CHAPTER 1

CITY INTRODUCTION

1.1 History

Tagbilaran was a small, advanced and civilized settlement established at Sitio Ubos, the lower portion at the back of the present Cathedral in Poblacion Uno, during the 15th Century. This settlement was then known as the “Bool Kingdom,” a part of the town of Baclayon. It is said that the place was first named Tinabilan, which means "screened," as she is shielded on the southwest by Panglao Island. But tradition has it that the word Tagbilaran was derived from the word Tagubilaan, a contraction from two local dialects *Tagu* (to hide) and *Bilaan* (a Muslim marauder tribe or Moros) who were feared by the early settlers because they pillaged and looted the place. In brief, Tagbilaran means “to hide from the Moros.”

The early settlers of Tagbilaran had established trade relations with China and Malaysia. When Spanish Captain Miguel Lopez de Legaspi landed on the shores of Tagbilaran on 16 March 1565, he forged a Treaty of Friendship with local Chieftain Datu Sikatuna. This event became the basis for the annual celebration called “Sandugo” or literally “one blood.” A historical marker now stands on the very spot where Legaspi and Sikatuna had the famous blood compact. The late President Elpidio Quirino perpetuated the memory and spirit of this treaty by establishing the “Order of Sikatuna,” a presidential award and decoration conferred upon visiting dignitaries.

On 9 February 1742, Governor-General Gaspar dela Torre signed a decree establishing the separate town of San Jose de Tagbilaran from the town of Baclayon. On 1 July 1966, Tagbilaran became a chartered city by virtue of Republic Act 4660.

1.2 Key Physical Characteristics

1.2.1 Location

Tagbilaran is the capital and a component city of the island province of Bohol. It is situated some 630 kilometers southeast of Manila and 72 kilometers south of Cebu City. Tagbilaran City lies on the southwestern part of the province. It is bounded on the North by the towns of Cortes and Corella; on the East by the towns of Baclayon and Corella; on the south by the Tagbilaran Strait and on the west by the Maribojoc Bay (see Figure 1.1).

Figure 1.1. Map of Bohol Province Highlighting Tagbilaran City

Source: islandsproperties.com

1.2.2 Land Area and Political Subdivisions

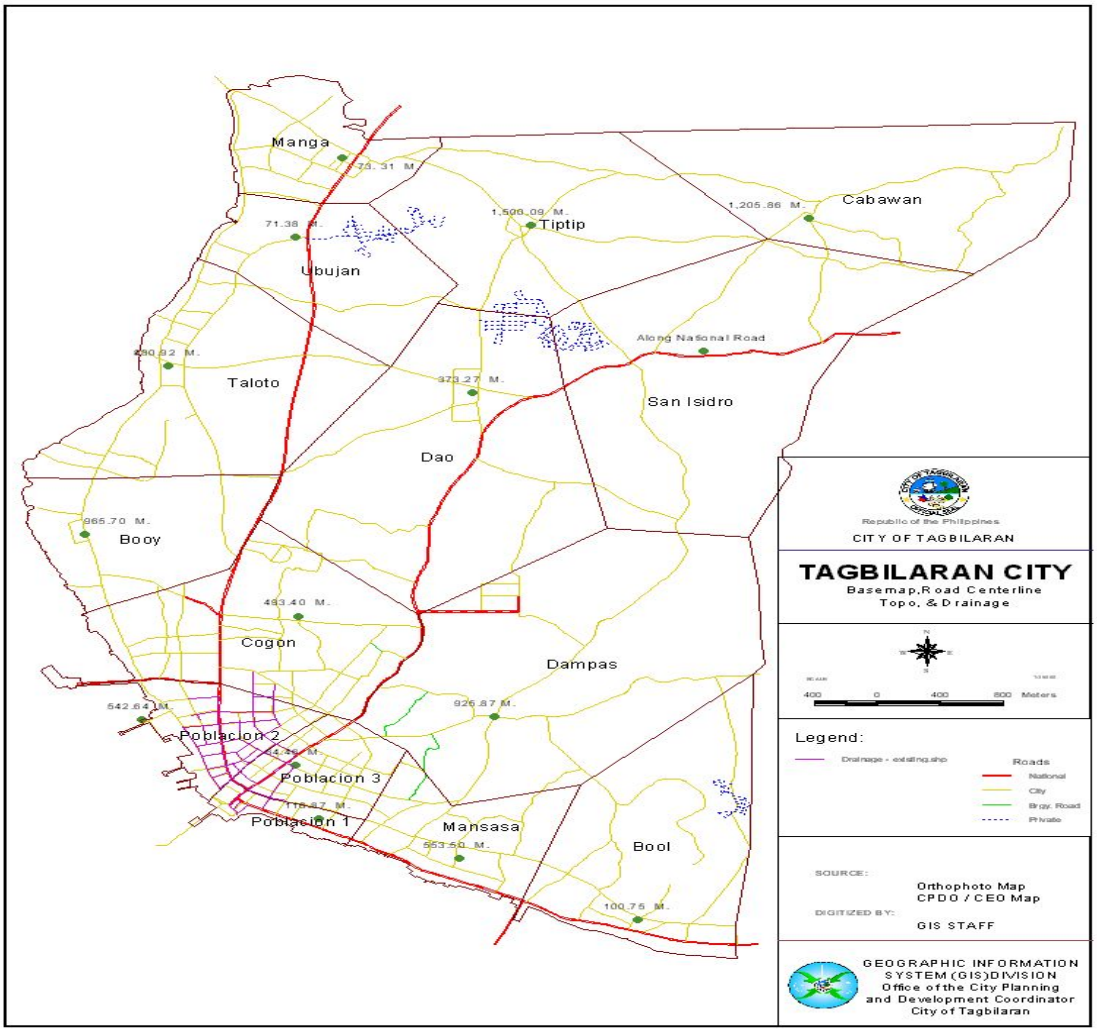
Tagbilaran has a total land area of 3,270 hectares, including about 13 kilometers of coastline. It has 15 barangays of which 4 comprise the urban districts while 11 comprise the rural districts. The urban districts cover an area of 371.31 hectares or 11.35% of the total land area while the rural districts cover an area of 2,898 hectares or 88.65% of the total land area.

Table 1.1 Land Areas by Barangay

Barangay	No. of Sitios	Area (in hectares)	% to Total
Urban	**31**	**371.20**	**11.35**
Poblacion I	6	25.90	0.79
Poblacion II	6	70.20	2.15
Poblacion III	7	70.70	2.16
Cogon	12	204.40	6.25
Rural	**61**	**2,898.90**	**88.65**
Bool	7	348.80	10.67
Booy	6	146.40	4.48
Cabawan	2	267.30	8.17
Dampas	6	443.70	13.57
Dao	5	390.90	11.95
Manga	6	117.30	3.59
Mansasa	4	82.90	2.54
San Isidro	7	429.40	13.13
Taloto	5	244.50	7.48
Tiptip	7	282.10	8.63
Ubujan	6	145.60	4.45
Total	**92**	**3,270.10**	**100.00**

Source: www.tagbilaran.gov.ph

Figure 1.2. Tagbilaran City Base Map



1.2.3 Topography and Terrain

The City forms an elongated strip varying in width from 500 meters at its narrowest to 2 kilometers at its widest following the configuration of the shoreline. Ridges with an average altitude of 30 meters run almost parallel to the shoreline. Two peaks rise on both ends of the ridge, Elley Hill (100-meters) on the north and Banat-i (145-meters) on the south. Except for these protrusions, the terrain ranges from moderately rolling with prevailing slopes from 3 to 6 percent along the coastlines to generally flat and level land.

1.2.4 Climate

The climate is typically tropical with no distinct wet and dry seasons. Rainfall is fairly distributed throughout the year and precipitation tends to be heavier during the second half. Temperature averages 27.6 degrees centigrade and relative humidity varies from 81 to 88 percent. Prevailing winds for the months of November to May are of the northeast direction, while the winds from June to October are of variable directions. Prevailing wind direction is northeasterly with velocities ranging from 1 to 2 miles per second. The city is protected from the southwest monsoon by

the Island of Panglao and from the cold stream of the north wind by the Maribojoc mountain range. Typhoons and earthquakes are rare.

1.2.5 Geology

Tagbilaran sits on a generally flat limestone formation with a relatively thin soil cover. The shallow superficial and unconsolidated soils are derived from the residual weathering of underlying coralline limestone. Due to the thin soil cover, bedrocks crop out even in low-lying portions, including shore areas. The hills (Mts. Elley and Banat-i) and the ridges are practically without soil cover due to the fairly rapid surface water run-off.

Natural sinkholes and sunken areas, varying in sizes to as big as 2 hectares, are predominant and serve as the natural drainage or catch basin of storm water. There are also numerous underground caves formed through the action of surface waters infiltrating the normal fissures and joints of the substrate.

1.2.6 Soil Characteristics and Vegetation

There are two main soil types: Faraon and Bolinao clay. Faraon clay is more dominant, covering about 2,139.16 hectares or 63% of the total land area and is mostly found in coastal barangays. The Bolinao clay accounts for 1,131.74 hectares or 34.7% of the total land area and are mostly found in the hinterland barangays.

The vegetation cover is generally open grassland with patches of woody shrubs and bushes. Agricultural cash crops are marginal. Permanent crops or fruit trees are occasionally grown with few stands of timber trees. Patches of mangrove are grown in shore areas.

1.2.7 Coastline

The coastline is irregular with a total length of about 13 kilometers. It embraces 8 barangays, stretching from Barangay Bool in the South to Barangay Manga in the North. The other coastal barangays are: Mansasa, Poblacion I, Poblacion 3, Cogon, Booy, Taloto and Ubujan. Beaches are predominantly rocky or stony and characteristically narrow and rise abruptly into rocky cliffs.

