

9.2 Results of Environmental and Social Considerations Study at EIA Level

Based on the results of environmental scoping, the environmental and social considerations study at EIA Level (EIA Study) has been conducted. The Environmental Baseline Study, Social Survey and Environmental Impact Assessment Study, which were conducted by the local consultant teams under supervision of the JICA study team respectively, have been undertaken.

9.2.1 Results of the Environmental Baseline Study

Information on present environmental conditions along and around the proposed project sites were collected as environmental baseline information to be utilized for examination of the conceivable environmental impacts as shown below. For the data collection, field measurement surveys for air quality, noise/vibration level, and surface water quality were conducted as well as field reconnaissance and secondary data collection.

Table 9.2.1 Environmental Data Collected in the Environmental Baseline Study

PHYSICAL ENVIRONMENT	
Geology	Regional setting, regional topography and geomorphology, regional geology, regional tectonic setting, regional seismicity, local geology (stratigraphy, structural features)
Hydrogeology	Hydrogeologic units, groundwater levels, aquifer recharge
Natural hazards	Seismic hazards, volcanic hazards, foundation hazard (settlement, expansive soil, grading and earthwork related hazards)
Hydrology	General features, flood frequency analysis (point-flood frequency analysis, regional flood estimation)
Water quality	Surface water quality (physical and chemical characteristics, bacteriological characteristics)
Meteorological and climatological data	Climate type, rainfall, temperature, relative humidity, prevailing wind, tropical cyclone frequency
Air quality	Ambient air quality, noise/vibration
Soils and land use	General features, agriculture, fisheries, industries, infrastructure and utilities, land use, soil type, soil erosion potential, slope, technical description of the project site
BIOLOGICAL ENVIRONMENT	
Terrestrial ecology	Biodiversity in the Philippine forests (floral diversity, faunal diversity, diversity in farmland), general composition of the flora and fauna
Aquatic ecology	Aquatic vegetation, benthic characteristics, putrefaction of organic matters, fishing activities

(1) Physical Environment

The physical environment of the project area is described in terms of geologic and topographic setting, soils and land use, air and surface/ground water conditions.

The Cavite Laguna area is located within a volcanic region in Southwest Luzon Uplands, which is bounded by three major offshore and two major onshore structures. The offshore structures include the eastward-dipping Manila trench on the west, the westward-dipping east Luzon trench along the east and the active

Lubang Fault to the southwest. On shore structures include the West Marikina Valley Fault System to the east and the 1,300 km-long Philippine Fault farther east.

The project area is characterized by a gently sloping terrain, which grades towards Manila Bay and dissected by a sub parallel network of streams emanating from the northern edge of the Tagaytay highlands. It is bounded to the east by the Laguna-de-Bay and to the south by the Tagaytay escarpment and farther south by Taal Lake. The principal rivers, which will be traversed by the proposed project, include the Ylang-Ylang, Rio Grande, Imus and Cañas.

The underlying geologic materials include weathered pyroclastics, which have adequate capacity to support the proposed road structures. The project area is subjected to the natural processes of erosion, siltation, mass movement, flooding, volcanic and seismic related hazards. With the exception of ground shaking generated by the seismic activities of the major geologic structures in the region, most of these processes are local and do not significantly affect the project area. The only portion of the project area susceptible to tidal flooding is the segment from Kawit to Las Piñas where the North–South Road originates.

Groundwater along the proposed routes of the proposed project occurs within the depth range of 60 m to 80 m and will therefore be unaffected by the activities related to construction and operation.

The overlying soils represent the weathering products of these volcanic materials and serve as the medium upon, which the vegetation and other land use components of the area are set. Traditionally, both Cavite and Laguna are predominantly agricultural provinces. Major crops include rice, corn, vegetable, fruits, root crops, coffee and coconut. Most of the areas originally utilized for agricultural purposes have been converted to or planned to be changed to agro-industrial or residential areas.

Cavite and Laguna Provinces belongs to Type I climate under the modified Coronas Climate Classification. This type is characterized by two pronounced seasons, dry season from November to April and wet season during the rest of the year. Heavy rainfall occurs between June and September.

Ambient air quality and noise conditions as reflected in the nine baseline stations fall within the DENR standards for residential areas. The concentrations of Total Suspended Particulates (TSP) exceeded the standards at three out of the nine stations, which are located near the road and are within highly urbanized areas. The high concentrations could also be attributed to the relatively high traffic volume in these areas. Results of the vibration survey indicate that vibration levels in all stations are under Japan's vibration standard with an average reading of 45.0 dB both for day and night periods.

The water quality sampling in 16 selected river stations representing the dry season condition for physico-chemical parameters show that all are still within the Class C standards. With the exception of five stations located in rivers used for irrigation, the results of analysis indicate a typical polluted water body. BOD values in six stations exceeded the DENR standard. Dissolved Oxygen levels at all stations fall below 5 mg/L. This condition is detrimental to fishes and other aquatic life.

Total coliform counts in all the stations were above the DENR Water Quality Criteria for Class C waters. This is not entirely surprising as the rivers are occasionally used as sewage and waste disposal area by nearby communities and industries.

a) Results of the Air Quality Measurements

Actual on-site ambient air quality sampling was conducted at the eight established stations. One-hour sampling was conducted in each station for Ozone (O_3) (1-hr sampling) and 24-hour sampling for Total Suspended Particulates (TSP), Suspended Particulate Matter (SPM), Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Nitrogen Oxide (NO), Carbon Oxide (CO), and Lead (Pb). The location of the established stations is shown in Figure 9.2.1.

Except at Stations AQ6, AQ7 and AQ8 for TSP, results in all stations are below the standard limit prescribed by DENR as shown in Table 9.2.2. These three (3) stations are located near the roadside and are within highly urbanized areas. The high concentrations could also be attributed to the relatively high traffic volume in the areas. Aside from industrial sources, the common sources of TSP include vehicular emissions.

Figure 9.2.1 Sampling Stations for Air Quality Measurement

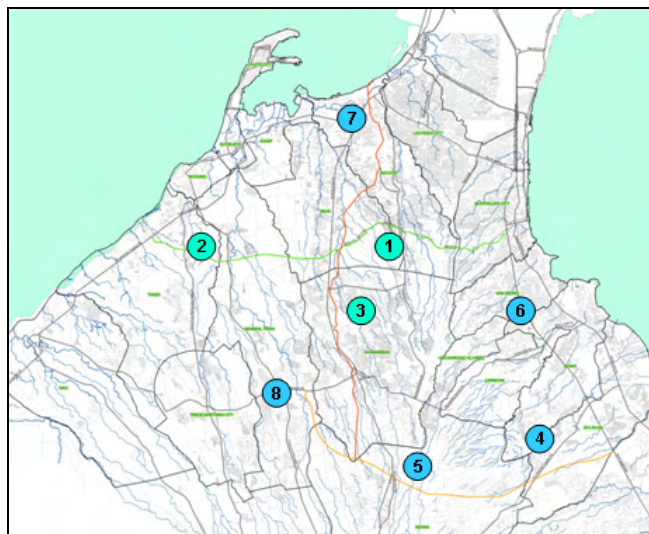


Table 9.2.2 Results of Air Quality Measurement

Parameters	DENR Standards	AQ1	AQ2	AQ3	AQ4	AQ5	AQ6	AQ7	AQ8
TSP	230 µg/Ncm	87	65	63	44	139	252	364	329
SPM	-	35	29	31	19	113	212	289	267
SO ₂	180 µg/Ncm	37	42	22	22	56	77	105	83
NO ₂	150 µg/Ncm	44	56	31	31	28	22	38	41
NO	-	29	34	17	21	17	14	23	26
CO	35 µg/Ncm	-	-	-	ND	ND	ND	ND	1.0
O ₃	140 µg/Ncm	55	22	88	5	18	87	55	32
Pb	1.5 µg/Ncm	0.022	0.043	0.009	0.021	0.161	0.387	0.433	0.322

Note: ND- Not detected.

b) Results of the Noise Level Measurements

Noise level measurement was undertaken for the same stations as the air quality sampling. The measurement was conducted for 24 hours for each location, 10 minutes continuous measurement per hour. The noise levels at the determined sampling stations were measured. The results of the noise level measurement and ambient noise standards as well as the classification of areas with maximum noise levels are shown in Table 9.2.3.

Sources of noise at stations NL1, NL2 and NL3 are the vehicles passing along a road by the residential area 20 m from the sampling stations. At station NL3, there are a number of dormitories of Universities nearby as well as vehicles passing through the subdivisions result to noise exceeding the standards. Stations NL4 and NL5 have noise readings within the standard while station NL6 which is a commercial area and have a parking area for tricycles and a car wash station that may be the possible source of the exceedance of the noise levels. Stations NL7 and NL8 are road intersections showed all readings exceeded the DENR Standards.

