coast of Redondo Peninsula" gives the information of their income level. However, it is easy to estimate their income level is much lower than other local groups as they have no stable source of cash income other than selling their daily catches of fishing.

**Table 7.5.2-6 Income Level by Target Group (Unit : 1,000 Pesos)**

| Target Group | | 1 less than 10 | 2 10 to 50 | 3 50 to 100 | 4 100 to 400 | 5 400 to 1,000 | 6 1000 to 2,000 | 7 more than 2,000 | Estimated Average * ('000 P.) | Actual Number no answer | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tourists | male | 2 | 0 | 3 | 6 | 5 | 2 | 4 | 920 | 26 | 48 |
| | female | 3 | 1 | 3 | 7 | 7 | 1 | 0 | 383 | 30 | 52 |
| | Total | 5 | 1 | 6 | 13 | 12 | 3 | 4 | 651 | 56 | 100 |
| Employers/ Employees | male | 4 | 1 | 3 | 1 | 0 | 0 | 0 | 58 | 3 | 12 |
| | female | 5 | 1 | 5 | 5 | 0 | 0 | 0 | 105 | 3 | 19 |
| | Total | 9 | 2 | 8 | 6 | 0 | 0 | 0 | 88 | 6 | 31 |
| Redondo Peninsula Fishermen | male | 0 | 0 | 0 | 0 | 0 | 0 | 0 | n.a. | 13 | 13 |
| | female | 0 | 0 | 0 | 0 | 0 | 0 | 0 | n.a. | 9 | 9 |
| | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | n.a | 22 | 22 |
| Workers/ Stevedores | male | 6 | 5 | 7 | 4 | 1 | 0 | 0 | 105 | 6 | 29 |
| | female | 3 | 4 | 5 | 6 | 0 | 0 | 0 | 112 | 4 | 22 |
| | Total | 9 | 9 | 12 | 10 | 1 | 0 | 0 | 108 | 10 | 51 |
| Total | male | 12 | 6 | 13 | 11 | 6 | 2 | 4 | 440 | 48 | 102 |
| | female | 11 | 6 | 13 | 18 | 7 | 1 | 0 | 216 | 46 | 102 |
| | Total | 23 | 12 | 26 | 29 | 13 | 3 | 4 | 321 | 94 | 204 |

* Average of those who answered.

(6) Perception of "Development" in general

Asked whether the samples appreciate "Development" in general, more than 90 % of them answered "YES" with the largest reason of "Development brings out **economic benefits** such as raise of income, more opportunity of employment, sales increase, etc. to us" (69.5 % of total "YES" answer) followed far behind by "Development brings out **social benefits,** such as improved infrastructure, improved public services, improved chances of education, etc. to us"(20.8 %). Other reasons such as "Development brings out **better national status**" (7.1 %) and "Development brings out **better natural environment**" (2.5 %) seem not much mattered in thinking the impact of "Development" and "Developmental Activities".

In those who answer "NO" to the initial question, two largest reason are "Development **pollutes our natural environment**" (40.0 % of total "NO" answer) and **social disturbance** with "Development brings out **social deficits,** such as moral disturbance, worsened infrastructure, less public services, etc. to us" (35.0 %) and "Developmental activities destroy our cultural heritage" (5.0 %). Other reason of "NO" answer is "Development brings out **economic deficits,** such as loss of jobs, less income, less sales of goods, etc. to us" (20.0 %).

It could be said that, those who appreciate "Development" and "Developmental Activities" put much weight on its economic benefits while those who do not appreciate them much care for social and natural environment.

By target groups, "Tourists" and "Employers/Employees" show higher ratio of not appreciating "Development". Reason of this tendency; the former group may be already enjoying benefits of "Development" with their higher income level while the latter group may be cautious to adverse effect of "Development" with their working place confined to proposed project site. Those groups who have not yet enjoyed economic benefits of "Development" seem to show higher appreciating ratio of "Development" putting much hope to enjoy economic benefits thereof.

**Table 7.5.2-7 Perception on "Development" in general**

| Question | | Reason of "YES" or "NO" | Tourists | Employers/ Employees | Residents of Redondo P. | Workers/ Stevedores | Total | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | *number* | % |
| Do you appreciate "Develop-ment" ? | YES | 1. economic benefits | 62.4 | 84.6 | 90.9 | 66.1 | *137* | 68.2 |
| | | 2. social benefits | 26.9 | 3.8 | 9.1 | 23.2 | *41* | 20.4 |
| | | 3. national status | 8.6 | 7.7 | 0.0 | 7.1 | *14* | 7.0 |
| | | 4. natural environment | 2.2 | 3.8 | 0.0 | 3.6 | *5* | 2.5 |
| | | 5. others | 0.0 | 0.0 | 0.0 | 0.0 | *0* | 0.0 |
| | | no answer | 3.1 | 3.7 | 0.0 | 0.0 | *4* | 2.0 |
| | | Total*: | 88.1 | 84.4 | 100.0 | 96.6 | *201* | 90.5 |
| | NO | 1. economic deficits | 23.1 | 20.0 | - | 0.0 | *4* | 20.0 |
| | | 2. social deficits | 30.8 | 20.0 | - | 100.0 | *7* | 35.0 |
| | | 3. pollution | 38.5 | 60.0 | - | 0.0 | *8* | 40.0 |
| | | 4. cultural destruction | 7.7 | 0.0 | - | 0.0 | *1* | 5.0 |
| | | 5. others | 0.0 | 0.0 | - | 0.0 | *0* | 0.0 |
| | | no answer | 0.0 | 0.0 | - | 0.0 | *0* | 20.0 |
| | | Total* | 11.9 | 15.6 | 0.0 | 3.4 | *20* | 9.0 |
| | no answer | | *0* | *1* | *0* | *0* | *1* | 0.5 |
| | TOTAL* | | *109* | *33* | *22* | *58* | *222* | 100.0 |

* Total number of answers is larger than the sample numbers because of "multi-answer" question.

Asked what type of "Development" is most desirable, only 2.1 % of total sample choose negative answer of "Development should not take place in anywhere and in anytime" while remaining 97.9 % choose positive answer(s). The largest choice of positive answer is concerning **economic benefits** ("Development must take place in consideration with the economic benefits of the local people") counting 32.5 % of the total (or, 33.2 % of total positive answers) followed by **social benefits** ("Development must take place in

consideration with the social benefits of the local people") with 26.4 % (or, 26.9 %). **Aim for the national benefits of the Philippines** comes the third place of 19.2 % (or, 19.4 %) and **consideration both for natural and social environment** the fourth (12.0 %). Not much importance is seemed to be put on **sustainable economic and social improvements**

**Table 7.5.2-8 Ideal Type of Development (%)**

| Target Group | Tourists | Employers/ Employees | Residents of Redondo P. | Workers/ Stevedores | Total | |
|---|---|---|---|---|---|---|
| | | | | | *number* | % |
| A. economic benefits of local people | 29.5 | 27.0 | 43.9 | 34.7 | *95* | 32.5 |
| B. social benefits of local people | 25.2 | 29.7 | 34.1 | 22.7 | *77* | 26.4 |
| C. national benefits of the Philippines | 23.0 | 18.9 | 12.2 | 16.0 | *56* | 19.2 |
| D. harmonious co-existence of environments | 10.8 | 16.2 | 7.3 | 14.7 | *35* | 12.0 |
| E. sustainable socioeconomic improvements | 9.4 | 2.7 | 2.4 | 10.7 | *23* | 7.9 |
| (positive answers sub-total) | 97.8 | 94.6 | 100.0 | 98.7 | *288* | 97.9 |
| F. negative opinion to Development | 2.2 | 5.4 | 0.0 | 1.3 | *6* | 2.1 |
| G. others | 0.0 | 0.0 | 0.0 | 0.0 | *0* | 0.0 |
| Total* | *139* | *37* | *41* | *75* | *292* | 100.0 |

* Total number of answers is larger than the sample numbers because of "multi-answer" question.

Asked if the sample wish to participate into "Development" and "Developmental Activities" when it takes place around them, majority of 87.6 % answered "YES" while nominal 2.5 % answered "NO", remaining 9.9 % of "DON'T KNOW" answers. Out of actual five (5) answers who said "NO", one (1) is a foreigner who came from developed country (USA), two (2) are already established ones with higher level of income and one (1) is an old man who is saying himself retired. That remains only one (1) who is against participating "Development" and "Developmental Activities" with an opinion of "Development should not take place in anywhere and in anytime".

Table 7.5.2-9 Will to Participate into "Development" (%)*

| Target Group | Tourists | Employers/ Employees | Residents of Redondo P. | Workers/ Stevedores | Total | |
|---|---|---|---|---|---|---|
| | | | | | *number* | % |
| A. YES | 84.0 | 82.8 | 81.8 | 100.0 | *177* | 87.6 |
| B. NO | 1.0 | 10.3 | 4.5 | 0.0 | *5* | 2.5 |
| C. DON'T KNOW | 15.0 | 6.9 | 13.6 | 0.0 | *20* | 9.9 |
| no. answer | *0* | *2* | *0* | *0* | *2* | - |
| Tota l | *100* | *31* | *22* | *51* | *204* | 100.0 |

* Percentage is for the total figure excluding "no answer".

(7) Perception of the "Present Project"

Asked if "Development" within the SBMA area give any impact to the samples, 86.9 % of the total answered "YES". Out of them, 63.8 % expressed "positive" impact while 23.1 % "negative" impact. "NO" impact opinion counted 7.4 % of the total answered and there are 5.7 % of "DON'T KNOW" answers.

Major reason of "positive" perception is economic benefits such as "better income chance"(47.9 % of total positive perception) and "better employment opportunity"(29.5 %). "Infrastructure improvement" is also anticipated (16.4 %), while "environmental improvement" (4.8 %) is not much counted for the benefit of such "Development" project.

On the contrary, major reason of "negative" perception is "environmental disturbance" (71.7 % of total negative perception) followed by "socioeconomic disturbance" (28.3 %).

"NO" impact opinion is consisted of "no social influence" (35.3 % of total "NO" impact), "no economic influence"(23.5 %) and "no environmental influence (23.5 %).

As has been mentioned in the former sections, more than 90 % of samples appreciate "Development" in general and express willingness to participate "Developmental Activities". Nevertheless, asked if such activities take place around them, they express rather cautious opinion. Especially in case of "Employers/Employees" group, negative perception surpasses positive one as a direct influence of the present project. In case of "Residents along the eastern coast of Redondo Peninsula" group, who are presently under the direct impact of the Shell project, all the sample who answered negative perception choose "socio-economic disturbance" for the reason of their opinion of adverse effect in "Development".