1.3 Main Features of City Development

Land Use and Urban Structure

Of the 3,270 hectares total land area, about 2,669.95 hectares or 81.64 percent constitute settlements and built-up areas (2,048.67 hectares are residential; 427.96 hectares are commercial; 80.13 hectares are for institutional uses; 86.22 hectares are industrial).

Table 1.2. Tagbilaran City Land Use Plan, 2000

Class	Area (in Has.)	% to Total
Build-up Area	**2,669.95**	**81.64**
Residential Area	2,048.67	69.98
Commercial Area	427.96	6.36
Institutional Area	80.13	2.45
Industrial Area	86.22	2.64
Beach Resort	15.17	0.46
Tourist Area	11.80	0.36

Agricultural Area	**326.20**	**9.98**
Livestock Facility	10.03	0.31
High Value Commercial Crops	300.00	9.17
Inland Fishery Reserve	16.17	0.49
Other Uses	**133.68**	**4.08**
Cemetery/Memorial Park	16.43	0.45
Airport Runway	7.92	0.24
Sanitary Landfill	2.53	0.08
Tree Park	106.80	3.27
Special Uses	**19.60**	**0.60**
ROW, high-tension power lines	19.60	0.60
Mangrove	**88.00**	**2.69**
Proposed Reclamation Area	**32.57**	**1.10**
TOTAL	**3,270.00**	**100.00**

Source: CLUP, 2000

As reflected in Table 1.2, 326.20 hectares are for agriculture; 19.60 are for special uses; and, 133.68 hectares are allocated for other uses (e.g., cemetery, airport runway, etc.). It also has 88 hectares of mangrove area.

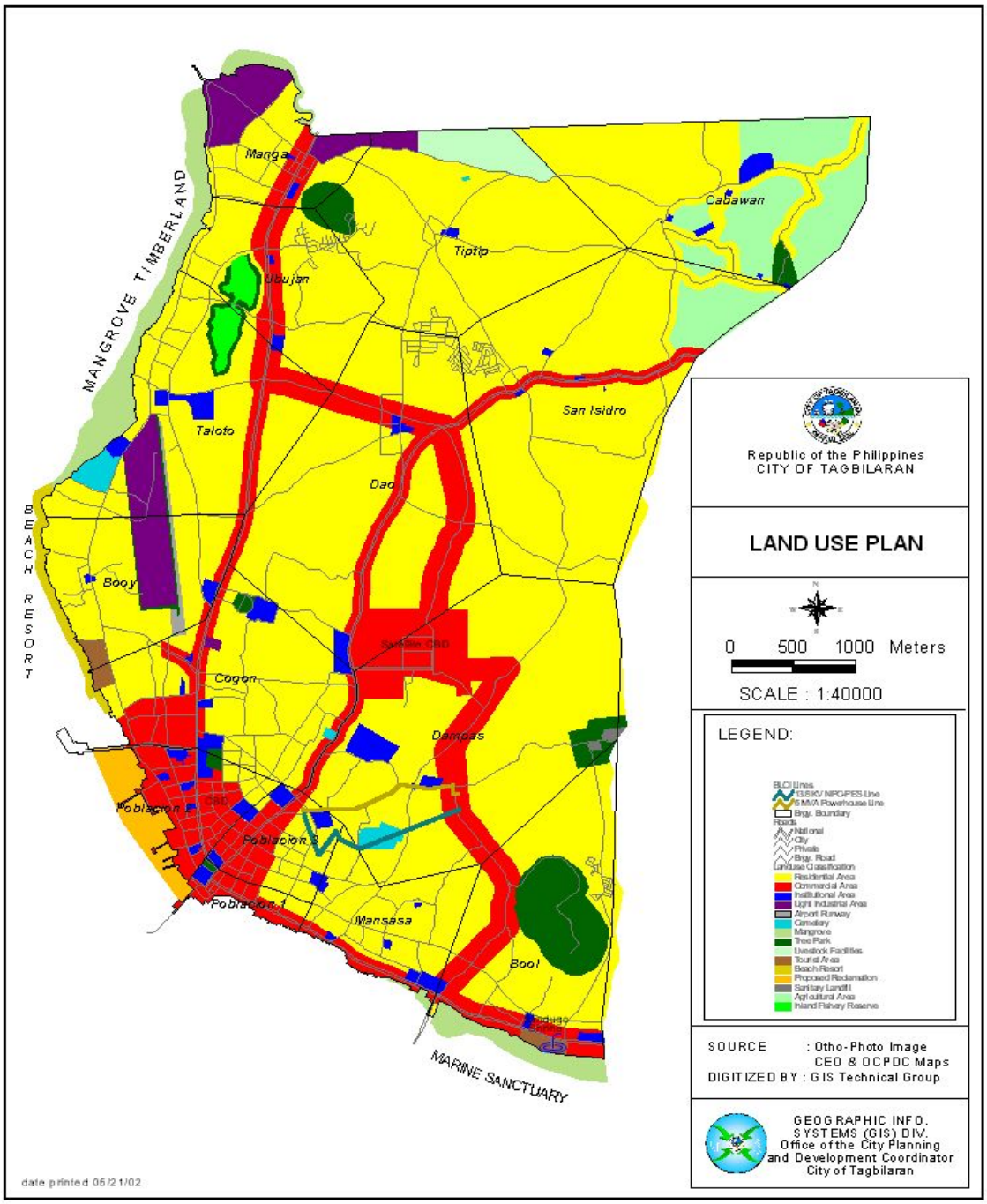
Agricultural land in the City has steadily decreased from 590 hectares (Tagbilaran 1999 CEP, 1999) to 326.20 ha (Tagbilaran 2000 CLUP) due to conversion into urban uses. On the other hand, land demand for urban and settlement use has been increasing (Table 1.3).

Table 1.3 Comparative Land Uses, 1999 and 2000

Class	1999 Land Area (Has.)	2000 Land Area (Has.)	Difference	Remarks
Agricultural	590.0	326.20	263.8	decreased
Residential	275.0	2048.67	1773.67	increased
Commercial	75.0	427.96	352.96	increased
Institutional	40.0	80.13	40.13	increased

Figure 1.3 Tagbilaran City Land Use Map

Tagbilaran Environmental Profile (SCP-LEPM)



1.4. Population Characteristics

1.4.1 Population Trends

In 1903, Tagbilaran had a population of 10,108 persons. Over the 50-year period from 1948 to 1998 the population grew by 58,267 with an average annual growth rate of 3.07%. A growth rate of 5.01% was recorded between 1960 and 1975 mainly attributed to the homecoming of Boholanos to avoid the social unrest in Mindanao.

In 1970, after 22 years, the population doubled to 33,005 people. It doubled up for the second time in 1995 with 66,683. In the year 2012, it is projected that the population will double for the third time with an estimated 123,263 people computed at a growth rate of 2.8 between the intercensal years of 1990-1995.

Table 1.4. Population Count and Growth Rate, 1900-2000

Census Year	Population	Ave. Annual Growth Rate
1903	10,108	-
1918	12,305	1.32
1939	15,617	1.14
1948	16,051	0.31
1960	20,250	1.96
1970	33,005	5.01
1975	37,335	2.50
1980	42,683	2.71
1985	49,523	3.10
1990	56,363	2.82
1995	66,683	3.42
2000	77,700	3.06

As of May 1, 2006, the city had a total population of 91,218 with an annual growth rate of 3.6%. Its total number of households is 18,039 with an average household size of 5 persons (City Health Office, 2006). Forty-one percent of the entire population resides in the 4 urban barangays where trade and commerce are concentrated.

Table 1.5. Population, Land Area and Density by Barangay, 2006

Barangay	Population	Land Area	Density
Bool	3,946	348.80	11.31
Booy	7,908	146.40	54.00
Cabawan	937	267.30	3.50
Cogon	19,051	204.40	93.20
Dampas	6,818	443.70	15.37
Dao	5,487	390.90	14.04
Manga	5,393	117.30	45.98
Mansasa	5,486	82.90	66.18
Poblacion I	3,760	25.90	145.17
Poblacion II	6,842	70.20	97.46
Poblacion III	7,319	70.70	103.52
San Isidro	4,433	429.40	10.32

Taloto	5,981	244.50	24.46
Tiptip	3,602	282.10	12.77
Ubujan	4,255	145.60	29.22
Total	**91,218**	**3,270.1**	

Source: City Health Office, Tagbilaran, 2006

Barangay Cogon has the highest population while Barangay Cabawan has the lowest. It is expected that over a 20 year period, Barangay Cogon will have a population of 35,000 while the city will have a total population of 150,000.

1.4.2 Population by Age and By Sex

The City's population is relatively young. About 64.43 percent are under 30 years of age, 28.9 percent are middle-aged (30 years to 59 years), and 6.6 percent are aged 60 years and over. Of the young population, 2.2 percent are below 1 year old while 21 percent are between the ages from 1 to 9 years.

The male-female ratio is almost 1 to 1 with 96 males per 100 females. There are more males in ages 9 years and below while there are more females at ages 10 years old and over.

1.4.3 Population Density

As per City Health Office's (CHO) records for 2006, the average density is 28 persons per hectare. The rural barangays have an average of 18.71 persons per hectare while the urban barangays indicate a higher density of 99.6 persons per hectare (Table 1.5).

The most densely populated barangay is Poblacion I with 145.17 persons per hectare while Barangay Cabawan is expectedly the sparsely populated barangay with only 3.5 persons per hectare.

The urban districts account for 36,972 or 40.53% of the city population while the rural districts account for 54,246 or 59.47% of the city population.