Table 9.2.3 Results of Noise Level Measurement

Area Classification (Based on dominant land use)	Average Noise Level (dB)			
	Morning (5:00am – 9:00am)	Daytime (9:00am – 6:00pm)	Evening (6:00pm – 10:00pm)	Nighttime (10:00pm – 5:00am)
<u>Class A- residential purpose</u>	<u>50.0</u>	<u>55.0</u>	<u>50.0</u>	<u>45.0</u>
NL1: Brgy Pasong Buaya, Imus Cavite	56.9	64.6	55.7	49.8
NL2: Brgy Tapia, Gen.Trias, Cavite	52.9	56.4	56.2	50.2
NL3: Moizon Subdivision, Brgy Buroi Main, Dasmariñas, Cavite	59.8	57.4	53.4	52.2
<u>Class B- commercial area</u>	<u>60.0</u>	<u>65.0</u>	<u>60.0</u>	<u>55.0</u>
NL4: R.C. Sta.Rosa Centro, Sta.Rosa, Laguna	52.5	52.9	52.6	51.5
NL5: Brgy Biga I, Silang, Cavite (Aguinaldo Highway)	56.0	56.9	56.8	54.2
NL6: Brgy San Antonio, San Pedro, Laguna	73.8	74.0	74.3	68.3
NL7: Brgy Panapaan, Int. Aguinaldo Highway /Tirona Highway	76.1	77.9	70.9	69.1
NL8: Brgy Mangahan, Int. Governor's Drive/Gen Trias-Indang Road	77.5	82.4	85.1	72.9

c) Results of the Vibration Level Measurements

Vibration level measurement survey was also conducted to measure the extent of disturbance (surface vibration) caused by ongoing construction (civil works), factory operation and/or existing road traffic in particular locations of the study area. The locations of the surveyed stations coincided with the locations of the air quality and noise level measurement surveys.

Results of the survey indicates that vibration levels in all stations are below the Japan's vibration standard with an average reading of 45.0 dB both for the day and night periods². The summary of the results are shown in the table below.

Table 9.2.4 Results of Vibration Level Measurement

Station No.	Location	Date	Area Type	Vibration Level Measurement - L10 (dB)	
				Day	Night
NL1	Daang Hari, Brgy. Pasong Buaya I, Imus, Cavite	May 19-20, 2006	Residential	47.2	45.0
NL5	Aguinaldo Highway, Brgy. Biga I, Silang, Cavite	May 22-23, 2006	Commercial	45.0	45.0
NL6	San Pedro Exit, South Luzon Expressway	May 24-25, 2006	Industrial	45.0	45.0
NL7	Intersection Aguinaldo/Tirona Highway, Bacoor, Cavite	May 18-19, 2006	Commercial	45.0	45.0
NL8	Intersection Governor's Drive & Gen Trias-Indang Road, Gen. Trias, Cavite	May 23-24, 2006	Commercial	45.0	45.0

d) Results of the Water Quality Measurements

The 16 stations are distributed as follows: Five (5) water quality stations were established in Imus River (WQ1, WQ2, WQ3, WQ4 and WQ5). There are four (4) stations in Ylang-Ylang River (WQ6, WQ7, WQ8 and WQ9) and Rio Grande River (WQ10, WQ11, WQ12 and WQ13), respectively. Three (3) stations (WQ14, WQ15 and WQ16) were located in Canas River.

All surface water quality sampling stations except for stations WQ5, WQ9, WQ12, WQ13 and WQ14 were characterized as having a shallow to very shallow depth, light to dark murky color (light brown to brown), and a turbid water-flow in all portions, and muddy substrate which indicate a typical polluted water body. Brownish color also indicates heavy siltation and erosion. Several sampling stations which are located in light to highly urbanized area were found to be full of garbage and used as sewerage discharges by the households nearby. Some stations also serve as dumping grounds of human excreta. Some of the clean water stations are all near agricultural farms and are used as irrigation source for the lands. These five stations are clean to moderately clean. Figure 9.2.2 shows the location of the sampling stations.

² There is no vibration standard in the Philippines.

Figure 9.2.2 Sampling Stations for Water Quality Measurement

Rivers	Sampling Sites	Number of Sites
Imus	WQ1-WQ5	5
Ylang-Ylang	WQ6-WQ9	4
Rio Grande	WQ10-WQ13	4
Canas	WQ14-WQ16	3
	Total	16

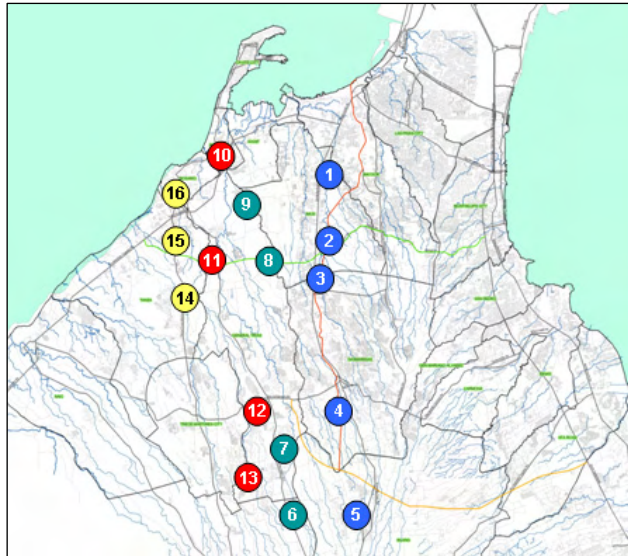


Table 9.2.5 Results of Water Quality Measurement

Parameters	DENR Standard (Class C Waters)	WQ1	WQ2	WQ3	WQ4	WQ5	WQ6	WQ7	WQ8
Physical Characteristics									
Temperature	3 (max. rise in deg Celsius)	28.8	26.1	27.7	26.0	25.3	25.4	26.4	28.6
Conductivity (ms/cm)	-	0.244	0.230	0.238	0.247	0.982	0.205	0.278	0.462
Salinity (ppm)	-	0.00	0.00	0.000	0.00	0.047	0.00	0.01	0.00
Chemical Characteristics									
pH	6.5 - 9.0	8.21	7.66	8.37	7.36	8.27	7.12	7.49	7.98
BOD	7(10) mg/L	3	2	3	7	10	12	2	10
DO	5.0 mg/L	3.08	2.09	3.08	2.18	3.00	2.13	2.10	2.16
Turbidity	NTU	21	12	20	15	20	17	11	18
TSS	60mg/L increase	20	60	20	40	70	60	30	60
Lead	0.05 mg/L	-	0.145	-	0.067	-	0.102	0.051	0.051
Bacteriological Characteristics									
Total coliform	5,000 MPN/100mL	-	12x10 ⁶	-	22x10 ⁴	-	34x10 ⁶	27x10 ⁴	4x10 ⁵

Parameters	DENR Standard (Class C Waters)	WQ9	WQ10	WQ11	WQ12	WQ13	WQ14	WQ15	WQ16
Physical Characteristics									
Temperature	3 (max. rise in deg Celsius)	27.5	26.5	27.8	26.9	27.2	28.5	28.1	28.3
Conductivity (ms/cm)	-	0.278	21.6	0.612	0.307	0.500	0.223	0.673	5.70
Salinity (ppm)	-	0.01	1.297	0.027	0.017	0.027	0.00	0.027	0.30
Chemical Characteristics									
pH	6.5 - 9.0	7.63	8.10	8.50	8.23	8.31	7.65	8.40	7.39
BOD	7(10) mg/L	7	6	14	3	9	5	5	9
DO	5.0 mg/L	2.10	2.96	2.97	11	2.99	2.18	3.07	2.11
Turbidity	NTU	11	24	15	32	15	15	19	20
TSS	60mg/L increase	60	20	50	20	20	30	20	40
Lead	0.05 mg/L	0.057	-	-	-	-	0.030	-	0.244
Bacteriological Characteristics									
Total coliform	5,000 MPN/100mL	8x10 ⁶	-	-	-	-	9x10 ⁵	-	3x10 ⁶

(2) Biological Environment

The provinces of Cavite and Laguna form an integral part of the Luzon Biogeographical Zone. Each biogeographic zone is characteristically unique from each other having different ecosystems and habitats, which harbor a high number of species and a diverse composition of flora and fauna.

There are no protected areas established under the National Integrated Protected Areas System (NIPAS). The project area does not include designated wetlands under the Ramsar Convention, World Heritage-listed areas and Man and the Biosphere Reserve designated by UN Educational, Scientific and Cultural Organization (UNESCO).

The proposed roadway alignment traversed various land uses. These are the built-up areas, agricultural land and the brush land/open land. Ocular observation showed that the density of flora and fauna here were relatively low. Along the proposed alignment, the species of flora, which were perceived to be directly impacted by the construction phase of the project, are very common in the region and throughout the country as well. Likewise, there are no faunal species considered as threatened or endangered within the project area.

The most common vegetation found within the rivers, which traverse the project area is the common kangkong. Presence of *Colocasia esculanta* (gabi), *Brachiaria muftica* (damong tubig) and *Musci sp.* (moss), which commonly grow on rocks and boulders was also noted.

Most of the rivers in the area have a muddy substrate with soft silty materials exuding putrid to very putrid smell. This is an indicator of a polluted water body. Putrefaction is present in some stations. Actual observation showed that the substrate is composed of organic debris/materials as well as inorganic debris. Organic materials found were small leaf, barks of woods, twigs, kitchen waste and sometimes human waste or human excreta. Inorganic materials include materials and wastes usually found in domestic garbage, but the most common are different kinds of polyethylene materials or plastics. This condition is detrimental to fishes and other aquatic organisms. As the river waters are polluted, fish species like *Glossogobius spp.* locally known as "bia" or "biya", *Tilapia spp.* (tilapia) *Ophicephalus spp.* (dalag), *Clarias spp.* (hito), and *Anguilla spp.* (ell) are rare or of limited occurrence.