**Table 7.5.2-10 Perception on the Present Project within the SBMA Area (%)***

| Question | Target Group | | Tourists | Employers/ Employees | Residents of Redondo P. | Workers/ Stevedores | Total |
|---|---|---|---|---|---|---|---|
| DEVELOP - MENT within the SBMA give any impact to you ? | A. YES, positively | 1. better income chance | 43.8 | 46.7 | 90.9 | 44.6 | 47.9 |
| | | 2. better employment opportunity | 29.7 | 40.0 | 9.1 | 30.4 | 29.5 |
| | | 3. infrastructure improvement | 15.6 | 13.3 | 0.0 | 21.4 | 16.4 |
| | | 4. environmental improvement | 7.8 | 0.0 | 0.0 | 3.6 | 4.8 |
| | | no answer | 3.1 | 0.0 | 0.0 | 0.0 | 1.4 |
| | | Total* | 59.3 | 41.7 | 50.0 | 88.9 | 63.8 |
| | B. YES, negatively | 1. socio-economic disturbance | 8.7 | 12.5 | 100.0 | 40.0 | 28.3 |
| | | 2. environmental disturbance | 91.3 | 87.5 | 0.0 | 60.0 | 71.7 |
| | | no answer | 0 | 0.0 | 0.0 | 0.0 | 0 |
| | | Total* | 21.3 | 44.4 | 40.0 | 7.9 | 23.1 |
| | C. NO | 1. no economic influence | 11.1 | 40.0 | 0.0 | 50.0 | 23.5 |
| | | 2. no social influence | 44.4 | 20.0 | 0.0 | 50.0 | 35.3 |
| | | 3. no environmental influence | 11.1 | 40.0 | 1.0 | 0.0 | 23.5 |
| | | no answer | 33.3 | 0.0 | 0.0 | 0.0 | 17.6 |
| | | Total* | 9 | 13.9 | 5.0 | 3.2 | 7.4 |
| | D. DONT KNOW | | 11.1 | 0.0 | 5.0 | 0.0 | 5.7 |
| | no answer | | *0* | *0* | *0* | *1* | *1* |
| | TOTAL | | *108* | *36* | *22* | *64* | *230* |

* Percentage to TOTAL answers excluding "no answer"

To know the will to participate into the present project, a question is made asking if the samples wish to participate into the construction of a container berth at Cubi Point, and if "YES" in what way and if "NO" in what reason. Out of 204 answers obtained, 80.4 % answered "YES" which is much higher than the positive perception of former question (63.8 %). Actual number of "NO" answers are 13 (6.4 %) which is smaller than that of former question (17 answers).

The largest way to participate into the present project is to get involved with the project such as "as an employee" (42.7 % of the total "YES" answers) and "as a labor force (29.3 %). Other ways chosen are such as "as a shopkeeper (at the project site)" (7.3 %), "as a caterer (to the project and its personnel)" (4.3 %), "as a guide (for echo-tours and tourism)" (3.0 %), and "as a vender" and "as a home-helper (for the project personnel)" (1.2 % respectively)

Among those who answer "NO" to the initial question, the largest reason is "there may not be any space for me to participate" (53,8 % of the total "NO" answer). That means they would be participating the project if enough opportunity is provided. Such reasons as actually refusing to participate into the project as "I am not interested in the present project" and "I am not interested in any development projects" are chosen by very few samples (representing 15.4 % of "NO" answers but only two (2) actual numbers).

"DON'T KNOW" answers increased from 17 of the former question to 27, representing 13.3 % of the total answers. Most of them are from "Tourists" group (22) whose socio-economic field of activity is not confined to the present project site and/or the SBMA area.

**Table 7.5.2-11 Participation to the Present Project (%)***

| Question | Target Group | | Tourists | Employers/ Employees | Residents of Redondo P. | Workers/ Stevedores | Total |
|---|---|---|---|---|---|---|---|
| Would you like to participate into the activities in and after the implementation of the project ? | A. YES | 1. as a labor force | 17.1 | 28.6 | 59.1 | 33.3 | 29.3 |
| | | 2. as an employee | 41.4 | 38.1 | 22.8 | 54.9 | 42.7 |
| | | 3. as a shopkeeper | 11.4 | 14.3 | 0.0 | 2.0 | 7.3 |
| | | 4. as a cater | 7.1 | 0.0 | 0.0 | 3.9 | 4.3 |
| | | 5. as a vender | 0.0 | 4.8 | 0.0 | 2.0 | 1.2 |
| | | 6. as a home-helper | 2.9 | 0.0 | 0.0 | 0.0 | 1.2 |
| | | 7. as a guide | 5.7 | 0.0 | 0.0 | 2.0 | 3.0 |
| | | 8 other | 0.0 | 4.8 | 9.1 | 2.0 | 2.4 |
| | | no answer | 14.3 | 9.5 | 9.1 | 11.8 | 8.5 |
| | | **Total*** | **70.0** | **82.8** | **95.7** | **92.3** | **80.4** |
| | B. NO | 1. no space | 37.5 | 100.0 | 0.0 | 100.0 | 33.8 |
| | | 2. not interested in the project | 25.0 | 0.0 | 0.0 | 0.0 | 15.4 |
| | | 3. not interested in any project | 12.5 | 0.0 | 100.0 | 0.0 | 15.4 |
| | | 4. other | 25.0 | 0.0 | 0.0 | 0.0 | 15.4 |
| | | no answer | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | **Total*** | **8.0** | **7.7** | **4.3** | **3.6** | **13.3** |
| | C. DONT KNOW | | 22.0 | 7.7 | 1.0 | 3.6 | 6.4 |
| | no answer | | *0* | *5* | *0* | *1* | *6* |
| | TOTAL** | | *100* | *31* | *23* | *56* | *210* |

* Percentage to TOTAL answers excluding "no answer"

(8) Environmental Consideration

In implementing the present project, a slight chance of environmental disturbance caused by reclamation works at the project site and vehicle traffic to and from the site are

anticipated. The Study Team is preparing several measures to prevent/control such adverse effects and a question is made to know what kind of measures the samples most interested.

In case of Reclamation Works, "selection of materials for reclamation to prevent any contamination by heavy metals and/or organic chemicals" measure is most interested by the samples sharing 35.4 % of total answers. Closely followed is "Control of diffusion of suspended solid" measure (29.8 %) "Control of diffusion of dusts in the air" also interested by 10.6 % of total answers. Other major measures interested are "The closest attention to protect natural environment" (20.7 %) although there is no coral reefs and/or precious echo-systems reported in and around the project site.

In case of Heavy Vehicle Traffic, not physical risk-control measures of "Control of vehicle fixing in consideration of air pollution" (15.7 % of the total answers) and "Control of traffic accidents by way of putting traffic instructors" (9,6 %) but rather mental measures of "Safety education to all those who are concerned" (43.4 %) and "Control and establishment of traffic rules" (30.3 %) are much more interested. The reason of this tendency may be; 1) The samples are enjoying and appreciating rather strict traffic rules and driving behaviors applied to the SBMA area and neighboring area, and 2) The samples are not much suffering from heavy air pollution and/or severe traffic accidents like in Metro Manila.

**Table 7.5.2-12 Environmental Considerations**

| Question | | | Tourists | Employers/ Employees | Residents of Redondo Pen. | Workers/ Stevedores | Total |
|---|---|---|---|---|---|---|---|
| Most Interested Measures to control Environmental Disturbance | A. Reclamation Works | 1. control of diffusion of suspended soil | 35.1 | 33.3 | 22.7 | 21.2 | 29.8 |
| | | 2. control of diffusion of dusts in the air | 12.4 | 0.0 | 4.5 | 15.4 | 10.6 |
| | | 3. protection of natural environment | 17.5 | 18.5 | 18.2 | 28.8 | 20.7 |
| | | 4. selection of poisonous materials | 35.1 | 44.4 | 54.5 | 34.6 | 35.4 |
| | | 5. other | 0.0 | 3.7 | 0.0 | 0.0 | 0.5 |
| | | no answer | *3* | *4* | *2* | *2* | *11* |
| | | Total * | *100* | *31* | *24* | *54* | *209* |
| | B. Vehicle Traffic | 1. control of traffic rules | 37.8 | 33.3 | 13.6 | 21.6 | 30.3 |
| | | 2. control of air pollution | 13.3 | 11.1 | 18.2 | 21.6 | 15.7 |
| | | 3. control of traffic accidents | 8.2 | 0.0 | 9.1 | 17.6 | 9.6 |
| | | 4. safety education | 40.8 | 51.9 | 59.1 | 37.3 | 43.3 |
| | | 5. other | 0.0 | 3.7 | 0.0 | 2.0 | 1 |
| | | no answer | *2* | *5* | *1* | *1* | *9* |
| | | Total* | *100* | *32* | *23* | *53* | *207* |

* Percentage to Total answers excluding "no answer"

### 7.5.3 Impact to Recreational Beach

Anticipated impact to the recreational beaches at Cubi Point by the project is closure or reduction of scale of a beach during and after the implementation of the construction of a container berth proposed by the Study. The closure or reduction of scale of the beach (i.e. Officers' Beach) will give two (2) types of socio-economic impact to two (2) types of human groups.

One is the "Tourists" visiting the beach for recreational and tourism purposes not only from the surrounding area but also from the national scale including Metro Manila and even from international scale. The questionnaire survey conducted for the sake of Social Environment this time counted 25 foreigners with 13 nationalities out of 100 tourists interviewed. The same survey revealed much higher level of income of them compared with the other target groups of local nature.

The other is "Employers/Employees having jobs at the project site". There is "Fisherman's Wharf" restaurant adjoining to the beach and the employer and employees of the restaurant may have a considerable impact if the beach is closed or reduced its scale. In addition to the restaurant, there are several shopkeepers and beachkeepers servicing to the tourists and customers of the restaurant. Closure or reduction of the scale of the beach may bring out closure or reduction of the scale of their sales activities, meaning less sales and/or loss of jobs.

In this regard, impact of the present project to recreational beach is studied by above mentioned "Tourists" and "Employers/Employees" groups.

(1) Impact and Opinion of Tourists

1) Characteristics of Tourists visiting the beach

A total of one hundred tourists are interviewed of which 48 are male and 52 are female with average age of 34.9 and 33.0 respectively. (refer to Table 7.5.2.1) The largest part of them come from Metro Manila (36.7 %) followed by Olongapo City (30.6 %) and foreign countries (25.5 %). It should be noted that, even all the tourists are interviewed at the beach, their ultimate purpose of visit here is not necessarily the swimming and/or sun bathing at the beach but shopping, business and conferences inside the SBMA area. Table 7.5.3-1 indicates the distribution of purpose of visit of tourists.