1.5. Economic Employment and Structure

The potential labor force is between the ages of 15-65, comprising about 49,512 or 64.15 percent of the city's population of 77,700 (2000 data). The dependent segment (ages 14 years and below, and over 65 years), on the other hand, is 28,166 or 36.50 percent of the population. As per the City's Local Poverty Reduction Action Program (LPRAP) Summary of Survey Results of 2004, about 16.93% of the labor force is unemployed.

Records from the City Agriculture Office (CAO) show that there are 2,662 farmers or 3.5 percent of the population (Tagbilaran City's Socioeconomic Profile, 2002). A total of 299 farmers are involved in corn production, 18 in rice, 338 in root crops, and 1,375 in fruit trees. Others are involved in industrial crop production. Agriculture, particularly cropping, is characteristically marginal and does not provide an economic support base for its people. Records from CAO also show that there are 2,095 fishermen in the city.

There are numerous cooperatives in Tagbilaran City. As of 1994, there are 68 cooperatives of various types duly registered with the Cooperative Authority. About 8,960 or 13 percent of the total population of 68,925 are members of cooperatives. Many are also employed in commerce and trade, and tourism.

1.6. Social Aspects

Tagbilaran City has a total of 18,039 households (CHO, 2006). Sixty-six percent of households earn below Php15,000 per month month, 30% earn not more than Php 10,000, 15% earn between Php20,000 and Php35,000, and about 8% earn more than Php 35,000 (based on the 1995 NCSO population data of 12,428 households).

The average monthly income of family households is pegged at Php12,900 while the median family household income is pegged at Php12, 700. According to LPRAP Summary of Survey Results, of the 15,114 households surveyed in 2004, 4,360 or 28.85% of the household live below the income threshold.

1.7. Administrative Aspects

The present organizational structure of the City Government includes five (5) administrative offices, six (6) management offices, seven (7) operations, and 10 non-organic offices. The city bureaucracy has a total of 587 plantilla positions with 464 positions filled-up and 123 positions still vacant.

The City serves as a general purpose government for the coordination and delivery of basic services and effective governance of its residents. Aside from being a service agency, the City also exercises corporate powers pursuant to Section 2 (d) of the Local Government Code.

The City Mayor exercises general supervision and control over all programs and activities of the City Government. The City Mayor is in-charge of the execution of all laws and ordinances of the city, and supervises the implementation of development plans.

There are 15 barangays, 4 of which are urban. Tagbilaran City is a 2nd class component city with a total income of P 249,644,137.79 (2005) and an average household income of P 141,028.00 per annum.

CHAPTER 2

DEVELOPMENT SETTING

2.1 Agriculture

2.1.1 Farming and Cropping

According to records of the City Agriculture Office, only 352.2 hectares or 33.6 percent of classified agricultural land are actually devoted to crops. There are 2,662 farmers representing 3.5 percent of the total population.

Crops grown are mostly for food sustenance of the farmers. Commercial crops of economic value are very limited. One hundred forty five (145) hectares is planted to corn or 38.9 percent of agricultural land. A total of 299 farmers are involved with an average production of 2.1 metric tons per hectare which is below the production parameter of 4 tons to a hectare set by the Department of Agriculture (DA). One hectare (1) is planted to rice with an average production of 1.6 metric tons per hectare which is below the parameter of 3.5 metric tons to a hectare (for rain-fed with moderate fertilization) set by the DA. There are 18 rice farmers, with an average area of about 555.5 square meters per farmer. Rice production is mostly for household consumption. Root crops (e.g., ubi, cassava, camote and gabi) are grown by marginal farmers for livelihood support. About 56.5 hectares are planted to root crops by 338 farmers. Industrial crops (e.g., coffee, cacao and spices) are grown in 2.25 hectares and production is very negligible. Fruit trees (e.g., mango, pineapple or citrus) occupy about 132.8 hectares planted by 1,375 farmers. Other fruit trees are grown as home lot plants.

2.1.2 Livestock and Poultry

The livestock and poultry industry is becoming a lucrative business, particularly in Barangays Cabawan, Tiptip and Dampas which are potential areas for livestock and poultry production. The City's Livestock Special Development Zone is located in Barangay Tiptip where an integrated livestock complex project (with Class "AA" Abattoir) has begun with funds from the DA and the National Meat Inspection Committee under the food security program of then President Estrada.

The animal population of the city recorded 943 cattle; 9,220 swine; 1,552 goats and 33,549 chickens in 1997(Tagbilaran CLUP). Records of the Philippine Ports Authority for the same year indicate that 837.64 metric tons of live animals were shipped out while 199.26 metric tons were shipped in. The difference in the import–export of livestock is due to the absence of a Class "AA" abattoir which is a requirement for meat exportation and the absence of meat processing plants in the City.

Table 2.1. Agriculture Sector Summary: Characteristics and Impacts

Agriculture	Characteristics and Significance	Impacts		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources** (Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
	• Rural –based organization (CRBOs) Human development (FA, RIC, 4-H, FLA; poultry raisers; goat raisers; swine raisers; root crop raisers; cattle raisers) Participate in policy formulation, planning and implementation/assessment/ monitoring and evaluation	The Sector uses land, water and energy resources.	• Air pollution	• nuisance
	Ginintuang Masaganang Ani (GMA) Program • GMA Corn, HUCC, livestock, fisheries • Agroforestry • Greenbelt areas • Food security/livelihood • Improve nutrition • Sustainable agriculture through organic farming/ and health	The sectors uses resources for firewood and construction purposes	• El Niño/La Niña phenomenon • Improper application of farming technology • Kaingin system	• Animal wastes disposal • Use of fertilizers and chemicals
	City/barangay nursery • Plant nurseries and demo farms • barangays as agricultural area CLUP Continuous supply of planting materials including vegetables, fruits and forest trees	Unlimited area for production Land conversion	• Air pollution • Soil erosion • Continuous planting of depleting crops	
	Urban agriculture • container/recycled gardening/farming			
	Natural farming system/ organic farming			

2.2 Fisheries

Records from City Agriculture Office show that there are 2,095 fishermen in the city.

Only three (3) barangays have fishing vessels: Barangay Manga (80 motorized bancas and 28 non-motorized boats); Barangay Ubujan (15 motorized bancas and 19 non-motorized); and Poblacion I (13 commercial fishing boats registered for deep sea fishing). The motorized and non- motorized bancas are used for near shore fishing.

The types of fishing gears used are: gill nets, bag nets, baby trawl, fish traps, fish pots and hook-and-line. Those who do not own boats or fishing gears gather shells to augment their income. Other sea products harvested for livelihood purposes are: *gozo*, *lokot*, *leto* and others. In Barangay Ubujan, a commercial scale *carageenan* (gozo culture) is being developed for industrial use.This Sector also uses mangroves, coral reefs and sea grass beds.

Table 2.2. Fisheries Sector Summary: Characteristics and Impacts

Fisheries	**Characteristics and Significance**	**Impacts**		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources** (Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
Fisheries	The Sector is composed of fishermen, fishpen operators, shell gleaners, fish coral owners and fish cage owners; some come from upland barangays. It is characterized by the following: • 12.2. lineal km of coastline • 13 fisherfolk organizations • 9 of 16 barangays are coastal; 7,657 households with a total coastal population of 57,109 • 319 motorized bancas and 393 non-motorized bancas • 2 fishports; 5 landing sites • 43.35% of coral reefs in fair condition • 3 marine/fish sanctuaries (Manga 15.45 ha; Bool 22.198 ha; Mababaw Reef 10.0 ha) • City Environmental Code	Most of these resources are sources of livelihood and income (taxes). The average fish catch / day is 4.7 kg fish catch/day (2001) There is increasing demand for seafood to meet the tourism industry.	This Sector has contributed to over-exploitation of resources, i.e. over-fishing and illegal fishing as a result of destructive fishing practices, including the catching of ornamental fish. The use of motorized bancas and other water transportation has also resulted to oil spillage.	Typhoons and rains brought by the SE monsoon result to increased sedimentation and siltation Inland erosion Dredging Sand extraction
Mangroves	The Sector also uses mangrove resources. Mangrove areas are characterized by the following: • 45 ha planted in 7 coastal barangays; 40-year old Tangal plantation found in Tagbilaran coast • 25 species belonging to 13 families identified • 32 species of mangrove- associated birds found; 4 species are rarely seen • presence of migratory birds, including local migrants, which periodically visit to feed and seek shelter	The Sector uses these mangrove resources for: habitat for nursery, feeding, protection, and breeding areas for fishes and other aquatic resources Tourism Control of coastal erosion or damage protection from storm, waves and wind P2,975,157 annual indirect use value of Maribojoc Bay on mangrove shoreline	The Sector's practice of illegal or over-fishing, and continued non-compliance with law has contributed to mangrove destruction. Other sector activities which impact on the resource include the presence of hotels, restaurants, and houses which encroach on mangrove areas; reclamation; and use for firewood • Reclamation • Firewood • Illegal fishing • Over fishing	Typhoons and rains brought by the SE monsoon result to increased sedimentation and siltation SE monsoon

		protection (non-use value)		
Coral Reefs	The Sector also makes use coral reefs. Coral reefs are characterized by the following: • 25 genera of coral reefs identified in 6 coastal barangays • coral reefs founds patch distribution with 100-1,000 meters from the shore of 10-25 foot deep • coral reef average live hard cover 43.36% • 233 individuals per 500 sq. m on fish population • 32 fish species of mostly reef dwellers The Sector provides the following benefits: • Php 34,338 annual net revenue per municipal fisher of coral reef (direct benefits) • Php 66,150 annual net revenue per municipal fisher (direct benefits) • Php 2,437,995 annual net revenue from fishing on coral reef • Php 12,563.980 annual indirect use value of Maribojoc Bay non-use value of coral reef biodiversity	Coral reefs are biologically diverse and serve as reservoirs for marine species of various genera.	• Increased nutrient content (storm water washed away unto the sea) • Wastes are source of both high nutrient and toxic substances • Oil waste from cargo/passenger/bilges • Poor waste management • Pollution from industrial establishment and agro-industrial activities	
Sea grass	Seagrass beds provides the following: • typhoon protection • nursery areas • staple food to many fish and invertebrates including migratory birds Most of these resources are disturbed or altered.	The Sector makes use of this resource in the following manner: as reclamation, for illegal fishing		

2.3 Mining and Minerals Extraction

Tagbilaran City hosts small scale mining activities such as limestone quarrying, crushed stone gathering and sea sand extraction. Most of the materials are mainly used for construction and back-filling purposes.