(3) Socio Economic Environment

a) Population and Growth Rate

Census data from NSO in 2000 showed that Cavite is the most populous province in Southern Tagalog with a total population of 2,063,161 and an annual growth rate of 5.5%. Cavite's population accounts for 17.5% of the total population of

Region IV. Laguna on the other hand registered a population of 1,965,872 or 16.7% of the total Region IV population. Laguna ranks second to Cavite in terms of population in Region IV.

The eight municipalities and one city of the project area have a total population of 2,021,175 as of the 2000 census. It has an annual growth rate of 4.0% for 1995-2000, which is much higher than the 2.2% national annual growth rate for the same period.

At the municipal/city level, the project area has an average population density of 38 persons/ha, which is much higher than the national average of 3 persons/ha. At the barangay level, the density ranges from 2 to 112 persons/ha.

b) Household Profile

The eight municipalities and one city have a combined total number of 416,802 households and an average household size of 5 persons/household. In the affected 58 barangays, there are a total of 46,829 households with an average size of 5 persons/household.

Majority (63.4%) of the households in the directly affected areas owns the land where their house is located, while a larger percentage (84.5%) owns the house that they are residing. A large majority of the households has houses that are single-detached one-storey type (70.7%) and single-detached two-storey type (15.8%). Likewise, a large majority has permanent (77.7%) and semi-permanent (12.1%) structure of house. However, only a small percentage of these houses are in good (42.4%) and very good (29.6%) condition.

c) Sources of Income

Until the last two decades or so, the main source of income in the area was agriculture. The situation has changed drastically since the 80's when the rapid progress and expansion of economic activities in Metro Manila brought about a shift to a largely industrial and services-based economy which created new and numerous job opportunities that benefited the local residents. This resulted to the influx of migrants looking for job and residential space causing the drastic increase of population growth rate in the area. Rapid industrialization and urbanization in the project area has thus resulted to massive conversion of land uses from agriculture and fishing to industrial, commercial and residential uses.

Cavite and Laguna rank second and the third in terms of the highest average family income for areas outside Metro Manila. The annual per capita poverty threshold of Cavite was estimated at P14,965 in 2000. Laguna on the other hand was estimated at P13,226. Family poverty incidence in Cavite reached 10.2% in 2000 while population poverty incidence was at 13.0%. Laguna's family poverty incidence in 2000 was at 8.6% while population poverty incidence was 11.4%.

d) Literacy Rate and Educational Attainment

Available data show a relatively high literacy rate in the project area, ranging from 95.1% to 98.5%. Imus registers a high percentage of the population that has reached or finished the tertiary (college or its equivalent, and above) level, followed by Bacoor. Dasmariñas has the largest percentage among those that has only reached the elementary grade level, while Sta. Rosa has the largest in the secondary grade level.

e) Employment Status

Available data show that generally only a little more than half of the working age population (15 years old and above) has joined the labor force. Out of those who join the labor force, a considerable percentage is still unemployed, the largest of which is found in Bacoor, Imus and Tanza. This is happening despite the various job opportunities created by the rapid industrialization and urbanization in the area.

f) Leading Causes of Morbidity and Mortality

Among the ten major causes of morbidity or illness in the respective municipalities/city of the project area, the most prevalent are: i) acute respiratory infection, ii) diarrhea, iii) skin disorder, iv) pneumonia, v) hypertension, vi) influenza/fever, vii) wound, viii) urinary tract infection, ix) parasitism, and x) gastro-intestinal disorder.

In the case of mortality or death, the most prevalent are: i) cancer, ii) heart disease, iii) pneumonia, iv) diabetes, v) tuberculosis, vi) hypertension, vii) accident, viii) kidney, ix) stillbirth, and x) asthma.

g) Community and Public Facilities and Services

Basic social services and infrastructures through most of the project area are generally adequate. Health services are provided by Rural Health Units (RHUs), Rural Health Centers, Barangay Health Centers and major hospitals.

Drinking water comes from one or a combination of the following: Maynilad Water Services, Inc, private deep wells, Water Districts, waterworks and barangay managed Level III water system. Overall, about 63.2% of the households are served with a Level 3 water supply system.

The project area is accessible mainly by land transportation from Metro Manila. The primary mode of transportation is the public utility vehicles such as FX, jeepneys and buses, complemented by privately owned vehicles.

Power supply in the project area is provided by the Manila Electric Company (MERALCO), which has a substation in Silang. An estimated 6.0% of the households are still not served with electricity.

Telecommunication services are provided by a number of companies augmenting the services of the Bureau of Telecommunication (BUTEL), namely: PLDT, Globe Telecom, and Digitel Telephone Co. and Smart. Other telecommunication companies that also provide fast cargo and related services are: LBC Express, RCPI, PT&T, and JRS express.

h) Public Participation and Social Acceptability

Intentions and opinions related to the proposed projects were inquired from potential project-affected peoples through the social surveys; Perception Survey and Household Inventory Survey for Resettlement. The Perception Survey was conducted in 58 barangays³ which have been identified through the field confirmation of the proposed road alignments including the alternative alignments. 696 households, who would not be potential affected by the ROW acquisition, were sampled from the above barangays for the Perception Survey with 95% statistical confidence coefficient. On the other, the Household Inventory Survey for Resettlement was conducted for total 826 households from 23 barangays⁴ where were located within the right-of-way (ROW) of the proposed alternative road alignments and households directly affected by the ROW acquisition. Some main results of the social surveys on the perception are shown below.

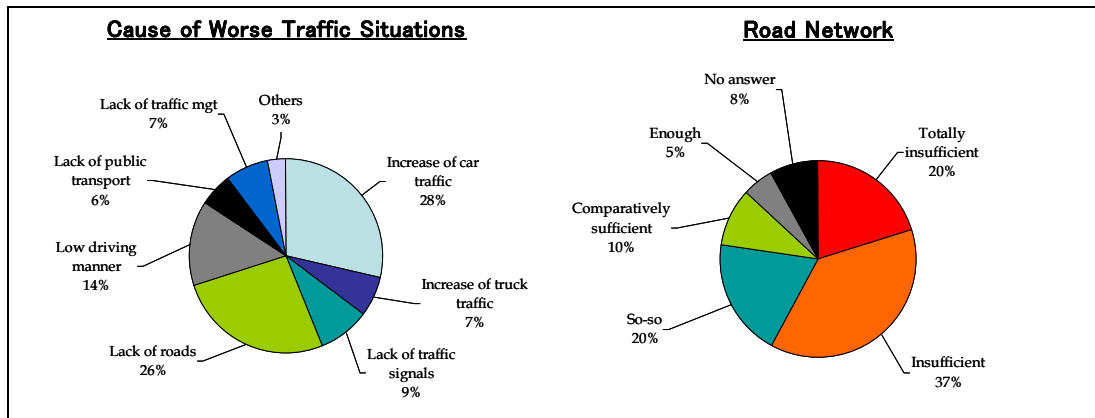
1) Impression on Present Road Conditions on Major Roads: General impressions on present road condition for four major roads were asked; Aguinaldo Highway, Governor's Drive, Manila-Cavite Coastal Highway, and Southern Luzon Expressway (SLEX). The respondents put worst impression (Very bad and Bad) to the Manila-Cavite Coastal Highway at 54% among the four roads, subsequently the Aguinaldo Highway at 47%. More than half of the respondents are somewhat satisfied with present conditions of the Governor's Drive (55%) and SLEX (48%).

2) Impression on Present Road Conditions: The respondents think that increase of vehicle traffic and lack of the roads are major causes of the worse traffic conditions in the study area (28% and 26%, respectively). Other main causes are; low driving manner (14%), lack of traffic signals (9%), and increase of truck traffic and lack of traffic management (7% each).