As is shown in Table 7.5.2-5, most (75.0 %) of their working place is outside Subic Bay and their average income level is more than six (6) times larger than other target group.

Not much difference is found in the perception of "Development", perception of "Ideal Type of Development" and "Will to participate into Development" compared with other target groups.

As their nature is not indigenous to Subic Bay area, eagerness to participate into the present project is not as high as other indigenous target groups. Nevertheless, more than 70 % of them expressed their positive will to participate the present development project inside the SBMA area. (refer to Table 7.5.2-11) Not much difference is also found in environmental considerations compared with other target groups.

**Table 7.5.3-1 Purpose of Visit of Tourists (%)**

| | | 1 Business within SBMA | 2 Conference /Meeting | 3 Sightseeing /Swimming | 4 Study/ Research | 5 Visiting relatives | 6 others | Actual Number no answer | Actual Number Total |
|---|---|---|---|---|---|---|---|---|---|
| By Sex | 1. male | 6.5 | 0.0 | 84.8 | 2.2 | 6.5 | 0.0 | *2* | *48* |
| | 2.female | 5.9 | 0.0 | 90.2 | 2.0 | 2.0 | 0.0 | *1* | *52* |
| | Total | 6.2 | 0.0 | 87.6 | 2.1 | 4.1 | 0.0 | *3* | *100* |
| By Age Group | 1. less than 14 | 50.0 | 0.0 | 50.0 | 0.0 | 0.0 | 0.0 | *0* | *2* |
| | 2. 15/19 | 0.0 | 0.0 | 85.7 | 0.0 | 14.3 | 0.0 | *0* | *7* |
| | 3. 20/24 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | *0* | *9* |
| | 4. 25/29 | 0.0 | 0.0 | 94.4 | 0.0 | 5.6 | 0.0 | *0* | *18* |
| | 5. 30/34 | 0.0 | 0.0 | 93.8 | 0.0 | 6.3 | 0.0 | *0* | *16* |
| | 6. 35/39 | 10.5 | 0.0 | 73.7 | 10.5 | 5.3 | 0.0 | *0* | *19* |
| | 7. 40/44 | 11.1 | 0.0 | 88.9 | 0.0 | 0.0 | 0.0 | *1* | *10* |
| | 8. 45/49 | 28.6 | 0.0 | 71.4 | 0.0 | 0.0 | 0.0 | *1* | *8* |
| | 9. 50/54 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | *0* | *5* |
| | 10. 55/59 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | *0* | *4* |
| | 11. 60/64 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0* | *0* |
| | 12. more than 65 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | *0* | *1* |
| | Total | 6.2 | 0.0 | 87.6 | 2.1 | 4.1 | 0.0 | *2* | *99* |
| By Natio-nality | 1. Filipino | 5.4 | 0.0 | 89.2 | 1.4 | 4.1 | 0.0 | *1* | *75* |
| | 2. Foreigner* | 8.7 | 0.0 | 82.6 | 4.3 | 4.3 | 0.0 | *2* | *25* |
| | Total | 6.2 | 0.0 | 87.6 | 2.1 | 4.1 | 0.0 | *3* | *100* |

* Foreigner consist of 3 Americans, 1 Bangladesh, 1 Hongkonese, 4 Indians, 1 Indonesian, 3 Japanese, 2 Koreans, 1 Mymmar, 1 Pakistani, 1 Papuan, 1 Polish, 2 Solomon Islanders, 1 Srilankan and 2 Taiwanese.

2) Reason Why the Tourists Choose the Beach

The largest reason why the tourists choose the beach is, "This beach is supposed to be the best for visiting because its **natural environment is very good**" counting 35.5 % of total answers. Closely following reason is, "This beach is supposed to be the best for visiting because of **facilities** compared with other beaches around Subic Bay" (31.0 %). These

are supposed to be positive reasoning to visit the beach while there is a rather passive reasoning of "Not much reason but just by chance" (16.1 %)

By sex, male tourists put much larger weight on "natural environment" while female tourists put larger weight on "facilities". And by nationality, foreigners put larger weight on "natural environment" and Filipino tourists on "facilities".

It could be said that almost two-third of tourists choose the beach with positive reasoning and visit it with a fixed purpose. (refer to Table 7.5.3-2)

**Table 7.5.3-2 Reason Why the Tourists Choose the Beach (%)***

| Reason | | 1. Best for its Facilities | 2. Best for its Natural Environment | 3. Recommended by Guides and Books | 4. not much reason but by chance | 5. Don't know | Actual Number | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | no answer | Total |
| By Sex | male | 29.2 | 38.5 | 12.3 | 20.0 | 1.5 | *0* | *66* |
| | female | 33.3 | 34.5 | 16.1 | 13.8 | 2.3 | *2* | *89* |
| By Nationality | Filipino | 34.8 | 34.8 | 14.3 | 15.2 | 0.9 | *2* | *114* |
| | Foreigner | 22.0 | 39.0 | 14.6 | 19.5 | 4.9 | *0* | *41* |
| Total | | 31.4 | 35.9 | 14.4 | 16.3 | 2.0 | *2* | *155* |

* Percentage is for the total answers (i.e. excluding "no answer")

3) Opinion on the Closure of the Beach

For a possible closure or reduction of the scale of the beach, 41.2 % of the total expressed "Feel some problem". Those who "Feel serious problem" (29.9 %) are slightly larger than those are who "Feel no problem at all" (28.9 %). In other words, more than 70 % of the tourists somewhat think it is inconvenient, regrettable and problematic to close or reduce the scale of the beach.

By sex, male and female tourists show not much difference in their opinion. By nationality, foreigners show higher opinion of "Feel some problem" and less degree of "No problem at all".

**Table 7.5.3-3 Opinion on the Closure of the Beach (%)***

| Opinion | | 1. No Problem at all | 2. Feel some Problem | 3. Feel serious Problem | Actual Number | |
|---|---|---|---|---|---|---|
| | | | | | no answer | Total |
| By Sex | male | 27.1 | 43.2 | 27.2 | *0* | *48* |
| | female | 30.6 | 38.8 | 30.6 | *3* | *52* |
| By Nationality | Filipino | 31.9 | 36.1 | 31.9 | *3* | *75* |
| | Foreigner | 20.0 | 56.0 | 24.0 | *0* | *25* |
| | Total | 28.9 | 41.2 | 29.9 | *3* | *100* |

* Percentage is for the total answers (i.e. excluding "no answer")

4) Opinion on the development of another beach

More than 80 % of the tourists wish the SBMA to develop another beach equivalent to the present one if it is closed, in most part "if possible".

By sex, male tourists seem less caring about the loss of the beach compared with female tourists. By nationality, foreigners seem also less caring about the loss mainly because they are one-time visitors and not the repeaters.

In any case, those who wish the SBMA to develop another equivalent beach is more than four (4) times larger than those who do not that some kind of measures should be taken either avoiding the closure of the beach or developing another equivalent beach in the course of development planning of the project site.

**Table 7.5.3-4 Opinion on the Creation of Equivalent Beach (%)***

| Opinion | | 1. YES, Definitely | 2. YES, if possible | 3. NO, no need | Actual Number | |
|---|---|---|---|---|---|---|
| | | | | | no answer | Total |
| By Sex | male | 6.3 | 70.8 | 22.9 | *0* | *48* |
| | female | 6.0 | 78.0 | 16.0 | *2* | *52* |
| By Nationality | Filipino | 5.5 | 78.1 | 16.4 | *3* | *75* |
| | Foreigner | 8.0 | 64.0 | 28.0 | *0* | *25* |
| Total | | 6.2 | 75.3 | 19.6 | *3* | *100* |

* Percentage is for the total answers (i.e. excluding "no answer")

5) Recommendation

It is found that the tourists visiting the beach unexpectedly stick to it including one time visitors and foreigners. There are many other beaches inside Subic Bay and even in the SBMA there are several of them. Even so, the beach seems to be one of the major charms of the Subic Freeport Zone and the closure of it may harm tourism resources of the area together with the closure or reduction of the scale of adjoining restaurant facility.

In this section, for the sake of tourism resources and tourists who wish the SBMA to develop another beach in most part "if possible", alternative beach in the vicinity of the container terminal which can create harmonious scenery from the modernized port activity, recommended to be taken by the SBMA in implementing the present project.

(2) Impacts and Opinions of Employers/Employees Having Jobs at the Project Site

1) Characteristics of Employers/Employees

At the "Fisherman's Wharf" restaurant and beachside shops, total of 31 Employers and Employees are interviewed covering most of the target group population. There are 5 Employers (1 male and 4 female), 7 Employees having contracted with the SBMA, 14 Employees having contracted with Employers and 4 part-timers. (refer to Table 7.5.3.5) Out of total 31 samples, 12 are male and 19 are female. Average age of the samples is estimated to be 34.8 years old which is the youngest of the three (3) local target groups. Out of these 31 samples, 16 think their occupation to be "Services", 4 think "None" and remaining 11 do not give any answer (refer to Table 7.5.2-3). 80.6 % of them are commuting from Olongapo City and 9.7 % from Subic Town.

As they are working at Cubi Point, all of them answered their working place is within the SBMA area. Their income level is observed to be the lowest average of 88,000 Pesos/year. Especially
in case of male samples, average income is estimated to be 58,000 Peso/year that is nearly a half of that of female average (105,000 Pesos/year as shown in Table 7.5.2-6).

**Table 7.5.3-5 Status of Employers/Employees (%)***

| | 1. Employer /Manager with Contract with SBMA | 2. Employer /Manager without Contract with SBMA | 3. Employee of facilities with Contract with SBMA | 4. Employee of facilities without Contract with SBMA | 5. Part time Worker | Actual Number | |
|---|---|---|---|---|---|---|---|
| | | | | | | no answer | Total |
| male | 7.1 | 0.0 | 27.3 | 45.5 | 18.2 | *1* | *12* |
| female | 21.1 | 0.0 | 21.1 | 47.4 | 10.5 | *0* | *19* |
| Total* | 16.7 | 0.0 | 23.3 | 46.7 | 13.3 | *1* | *31* |

* Percentage is for the total answers (i.e., excluding "no answer")

In expressing perception on "Development" in general, this group shows the lowest appreciation of "Development" in general. Asked if they appreciate "Development", only 84.4 % of them answered "YES" and 15.6 % "NO". Compared with the other groups, these ratios are among the lowest and the highest respectively. Even tourists who may less interested in local developmental activities answered 88.1 % positively and 11.9 % negatively (refer to

Table 7.5.2-7). Major reason of "YES" is "economic benefits" and that of "NO" is "pollution of natural environment".