Table 2.3. Mining Sector Summary: Characteristics and Impacts

Mining	Characteristics and Significance	Impacts		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources (**Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
	There is small-scale mining in some districts within Tagbilaran City.	The Sector uses land, water and energy resources. The resources are used as filling materials/aggregates.	The Sector contributes to increased water and energy consumption and solid waste generation. Mining has resulted to a change in landscape, emission of dust particles and soil erosion. Extraction of limetones has caused depletion of the resource.	

2.4 Commerce, Trade and Industry

Tagbilaran City is considered the central business district, the center of education and transportation, and the center of governance in Bohol Province. This has made commerce and trade very promising in the city.

Major establishments in the city are malls/supermarkets (6); hotels, inns and pension houses (34); restaurants and fast food centers (40); and, banks (19).

Table 2.4. Commerce and Industry Sector Summary: Characteristics and Impacts

Commerce and Industry	Characteristics and Significance	Impacts		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources (**Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
	The major commercial establishments in the city include the malls and bottling plant	The Sector uses land for malls, plants and parking spaces; water and energy resources.	The Sector contributes to increased water and energy consumption; increased solid and liquid waste generation; traffic congestion.	

2.5 Transportation and Communication

Tagbilaran City avails of land, sea and air transportation. The road network is classified into national, city and barangay roads. As of 2006, the total length of these roads is 145.502 kms. of which 18.587 kms. are national roads, 66.064 kms are city roads and 60.851 kms are barangay roads. The modes of land transportation range from tricycles to motorcycles, multicabs, jeepneys, private cars and several others.

The extension and improvement of the port and its facilities have resulted to an increase in the number of ships calling at the port of Tagbilaran.

Tagbilaran City also hosts an all-weather type of airport for short and medium range flights.

In terms of communication facilities, Tagbilaran City has three main telephone service providers, namely: Cruztelco, PLDT and ISLACOM and cellphone providers such as Mobiline, Smart, Islacom and Globe. Other means of communication are telegraph services, radio and cable system, postal and messenger services, and internet access.

Table 2.5. Transportation and Communication Sector Summary: Characteristics and Impact

Transport	Characteristics and Significance	Impacts		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources** (Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
	Land vehicles are the major mode of transportation within the City and provide accessibility/mobility; provide a source of livelihood; allow transport and distribution of goods; and generally support the development of the city. There is an increasing growth trend in private vehicles, tricycles (about 2,000 units using 2-and4-stroke engines), buses, vans for hire, motorcycles, tourist buses, multi-cab, habal-habal Motorellas and jeepneys are decreasing and are being replaced by the multicabs Many vans for hire and tourist buses are unregistered. Of 15 tourist buses operating, only 2 are registered. Habal-habals are also mostly unregistered and so are non-motorized vehicles.	The Sector uses fuel (diesel, some still unleaded gas), water, and land for parking and road networks. An increase in the number of vehicles generates a corresponding increase in fuel, water and land use.	The Sector's impact on environmental resources include the following: • Water pollution as a result of oil discharges • Increased demand for water for washing, running engines, etc. • Air pollution (air pollutants such as sulphur emissions) • Noise pollution • Increased demand for land for parking use • Traffic congestion and degradation of road networks	The environmental hazards caused by the sector also affect the very sector that causes it. Thus, air pollutants (e.g. sulfur dioxide, carbon monoxide, suspended particulate matter, nitrogen oxide, ozone and lead) can cause health problems such as dizziness, fatigue, headache, nausea and unconsciousness.
	Water vehicles provide the same functions as land vehicles; they also support the livelihood of fisherfolks and are essential to food production. There is an increasing growth trend in ferries, fishing boats, barges, and tugboats and the wharf is becoming too small to accommodate the increasing number of vessels.	This sector makes use of petroleum products and water resources.	• Water pollution caused by oil discharges result to a decrease in fish catch or fish kills • Noise pollution	Water pollution may affect the health of the people.
	Aircrafts also provide the same functions as above.	This sector makes use of petroleum products, water,	• Noise pollution	Typhoons and power interruptions can disrupt operations of

	There is an increasing growth trend in aircrafts and the airport is becoming too small to accommodate larger planes.	and land resources.		this sector.
Communication	Communications facilities and services include telephone landlines, cell phones, handheld radios, facsimile machines, internet and courier services. These facilities and services connect the city to various areas of the country and abroad, and generally support the growth of the city.	This sector makes use of energy, water, and land resources.	•	There is possible risk in radiation exposure from cell sites and transmission lines.

2.6 Housing

About 2,048.67 hectares of the total land area of Tagbilaran City is residential land occupied by 18,039 households. Most of the occupants are tenants or renters who have migrated to the City for employment and educational purposes. The average dwelling unit within the city is 50 square meters. Most of the residential areas are located in the periphery of the city. The affluent and middle-income sectors of the population are distributed in sprawling subdivisions around the city.

Table 2.6. Housing Sector Impacts

Housing	**Characteristics and Significance**	**Impacts**		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources (**Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
		The Sector uses land, water and energy resources.	The Sector contributes to increased water and energy consumption and solid waste generation. Increased solid waste generation and improper disposal has also led to water pollution and clogged waterways; air pollution as a result of burning solid wastes; and, contamination of ground/soil due to liquid wastes or leachate/leakage. The increasing demand for housing has resulted to land conversion increased use of construction materials,	

2.7 Education

Tagbilaran Environmental Profile (SCP-LEPM)

Tagbilaran has a school age population (between 6 to 21 yrs.) of 24,005 or 36.04 percent of its total population.

As of August 2006, the City has 41 preparatory schools, 33 of which are government day care centers and 8 are private kindergarten schools. It is also one of the pilot areas of the Early Childhood Development Project of the Department of Social Welfare and Development.

At the primary level, there 22 elementary schools, 16 of which are public and 6 are private. Total enrollees number 10,602 or 15.9 percent of the school age population. .At the secondary level, there are 11 schools, 6 of which are public and 5 are private. Among these schools are the Tagbilaran City Science High School and the Special Education (SPED) high schools for the handicapped. Total enrollees number 6,068 or 9.1 percent of the school age population. The Dr. Cecilio Putong High School (formerly the Bohol National High School) has the highest number of enrollees with 3,124 or 30.3%. The SPED High School has the lowest enrollees at 26 enrollees.

There are two (2) universities which are: the University of Bohol, Holy Name University (formerly the Divine Word College of Tagbilaran); and six (6) collegiate level institutions, among them: Central Visayas State College of Agriculture, Forestry and Technology, Philippine Maritime Institute, the Bohol Institute of Technology, AMA Computer Learning Center, STI and Informatics. Total enrollees number 7,335 or 11.01 percent of the school age population.

Vocational courses are also available through the TESDA and the City Social Welfare and Development Office.

Table 2.7. Education Sector Summary: Characteristics and Impacts

Education	**Characteristics and Significance**	**Impacts**		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources (**Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
	Number employed: • 1,455 (Private vocational, tertiary, secondary and primary schools) • 250 (Public vocational, tertiary schools) • 600 (Public secondary, primary and pre-schools) Number enrolled: • 20,000 (Private vocational, tertiary schools) • 25,000 (Private secondary, primary schools) • 5,000 (Public vocational, tertiary schools) • 15,000 (Public secondary, primary schools) Trends • 2% annual increase in the number of students in private universities • decrease in the number of students in private secondary and primary schools due to increased tuitions • increase in the number of students in	The Sector uses land, water, and energy resources The size and scale of resource use varies; the consumption for land, water and energy is increasing Land resources are available but limited; cost of land is increasing Ground water as a major source of water is being depleted; there is water rationing in Dao, Eastern	The Sector contributes to increased water and energy consumption; increased solid and liquid waste generation	Typhoons cause damage to school buildings and properties; disrupt classes; and increase incidence of water-borne/related illnesses

	public secondary and primary schools • increase in employment of new teachers • increase in the construction of school buildings Linkages • business establishments for practicum and community service • LGUs for financial support of public schools • PNP for anti-drug abuse program and peace and order • DOH for health and nutritional needs • DPWH for construction and repair of school buildings	Cogon, Poblacion. 2; public schools students bring their own water		

2.8 Health

All barangays in Tagbilaran City have barangay health centers that provide preventive health care, prenatal care, vaccination and consultation services. Aside from health centers, there are hospitals that also provide health services. These hospitals and clinics have a combined bed capacity of 473 with a total personnel force of 692. The City Health Office likewise provides health services, particularly the implementation of the nutrition program for children.