³ 49 barangays in Cavite Province, 7 barangays in Laguna Province, and 2 barangays in Muntinlupa City of Metro Manila

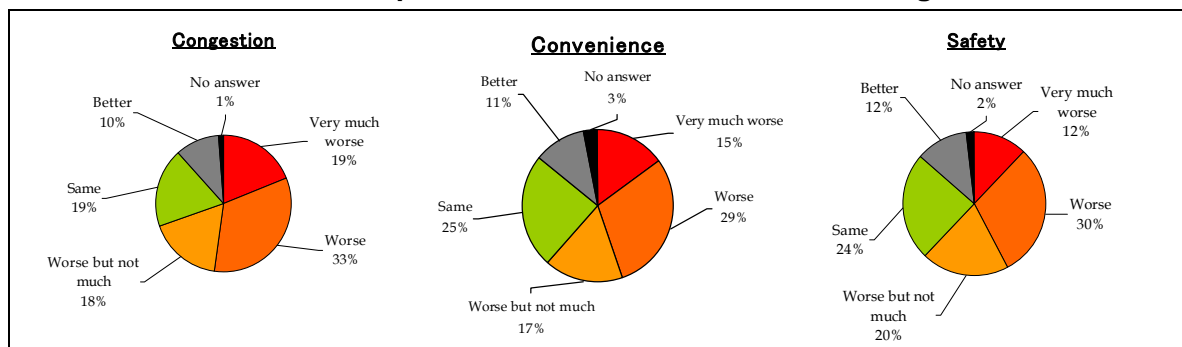
⁴ 23 barangays in Cavite Province, none both in Laguna Province and in Muntinlupa City of Metro Manila

Figure 9.2.3 Impression on Present Road Conditions



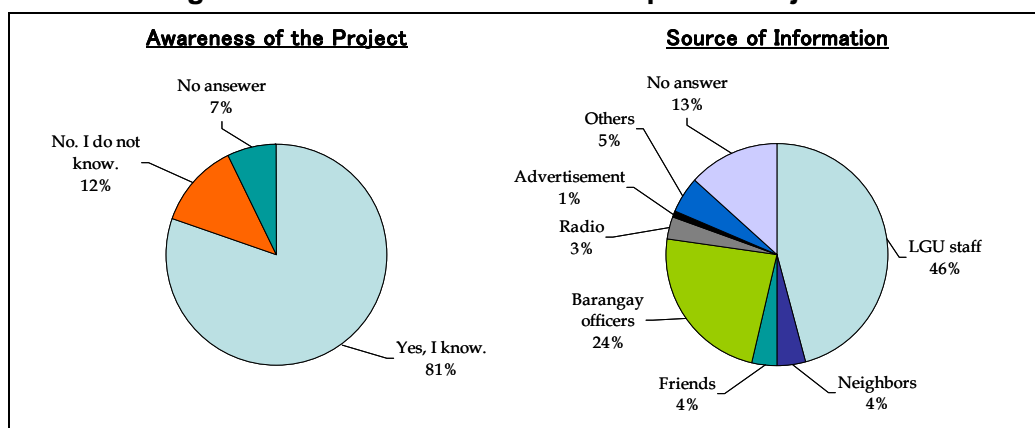
3) Comparison between Past and Present Road Situations: In terms of congestion, safety, and convenience, the respondents feel that conditions of the roads in the study area have become worsen compared to that in 5 years ago (70%, 62%,and 61%, respectively).

Figure 9.2.4 Impression on Present Road Conditions: Comparison to Past Situation of 5 Years Ago



4) Awareness of the Project: 81% of the respondents are generally aware of the project. The level of awareness was reported higher in the case of the North-South Road section. In all cases, LGUs were primary source of information about the project.

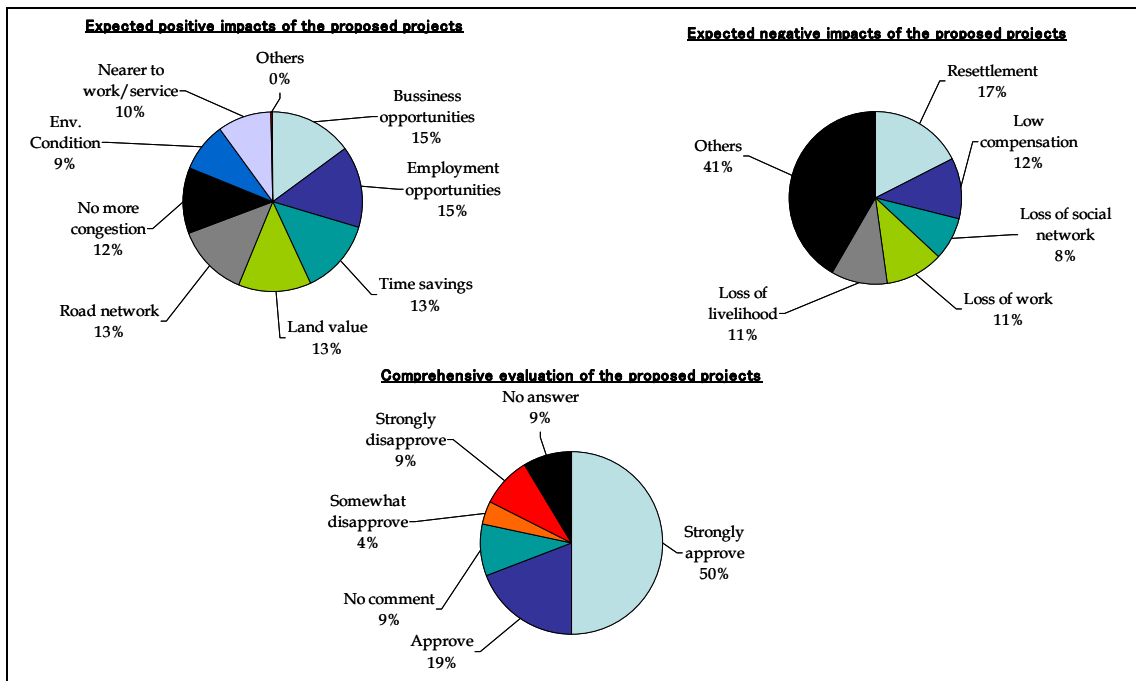
Figure 9.2.5 Awareness of the Proposed Projects



5) Benefits and Adverse Impacts: The respondents cited both positive and negative impacts of the project. The likely positive impacts perceived by the respondents include employment, new business opportunities, new investments in the area, and time savings from improved traffic conditions. The adverse impacts as mentioned by the respondents are displacement/relocation, potentially lower and unjust compensation for lost assets, loss of social network and livelihood caused by inadequate resettlement assistance. Households who already had experienced demolition previously were very vocal in their opposition to the project.

6) Responses to the Project: Over two-thirds of the respondents support the construction of the project roads. The approval/disapproval rate for all three road sections are summarized as follows: strongly approve (50%); approve (19%); disapprove (4%); strongly disapprove (9%); no comment (9%); and no answer (9%).

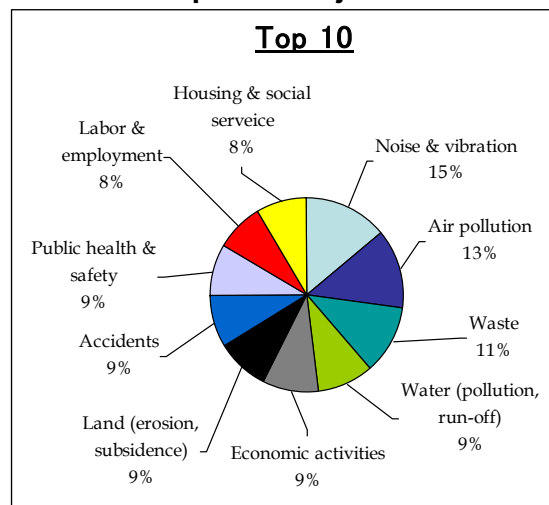
Figure 9.2.6 Intention on Implementation of the Proposed Projects



7) Social and Environmental Concerns on the Proposed Projects:

Figure 9.2.7 Social and Environmental Concerns on the Proposed Projects

Various concerns on social and environmental aspects on the proposed projects were raised from the respondents as shown in Figure 9.2.7. First concern was increase of noise & vibration level caused by the road (15%), subsequently, air pollution (13%), waste disposal issue (11%), water aspect including pollution and runoff (9%), and revitalization of the economic activities (9%).



The extent of people's understanding and notions about the project was determined through a perception survey and corroborated by FGDs and primary observations, which also dwelt on significant issues/concerns raised by community stakeholders.

The perception survey generated the following results:

1. The Governor's Drive is the worst of the four alignments as far as the directly affected households are concerned. Among the indirectly affected household, the Coastal Road is the worst. On the contrary, the Coastal Road got a high rating among the directly affected households.
2. Among the directly affected households, the perceived cause of bad traffic situation is "increase of car traffic" followed by "lack of roads." Among the indirectly affected household, "lack of road" is the foremost cause followed by "increase in car traffic."
3. Both directly and indirectly affected households believe traffic congestion has worsened followed by convenience and then safety.
4. Majority of the directly and indirectly affected households consider the existing road network as either plainly insufficient or totally insufficient. In order to address these problems, the directly affected households prefer the extension of the Manila-Cavite Road followed by improvement of the SLEX and the North-South Busway. Among the indirectly affected households, the top priority is the construction of the East-West Alternative A Road followed by expansion of the Coastal Road and the East-West Alternative B.
5. Households that are directly affected by the Cavite-Laguna Road alignment manifest the highest level of awareness while those indirectly affected by the North-South Road show the highest level of awareness.
6. Majority of the directly affected households got their information about the project from LGU staff. On the other hand, the largest percentage of the indirectly affected households got their information from barangay officials.