In the question of "Ideal Type of Development", only this group put the heaviest weight on the "Social benefits" rather than on the "Economic benefits". Negative opinion of "Development should not take place in anywhere and in anytime" show the largest ratio in this group (refer to Table 7.5.2-8).

Asked the willingness to participate into "Development" and "Developmental Activities" when it takes place around them, 82.8 % them answered "YES" which is the second lowest among target groups and 10.3 % said "NO" which is the highest. (refer to Table 7.5.2-9).

This group seems to be most cautious to "Development" among the target groups. Asked if the "Development" within the SBMA area give any impact to them, only this group expressed larger negative "YES" (44.4 % of the total answers) than positive "YES" (41.7 %) with the largest portion of "NO" answers (13.9 %). (refer to Table 7.5.2-10)

2) Opinion on the Closure of the Facilities (Employers)

Opinion on the reduction, sustenance or closure of the facilities at Cubi Point was asked to Employers/Managers of the facilities. There are only 5 of them expressed 6 answers. Out of 6 answers, 3 are "Hope such cases to be as **minimum as possible**" and another 3 are "Hope our occupation **to be maintained even if its scale might be reduced**". There is no request of compensation, re-contract and/or replacement nor opinion of shifting to another place. As the major facility, i.e., Fisherman's Wharf Restaurant is owned and managed by Crown Peak Gardens group with a contract with the SBMA, Employers/Managers seem not much cared about such impacts caused by the implementation of the project.

3) Opinion on the Reduction, Sustenance and/or Closure of the Job (Employees)

Opinion on the reduction, sustenance and/or closure of the Jobs by the implementation of the project is asked to Employees/Workers. Out of 26 answers obtained, 19 wished the SBMA to give them either "alternative place/facility to maintain present job" (5), "alternative chance of employment equivalent to present job" (13) or "some kind of the project-related new job" (2) while 5 declared "look for another place and/or another chance of employment outside the project site". The latter seems to represent a sub group who is neither interested in the "Development" nor expecting anything from it.

Table 7.5.3-6 Request against the Job Reduction and/or Closure (Employees)

(actual numbers)

| | 1. alternative job opportunity | 2. alternative equivalent employment | 3. project-related new job | 4. look for another chance | 5. don't know | no answer | Total |
|---|---|---|---|---|---|---|---|
| male | 0 | 7 | 2 | 1 | 0 | 1 | 11 |
| female | 5 | 6 | 0 | 4 | 1 | 0 | 16 |
| Total | 5 | 13 | 2 | 5 | 1 | 1 | 27 |

4) Recommendation

Judging from the result of the questionnaire survey, the "Employers/Employees" group is comparatively indifferent both to "Development" and impacts thereof. This behavior is very much understandable considering their status under the contract with the SBMA especially in case of Employees who can do nothing about the process of "Development" and its impact even if it were adversely influence their job and employment.

Therefore, it is recommended to take closest attention so as not to adversely effect their job and employment during and after the implementation of the project, and if possible, plan and incorporate the way of implementing the project by which they can share the benefits of it.

### 7.5.4 Impact to the Socioeconomic Activities in Redondo Peninsula

Through the investigation for construction material, it is found that filling materials for reclamation can be obtained either by dredging the Cubi / nearby Shoals and or land fill from Mt. Maritan behind POL Pier. Regarding armor stone for revetment, almost whole area of Redondo peninsular is supply sources of these stone. Traces of cutting stone on the hill of Agusuhin in the center of eastern coast of Redondo Peninsula was observed and confirmed as a good quality for the armor stone.

(1) Characteristics of the group

As the largest influences of the Shell Project, Sitio Augushin of Barangay Cawag, Subic Town where the construction of the floating rig is under way, is chosen for the interviewing concerning as one of possible site for quarrying . Only half a year ago, it was a small community of fishermen without any public services of transport , power and water supply.

A total of 22 samples are interviewed. Of them, 13 are male with the highest average age among the target groups of 41.2 years old and 9 are female with the youngest average age among the target groups of 32,6 years old '(refer to Table 7.5.2.1). As a matter of course, their residential place is expressed to be inside Subic Town which includes Barangay Cawag where

the Sitio Augushin is situated. Occupation of the samples should have been totally "Fishery" a half year ago, but this time only 5 of them declared to be so and there are each one of "Mining/Quarrying" and "Construction" who may be employed by the Shell Project and one who declared "Services" may be catering to the project (refer to Table 7.5.2-3). All of them are working at their residential place where classified as "inside Subic Bay".

(2) Perception of "Development" in general

Asked if they appreciate "Development" in general, all the samples answered "YES" with as high as 90.9 % of them pointing out the "economic benefits" for the reason. "Economic benefits of local people" comes the first priority of their opinion of "Ideal type of Development" counting the highest ratio of 43.9 % that is also the highest among the target groups. (refer to Tables 7.5.2-7 and 7.5.2-8) However, asked if they wish to participate into "Development", the lowest ratio among the target groups of 81.8 % answered "YES" and a considerable part of them (13.6 %) answered "DON'T KNOW". (refer to Table 7.5.2-9)

(3) Perception on the Present Project

Asked if a "Development" activities within the SBMA area give any impact on them, positive "YES" counts 50.0 % while negative "YES" as large as 40.0 %. Either positive or negative, they seem to feel impact of such remote activities with only 5.0 % of "NO" answers.

Asked if they wish to participate into such developmental activities as the present project, the highest among the target groups of 95.7 % answered "YES" with the intention to be labor force (59.1 %) and/or employee (22.8 %) of the project.

(4) Perception of Environment

In controlling environmental disturbance, the group shows much larger interest to "control and selection of materials for reclamation work: avoidance of heavy metals and organic chemicals" in case of reclamation works, and also the highest interest among the target groups in "safety education" in case of vehicle traffic. (refer to Table 7.5.2-12)

(5) Opinion to Quarrying and /Filling Material Collection at the area for the Present Project

In relation with the present project, opinion is asked if they welcome Quarrying and filling material collection from their area for the reclamation work of the present project. Out of 43 multi-answers obtained, "not welcome" answers (58.1 % of the total answers) are far larger than "welcome" ones (37.2 %) especially in case of female samples. Even one-third of those samples who express positive "YES" impacts of developmental activities

express negative opinion mainly because of "social disturbance brought out by such activities". As they are presently under the direct impact of reclamation activities of the Shell Project, it could be said that this negative majority of "not welcome" feeling is brought out by the activities.(refer to Table 7.5.4-1)

Further asked if they wish to participate into such developmental activities, again, majority (54.5 %) expressed negative opinion mainly because of "environmental disturbance". Even in the positive opinion in participating such developmental activities, major part need enough explanation and no environmental disturbance. Here, "economic benefits" seems not much mattered for their formulation of opinions. (refer to Table 7.5.4-2)

(6) Recommendations

In general, this group of samples appreciate "Development" and "Developmental Activities" and are willing to participate into it as far as it takes place not at their own residential area. However, with direct impact of the Shell Project which was initiated without clear explanation to them and the similarity of the proposed activities of the port development project, they seem to become very much cautious and hesitant to participate because of adverse impacts that they may have experienced during the implementation of the Shell Project.

The recommendable solution to get the consensus of the inhabitants will be brought by appropriate formal approach through the municipal government authority given with enough explanation, dissemination and well prepared means and measures for their environmental issues. As a matter of fact, a filling material for reclamation can be obtained from other sources as mentioned before, requirement from this site is only armor stone so that the social influence will also be restricted

## Table 7.5.4-1 Opinion on the Activities of Quarrying and filling material Collection (actual numbers)

| Question | Opinion | Reason of the Opinion | By Sex | | | By Perception of Impact | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | male | female | Total | Positive YES | Negative YES | NO | Total |
| Quarrying and filling material collection activities at and around the area | 1. Such activities are welcome | 1. income increase | 5 | 2 | 7 | 6 | 1 | 0 | 7 |
| | | 2. chance of employment | 4 | 3 | 7 | 7 | 0 | 0 | 7 |
| | | 3. improve infrastructure | 2 | 0 | 2 | 2 | 0 | 0 | 2 |
| | | 4. bring out development | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 5. other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | no answer | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Total | 11 | 5 | 16 | 15 | 1 | 0 | 16 |
| | 2. Such activities are not welcome | 1. environmental pollution | 2 | 3 | 5 | 2 | 3 | 0 | 5 |
| | | 2. social disturbance | 5 | 6 | 11 | 3 | 8 | 0 | 11 |
| | | 3. economic difficulty | 3 | 4 | 7 | 2 | 5 | 0 | 7 |
| | | 4. outside workers | 1 | 1 | 2 | 1 | 1 | 0 | 2 |
| | | 5. other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | no answer | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Total | 11 | 14 | 25 | 8 | 17 | 0 | 25 |
| | 3. Don't know | | 2 | 0 | 2 | 1 | 0 | 1 | 2 |
| | no answer | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TOTAL | | 24 | 19 | 43 | 24 | 18 | 1 | 43 |

## Table 7.5.4-2 Willingness to Participate into Developmental Activities (actual numbers)

| Question | Opinion | By Sex | | | By Perception of Impact | | | |
|---|---|---|---|---|---|---|---|---|
| | | male | female | Total | Positive YES | Negative YES | NO | Total |
| Do you wish to participate into such development-activities ? | 1. YES, with explanation and no disturbance | 5 | 2 | 7 | 6 | 0 | 1 | 7 |
| | 2. YES, with economical benefits | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| | 3. YES, with the Peninsula development | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| | (Sub Total : positive answer) | 6 | 3 | 9 | 8 | 0 | 1 | 9 |
| | 4. NO, with environmental disturbance | 6 | 6 | 12 | 4 | 8 | 0 | 12 |
| | 5. NO, without nothing to do daily life | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (Sub Total : negative answer) | 6 | 6 | 12 | 4 | 8 | 0 | 12 |
| | 6. Don't know | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| | no answer | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 13 | 9 | 22 | 11 | 10 | 1 | 22 |

### 7.5.5 Impact on Port Labor

As a potential influence of the present project, Workers/Stevedores of the Subic Bay Port are included as one of the target groups of the socioeconomic impact survey. Two additional questions are prepared to know their opinion for 1). Construction and reclamation work for the establishment of a container berth at Cubi Point, and 2). Change/increase of work shifts which will be caused by the increase of cargo vessels and handling of cargo.

(1) Characteristics of the group

A total of 51 Workers/Stevedores interviewed consisted of 29 male and 22 female. Contrary to the estimation of the Study Team, not the majority of them but only 60.8 % of them are from Olongapo City and a considerable part (more than one-fourth) of these port labors are commuting to the SBMA from surrounding municipalities other than Olongapo City and Subic Town. Naturally their working place is mostly inside the SBMA with a marginal part scattered inside Subic Bay area. Most of them think themselves in "Services" occupation and employed by the government (i.e., the SBMA).Their average income level is a little over 100 thousand Pesos/year that is much higher than that of "Employers/Employees" group.(refer to Table 7.5.2-6).