Table 2.8. Health Sector Summary: Characteristics and Impacts

Health	**Characteristics and Significance**	**Impacts**		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources (**Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
	Number employed: • 205 (City Health Officers/ Barangay Health Workers) • 76 (private hospital) • 400 (public hospital) Number of patients: • 15 (private hospital in-patients/day) • 50 (private hospital out- patients/day) • 60 (public hospital in-patients/day) • 250-300 (public hospital out-patients/day) Ratio of health worker: patient • 1:8 (private hospital) • 1:25 (City Health Office) • 1:10 (public hospital in- patient) • 1:30-40 (public hospital out-patient) Trends • increase in the number of patients • decrease in the number of qualified health workers Linkages		The Sector contributes to increased water demand; increased solid and hospital waste generation	Typhoons increase the incidence of water-borne/related illnesses

	• DepEd for health and nutrition needs of school children • City Planning Office for location of businesses, agriculture • Agriculture/Veterinary • BFAD			

2.9 Tourism and Recreation

There are various tourist attractions and recreational facilities in the City. These include: Banat-i Hill, Blood Compact Shrine and Monument, Cainggit Beach, Talisay Beach, City Botanical Garden and Park, Lahos-Lahos Cave, Underground Stream, Elley Hill, Plaza Rizal, Sitio Ubos Ancestral Homes, St. Joseph Cathedral, City Tourist Port, Bohol Museum, IHM Seminary Animal Show Park, Tubig Daku Spring, Victoria Memorial Park, and Capt. Salazar Memorial Park.

Tagbilaran City celebrates various festivals which also serve as tourist attractions. The most famous is the annual Sandugo Festival from July 1 to 22. "Sandugo", which literally means "One Blood", was a covenant of friendship via a blood compact between Datu Sikatuna and Captain General Miguel Lopez de Legaspi in 1565. Other major festivals are listed below.

Table 2.9. Tourism Sector Summary: Characteristics and Impacts

Tourism	**Characteristics and Significance**	**Impacts**		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources (**Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
		The Sector uses land, water and energy resources for the numerous hotels and restaurants that cater to an increasing number of local and foreign tourists. There is also an increased demand for sea food.	The Sector contributes to increased water and energy consumption and solid waste generation. It is contributing to the destruction and vandalism of coral reefs.	

2.10 Parks, Open Spaces and Natural Areas

Tagbilaran City has no forest area except for some greenbelt areas found at the outskirts of the city and along main public roads going out of the city. Some patches of trees are found in different parks within the city, including the Rizal Park fronting the Provincial Capitol.

Table 2.10. Parks and Open Spaces: Characteristics and Impacts

Parks and Open Spaces	**Characteristics and Significance**	**Impacts**		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources (**Depletion/ Degradation)	**Impact of Environmental Hazards on Sector**

	These serve as the "lungs" of the city; serve as habitat for some wildlife; contribute to biodiversity; control pollution; and, contribute to the recharge of groundwater	The Sector uses water resources to maintain green parks; and minimal energy	The Sector contributes to increased water and energy consumption.	

2.11 Energy and Power

The energy demand of Tagbilaran City is the highest in the province primarily because it is host to numerous establishments for commerce and trade, education, health and many more. The sources of power for Tagbilaran City are sourced from outside the City, except for the Dampas Diesel Plant. The National Power Corporation supplies power to the City.

Table 2.11. Energy Sector Summary: Characteristics and Impacts

Energy	**Characteristics and Significance**	**Impacts**		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources** (Depletion/Degradation)	**Impact of Environmental Hazards on Sector**
	The City relies on electricity generated by the NPC, distributed by the BLCI, and is mainly sourced outside Tagbilaran. The demand for electricity increases as population increases	All sectors use energy. Most households rely on LPG for cooking instead of electricity. Some households in the barangays use firewood and charcoal	There is no record of any problem about this resource since power is sourced from outside the province**.**	Typhoons cause power interruptions.

2.12 Water

Tagbilaran City relies mainly on groundwater for its water supply. Two government agencies supply potable water, namely: the Provincial Public Utilities Department (PWUD) and the Tagbilaran City Rural Waterworks System (TCRWS). There is no water district in the city.

The total water discharge from the PWUD and TCRWS is approximately 97,224 cu.m per day. Private water supply companies also deliver water, including filtered drinking water. Those with limited or no access to the water systems, especially in the rural areas, rely on backyard or shallow water wells and rainwater collectors.

The increasing population and urbanization of Tagbilaran City can have potential impacts in water demand and supply and could present a major problem if not addressed immediately

Table 2.12. Water Sector Summary: Characteristics and Impacts

Water	**Characteristics and Significance**	**Impacts**		
		Sector's Use of Environmental Resources	**Sector's Impact on Environmental Resources**	**Impact of Environmental Hazards on**

Tagbilaran Environmental Profile (SCP-LEPM)

			(Depletion/ Degradation)	**Sector**
	The City relies mainly on BWUI and TCRWS for the supply of water. . Water is sourced underground. Some pumping stations have been condemned either because they have dried up or due to saltwater intrusion. Rainwater is also collected for washing, bathing and watering plants Private suppliers provide alternate supply during water shortage due to power interruptions	Water is used for business, domestic and other uses.	Over pumping of water has either degraded the quality of water and/or resulted to saltwater intrusion	Typhoons cause water turbidity, water supply interruptions, as well as power interruptions.

CHAPTER 3

THE ENVIRONMENTAL SETTING

3.1 Natural Resources

3.1.1 Air

The City's prevailing wind direction is northeasterly, with velocities ranging from 1 to 2 m/sec. Monsoon winds blow during the summer months of March to May. Although typhoons rarely occur, strong winds can be felt every time a storm hits nearby provinces. The following table shows the activity sectors that are major source of air pollution:

Table 3.1. Major Sources of Air Pollution

Activity Sector	Emission in cum/day	Content	Remarks
Emission from the industries			
Vehicle emission			
Welding shops etc			
Garbage burning			
Stationary source e.g. poultry, pesticides, or fungicides			
Others			
Total			

At present there is very poor monitoring and apprehensions regarding tricycles and other smoke-belching vehicles, which are the main cause of air pollution.

Table 3.2. Inventory of Land Transport Vehicles

Type of Vehicle	Private	Public Utility	Government	Total
Light Vehicles	5,800	1,200	82	7,082
Truck	5,516	870	10	6,396
Motorcycle	10,979		360	11,339
Bus	50			50
Tricycle		2,464		2,464
School Bus		3		3
Trailer	5			5
Heavy Trucks	20		240	260
TOTAL	**22,370**	**4,537**	**692**	**27,599**

Perhaps there is need for proper monitoring and apprehensions, i.e., industries need to emit allowable emission; ban of two stroke engine service; and implementation of Clean Air Act. But as of now no such arrangements have been made adequately. Indeed the Technical Working Group on air quality and traffic management was formed under the initiative of local Environmental Planning and Management Office way back in 1999.

The issues, causes, implications and policy options have been noted during the City consultation and workshop held in May 2006 as shown in Table 3.3.

Table 3.3. Problem-Solution Matrix on Air Pollution

Issue / Problem	Explanation	Implication	Policy Options
Air Pollution	• Influx of vehicles • Emission from 2-stroke engine • Poor monitoring and apprehensions • Non-implementation of Clean Air Act • Burning of garbage • Rapid growth of traffic volume • Climate change • Parking problems	• Health problem • Dust	• Car emission regulation • Installation of monitoring devices • Advocacy and development of Sustainable Transport System (STS), Mass Transit (MT), and Traffic Impact Assessment (TIA), • Institutionalize TIA • Enforcement of law (CAA) • Implement parking fee scheme • Zoning • Implement Travel Demand Management (TDM) measures • Strict implementation of Clean Air Act • Phase out of 2-stroke vehicles • Sale only unleaded gas

The above table identified the main causes of air pollution which includes influx of vehicles, emission from 2-stroke engine and non-implementation of the Clean Air Act. The proper traffic management system and implementation of the Clean Air Act can prevent air pollution-related health problems and dust.

3.1.2 Coast/Marine Resources

An estuary serves as a buffer or transition zone between the freshwater and saltwater environment. The estuary is generally characterized as semi-enclosed bodies of brackish water usually ordered by mangrove or nip trees. These plants help in the nutrient recycling processes that occur within the estuarine system of Tagbilaran's at least nine coastal barangays. The City coast line distance is 13 linear kilometers. Mangrove communities are the integral and important components of the coastal ecosystem of Tagbilaran. These plants in fact produce food for fish and other sea creatures, i.e., shrimps, crabs, and shells. Tiny sea animals called polyps on the other hand form coral reefs. These are also of the coastal ecosystem which provide the most substantial and sustainable source of sustenance to the coastal barangays of Tagbilaran. As these resources provide food and sustain the food chain, ecological balance is ensured.

Fishery is indispensably interrelated to the status of various ecosystems in the coastal zone. The abundance of the fish and other marine species is dependent on the good status of the mangroves, corals, as well as other ecosystem. Unfortunately, the presence of squatters along the shore, the direct cutting of mangroves and coastal pollution as a result to the indiscriminate dumping of waste material do not only degrade the coastal but they also serve as eyesores. The coral reef destruction due to

blasting, cyanide, catching of ornamental fish and improper waste disposal can also be added in the list.

The Office of the City Agriculturist is tasked to oversee coastal resource management activities. A Technical Working Group (TWG) has been formed and is composed of the City Agriculture and Fisheries Council, Barangay Fisheries and Aquatic Resources Management Council (BFARMC), Philippine National Police Maritime, Department of Environmental and Natural Resources (DENR), barangay officials, Philippine Coast Guard, MARINA, Barangay Fisheries and Aquatic Resources, Bohol Environmental Management Office, Department of Education, Provincial Agriculture, Fishermen's Association, the PCUP and the Non Government Organizations (NGOs).