7. Majority of both the directly and indirectly affected households assessed the project as a good initiative, which could provide more business and employment opportunities.
8. The most frequently mentioned negative impact is the relocation of affected households.
9. Overall, majority of the directly affected households and the indirectly affected ones have manifested their approval of the project.
10. In general, the survey indicated a conditional acceptance of resettlement for nearly 50% of the directly affected households. Those who accepted with conditions were demanding fair compensation and good relocation site complete with basic facilities such as light and water.
11. The survey results show certain similarities in the significance attached by the directly and the indirectly affected households on the issues and concerns raised with respect to the three phases of the project (pre-construction, construction, and operation). "Air pollution/offensive odor" and "noise and vibration" are the topmost concerns. During the construction phase, "economic activities" are the foremost concern of the directly affected households, while "accidents" and "waste generation" are the foremost concerns of the indirectly affected households.
12. Resettlement and influx of workers are foremost concerns among the indirectly affected households, while it is not so among the directly affected ones. "Conflict of interest" involving government personnel that are at the same time beneficiaries of the project, is a common concern to both households.
13. Inequality of perceived benefits that the indirectly affected households will receive from the project against the negative impacts that will be experienced by the directly affected households in terms of resettlement and "forced sales of land and crops" was raised.
14. Other specific issues raised regarding pre-construction activities include among others alternatives of project affected persons, payment and structure of payment for lands to be affected by the project, compensation for trees and crops, partial effects on structures and lands, relocation, assurance of compensation, final road alignment, compensation of tenants, conversion of agricultural land to road use.
15. Issues raised regarding the construction period include accidents, land collapse, waste disposal, effects on archaeological and historical sites, possible disruption of public utilities and infrastructure and stability of road foundation.
16. Issues and concerns regarding the maintenance/operation phase include noise and vibration, water runoff and contamination, likely change in land use and zoning, improvement of aesthetic and visual effects of the areas where the road alignments will pass, relocation of households and provision of social services, public health and safety, change in culture, lifestyle and values, improved accessibility of women and other vulnerable groups in sourcing their household supplies and better access to basic services.

i) Preliminary Examination on Regional Severance

Regional severance or movement interruption to be potentially caused by the proposed projects was examined as a social impact of the proposed projects. Specific sites and areas, where the proposed road may interrupt movement of people/vehicle from one to another sides along the proposed road by the proposed road traversing the sites, were identified by means of aerial photograph with proposed road alignment as well as field reconnaissance.

In the project area along the proposed roads, the following type of the interruption were mainly considered; i) Division of a community such as dense residential area and subdivision, ii) Division of the existing road that the proposed road intersects, iii) Division of the farm land, and iv) other types of interruption.

An example of the preliminary examination on regional severance for Section 1 of the North-South Road is shown in Table 9.2.6 and Figure 9.2.8.

Table 9.2.6 Example of Preliminary Examination on Regional Severance

Serial No.	Type of Interruption	Proposed Measure
NS1-1	Farmland (aqua farm)	Proposed coastal road should have bridge to allow outrigger/banca fishing boat to access the shore or there should be a breakwater connecting to the R1 with a service road.
NS1-2	Road	Underpass is required. (Box-culvert type underpass (vehicle type and volume to be checked in the further stage.))
NS1-3	Farmland	No measure is required.
NS1-4	Road	Underpass is required.
NS1-5	Community/open space	No measure is required.
NS1-6	Farmland	No measure is required
NS1-7	Road	No measure is required. (use under flyover)
NS1-8	Farmland	Flyover is required.
NS1-9	Community/open space	Flyover is required.
NS1-10	Road	Flyover is required.
NS1-11	Community/open space	Flyover is required.

As results of the examination, potential interruptions were identified for the proposed three roads; 69 for North-South Road, 42 for Daang Hari Road, and 44 for CALA Expressway, respectively as shown in the following table.

Table 9.2.7 Identified Interruptions by Type of Interruption

Type of Interruption	North-South Road	Daang Hari Road	CALA Expressway
(1) Community/open space	9	3	3
(2) Road	32	24	24
(3) Farmland	27	15	17
(4) Others	1	0	0
Total	69	42	44

Figure 9.2.8 Example of Preliminary Examination on Regional Severance



Based on the identified locations of interruption, social impacts at the location were examined and measures to alleviate the impacts were proposed as shown in the following table. Provision of the pedestrian bridge should be considered, especially at the site for bus stop, in the further study stage.

Table 9.2.8 Proposed Measures for the Interruption

Type of Measure	North-South Road	Daang Hari Road	CALA Expressway
(1) At-grade intersection	7	13	1
(2) Multi-level intersection	1	0	0
(3) Flyover ¹⁾	16	2	2
(4) Viaduct ¹⁾	1	0	0
(5) Underpass ²⁾	2	0	3
(6) Overpass ²⁾	0	0	4
(7) Other way	7	4	24
(8) No measure is required.	35	23	10
Total	69	42	44

Note: ¹⁾ Flyover (or viaduct) structure for the proposed road has to be provided at the site of interruption.

²⁾ Underpass/culvert (or overpass) has to be provided under the proposed road at the site of interruption.

9.2.2 Impact Assessment and Mitigation/Enhancement Measures

The three road alignments of the proposed project will affect 58 barangays located in: six municipalities of Cavite, one municipality of Laguna, and Muntinlupa City. The CALA project impacts were classified into three major categories under the physical, biological and socio-economic environment modules. These were further classified according to the two phases of project development: pre-construction/construction, and operation and maintenance phases.

The issues and impacts identified during the study were evaluated in terms of their nature, their duration (time-scale), areal extent, reversibility or permanency and cumulative effects. Collectively, these serve to establish the overall degree or magnitude of the impact, which is described as follows:

- Significant (S)
- Moderately Significant (MS)
- Non-Significant (NS)

Table 9.2.9 summarizes the overall project impacts (negative and positive) and their corresponding mitigation and enhancement measures by development phase and by environmental module: physical, biological and socio-economic.

Table 9.2.9 Summary of Environmental Impacts and their Corresponding Mitigation/Enhancement Measures and Environmental Management Plan

Project Activities	Predicted Environmental Impacts	Degree /type of Impact	Mitigation/Enhancement Measure	Cost	Responsible Institution	Guarantees/Agreements
1. Pre-Construction/ Construction Period						
<i>A. Physical Environment</i>						
Land						
<ul style="list-style-type: none"> ▪ Detailed engineering design; clearing within ROW area; site grading, excavation, backfilling bored piling at bridge areas, hauling/stockpiling of excavated and construction materials 	Terrain modification, soil and weathered rock displacement Erosion, siltation of local waterways particularly at bridge crossings	S, P (negative) S, T (negative)	<ul style="list-style-type: none"> ▪ Clearing and excavation works to be planned during dry season where practicable and scheduled so as to allow speedy concreting/backfilling of excavated sections ▪ Use of temporary siltation ponds⁵ ▪ Excavated materials be placed on appropriate dumpsites or spoils area at some distance from structure sites and provided with adequate containment; re-use soil spoils for backfilling ▪ Stockpiles of sand and gravel be fenced or so located to reduce transport of sediments during heavy rains including reducing storage time in work areas ▪ Observance of proper materials handling and heavy equipment operations for transport, hauling and moving earth spoils to minimize spills into rivers and nearby waterways⁶ ▪ Immediate revegetation of exposed areas which will not be occupied by road structures ▪ Strict observance of proper cut and fill procedures and materials balance to minimize wastage of excavated materials from work areas ▪ Restoration or dredging of silted waterways upon completion of construction activities ▪ Use of temporary sumps for detention of bentonite used in drilling bored piles ▪ Use of tarpaulins or equivalent to cover exposed stockpiles of excavated and construction materials ▪ Monitor river quarrying for construction materials 	<ul style="list-style-type: none"> ▪ Part of construction cost 	<ul style="list-style-type: none"> ▪ Contractor, DPWH, DENR, MMT 	<ul style="list-style-type: none"> ▪ Part of contractor's contract and as input to the feasibility study

⁵ *Station ponds* correspond to sumps which temporary detain water pumped out of excavations. Detention will facilitate the settlement of sediments from the water prior to eventual release into the nearby waterway.

⁶ This refers to the observance of caution in moving loaders and trucks laden with loose materials so as to minimize spillage and likely siltation while crossing waterways.

Table 9.2.9 Summary of Environmental Impacts and their Corresponding Mitigation/Enhancement Measures and Environmental Management Plan

Project Activities	Predicted Environmental Impacts	Degree /type of Impact	Mitigation/Enhancement Measure	Cost	Responsible Institution	Guarantees/Agreements
			<p>within the project area. Sources of construction materials for the project will be identified and approved for quarrying by the Mines and Geosciences Bureau and/or the concerned LGU.</p> <ul style="list-style-type: none"> Monitoring of earthmoving activities by a qualified geotechnical engineer or engineering geologist 			
	Slope destabilization at new cuts	MS, T (negative)	<ul style="list-style-type: none"> Undertake slope stability analysis supported by adequate geologic mapping, field tests and laboratory analysis for sections which will involve large cuts. Drilling accompanied by appropriate laboratory test may be undertaken. This is an option to be taken by the contractor should his designer require subsurface data for the proposed slope stabilization measure. Install as necessary slope protection measures such as shotcreting, rock bolts or soil nails. A soil nail anchors soil like materials which are likely to fail into more stable strata located farther into the slope. 	<ul style="list-style-type: none"> Part of Design Cost Part of construction cost 	<ul style="list-style-type: none"> Contractor and DPWH Contractor, DPWH, DENR, MMT 	<ul style="list-style-type: none"> Part of contractor's contract and as input into the design stage Part of contractor's contract
	Degradation of national and provincial roads used for hauling construction materials and for movement of heavy equipment	MS, T (negative)	<ul style="list-style-type: none"> Regular road maintenance, restoration of roads original conditions after construction activities. As practiced, the roads used by the contractors that are degraded by the passage of heavy equipment are restored or repaired at the end of the project or upon completion of construction activities in the particular area. 	<ul style="list-style-type: none"> Part of construction cost 	<ul style="list-style-type: none"> Contractor, DPWH, DENR, MMT 	<ul style="list-style-type: none"> Part of contractor's contract
	Increased generation of solid wastes	NS, T (negative)	<ul style="list-style-type: none"> Provision of waste bins in various strategic points within the construction area for the workers to dispose their wastes. Wastes from these containers will be collected (dump truck of the contractor) regularly to be disposed at a designated waste disposal site. Re-use and recycling of scrap materials and containers such as bottles, cans, boxes and plastics as much as practicable or selling them to scrap buyers. Conduct of a thorough orientation of workers on proper waste disposal practices. Re-use construction spoils as aggregate or filling materials where practicable. Regular hauling of construction debris to the 	<ul style="list-style-type: none"> Part of construction cost 	<ul style="list-style-type: none"> Contractor and DPWH 	<ul style="list-style-type: none"> Part of contractor's contract