(2) Perception on "Development" in general

A 96.6 % of the total Workers/Stevedores appreciate positively "Development" with the major reason of "economic benefits" (66.1 % of the total). A 98.7 % of the total positively choose "Ideal type of Development" with the priorities of "economic benefits (34.7 %), "social benefits" (22.7 %) and "national status" (16.0 %). All of the samples show eagerness to participate into "Development" and "Developmental Activities" without exception. (refer to Table 7.5.2-7)

(3) Perception on the Present Project

Asked if they receive any impact from the present project within the SBMA area, very high ratio of 88.9 % answered positive "YES" and the lowest ratio of negative "YES" (7.9 %).

These ratios are quite remarkable comparing with those of "Employers/Employees" group (only 41.7 % of positive "YES" and 44.4 % of negative "YES") and even the "Tourists" group (59.3 % of positive "YES" and 21.3 % of negative "YES"). Reason of positive "YES" is mainly economic as "better income chance" (44.6 %) and "better employment opportunity"(20.4 %) similar to other target groups. However, "infrastructure

improvement" comes the third reason with 21.4 % of share which is remarkably high compared with other groups. (refer to Table 7.5.2-10)

Asked if they wish to participate into the developmental activities in and after the implementation of the present project, 92.3 % of the total answered "YES" with the status of "as an employee" as the largest interest of 54.9 %. "As a labor force" comes the second interest of 33.3 %. (refer to Table 7.5.2-11)

(4) Environmental Consideration

Same as other target groups, most interested measure to control reclamation works is "selection of poisonous materials" but to some extent lower ratio of 34.6 % compared with that of 54.5 % in "Residents of Redondo Peninsula" and 44.4 % of "Employers/Employees". Instead, "protection of natural environment" with the ratio of 28.8 % gather more interest than in other target groups (around 17 to 18 %).

In case of "Heavy Vehicle Traffic" too, result of much similar priority but lower ratio of interest compared with other target groups is obtained as "safety education" (37.3 %) comes the first priority. Second and third priority is given to "control of traffic rules" and "control air pollution" (21.7 % each).

These results indicate much more sophisticated approach to environmental issues with diversified attention and interest in this target group. (refer to Table 7.5.2-12)

(5) Opinion on the Present Project's Development Activities at Cubi Point

Concerning the present project at Cubi Point, as large as 97 % of the samples answered it is "Welcome" either reason of "with much more employment opportunity" (57.5 %) or "with much more chance of income increase" (38.4 %). Only 2.7 % (or, 2 samples) expressed it is "Unwelcome" because of "much more outsiders".

**Table 7.5.5-1 Opinion on the Development Activities at Cubi Point (%)***

| | 1. Welcome with much more opportunity | 2. Welcome with much more income | 3. Unwelcome with much more outsiders | 4. Unwelcome with much harder working conditions | 5. don't know | Actual Number | |
|---|---|---|---|---|---|---|---|
| | | | | | | no answer | Total |
| male | 61.5 | 33.3 | 5.1 | 0.0 | 0.0 | *1* | *40* |
| female | 52.9 | 44.1 | 0.0 | 0.0 | 2.9 | *0* | *34* |
| Total | 57.5 | 38.4 | 2.7 | 0.0 | 1.4 | *1* | *74* |

* Percentage is for the total answers excluding "no answer"

In case of change/increase of work shifts which will be brought out from increase of port activities, again, more than 95 % of total answers indicate it "welcome" with the reasons of "with much more job opportunity" (55.4 %), "with much more income generation" (31.1 %) and "with

commuting facility provided"(9.5 %). Again, "unwelcome" opinion is marginal 2.8 % (or, 2 answers) of which reason are "hardened working conditions" and "with much more outsiders" (1.4 % each).

**Table 7.5.5-2 Opinion against Change/Increase of Work Shift (%)***

| | 1.Welcome with much more opportunity | 2. Welcome with much more income | 3.Welcome if provided commuting facilities | 4. Unwelcome with hardened work condition | 5. Unwelcome with much more outsiders | 6. don't know | Actual Number | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | no answer | Total |
| male | 55.3 | 31.6 | 10.5 | 0 | 0 | 2.6 | *1* | *39* |
| female | 55.6 | 30.6 | 8.3 | 2.8 | 2.8 | 0 | *0* | *36* |
| Total | 55.4 | 31.1 | 9.5 | 1.4 | 1.4 | 1.4 | *1* | *75* |

* Percentage is for the total answers excluding "no answer"

(6) Conclusion

This target group seem to be most appreciate any "Development" and "Developmental Activities" and most willing to participate it. Furthermore, their attention and interest in considering the impacts and benefits of "Development" is most sophisticated as if they know the meaning of development and have experienced some kind of benefits thereof.

They could be a most promotive human resources group in conducting "Developmental Activities" either outside or inside the SBMA area and it is recommended the SBMA to take encouraging measure to answer their intention and opinion.

## 7.6 Environmental Monitoring

### 7.6.1 Monitoring Area and Monitoring Items

The area approximately 1 km away from the dredging and reclamation point is defined as a secondary impact area (Line 1) and concentration of suspended solid (SS) and turbidity at 9 monitoring stations on the Line 1 will be measured. Furthermore, one more monitoring line (Line 2) in Triboa Bay, where the classification of environmental standard is Class SA, is defined. During Construction Stage 2, one more monitoring station located just near the outlet of waste way (Station W) will be added. The monitoring areas and stations during construction stages are shown in Figure 7.6.1-1.

Monitoring items are concentration of SS and turbidity. However, since chemical analysis of SS takes a few days, the main monitoring item should be the observation of turbidity. And, if the turbidity shows high value, chemical analysis of SS will be examined. Therefore, we have to define the correlation between concentration of SS and turbidity at Detail Design Stage and at the beginning of Construction Stage. And since the environmental standards of SS are defined as an increase from the present SS value, the background value of SS must be defined in Detail Design Stage and at the beginning of Construction Stage.

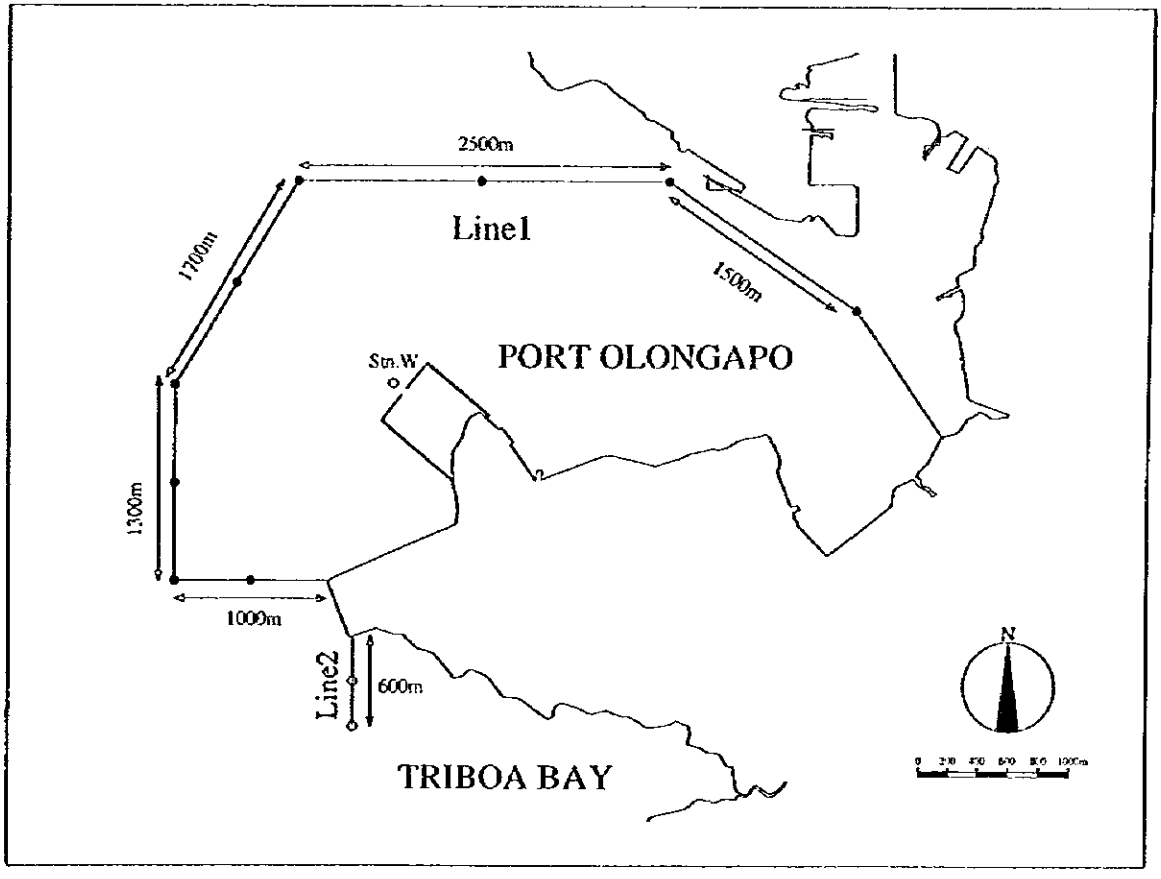


Figure 7.6.1-1 Monitoring Lines and Stations

### 7.6.2 Monitoring Frequency and the Countermeasures

(1) Monitoring during construction

Turbidity will be measured once a day at all monitoring stations. Measurements of turbidity will be carried out at the surface, middle and bottom layers. All results of these measurements will be converted from turbidity to concentration of SS. If the concentration of SS measured at the monitoring station exceeds the environmental standards defined by 30 mg/L increase at Line 1, 2 mg/L increase at Line 2 and 250 mg/L at Station W, we have to pick up water samples at the corresponding stations. The sampling layers are surface and middle. These samples will be analyzed in the laboratory with regard to the item of SS. Until the results of the chemical analysis are shown, the contractor should take environmental concern into consideration. If the results of chemical analysis exceed the environmental standard value, the contractor must take countermeasures to reduce the SS loads at the dredging and reclamation works. The countermeasures proposed now are shown below;

① Construction Stage 1
Establishment of a bucket protector around the grab

② Construction Stage 2
Establishment of silt screen around the waste way
Scattering of coagulating agent to reduce the SS concentration of waste water
Reconsideration of construction plan

The schematic image of environmental monitoring is shown in Figure 7.6.2-1.