The City has Barangay Fisheries and Aquatic Resources Management Councils (BFARMC). These councils serve in an advisory capacity to the local government unit (LGU) and mandated to assist in the enforcement of fishery laws, rules and regulation. Moreover, the Tagbilaran City Warden Task Force, composed of the coastguard, maritime police and deputized fish warden, looks into the surveillance, monitoring of coastal waters as well as the illegal fishing activities and enforcement of law through apprehension of violators. As of today, the police and the bantay-dagat are helpless with no floating assets to pursue illegal activities in the sea.

The marine life is substantially disturbed due to the above-mentioned constraints, which has resulted to poor water quality (presence of bacterial content). Further, the pockets of reclamation to expand the business and property had reduced the City's foreshore area, destructed the prestige, deprived fisher folks' livelihood and decreased marine life. The recent workshop diagnosed the issues confronting marine resources (see Table 3.4).

Table 3.4. Problem-Solution Matrix on Degradation of Marine Resources

Issue/ problem	Explanation	Implications	Policy Options
Cutting of Mangroves	• Lack of awareness on its importance • Poverty	• Decrease of fish and shell catch	• Enforcement of laws and ordinance
Presence of Squatters/ Underprivileged	• Migration of people from other places • Poverty	• Marine life disturbance • Poor water quality	• Relocation under Local Housing Board
Pocket Reclamation	• Business and property expansion • Limited area for open spaces and institutional needs	• Reduce the city's foreshore area • Destruct the pristine view • Deprive fisher folks' livelihood	• Enforcement of law and ordinance
Coral Reef Destruction	• Blasting • Cyanide • Catching of ornamental fish • Improper waste disposal	• Decrease marine life • Destroy marine habitat	• Activate Coastal law enforcement team • IEC • Allocate funds for coastal law enforcement

Table 3.4 shows problems of cutting of mangroves due to the lack of awareness on its importance; presence of squatters/underprivileged because of the migration of people from other places due to poverty; pocket reclamation, and coral reef destruction which is caused by blasting, cyanide catching of ornamental fish and improper waste disposal. Implications of such activities include decrease of fish and shell catch, marine life disturbance and poor water quality thus, proper enforcement of laws and ordinance and relocation under Local Housing Board are some of the options that concerned authorities should undertake.

3.1.3 Greenbelt Area

Greenbelt Area refers to the habitats of wild animals, birds, insects, and plants. At present, they are limited to those areas further from the urban populace. The absence of mountainous region in the City has made these areas susceptible to both natural and man-made hazards. The activity sectors utilize these areas for different purposes. Among these are for relaxation, for release of urban pressure, for getting cooler air, and for utilization of wood as construction material and firewood. The resources are of limited level, and thus cannot be used for commercial purposes. The DENR has the jurisdiction over the City's forestry/greenbelt spaces. It is practically under the City Environment and Natural Resources Office (CENRO).

Table 3.5 summarizes the issues and problem identified during the workshop held on May 2006 in Bohol.

Table 3.5. Problem-Solution Matrix: Greenbelt Areas

Issues/ Problems	Explanation	Implications	Policy Options
• Lack of sanitation facilities	• Not prioritized in budget allocation • Domestic activities/attitude towards cleanliness and sanitation	• Health problem (e.g. air born diseases) • Reduced aesthetic value and use • Reduced income	• Uphold and enforce sanitation code • Allocate budget • Policy implementation • IEC
• Lack of maintenance of facilities and protection example of insufficient water supply and limited space for greenbelt areas	• Not prioritized in budget allocation • Lack of knowledge on the value of natural resources	• Deterioration of natural and man-made resources • No more place for recreation • Reduced aesthetic value, use and income	
• Presence of gangster	• Laxity in enforcement of security measures	• Less interest in going to the area	
• Ongoing erosion and health problems			• Implement and promote programs on the youth sector (e.g. counseling, sports, skills development, etc.)

As shown in Table 3.5, the lack of sanitation facilities, maintenance, protection, water supply, and space for greenbelt areas are some of the concerns of the City. The presence of gangster, ongoing erosion and deteriorating health conditions are additional problems that have to be addressed by

implementing the Sanitation Code, allocating budget, and promoting programs on the youth sector (e.g. counseling, sports, skills development, etc.).

3.1.4 Land

Land Use and Urban Structure

Of Tagbilaran City's 3,270-hectare land area, 2,669.95 hectares or roughly eighty-two percent (82%) is devoted to settlements and built-up areas. Lands for marginal agriculture constitute 326.20 hectares. The city terrain ranges from moderately rolling with prevailing slopes from 3% to 6% along the coastlines to generally flat and level land. (See Table 3.6.)

Table 3.6. Land Use Plan, 2000 City of Tagbilaran

Class	Area (in hectares)	Percent to Total (%)
Build-up Area	**2,669.95**	**81.64**
Residential Area	2,048.67	69.98
Commercial Area	427.96	6.36
Institutional	80.13	2.45
Industrial Area	86.22	2.64
Beach Resort	15.17	0.46
Tourist Area	11.80	0.36
Agricultural Area	**326.20**	**9.98**
Livestock Facility	10.03	0.31
High Value Commercial Crops	300.00	9.17
Inland Fishery Reserve	16.17	0.49
Other Uses	**133.68**	**4.08**
Cemetery/Memorial Park	16.43	0.45
Airport Runway	7.92	0.24
Sanitary Landfill	2.53	0.08
Tree Park	106.80	3.27
Special Uses	**19.60**	**0.60**
ROW, high-tension power lines	19.60	0.60
Mangrove	**88.00**	**2.69**
Proposed Reclamation Area	**32.57**	**1.10**
TOTAL	**3,270.00**	**100.00**

Source: Socio-Economic Profile: City of Tagbilaran, 2002

The estimated land prices in Tagbilaran city, specifically in the central business district ranges from Php 200 to Php 3,000 per square meter. Residential land price fetches from Php 40 to Php 450 per square meter. Land value for industrial (class 13 to 11) runs from Php 180 to Php 600 per square meter. Agriculture land on the other hand costs between Php 48,000 to Php 86,400 per hectare.

The Office of the City Planning and Development Office, headed by Mr. Eduardo C. Macalandag, is responsible for planning and management of the city land.

3.1.5 Seawater and Groundwater

The sea water of Tagbilaran has not yet reached the level of critical stage. However the catch of the traditional fisheries along Tagbilaran Bay has been declining. Likewise pollution and habitat destruction are rapidly taking place. The storm water that brings

commercial and domestic wastes, effluents and sewage from unsanitary toilets to drain to the sea is posing constraints for future safety.

Potable ground water supply has already been strained in most of the areas of the City. Most of the areas are drawing out ground water continuously. The source of the potable water is from the aquifers. There are 31 deep wells operating in the City with a discharge capacity ranging from 50 to 170 gallon per minute. The total discharge of these wells is 9,900 cum. per day that serves 11,300 households. Aside from this, some households have backyard pumps or shallow water wells. Further the rain water is stored and used by some households.

Table 3.7 shows the details of water sources for level II system of Tagbilaran by location. It also gives details on the number and percentage of population served per water district.

Table 3. 7. Tagbilaran City Waterworks System, 2003

Location of Water Sources	Location and No. of Pumps	Capacity (liters/sec)	Barangays Served	HH Population Served	
				Number	Percentage (%)
Tiptip District	PS no. 1	2.02	Tiptip, Manga, Ubujan	1,325	33
Tiptip District	PS no. 2	2.84	Tiptip, Manga, Ubujan	1,325	33
Dao District	PS no. 3	4.11	Dao, Booy, Taloto, Cogon	1,539	33
Tiptip District	PS no. 4	13.27	Tiptip, Dao, Booy, Taloto, Cogon	1,881	20
Dao District	PS no. 5	6.95	Tiptip, Dao, Booy, Taloto, Cogon	1,881	20
Dao District	PS no. 6	Not operational	Not operational	-	-
Dao District	PS no. 7	4.42	Tiptip, Dao, Booy, Taloto, Cogon	1,881	20
Tiptip District	PS no. 8	3.16	Ubujan, Booy, Taloto, Cogon, Uptown	1,749	20
Bool District	PS no. 9	2.02	Bool Dist., San Isidro	78	100
San Isidro District	PS no. 10	1.90	San Isidro, Tiptip	433	50
Dao District	PS no. 11		-	-	-
Tiptip District	PS no. 12	13.27	Tiptip, Ubujan, Booy, Taloto, Cogon	1,797	20
San Isidro District	PS no. 13	1.58	San Isidro, Dao District	515	50
Cabawan District	PS no. 14	0.88	Cabawan District	56	100
San Isidro District	PS no. 15	2.84	San Isidro, Dao District	515	50
Tiptip District	PS no. 16	7.58	Ubujan, Booy, Taloto, Cogon, Uptown	1,749	20
Tiptip District	PS no. 17	10.93	Ubujan, Booy, Taloto, Cogon, Uptown, Tiptp	2,091	16
San Isidro District	PS no. 18	2.21	San Isidro, Cabawan	147	50
San Isidro District	PS no. 19	1.58	San Isidro, Cabawan	147	50

Source: Local Water Districts

The diagnosis of the recent issues and problems regarding water is given in Table 3.8 below:

Table 3.8. Problem-Solution Matrix: Water

Issue/ problem	Explanation	Implications	Policy Options
Salt Water Intrusion	Over pumping / Over extraction of ground water	• Degraded water quality / fresh water not available • Require to explore new water sources for pumping	• Legal restriction on issuing permits for water extraction w/c must be done • Combining source to dilute salt water
Water Quality	• High mineral content in water due to natural soil condition • Bacterial content due to leakage in pipe lines	• People have to buy bottled water which is expensive	• BUWL are monitoring and conducting chemical tests and chlorination of water sources
Increasing demand of water	• Increasing population • Increase in economic activities	• The demand is greater than supply • Not 24 hrs high pressure water supply in most places	• Try finding another source of water like surface water • Water saving information dissemination • Collect or utilize rain water for washing, watering the plants and for cleaning.