Table 9.2.9 Summary of Environmental Impacts and their Corresponding Mitigation/Enhancement Measures and Environmental Management Plan

Project Activities	Predicted Environmental Impacts	Degree /type of Impact	Mitigation/Enhancement Measure	Cost	Responsible Institution	Guarantees/Agreements
Air	Increase in particulates and gaseous emissions and noise levels	MS, T (negative)	<p>designated disposal area to prevent their accumulation on-site resulting to negative effects on the landscape.</p> <ul style="list-style-type: none"> ▪ Conduct of equipment/vehicle cleanup and maintenance in only one designated area located as far away as possible from waterways. Spent and used oil should be collected and placed in sealed containers and disposed of properly to prevent draining into waterways or sold to used oil recyclers/buyers. ▪ Efficient housekeeping practices including the use of covered receptacles for refuse generated by workers and construction scrap/debris will ensure the proper handling and disposal of solid wastes. ▪ In order to minimize the need to dispose of earth materials, the contractor shall make use of excavated materials as much as possible for filling and as part of construction materials. For non-suitable materials, these are placed in low areas where the possibility of erosion is limited. 	Part of construction cost	Contractor, DPWH, DENR, MMT	Part of contractor's contract
	Increased traffic at road intersections leading to construction areas	MS, T (negative)	<ul style="list-style-type: none"> ▪ Sprinkle water in exposed areas on regular basis especially during dry and windy periods ▪ Speed of vehicles used for construction should be regulated to minimize stirring up of loose materials sinks for dusts/spoils ▪ Proper handling and storage of spoil materials ▪ Proper maintenance of engines for efficient fuel burning to lessen gaseous emissions ▪ Schedule construction activities during daytime ▪ Installation of silencers or mufflers for as many vehicle engines and heavy equipments as possible ▪ Contractor to assign traffic aides at key road sections to assist in traffic management 	Part of construction cost	Contractor, DPWH	Part of contractor's contract

Table 9.2.9 Summary of Environmental Impacts and their Corresponding Mitigation/Enhancement Measures and Environmental Management Plan

Project Activities	Predicted Environmental Impacts	Degree /type of Impact	Mitigation/Enhancement Measure	Cost	Responsible Institution	Guarantees/Agreements
Water						
	Changes in river water quality	S, T (negative)	<ul style="list-style-type: none"> ▪ Refer to mitigation measures on soil displacement, erosion and siltation of waterways ▪ Locate gravel crushing, screening areas and concrete batching operations as far away as possible from waterways ▪ Undertake regular monitoring of water quality focusing on DO, BOD, TSS and TDS ▪ Provide adequate temporary sanitary facilities with proper drainage to prevent leaching and wash water from reaching water courses, use of portalets ▪ Contractors to prepare and implement a materials handling program for construction spoils and solid waste management ▪ Contractor to observe proper equipment maintenance and operation to minimize spillage of oil and grease into waterways 	▪ Part of construction cost	▪ Contractor, DPWH, DENR, MMT	▪ Part of contractor's contract
B. Biological Environment						
Terrestrial						
▪ Vegetation clearing, excavation and grading and other construction activities	Loss, disturbance and damage to existing vegetation; Habitat degradation of dependent species	MS, T (negative)	<ul style="list-style-type: none"> ▪ For every tree cut, the required replacements must be made⁷ ▪ Secure necessary permit from DENR for tree cutting ▪ Implement tree balling where practicable ▪ Immediate revegetation 	▪ Part of construction cost	▪ DPWH	▪ Part of ECC requirement
Freshwater						
	Local aquatic habitat alteration and temporary displacement of species	NS, T (negative)	<ul style="list-style-type: none"> ▪ Same mitigation for the control of soil erosion and sedimentation 			

⁷ Cutting of trees is generally guided by the provisions of PD 705 – Revised Forestry Code of the Philippines (Section 23). In the case of trees located in private lands, guidelines for cutting are embodied in DAO-21 which refers to the Revised Guidelines in the issuance of Private Land Timber Permit/Special Private Land Timber Permit (PLTP/SPLTP). A 100 tree inventory is required and this must be undertaken by a registered forester or by the local DENR office.

Table 9.2.9 Summary of Environmental Impacts and their Corresponding Mitigation/Enhancement Measures and Environmental Management Plan

Project Activities	Predicted Environmental Impacts	Degree /type of Impact	Mitigation/Enhancement Measure	Cost	Responsible Institution	Guarantees/Agreements
C. Socio-economic Environment						
<ul style="list-style-type: none"> ▪ Detailed engineering design; clearing within ROW area; site grading, excavation, backfilling bored piling at bridge areas, hauling/stockpiling of excavated and construction materials including ROW acquisition 	Total or partial loss of land/farm area, properties and crops, dislocation and loss of income due to ROW acquisition	S, P (negative)	<ul style="list-style-type: none"> ▪ Negotiate with PAFs/PAPs for an acceptable compromise on valuation and compensation ▪ Finalize the RAP incorporating therein the agreements reached during public consultations 	NA	<ul style="list-style-type: none"> ▪ DPWH 	<ul style="list-style-type: none"> ▪ Commitment of DPWH via MOA
	Increase in employment opportunities	MS, T (positive)	<ul style="list-style-type: none"> ▪ Require contractors to source workforce from qualified locals ▪ Contractors to orient workers on desirable working relationship especially if there are non-resident workers 	NA	<ul style="list-style-type: none"> ▪ Contractor, DPWH 	<ul style="list-style-type: none"> ▪ Part of contractor's contract
	Increase in livelihood and business opportunities	MS, T (positive)	<ul style="list-style-type: none"> ▪ Priority to be given to local subcontractors ▪ Priority to be given to local suppliers of construction materials and equipment ▪ Supply of food and catering to be preferentially awarded to local suppliers 	NA	<ul style="list-style-type: none"> ▪ Contractor, DPWH 	<ul style="list-style-type: none"> ▪ MOA of LGU with Contractor
Potential health, sanitation and safety problems		NS, T (negative)	<ul style="list-style-type: none"> ▪ Contractor to provide temporary housing facilities for workers equipped with adequate water and sanitation facilities 			
			<ul style="list-style-type: none"> ▪ Contractors to implement proper solid waste management in the work site, workers will be oriented to observe proper hygiene and sanitation practices and provided with appropriate protection gears while working ▪ Construction areas to be enclosed as necessary and provided with appropriate signage to avoid accidents 			
D. Land Use						
Land Use and Zoning						
	Change in land value	S, P (positive)	<ul style="list-style-type: none"> ▪ Property appraisal by the local government unit before construction 			

Table 9.2.9 Summary of Environmental Impacts and their Corresponding Mitigation/Enhancement Measures and Environmental Management Plan

Project Activities	Predicted Environmental Impacts	Degree /type of Impact	Mitigation/Enhancement Measure	Cost	Responsible Institution	Guarantees/Agreements
2. Operations and Maintenance Period						
<i>A. Physical Environment</i>						
Land						
	Erosion at major discharge points of the road's storm drains	NS, T (negative)	<ul style="list-style-type: none"> Installation of dissipators at major discharge points of the roads' storm drains 	Dissipators: P1,481,000		
Air						
<ul style="list-style-type: none"> Operation and maintenance of roads 	Increase in particulates and gaseous emissions	MS, P (negative)	<ul style="list-style-type: none"> IEC to road users on the proper maintenance of engines for efficient fuel burning and minimization of gaseous emissions Tree planting along the roads Regular road cleaning activity such as regular water sprinkling should be done 	<ul style="list-style-type: none"> Tree Planting: P158,090,000 	DPWH, Tollway operator	<ul style="list-style-type: none"> Part of ECC requirement
	Increase in noise levels	MS, P (negative)	<ul style="list-style-type: none"> Traffic controls (e.g. speed limits and traffic-volume restrictions) and Vehicle controls along the highway (e.g., truck bans) Tree planting along the roads Noise barrier panel should be installed along the roads which pass sensitive areas such as hospital and school. 	<ul style="list-style-type: none"> Tree Planting: P158,090,000 Sound Barrier: P6,459,000 		
<i>B. Socio-economic Environment</i>						
<ul style="list-style-type: none"> Operation and maintenance of roads 	Lessened traffic congestion and improved access to public utilities and services	MS, P (positive)	<ul style="list-style-type: none"> Enhance the accessibility by providing appropriate signage to guide traveling public to use shortest and most convenient route to reach the interior places from the highway via the existing access roads and vice versa 	Part of operations cost	DPWH, Tollway operator	<ul style="list-style-type: none"> Part of ECC requirement and standard operation procedures
	Increased livelihood and business opportunities, and revenues for LGUs	MS, P (positive)	<ul style="list-style-type: none"> Encourage LGUs to use part of the increase revenues for promoting conducive for expanding business operation and establishing new livelihood activities, by maintaining peace and order and improving basic services and infrastructure and utilities 	NA	Initiative of LGU	<ul style="list-style-type: none"> Initiative of LGU