(2) Monitoring after construction

Shoreline along the Subic Bay is not forecasted to be changed. However, there is a probability that the modern coastal engineering can not forecast the precise change of shoreline. Therefore, the change of shoreline near the reclamation area must be monitored after the construction. The shoreline, in particular a bathing beach and important coasts, facing Olongapo Bay along the Subic Bay International Airport must be investigated by visual observation and taking pictures. And if unusual signs are seen, detailed investigation and remedial measures must be carried out.

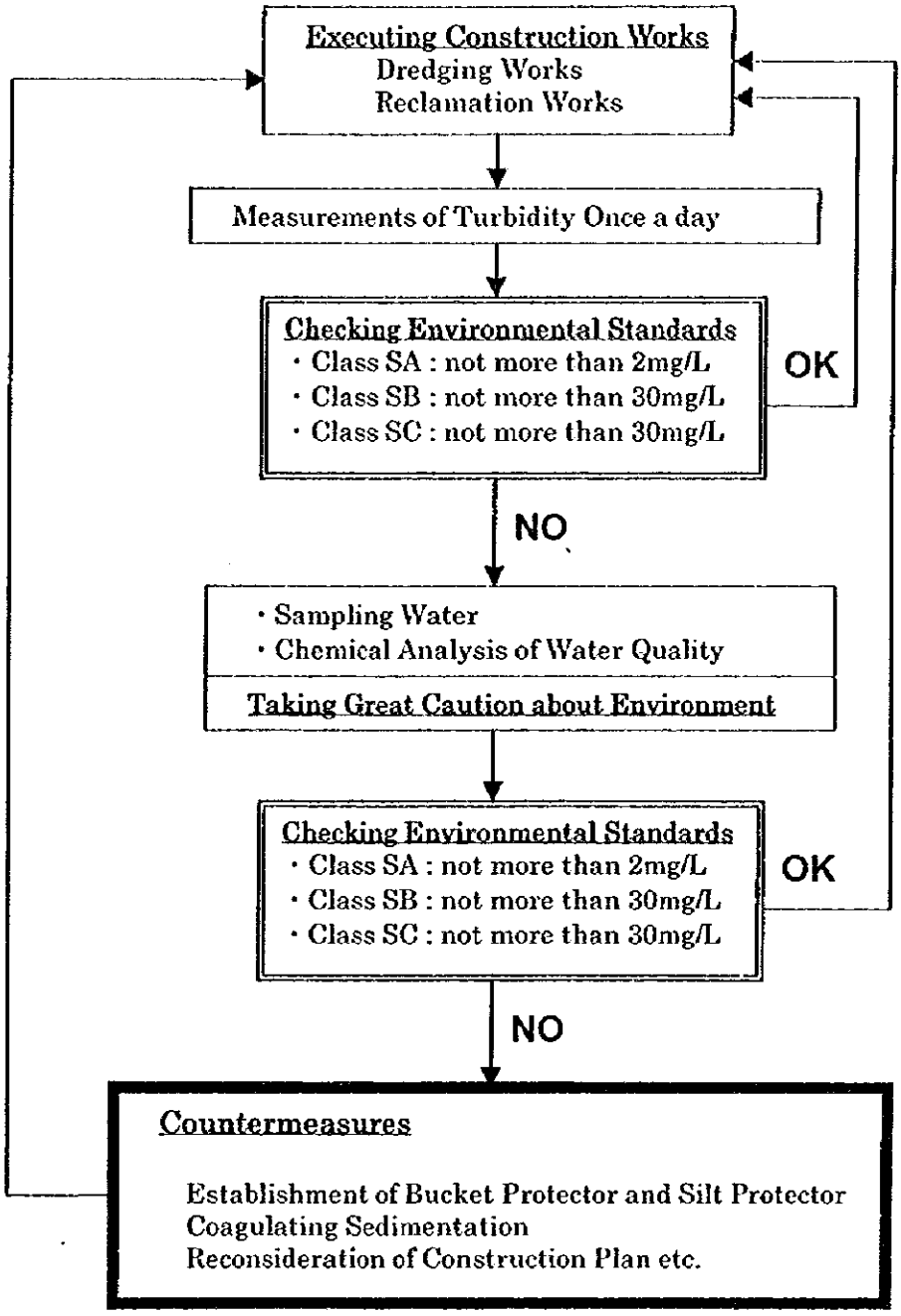


Figure 7.6.2-1 Schematic Image of Environmental Monitoring

## 7.7 Evaluation

It is concluded that the proposed project involves no potential elements which may cause serious impacts on either the natural or socioeconomic environment.

However, in the course of the EIA of this study, the following items were identified to be potential elements which cause relatively medium and small magnitudes of impacts on the environment.

| | |
|---|---|
| (1) Change in coastal currents | C(negligible small impact) |
| (2) Dispersal of reclamation material | B |
| (3) Natural resource utilization (fishery) | B |
| (4) Loss of recreational beach | B |
| (5) Residents in Redondo Peninsula | B |
| (6) Workers in port facilities | B(positive impact) |

where B and C denote that the magnitude of the impact would be relatively medium and small, respectively.

The required countermeasures and mitigation for the items of medium negative impact are as follows;

1) Dispersal of reclamation material

The SS dispersion must be monitored and the marine water pollution caused by the construction work must be controlled regarding SS.

Also, the volume of sediments containing high concentration of cadmium and/or chromium must be determined by leaching tests and, the dredging and reclamation methods must be carefully decided according to the volume of the concentrated sediments. And in case of need, the reclamation material must be taken from land.

2) Natural resource utilization

SBMA should take charge of overseeing compliance with environmental rules and regulations and the standards, including enforcement and monitoring, regarding all domestic waste discharge and bilge water from calling ships.

The existing navigational lights/marker buoys should be increased in number and extended southwards to aid navigation. In addition, a new lighthouse in Grande Island should be installed.

Fishers will be allowed to pass through the channel between Camayan Point and Grande Island through a much wider area avoiding the turning area of calling ships to terminal.

Subic Bay residents should be given priority in employment when the project is implemented.

3) Loss of recreational beach

A new beach must be created at the base and the south side of the reclamation area to compensate for the loss of the beach (Officer's Beach).

4) Residents in Redondo Peninsula

A sufficient explanation of the project (quarrying the armor rock) must be published to obtain the consensus of the people in Redondo Peninsula.

Consequently, this project is feasible from the environmental aspect. However, it should be noted that the EIA was conducted on the proposed conditions of which the project involves: facility layout plan, structural design, construction method, construction schedule and so on. Therefore, if any of those conditions is modified in the stage of implementation of the project, the impact in the form of these elements listed above should be re-evaluated in an appropriate manner.

## 8. Overall Evaluation

The short term plan proposed in the study was evaluated from various viewpoints as follows.

(1) Cargo handling capacity

Cargo handling capacity in the short term plan is sufficient to handle the cargo traffic volume in the target year.

(2) Port development, management and operation systems

SBMA should take a leading role in developing SBF and should bear most of the investment burden for reclamation work, construction of quay and access road, and procurement of gantry cranes. All other onshore facilities and equipment are to be the responsibility of the private sector.

However, the new Seaport Department of SBMA will concentrate its efforts on the planning and administration of the Port as a Port Management Body, because the operation of container terminals is to be privatized and the SBMA should act as a landlord of the Port.

This scenario is most realistic and effective for the port development, management and operation.

(3) Economic analysis

The short term plan is beneficial from the viewpoint of the national economy.

(4) Financial analysis

If the SBMA utilizes a soft foreign loan to invest in the short term plan, both SBMA and container terminal operators will be able to maintain a sound financial status during the life of this project.

(5) Environment impact assessment

Through EIA, no elements were identified as those on which the project give considerable impact. If care is taken during the construction period, the impact on the natural and socioeconomic environment can be minimized.

On the basis of above discussion and evaluation, it is concluded that the project, the short term plan, is feasible.

# 9. Conclusions and Recommendations

## 9.1 Conclusions

### 9.1.1 Cargo Forecast

Container cargo and non-container cargo demand in SBF is shown in Table 9.1.1-1.

Table 9.1.1-1 Demand Forecast of Container and Non-container Cargo

| Year | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|
| Container (1,000TEU) | 122 | 275 | 420 | 567 | 720 |
| Non-container(1,000tons) | | | | | |
| Including Soya | 527 | 632 | 743 | 863 | 995 |
| Excluding Soya | 527 | 424 | 504 | 594 | 698 |

Note: Soya bean meal will be handled in a private terminal from 2002.

### 9.1.2 Phasing of Long Term Plan

(1) Phasing plan

1) Container cargo

The long term plan can be divided into three phases. Planned container terminal facilities by phasing plan are shown in Table 9.1.2-1.

Table 9.1.2-1 Planned Container Terminal Facilities by Phasing Plan

| | Phase 1 | Phase 2 | Phase 3 |
|---|---|---|---|
| Total Handling Capacity (TEU) | 297,000 | 594,000 | 891,000 |
| Total Berth Length (m) | 280 | 560 | 840 |
| Berth Depth (m) | 13 | 13 | 13 |
| Total Ground Slots (TEU) | 2,112 | 4,224 | 6,336 |
| Total Number of Gantry Crane | 2 | 4 | 6 |
| Total Land Area (ha) | 16 | 30 | 44 |

The proposed gantry crane which will be installed at the new container terminal must be an articulated crane type with the height of 51.5 m because of the height limitation in the airport.

2) Non-container cargo

The existing number of berths at NSD (3 berths) and Boton (2 berths) Wharves is sufficient for the future cargo traffic demand up to 2020.

The scale of existing cargo storage facilities (transit sheds, warehouses, open storage yard at NSD and Boton areas) is sufficient for required cargo storage demand up to 2020.

(2) Short Term Plan

1) Urgent Development Plan

Phase 1 construction in the short term plan will start from 2003 and be completed in 2005. Prior to the completion of short term plan, the following urgent development plan is recommended.

① Installation of at least one second-hand gantry crane at Sattler Pier

② Pavement work on the existing container yard (10 ha) at NSD area.

2) Short Term Plan

The short term plan includes the following items:

① The new container terminal construction (including reclamation) with berth length of 560 m, and procurement of gantry cranes (Phase 1 and Phase 2)

② Construction of an access road from Boton area to the new container terminal

③ Rehabilitation work of the NSD wharves and other existing port facilities

④ Installation of new navigational aids

⑤ Procurement of container and non-container cargo handling equipment

(3) Port Facilities design for Short Term Plan

The selected structural type for container wharf is gravity concrete caisson type quay wall. An approximately 2.2 million $m^3$ filling material for reclamation of container terminal is estimated to be obtained by dredging (approximately 80 %) at Cubi Point shoal, Caiman and Carrasco shoal and land fill (20 %) from a quarry site at Mt. Maritan .