Table 3.8 identifies the issues and problem related to salt water intrusion, water quality and increasing demand of the water in most of the places. Over population is considered one of the major factors that influence the increase in the extraction of ground water. Moreover the economic activities in the City are increasing and the demand is greater than the available supply. Thus the legal restriction on issuing permit for water extraction can be considered as one of the remedy. Perhaps there is need to find other source of water like surface water and rain water that can be utilized for washing, watering the plants and cleaning.

Hence both Provincial Public Utilities Department (PPUD) and City Rural Waterworks System (TCRWS) are responsible for all issues concerning water resource in the City, although each has specific area of coverage. The PPUD operates in urban areas, while the city government owns TCRWS, which operates in the rural districts. Therefore, It is needed to have joint efforts should be undertaken by all concerned sectors, especially those mentioned above, to regulate the use of water as much as possible and to protect the available resources from further depletion and pollution. Following are some of the immediate doable that were suggested in the previous report in 1999:

a. Conduct of comprehensive hydrological/bacteriological studies;

b. Feedback and dissemination results/info to encourage corresponding action;
c. Development of data (deep wells-monitoring);
d. Conduct of periodic water quality testing and monitoring;
e. Strict enforcement/implementation of planning standard per building code (construction of standard septic tanks);
f. Improvement/cleaning up of drainage canals;
g. Identify map-out and protest/ban the sink-hole; and
h. Encourage barangay officials in close coordination with POs/NGOs to designate area for greenbelt in their respective localities tom plant more trees to protect underground water.

3.1.6 Tourism/Recreational Resources and Historical Heritage

Whereas, Bohol is famous, among others, for its Chocolate Hills, the Tarsier – the world's smallest primate, for its white sandy beaches, dive spots, heritage sites and old stone churches. The province is noted for being one of the five Eco-Tourism destinations identified by the Department of Tourism and most recently declared as the top tourist destination in the country.

Bohol is the finest example of a "Fiesta Island", which celebrates the annual Sandugo Festival from July 1 to 22, aside from month-long fiesta celebrations every May. The "Sandugo", which literally means "One Blood", was a covenant of friendship via a blood compact between Datu Sikatuna and Captain General Miguel Lopez de Legaspi in 1565.

Tagbilaran City, being the province's gateway and service center to its tourism industry, has also much to offer when it comes to beautiful, scenic spots. Scattered around the City are various tourist attractions. It is also home to several first-class hotels, resorts and restaurants, and consequently, has recently become a haven for national conventions. It has maintained the increased tourist arrivals due to the improved peace and order.

Table 3.9 Comparative Annual Arrival of Tourists, Provincial Count (2003-2006)

Prov'l Entry Count	January	June	December	Total
2003	6,894	6,262	7,042	95,311
2004	18,064	16,407	18,451	249,729
2005	28,496	25,881	29,105	393,941
2006	3,1063	31,201	……..	……

Source: Bohol Tourism Office

A City Tourism Council (CTC) was established to promote local historical sites and tourist spots. It is composed of the City Mayor, as Chairman; the Chairman of the SP Committee on Tourism, designated as the City Tourism Action Officer; and a representative from the nongovernmental organization, serving as the Vice-Chairman of the Council. Other members include a representative from the youth sector, the City Planning and Development Officer, a representative from the Department of Education and a representative from the St. Joseph Cathedral Parish Pastoral Council.

Some of the powers and functions of the CTC (as stipulated in the City's Environment Code) include:

- To initiate, maintain and monitor sanitation, cleanliness and beautification activities in the community;
- To develop and promote regular food festivals, sports fest, cultural presentations, flea markets, etc., as tourism activities;
- To liaise and coordinate with police agencies on matters on traffic and peace and order conditions affecting tourism and to monitor and assist in the early resolution of crimes reported by tourists;
- To plan, develop and initiate training programs for personnel in food and lodging establishments and local tour guides (when necessary) in collaboration with accredited organizations;
- To study and initiate the development and establishment of a cultural/tourism museum depicting the history, cultural development and achievement of the community;
- To study and initiate installation of highly visible (land uniform) road directional signs and billboards leading to various tourist destinations in the community;
- To initiate and promote exchange visit programs among civil/religious organizations with their counterparts in other provinces and regions;
- To monitor availability of communication in transport services, i.e., airports, bus stations, railroads;
- To create and promote continued awareness on the benefits of tourism through local media.

Table 3.10 summarizes the tourism/ recreational related issues/ problems identified during Workshop held in May 2006 in Bohol.

Table 3.10. Problem Solution Matrix: Tourism

Issues/ problems	Explanation	Implications	Policy Options
Ecosystem destruction Coastal	• Reclamation • Illegal activities (fishing, etc.) • Illegal settlers	• Reduction of trees, forest, local flora and fauna • Depletion of natural resources • Lesser livelihood opportunities	• Strict implementation of laws • More parks (marine parks, protected areas)
Solid waste pollution	• Improper disposal • Increased consumption and population (influence of people) • Insufficient segregation (education and practicality)	• Bad city appearance/ bad image • Health problems • Drainage blockage • Penalties	• Strict implementation of segregation and proper disposal • Intensive IEC (info-education campaign) • Better waste disposal technologies/facilities
Liquid waste pollution	• Improper disposal • Increased consumption and population (influence	• Bad city appearance bad image • Health problems • Drainage blockage	• Strict implementation of segregation and proper disposal • Intensive IEC (info-

	of people) • Insufficient segregation (education and practicality) • Toilets / septic tanks (lack of it)	• Penalties • Habitat destruction	education campaign) • Better waste disposal technologies/facilities
Air pollution	• Influx of vehicles • 2-stroke engine emissions • poor monitoring and apprehensions • Non-implementation of Clean Air Act • Burning of garbage	• Health problems • Dust	• Car emission regulations • Strict implementation of Clean Air Act • Phase-out of two-stroke vehicles • Sell only unleaded gas
Noise pollution	• Transport (sea, land and air) • Videoke houses • Construction work	• Hearing and sleeping problems	• Observance of curfew hours for videoke houses (residential and commercial) • Rules / ordinances on routes schedules
			Overall Recommendations • Strong partnership among all sectors • Feed backing mechanisms

Table 3.10 identifies the issues and problems generated due to tourism/recreational activities. Ecosystem destruction, solid waste pollution, liquid waste pollution, air pollution and noise pollution are considered as major resultant of tourism and related activities. The numbers of vehicles are increasing in the City. The illegal activities have been noticed which include among others illegal fishing, encroachment along roadsides and illegal settlers. Moreover the improper garbage disposal and non implementation of Clean Air Act is common. Thus, there should be strict implementation of laws that promote proper segregation, use of better waste disposal technologies, and strict implementation of Clean Air Act. Perhaps there is need to come up with position paper in solving the issues/problems related to tourism and related activities.

3.1.7 Solid Waste Management

The sight of uncollected garbage in some open spaces has a diminishing effect on Tagbilaran's image as an environment-friendly City. The average waste generation for Tagbilaran is marked at .50 - .70 kilogram daily. This accounts to 54,000 kg/day of solid waste collected by the City TCEPMO on a daily basis. This is based on the study done in 1997. The growing trend of population and continued influx of migrants and transients directly correlate with the increase in the volume of solid waste.

Table 3.11 summarizes the solid waste management related issues/ problems identified during the workshop held in May 2006 in Bohol.

Table 3.11 Problem Solution Matrix: Solid Waste Management

Issues/ Problems	Causes	Implications	Policy Options
Increase in the volume of garbage	- Increase in population - Increasing no. of business establishments	- Health Hazard - Environmental Pollution	- Zero waste Mgt. - recycling - re-used - segregation at source
Improper disposal of healthcare waste generated by: - clinics - hospitals - funerals - labs Research - Pharmacies - Lying-in clinics - blood testing center - drug testing Center (data of waste: 0.4-05 kg/patient/day, 250 patients/day/hospital, 70-80% are recyclable but not recycled)	- lack of recycling facility - no space for infectious waste disposal - Hospital incinerator not in use due to the clean air act - no waste water treatment plant - Increasing # of patients	- Infection - Air/water/soil pollution	- Recycling facilities - provision for infectious waste disposal - provision for waste water treatment - Area for for disposal of infectious waste, (e.g. Body parts particularly placenta) - Provision of safe container for sharp objects
Improper disposal of sludge from septic tank	- No treatment facilities - lack of implementation of the existing laws	- infection - pollution (air, water & land)	- Strict implementation of the laws - provision of facilities for sludge disposal
Improper disposal of industrial liquid waste	- lack of treatment facility	- water contamination - land degradation	- eliminate industrial waste - strict implementation of law - provision of treatment facilities
Waste water accumulation in front of ICM	- Inadequate drainage facilities of the central market	- Environmental contamination - Health hazard - Harborage of pests	- Enhance/improve drainage of central market - Putting up of waste water treatment facility - Apply mitigating

			measure like reforestation, land filling, etc

3.2 Environmental Hazards

3.2.1 Typhoons

The City of Tagbilaran is fortunate to face only two environmental hazards that are minor and can be responded by providing the right measures. Records show that Tagbilaran encounters major typhoons only every 15-20 years. The City is protected by the island of Panglao from the southeast westerly wind or so called “habagat.” The Philippine Institute for Volcanology and Seismology has identified Tagbilaran to be far from the earthquake line making such calamity a remote possibility to affect the City.