Table 9.2.9 Summary of Environmental Impacts and their Corresponding Mitigation/Enhancement Measures and Environmental Management Plan

Project Activities	Predicted Environmental Impacts	Degree /type of Impact	Mitigation/Enhancement Measure	Cost	Responsible Institution	Guarantees/Agreements
	Increased migration and population	MS, P (negative)	<ul style="list-style-type: none"> ▪ Concerned LGUs (barangay and municipal/city) to regulate encroachment in watershed areas (forest-land) through proper zoning and enforcement ▪ LGUs to adequately plan/provide for social services and infrastructures including health services, waste management and facilities and road network ▪ Encourage the LGUs to regulate or prevent the establishment of squatter colonies by strictly enforcing RA 7279 or the "Urban Development Housing Act (UDHA)" 	NA	<ul style="list-style-type: none"> ▪ Initiative of LGU 	<ul style="list-style-type: none"> ▪ Initiative of LGU
	Regional severance	S, P (negative)	<ul style="list-style-type: none"> ▪ In order not to disturb human flow between communities, measures for crossing the road should be installed such as flyover, underpass, at grade intersection, and service road. 	<ul style="list-style-type: none"> ▪ Part of construction cost 	<ul style="list-style-type: none"> ▪ Contractor, DPWH 	<ul style="list-style-type: none"> ▪ Part of contractor's contract and as input into the design stage
	Increased accidents	MS, T (negative)	<ul style="list-style-type: none"> ▪ Intersection signal and sign board installation 	<ul style="list-style-type: none"> ▪ Part of construction cost 	<ul style="list-style-type: none"> ▪ Contractor, DPWH 	<ul style="list-style-type: none"> ▪ Part of contractor's contract and as input into the design stage
	Damage of landscape	MS, P (negative)	<ul style="list-style-type: none"> ▪ Revegetation of the exposed areas ▪ Tree planting along the roads 	<ul style="list-style-type: none"> ▪ Tree Planting: P158,090,000 	<ul style="list-style-type: none"> ▪ Contractor, DPWH 	<ul style="list-style-type: none"> ▪ Part of contractor's contract and as input into the design stage
C. Land Use						
Land Use and Zoning						
	Change in land value	S, P (positive)	<ul style="list-style-type: none"> ▪ Regular property appraisal by the local government 			

Note: S - Significant impact, MS - Moderately significant impact, NS - Not significant impact

T - Temporary impact, P - Permanent impact
 negative - negative impact, positive - positive impact

(1) Impacts during Pre-Construction/Construction Phase

The major impacts during pre-construction and construction period range from moderately significant to significant. The land clearing and earthmoving activities will modify remove the vegetation cover, alter the terrain, temporarily cause soil displacement and erosion that could result in the deterioration of river water quality and aquatic habitat alteration including the displacement of the already limited aquatic species. Local air/noise quality could also be affected. These impacts are deemed temporary and short-term and can be well minimized or mitigated by proper design based on detailed site investigations and construction management especially the timing of construction during dry period, close monitoring of unstable slopes and water quality, materials handling program for spoils and solid waste management including restoration and revegetation measures.

The negative socio-economic impacts will be significant and will last well beyond the construction period. Foremost among these impacts is the displacement and relocation of a total of 487 households residing in 28 barangays in six municipalities. Loss of crops properties will also be experienced. These can be mitigated though proper and timely compensation and relocation of affected families.

A Resettlement Action Plan (RAP) to be prepared by the DPWH has to be implemented in coordination with the assistance of the respective LGUs, and concerned national government agencies such as the National Housing Authority (NHA), DENR, DAR and the Philippine National Police.

Other negative impacts include the influx of construction workers and their families, decline in health and sanitation conditions at work areas, potential increase in the incidence of work related accidents, and increased competition for available construction jobs. These can be mitigated through the provision of temporary housing with provisions for adequate water, toilet and waste disposal facilities for construction workers, required use of appropriate safety gears and the installation of necessary enclosures and signage, and prioritization of locally capable labor in hiring as well as proper screening prior to hiring.

The positive project impacts include increased employment, livelihood and business opportunities which could translate to added income of residents and local enterprises. This will redound to increase in revenues to the LGUs, in the form of taxes, and hence additional source of funds to improve the delivery of basic LGU services to the community. These may be enhanced by adopting a policy of local procurement of construction materials and other supply requirements if these are available within the project area.

The areas traversed by or located near the new roadways will change in value. Improved access will increase the value of lots while unfavorable partition will contribute to possible decline in assessment. The rise in value will translate to

higher real estate taxes for the concerned LGU. In order to enhance this, the LGUs must undertake a regular assessment of properties within its jurisdiction to provide local residents, establishments and institutions an updated appraisal of the value of the land in the area prior to construction.

(2) Impacts during the Operation and Maintenance Phase

Road operation and maintenance will bring about increased air pollution and noise levels as more vehicles begin to use the new roadways. These can be mitigated by tree planting to be located at the center of and/or along the proposed roads, noise barriers to be installed at the specific locations with socially sensitive facilities along the proposed roads such as hospital and school, and flyover structure at the specific locations where the roads pass through or aside the lower-storey residential area to disperse air and noise to the sky as well as regular air and noise monitoring and strict implementation of speed limits. An example of the mitigation measures for Section 1 of the North-South Road is shown in Figure 9.2.9. The figures of the mitigation measures for all road sections are shown in the draft EIS Report of Appendix 9.2. Expected noise reduction effects of the proposed measures are shown in the following table.

Table 9.2.10 Expected Noise Reduction Effects of the Proposed Measures

Mitigation Measures	Noise Reduction Range	Remarks
Flyover	3.7 - 4.7 dB ¹⁾	Height of flyover: 7-9 m
Flyover + Noise barrier	4.5 - 6.3 dB ¹⁾	Height of flyover: 7-9 m Height of noise barrier: 3 m
Tree Planting	0.4 - 0.6 dB ²⁾	Tree planting zone: height 1.5m X breadth 0.4 - 1.0m

Note: ¹⁾ - Estimated by JICA Study Team

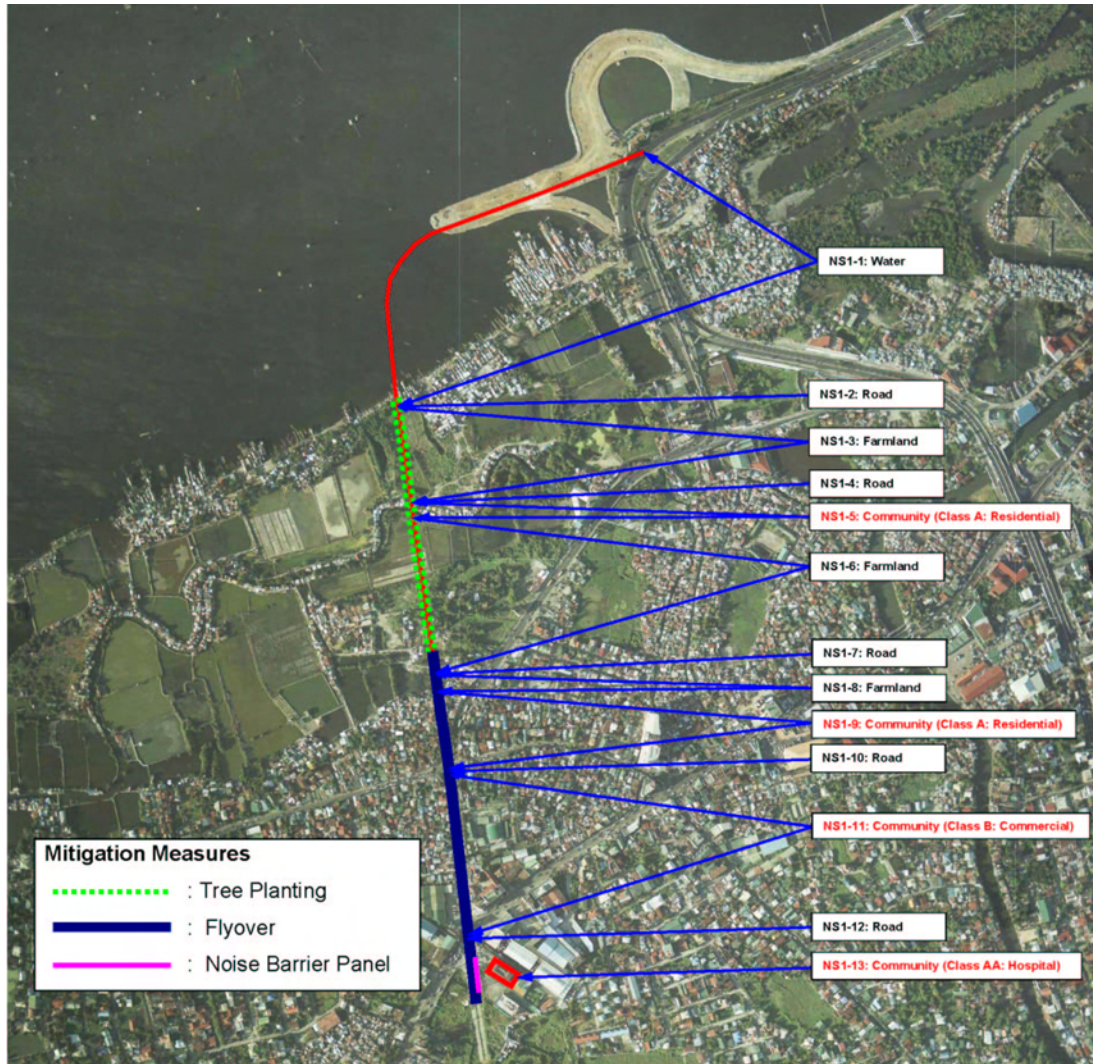
²⁾ - The values are based on experimental measurements in Japan under the Study on effect by planting belts on noise attenuation (5th Report) – Road traffic noise attenuation-, 1989