A mound type structure is selected for the new access road of approximately 3.7 km in length, which is connecting the new container terminal to the main road, Argonaut Highway.

The existing Marine terminal will be improved by additional steel pipe piles and reinforced concrete deck.

An integrated navigational aid system with a lighthouse and light/marker buoys is also included in the plan.

(4) Cost Estimate for Short Term Plan

The total cost estimate for the short term plan is US$ 214.9 million (SBMA 184.6 million, Operator 30.3 million); the breakdown of the cost is shown in Table 9.1.2-2.

Table 9.1.2-2 Project Cost for Short Term Plan

(unit: US$ million)

| | SBMA | Operator | Total |
|---|---|---|---|
| 1 Detailed Design/Tender Preparation | 6.0 | | 6.0 |
| 2 Construction Cost | 117.6 | 25.2 | 142.8 |
| 2.1 New Container Terminal | 95.6 | 23.7 | 119.4 |
| Construction | 70.6 | 5.5 | 76.2 |
| Equipment Procurement | 25.0 | 18.2 | 43.2 |
| 2.2 Rehabilitation of Marine Terminal | 8.0 | | 8.0 |
| 2.3 Access Road to the New Container Terminal | 11.6 | | 11.6 |
| 2.4 Navigation Aid | 2.4 | | 2.4 |
| 2.5 Equipment Procurement (for non-container) | | 1.4 | 1.4 |
| 3 Consulting Supervisory Services | 6.7 | | 6.7 |
| 4 Price Escalation (2% per annum for items 1,2,3) | 13.6 | 2.6 | 16.2 |
| 5 Physical Contingency (10% for items 1,2,3) | 13.0 | 2.5 | 15.5 |
| 6 Sub-total of items from1 to 5 | 156.9 | 30.3 | 187.2 |
| 7 SBMA Rehabilitation Program * | 22.2 | | 22.2 |
| 8 Administration Cost | 5.5 | | 5.5 |
| Grand Total | 184.6 | 30.3 | 214.9 |

* Existing Roads, Rivera/Bravo Wharf and Relocation of Buildings/Utilities behind Boton Wharf

(5) Construction Program for Short Term Plan

In order to minimize mobilization and preparatory works of the contractors, both Phase 1 and 2 of the development will be continuously carried out, preferably in a single package of the construction.

The required construction period has been estimated at a minimum 36 months for both Phase 1 and Phase 2; 20 months for Phase 1 and 16 months for Phase 2.

### 9.1.3 Port Development, Management and Operation

(1) Introduction of private sector and responsibility of SBMA

In order for the proposed privatization to be a success, it is necessary for SBMA to make the following points and concepts as a base for the management:

① Fostering the Entrepreneurial Spirit
② Securing the Necessary Profit
③ Transparency
④ Fairness

(2) Recommendable institutional and regulatory framework

The degree to which port privatization is healthy can be determined by checking the following: ①Business Ethics/Service Standard, ②Efficiency/Productivity, ③Profitability, ④Degree of Public Nature.

The main feature of the fundamental functions of the SBMA may be summarized as follows: ① Port development, administration and management to be assigned to SBMA, ② The development cost should be the responsibility of SBMA with the back up of the central

government, ③ SBMA as a Port Management Body should be prohibited from being engaged in Port-related business that is suitable for the private sector and ④ Right of SBMA to review, plan and authorize development plan of the port of Subic in collaboration with the central government to be confirmed.

(1) Technology transfer method and training system

There are three main methods, namely ① OJT (On the Job Training), ② BOT (Build-Operation-Transfer) and ③ TCC (Training through Curriculum Course)

In order to have SBMA in-house training system as the final target, it is proposed to utilize PPA's Training System and Japanese Government's Training Program.

(2) Marketing Strategy for Port Promotion

The sales motto and the marketing strategy for port promotion of Port of Subic are: ① Capital Port of Central Luzon, ② Future Regional Hub Port in Asia-Pacific Region and ③ Sea-Air-Park Compound Port.

To promote the port sales of Subic, it is necessary to ① Prepare Port Sales Information and Materials, ② Prepare Sales Promotion Brochures, ③ Advertise in Marine/Trade Magazines, ④ Prepare Video Tape of the Port of Subic, ⑤ Make Port Sales Promotion Tour and ⑥ Set up Port Sales Offices abroad.

(3) Action program for improvement of management and operation system

In relation to the necessary improvements, SBMA must: ① Reduce the number of employees, ② Reorganize the Seaport Department, ③ Construct new container terminals, ④ Improve operation of conventional type of vessels, ⑤ Set up a working committee on ISO Certificate and ⑥ Upgrade EDP and preparation of EDI.

(4) Improvement plan and schedule for short term plan

The two cases are assumed: Case 1: One Terminal Operator for Whole Terminal Site, and Case 2: Two Terminal Operators for Two Terminal Sites. In conclusion, Case 2 is recommended.

(5) Organization and tariff for short term plan

New Seaport Department Organization is proposed in page 4-13 in the Draft Final Report Volume 2 as Figure 4.1.1-2.

The current Seaport Tariff is scheduled to be revised this coming May or June with an average increase of 20 to 25 percent. It is calculated that SBMA earning per TEU is about US$ 21 as per current Tariff, about US$ 25 after the revision and about US$ 30 in 2005, assuming that another 20 percent increase in rates will be possible.

(6) Implementation and financial programs for the short term plan

The three concepts of lease fee of container terminals are: ① All Throughput

Calculation Lease Fee (Variable Fee), ② Combined Lease Fee of Land Usage and Throughput and ③ All Inclusive Lump-sum Lease Fee (Fixed Fee). Proposed financial scheme is a modification of ② Combined Lease Fee of Fixed Sum and Throughput Linked Charge (so called Profit and Loss Share System).

### 9.1.4 Economic Analysis

(1) "With" Case and "Without" Case

The economic internal rate of return (EIRR) based on a cost-benefit analysis is used to appraise the feasibility of the project.

In the cost-benefit analysis, the benefits and the cost of the project are defined as the difference between the "Without" case and "With" case of the project.

1) "With" Case

The "With" case scenario includes all improvements in productivity and all expansion of port facilities in the short term plan.

2) "Without" Case

① No investment is made for the port

② When handling volume reaches the maximum volume of handling capacity of the port, the cargoes imported/exported which can not be handled in the port are assumed to be handled in adjacent ports.

③ The locators which are expecting a main port for foreign trade may not come in to future planning industrial estates because of inconvenience to their operation.

(2) Costs of the projects (difference between "With" case and "Without" case)

Costs of the project consist of construction cost, re-investment costs and operation costs(maintenance costs, personnel costs, others).

(3) Benefits of the projects

Benefit items of the projects are as follows:

① Saving inland transportation costs

a) Container cargo for industrial estate at SBFZ

b) Container cargo for industrial estate outside of SBFZ

c) Non-containerized cargo

② Saving of costs in cargo handling

An arbitrary charge (out-port surcharge) of about US$ 200 per one TEU is levied on container handling at SBF.

③ Promotion of regional economic development

The value added to port is 5 % of the amount of value added borne by the project.

(4) EIRR and evaluation

The results of EIRR calculation are as follows:

| | |
|---|---|
| Base Case | 29.0 % |

| | |
|---|---|
| The costs increase by 10 % | 26.1 % |
| The benefits decrease by 10 % | 25.8 % |
| The costs increase by 10 % and the benefits decrease by 10 % | 23.2 % |

It is generally considered that a project with an EIRR of more than 10-15 % is economically feasible for infrastructure or social service projects. Therefore, this short term plan is feasible from the viewpoint of the national economy.

### 9.1.5 Financial Analysis

(1) Operation scheme

It is assumed that SBMA shall be the owner of the facilities and that the container terminal shall be leased to two private operators: Operator A and Operator B each lease a 280 m long berth and 2 gantry cranes. The non-container wharves shall be rented to stevedoring companies at their request.

(2) Costs and revenues

The cost (investment) shouldered and the revenue obtained by the SBMA and those by the Operators are assumed to be as listed in Table 9.1.5-1.

Table 9.1.5-1 Cost and Revenue of SBMA and Container Terminal Operators

| | SBMA | Operators A and B |
|---|---|---|
| Cost | 1. Construction cost (excluding operators' buildings)<br>2. Installation of gantry cranes<br>3. Administration cost | 1.Construction cost of operators' buildings<br>2.Installation of handling equipment other than gantry cranes<br>3. Lease fee (container terminal)<br>4. Daily maintenance cost<br>5.Administration and operation cost |
| Revenue | 1. Pilotage fee<br>2. Harbor fee<br>3. Berthing fee for non-container ships<br>4. Wharfage and storage fee (non-container wharf)<br>5. Lease fee (container terminal) | 1. Berthing fee for container ships<br>2. Cargo handling charge (container cargoes) |

(3) FIRR and evaluation

It is assumed that SBMA charges the same fee as the new port tariff (to be revised by June 1999) and operators charge US$ 67 per TEU (inclusive of berthing fee and container handling charge).

The results of FIRR calculation are as follows:

| | |
|---|---|
| Base Case | 11.1 % |
| The costs increase by 10 % | 9.7 % |
| The revenues decrease by 10 % | 9.3 % |
| The costs increase by 10 % and the revenues decrease by 10 % | 8.0 % |

If 85 % of initial investment by SBMA is covered by a soft loan (interest rate of 1.8 %/year) and the rest of the initial cost shouldered by both SBMA and Operators is covered by a loan with an interest rate of 6 %/year (the real interest rate excluding inflation rate), the weighted average interest rate for the total investment becomes 2.9 %. Since the FIRR calculated above exceeds the weighted average interest rate, the project is assessed to be financially viable.

### 9.1.6 Environmental Impact Assessment

(1) Objective of the environmental impact assessment

The present natural and social environment at and around the project site is as follows:

1) Air quality data from the World Bank Environmental Baseline Study in 1995-1996 and EIA Studies in1998 revealed that total suspended particulate (TSP), nitrogen dioxide ($NO_2$) and sulfur dioxide ($SO_2$) were well below the DENR air quality standards.
2) The coastal waters of Subic Bay are generally in good condition. Most of the water quality parameters are in conformance with the applicable DENR Standards for Coastal and Marine Waters Class SB.
3) The down stream portions of the rivers draining into the bay are generally within the prescribed DENR Criteria for Fresh Waters Class C and still in good condition.
4) The water and bottom sediments of Subic Bay were found to contain heavy metals. Levels of heavy metals in water were way below the DENR standards. However, high levels in bottom sediments were detected, generally higher than the sediment screening values developed by the U.S. National Oceanic and Atmospheric Administration (NOAA).
5) Except for the mangrove stands in the mouths of Binictican River and Boton River, no other sensitive biological communities (SBC's) are found in the proposed area for port development.
6) Implementing the development project poses little or no problem to the social environment of the Subic area, except the natural resource utilization (fishery) and recreational beaches.