3.2.2 Fire Hazards

Fire is one of the two identified environmental hazards to which the City is prone. The increase in population gives rise to infrastructure and overcrowding of houses and other building to facilitate the increasing demand. The usual reports on the causes of fire in the City are faulty electrical wires, arson, and accident related. Records from 1994 to 2005 show that the fire incidents were increasing, and are mostly structural in nature. The main causes are accidental.

For managerial arrangement, the City Fire Services is the concerned office, which at present is comprised of five (5) fire substations located at the City hall compound, at Barangays Ubujan, Mansasa, Lindaville and Cogon. It is equipped with eleven (11) firetrucks, and has regular force of 73 personnel. The firemen-population ratio is 1:2,173, which is beyond the standard of 1 fireman to 1000 population.

3.2.3 Flooding

Flooding in the City of Tagbilaran is slight and very minimal. Its terrain ranges from moderately rolling with prevailing slopes from 3 to 6 percent along the coastlines to flat and level land particularly along Mansasa.

The city government office tasked to respond to flooding related problems is the City Planning and Development Office, headed by Mr. Eduardo C. Macalandag, in close coordination with the City Engineering Office as its implementing arm. Those areas with most pressing drainage problems should be given top priority by the City in laying the pipeline, updating and improving in selected sites

CHAPTER 4

MANAGEMENT SETTING

This section identifies the key stakeholders who have important relationships with activity sectors and/or environmental resources in Tagbilaran City. These are people or interest groups who come from both the public and private sectors. There are also institutions that focus on public sector functions and emphasize information and education, policy formulation, and policy implementation.

Key Stakeholders

4.1. Central Government

The national government agencies directly involved in managing the environment and development in Tagbilaran City are as follows:

Table 4.1. Government Institutions and Functions

Institutions	Functions
Department of Environment and Natural Resources (DENR)	• In charge of the conservation, management, development, and proper use of the environment and natural resources in Tagbilaran City • Implements the Coastal Environment Program (CEP) in selected coastal barangays of Tagbilaran City
Department of Interior and Local Government (DILG)	• Implements the Clean and Green Program in all barangays of the city
Bureau of Fisheries and Aquatic Resources (BFAR)	• Monitors fishing activities in coastal areas • Promotes aquaculture activities as alternative livelihood for fishermen
Department of Education, Culture, and Sports (DECS)	• Educates the youth of the importance of the environment and natural resources and imbibes in them the conservation ethic
Department of Science and Technology (DOST)	• Undertakes scientific and technological research and development • Develop and implement programs for strengthening scientific and technological capabilities through manpower training, infrastructure, and institution-building
Philippine Information Agency (PIA)	• Plans and carries out national information programs • Assists other government agencies in carrying out their communication and information projects
Philippine National Police (PNP)	• Enforces the law and apprehends violators
Philippine Coast Guard (PCG)	• Monitors coastal waters, monitors illegal fishing activities, and apprehends violators • Assists in formulating policies for coastal management
Philippine Ports Authority (PPA)	• Manages the maritime and fishing ports of

	Tagbilaran City

4.2. Local Government

Environmental Planning and Management Unit

On November 27, 1998 the Tagbilaran City Environmental Management Office (TCEMO) was created by virtue of Executive Order No. 10 to support the Local Environmental Planning and Management (Local-EPM) Project of the DENR and League of Cities of the Philippines. This project aims to strengthen the capabilities of the City to respond to environmental concerns and issues. The United Nations Development Program (UNDP) provides the Local-EPM Project with technical and financial assistance. However, this Office ceased to exist, and was replaced by the Environmental Planning and Management Unit (EPMU). Then again, EPMU has yet any personnel to carry-out its functions.

Though this is the case, there are other units under the previous institutional set-up that remains functional. These are the Solid Waste Management Unit and the Coastal Management, Water Quality, and Liquid Wastes Unit. (Their functions are discussed in Table 4.2.)

There were three units in the TCEMO management structure. Each unit has a coordinator and a task force for monitoring and evaluation. The members of the task force and their functions are briefly described in the table below:

Table 4.2. TCEMO Units and Functions

TCEMO Management Unit	Task Force and Functions
Solid Waste Management	• The TCEMO has the task of managing solid wastes (i.e. collection and disposal) generated within the city. The office provides the required manpower, which includes drivers, collectors, technicians, street sweepers, and dumpsite personnel to undertake this task. • Logistic support is provided by the City Engineer's Office (CEO) and the General Services Office (GSO).
Coastal Management, Water Quality, and Liquid Wastes - Coastal Management	• The Office of the City Agriculturist (OCA) oversees the management of coastal resources. It works in close coordination with the TCEMO. • A Technical Working Group (TWG) has been formed to support the OCA in this task. The TWG is composed of the following members: a. City Fisheries and Aquatic Resource Management Council (CFAMRC) b. City Agriculture and Fisheries Council (CAFC) c. Barangay Fisheries and Aquatic Resource Management Council (BFARMC) d. Philippine National Police Maritime e. DENR f. Barangay officials g. PCG h. MARINA i. BFAR j. Bohol Environmental Management Office (BEMO) k. DepEd

	l. PCUP m. Non-government organizations • The Tagbilaran City Fish Warden Task Force is involved in law enforcement and surveillance, monitoring of coastal waters, monitoring of illegal fishing activities, and apprehending violators. • The Provincial Health Office (PHO) conducts periodic coastal water monitoring and sampling of bacterial content.
- Water Quality	• The Tagbilaran City Waterworks System (TCWS) and Provincial Public Utilities Department (PPUD) ensure that drinking water is of acceptable quality. These two are responsible for the containment and treatment of contaminated water in the rural and urban areas, respectively. • The Provincial Health Office (PHO) makes regular collection of samples and monitoring of bacterial content of water. • A TWG has been formed to support the TCWS and PPUD in this task, which consists of: a. City Health Office b. Barangay officials c. Commercial water suppliers d. DENR e. NGOs
- Liquid Wastes	• The TCEMO works closely with the City Engineering Office (CEO) and City Planning and Development Office (CPDO) to manage liquid wastes. • A TWG has been formed to support the CEO and CPDO in this task, which consists of: a. PHO b. CHO c. PPUD d. TCWS e. DENR
Air Quality	• The City Police Department and the City Traffic Management Office in coordination with the Traffic Management Board work closely in managing not only traffic in the city but also air quality. A multi-sectoral TWG has been formed to assist the CPD, CTMO, and TMB in the formulation and implementation of vehicle emission control schemes.

The former City Council for Environmental Protection, Science and Technology, which serves as an advisory body to the TCEMO, was split into two new bodies: the City Environmental and Natural Resources Protection Council (CENRPC) and the City Council for Science and Technology by virtue of Ordinance No. C-124 approved on October 10, 2002. The CENRPC is a citywide multi-sectoral group that acts as a coordinating body of the City on natural resources and environmental governance. It is tasked to exercise supervision and control over the formulation, adoption, implementation, monitoring and evaluation, and review of the environmental documents and its action programs and projects.

City Legislative Council (Sangguniang Panglungsod)

The City Legislative Council is responsible for the formulation and ratification of ordinances relevant to the environment and natural resources. It played a vital role in the creation of the City Environment Code.

The Chairman of the Environment Committee of the City Legislative Council actively participates in forum and consultations. Legislations/ ordinances are then formulated and approved based on the results of the consultation process.

Other City Government Departments

Other departments under the executive branch of the Tagbilaran City Government are also directly/ indirectly involved in environmental management. These departments and their environment-related functions are summarized below:

Table 4.3. Other City Government Departments and Functions

Departments	Relevant Functions
1. City Planning and Development Office	• Coordinates development planning • Regulates land use and zoning • Evaluate subdivision plan • Monitor and evaluate projects and programs being implemented
2. City Engineer's Office	• Plan, administer, supervise, and control infrastructure development • Maintains/ improves drainage system, roads, and bridges • Constructs and manages water supply system
3. City General Services Office	• Maintains and supervise janitorial, security, and other services in government/ public buildings
4. City Health Office	• Conducts sanitary inspections of all business establishments • Imposes penalties to violators of sanitation-related code and ordinances
5. City Auditor's Office	• Improves the welfare of urban informal settlers • Undertakes public market contracting and quarantine of animals • Process and issue business permits
6. City Agriculturist Office	• Assists in the establishments/ extension services of demonstration farms or aquaculture and marine products • Enforces regulations on agriculture and aquaculture
7. City Veterinary Office	• Monitors and regulates health and environmental safety of livestock and poultry

Bohol Environmental Management Office

In 1998, the Provincial Government of Bohol and its stakeholders drafted the Bohol Environment Code to safeguard and conserve the province's natural resources by imposing penalties to violators. To ensure effective implementation of this Code, the Bohol Environmental Management Office (BEMO) was created.

The BEMO assists the local government units (LGUs) in terms of environmental management and coordinates with various non-government organizations (NGOs).

4.3. Private Sector, Educational Institutions, and NGOs

Private sector groups, educational institutions, and NGOs also actively partake in the consultation process relevant to Tagbilaran City's environment and development. Some of these interest groups are:

- Bohol Chamber of Commerce and Industry (BCCI);
- Bohol Alliance of Non-Government Organizations (BANGON);
- Hospitals;
- Bohol Association of Hotels, Resorts, and Restaurants (BAHRR);
- Environmental Legal Assistance Center (ELAC);
- National Master Plumber/ Plumbing Engineers Association of the Philippines (NAMPAP);
- Association of Writers and Radio Announcers Foundation, Inc. (AWRA);
- Media/ radio stations and local newspapers
- Market Vendors Association;
- Uptown Tagbilaran Housing Project;
- Churches and religious organizations; and,
- Owners of gasoline stations and depots.

Figure 4.1
Current Structure of the City Environmental Management Office
And the Local-EPM Unit Organizations