Consequently, according to IEE for the master plan, the EIA focused on the following items:

① Change in coastal currents by reclamation
② Dispersion of reclamation material

③ Natural resource utilization

④ Socioeconomic environment consisting of beach recreation, activities in Redondo Peninsula and port labor conditions

(2) EIA for change in coastal currents

According to the results of the computer simulation, in both future cases (long term, short term plan) changes in current velocity of more than 2 cm/s are limited to the area adjacent to the project site.

(3) EIA for dispersal of reclamation material

1) Suspended Solid (SS)

According to the results of the computer simulation, SS dispersion is limited to the area adjacent to dredging and reclamation works site and is in conformity with the SS criteria of marine waters regulated by SBMA.

2) Sea bottom quality

High value of cadmium and chromium concentrations were detected at the proposed project site, Cubi Point. Therefore, leaching tests of sea bottom concerning cadmium and chromium must be conducted during the detailed design stage, and if the cadmium solution shows more than 0.1 ppm and/or the chromium solution shows more than 2 ppm, prudent dredging/reclamation works or change of sand site for reclamation from sea bottom to land will be required.

(4) EIA for natural resource utilization

There are not many natural resources other than fishery around Subic Bay. According to the results of a perception survey in fishing communities, the major recommendations are as follows:

① The SBMA shall take charge of overseeing compliance with environmental rules and regulations and the standards, including enforcement and monitoring regarding all domestic waste and bilge water discharge from calling ships.

② The existing navigational lights/marker buoys should be increased in number and extended southwards to aid navigation. In addition, a new lighthouse in Grande island should be installed.

③ Subic Bay residents should be given priority in employment when the project is implemented.

(5) EIA for socioeconomic environment

According to the results of a questionnaire survey, the following is recommended:

① To provide alternative beach facility

② To explain the project and quarrying method to residents along the eastern coast of Redondo Peninsula in order to obtain their consensus

(6) Evaluation of environmental issues

It is concluded that the proposed project involves no potential elements which may cause serious impacts on either the natural or socioeconomic environment. The required countermeasures and mitigation are as follows:

① To monitor SS during construction stage
② To conduct leaching tests for cadmium and chromium in sea bottom and to decide the construction method
③ To construct a new beach at the reclamation area
④ To publish the project in detail to obtain the consensus from related people

### 9.1.7 Overall Evaluation

The short term plan was evaluated as feasible from various viewpoints.

## 9.2 Recommendations

### 9.2.1 Matters with Regard to Airport

(1) Observance of rules and regulations concerning airport

It is strictly required to observe the rules and regulations of the airport and to consult with the airport staff in order to maintain safe airplane operations.

The following matters deserve special attention.

1) Detail design stage

①Height limitation

When the port facilities, especially the access road and gantry cranes, are planned to be designed, the height limitation must be considered taking notice of construction stage as well as operation stage.

Aerial obstacle lights must be installed at the facilities that are designed to be close to the height limitation.

②Influence on the transponder landing system (TLS)

Since the elevation of the access road is planned to be 10 m lower than the elevation of the runway, the container trucks using the access road would not affect the TLS installed on the runway. However, the effect on TLS can not be obviously identified now, because TLS is a newly-invented landing system and the Subic International Airport is the first airport to install this system in the world. Therefore, it is necessary to confirm whether there will be an impact on TLS and if so, a countermeasure must be taken.

③Lighting systems in the container terminal and the access road

When the lighting systems in the container yard and the access road are designed, the direction of light must not be upward or interfere in the course to the airport. And the port lighting system must not be confused for the airport lighting system.

④Radio system

When the radio system for the port operation is designed, it is required to adjust the radio frequency with the airport in order not to influence the airport radio system.

⑤ Airport radar system

Considering the location and size of the port facilities, the influence on the airport radar system would be small, but it is difficult to forecast the influence of the port facilities on the airport radar system precisely at this moment. Therefore, if it is necessary, the design of the port facilities , especially gantry cranes, must be duly considered.

⑥Shelter of the access road

There is a fear that jet engine blast from airplanes taking off or landing would blow trucks down. After checking the exact take-off and landing points of airplanes, the necessary length of shelter that prevent the trucks on the access road from engine blast should be designed in the detail design stage.

2) Construction stage

Though the construction period for the short term plan is short, it is necessary to discuss with the airport the same issues as mentioned in "1) Detail design stage" above at construction stage, especially concerning height limitation, influence on the TLS, lighting system, radio system and airport radar system.

The Federal Express Corporation (FedEx) requires that there will be no construction cranes that penetrate the OCS during normal FedEx operational hours (2200 in the evening until 0500 the next morning local time). And if such construction cranes or other equipment is necessary during non-FedEx operational hours, they would be properly informed through Notice to Air Men (NOTAM) and marked.

### 9.2.2 Matters with Regard to Environment

(1) Environmental issues concerning suspended solids

The major potential adverse effect on the natural environment is the level of suspended solids (SS) in the marine water during the dredging and reclamation works period.

1) Detail Design Stage

Since the laboratory test of SS needs two or three days, the monitoring of SS should be conducted by turbidity at the monitoring points. Therefore, the correlation equation between turbidity and SS should be formulated in the detail design stage and the beginning of construction stage before the full-scale dredging and reclamation works start.

And it is also required that the value of SS in the background must be grasped in every season especially during rainy season (SS in rainy days would be higher than in clear days).

2) Construction Stage

In the construction stage, it is necessary to analyze SS in the monitoring points and distinguish the impact of dredging and reclamation works from other impacts. In particular, SS would be influenced by ground surface effluent of rainwater. Therefore, SS of the background must be clarified and, if SS increases more than the background, the reason for the increase must be identified.

(2) Environmental issues concerning shoreline change

Shoreline change (beach erosion , accretion) was not forecasted in IEE, because there is no specific littoral drift at present and no significant change of tidal current. However, there have been cases in which unforecasted shoreline change occurred after completion of an artificial structure in the sea. Therefore, investigation of shoreline is required in the operation stage.

(3) Environmental issues concerning sediments containing cadmium and/or chromium

In the detailed design stage leaching tests of sea bottom concerning cadmium and

chromium must be conducted. According to the results of the tests, if necessary, the countermeasure (prudent dredging and reclamation works, change of sand site for reclamation) must be selected.

### 9.2.3 Port Development, Management and Operation

(1) Institutional framework

The main feature of the fundamental functions of SBMA may be summarized: ① Port development, administration and management to be assigned to SBMA, ② The development cost should be the responsibility of SBMA with the back up of the central government, ③ SBMA as a Port Management Body should be prohibited from being engaged in port-related business that is suitable for the private sector and ④ Right of SBMA to review, plan and authorize development plan of the port of Subic in collaboration with the central government to be confirmed.

(2) Training system

To create and foster an SBMA in-house training system as the final target, it is proposed to utilize ① PPA's Training System and ② Japanese Government's Training Program.

(3) Port Promotion and sales

The sales motto and the marketing strategy for port promotion of Port of Subic are: ① Capital Port of Central Luzon deleting arbitrary charge of ANERA (shipping conference), ② Future Regional Hub Port in Asia-Pacific Region and ③ Sea-Air-Park Compound Port.

(4) Improvement of management and operation system

SBMA must carry out: ① Reducing the number of employees, ② Reorganization of Seaport Department, ③ Constructing new container terminals, ④ Improving operation of conventional type vessels, ⑤ Working committee on ISO Certificate and ⑥ Upgrading EDP and preparation of EDI.

(5) Container terminal operation

Two cases are assumed: Case 1: One Terminal Operator for Whole Terminal Site, and Case 2: Two Terminal Operators for Two Terminal Sites. In conclusion, Case 2 is recommended.

(6) Financial scheme for short term plan

Three concepts of lease fee of container terminals are: ① All Throughput Calculation Lease Fee, ② Combined Lease Fee of Land Usage and Throughput and ③ All Inclusive Lump-sum Lease Fee. Proposed financial scheme is a modification of ② Combined Lease Fee System of Fixed and Variable Charge (Profit and Loss Share System).

(7) Privatization of Businesses other than Container Terminal

Container Terminal is a part of the total waterfront. Therefore, the SBMA's role should be clearly demarcated while related business should be privatized to the extent possible.

(8) Review of Port Tariff

Existing Port Tariff should be reviewed and re-framed after the new demarcation of SBMA's role.

(9) Fund for the development of the short term plan

Since the project cost for the short term plan is extremely high at US$ 215 million (both SBMA's and operators' investment), it is recommended that the SBMA make a great effort to obtain a soft loan for the port development in order to strengthen the SBMA's financial soundness and to establish a competitive tariff in SBF.

### 9.2.4 Function and Role of the Ecology Center as a Constituent of SMBA

The Ecology Center is one of the departments of SBMA which equally share the responsibility to pursue the strategic policies and objectives of SBMA, which is prescribed in Republic Act No. 7227.

The Ecology Center monitors all the activities within the area under the jurisdiction of SBMA. It is of course, therefore, a very important task of the Center to examine the proposals of new activities, projects, etc. From the viewpoint of the conformity of the guidelines and standards for environmental pollution control, the Center should give *constructive* comments and advice to the proponents to realize the proposed projects in such a manner that the development and the conservation of ecology are harmonized. All proposals for new projects should be examined in a positive manner, i.e. how the development and the conservation of ecology can be harmonized with each other.

In addition, another important function of the Center is to monitor the impact of *on-going and existing activities* on natural and *social* environment of both within the SBF area and also the *adjacent area*. The on-going construction of an oilrig generated a conflict between the SBMA project and the inhabitants near the project site. One of the reasons why the conflict occurred seems to be that the public was not properly informed before the commencement of the project. Such a conflict might have been predicted if the Ecology Center would have been involved in the decision making process of SBMA to let the Shell Incorporate start the construction.

To this end, the Center should conduct systematic observation and monitoring of all the activities in SBF. When something does not conform to its guidelines and standards, the Center

must initiate the action to examine in detail, gather the data and information and analyze the phenomena. It should also coordinate all those who are concerned to negotiate a solution to the problem.

The underlying policy of the establishment of SBMA seems to be creating an entity that integrates authorities of various governmental agencies hurry up the base conversion and development by eliminating the *Red Tapes* that might exist among the ministries. Therefore, any department of SBMA should not act as a branch office of respective ministries. Again, auditing the activities of other department is not the role of the Ecology Center, but identifying the problems that endanger the sustainability of ecology and social environment and initiate the steps to settle the problems.