The new roads will bring about improved access to public utilities/services, increase land values and provide increased economic opportunities and revenues for the LGUs. Enhancement of these positive impacts should include an Information, Education and Communication (IEC) campaign to enhance social acceptability and people's cooperation for the proper maintenance of the constructed roads in combination with the installation of proper signages to guide the commuters to the shortest and most convenient route to reach their destinations, regular assessment of real estate properties, and the use of funds generated from taxes to improve the delivery of basic LGU services and utilities.

Increased migration and rapid population growth will be experienced in the project area, which can bring about congestion and the proliferation of informal settlers. In order to address this potential development scenario, the development of suburban subdivisions should be promoted; while that of squatter colonies should be prevented or strictly regulated in a manner that does not violate the

constitutional rights of abode and other human rights of those involved, otherwise known as “informal settlers”.

Figure 9.2.9 Example of Mitigation Measures to be Installed



9.2.3 Environmental Management and Monitoring Plan

The Environmental Management and Monitoring Plan (EMMP) represents the key mitigation and enhancement measures for major impacts, which are translated into concrete action programs/projects and defines the institutional framework and mechanisms for ensuring their appropriate implementation. It likewise provides the estimated investment requirements and commitments/guarantees to carry out the proposed plan.

The EMMP shall be composed of the following components:

- Design and Construction Management Program
- Social Development and Institutional Plans
- Environmental Monitoring Plan

(1) Design and Construction Management Program

Careful planning and adequate engineering design as well as observance of proper construction practices are expected to address the impacts predicted to occur during the construction and operation phases of the CALA project.

DPWH or its consultants shall prepare the appropriate engineering studies/plans and implement the construction program. The critical component covered by the program refers to construction management since the key impacts are those generated during this phase of work. It will include among others implementation of a sound materials handling program, proper waste management, provision of adequate utilities as well as health and sanitation facilities, dry season scheduling of earthmoving where practicable, installation of silt traps and siltation ponds where necessary and observance of proper operational procedures in the use of heavy equipment for transporting, hauling and moving earth spoils from one area to another.

The construction management program shall also include implementation of safety procedures such as the designation of a safety engineer at the construction site, provision of safety equipment for all workers.

In the case of the proposed projects, the risk is essentially limited to vehicular accidents. Mitigation of vehicular accidents shall be part of the implementation of the project traffic rules and regulations as required by DPWH and the Department of Transportation and Communications (DOTC).

(2) Social Development Program (SDP)

The SDP addresses the key socio-economic issues/concerns raised during the household and perception surveys and FGDs. It consists of the following components:

- Information, Education and Communication (IEC)
- Land Acquisition and Resettlement
- Employment and Livelihood Development

The IEC will be undertaken to encourage the participation and cooperation not only of the affected households but a broader sector of stakeholders and facilitate the establishment of support linkages in the implementation of the project. The IEC consists of the following:

- Information dissemination on the results of the EIA;
- Information on the final design of the proposed road alignments based on the detailed engineering study and consultation with the affected households; and

- Information on project implementation and monitoring.

The detailed RAP shall be prepared and finalized to come up with an appropriate and acceptable measure for mitigating the loss of land and other properties as well as income opportunities of project affected families and persons (PAFs/PAPs). It shall include an entitlements and compensation scheme which will cover productive lands and crops, residential land house and other structures, loss of business, voluntary land donations, costs and budget, complaints and grievances.

Information on project implementation and monitoring will cover implementation arrangements, supervision and monitoring, relocation phases and processes, actual relocation phase and post relocation phase.

(3) Institutional Plan

An environmental group exists within the DPWH, which is responsible for the compliance of the agency to existing environmental rules and regulations. The same group shall be responsible for the overall implementation of the EMMP, which will include among others:

- Overall planning and management of environmental mitigation, enhancement and monitoring measures;
- Overseeing the finalization and implementation of the various proposed plans such as the RAP and Social Development Program;
- Organization of the Multi-Partite Monitoring Team (MMT) and secretariat support to the various committees of the MMT;
- Coordination with DENR, LGUs, IAs/FIA and local communities concerning the implementation of the various management plans; and
- Regular checking of the operation of the construction contractors regarding their compliance with environmental clauses/conditionalities in their contracts.

(4) Environmental Monitoring Program

Environmental monitoring shall be undertaken;

- To ensure that the recommended mitigation and enhancement measures as embodied in the EMMP and ECC conditionalities are being implemented;
- To undertake regular monitoring of specific parameters in compliance with existing environmental quality standards; and
- To determine the effectiveness of the EMMP and make recommendations for any corrective or additional mitigating measures.

A monitoring plan shall be developed based on the mitigation/enhancement measures identified for significant environmental impacts and those that are

moderately significant, but can have critical effects if not mitigated. The environmental monitoring plan proposed including the key parameters to be monitored is presented in Table 9.2.11. This covers both the pre-construction/construction and operation stages.

The key parameters to be closely monitored are the following:

- Soil erosion and sedimentation of water bodies during construction
- Changes in water quality during construction
- Air quality and noise impacts during both construction and operation
- Tree planting and revegetation of critical areas

Based on the anticipated impacts, the frequency of monitoring by DPWH and the MMT will be more constant and rigid during the construction phase. Monitoring by DPWH during the operation phase will be closely coordinated with the regional office of DENR. The baseline information generated during the EIA will generally serve as the benchmark data. Additional measurements shall be made at stations near the proposed final alignment on the final road position as determined in the feasibility study.

In compliance with the guidelines of DAO 96-37, a Multi-Partite Monitoring Team (MMT) shall be established to take charge of the preparation of the final monitoring program and annual monitoring plan including the conduct of monitoring activities. The MMT is proposed to be composed of the following:

- DPWH Representative
- DENR Representatives (DENR Regional EMB and/or PENRO/CENRO)
- LGU designated representative(s)
- NGO/PO designated representative
- Barangay designated representatives

The constituted/organized MMT shall review and validate the following:

- coverage of monitoring
- frequency of monitoring
- standard procedures/method of monitoring
- schedule of monitoring
- manpower requirements
- logistics

Table 9.2.11 Environmental Monitoring Plan

Project Phase	Method and Scope	Parameter	Location	Frequency	Responsibility	Cost (P)	
Pre-Construction/ Construction Period							
Physical							
<ul style="list-style-type: none"> ▪ Right of Way Acquisition ▪ Vegetation clearing/tree cutting ▪ Excavation works ▪ Foundation works 	<ul style="list-style-type: none"> ▪ Monitoring of Earthmoving activities 	<ul style="list-style-type: none"> ▪ Contractor's material handling Program 	<ul style="list-style-type: none"> ▪ Construction sites especially at bridge sites 	Once a week during construction	DPWH	Part of DPWH supervision cost	
	<ul style="list-style-type: none"> ▪ Engineering geological assessment of slopes 	<ul style="list-style-type: none"> ▪ Slope profile and signs of instability 	<ul style="list-style-type: none"> ▪ Abutments of bridge crossings, steep and high cuts 	<ul style="list-style-type: none"> ▪ Once a week during construction or after heavy rains or earthquake event 	Once a week during construction or after heavy rains or earthquake event	Construction Contractor	Part of CC cost
	<ul style="list-style-type: none"> ▪ Water quality tests (DENR Administrative Order No.34 (1990)) 	<ul style="list-style-type: none"> ▪ River water quality- DO, pH, TSS, BOD, total and fecal coliform 	<ul style="list-style-type: none"> ▪ Within 50 m downstream of bridge sites (only at the point where river water is used for some purpose downstream) 	<ul style="list-style-type: none"> ▪ Monthly during active construction periods 	Monthly during active construction periods	DPWH/DENR/ MMT	P750, 000/ year ~P 9,000,00 per point
	<ul style="list-style-type: none"> ▪ Geo-hazard assessment 	<ul style="list-style-type: none"> ▪ Erosion and siltation 	<ul style="list-style-type: none"> ▪ Waterways near construction sites 	<ul style="list-style-type: none"> ▪ Weekly 	Weekly	DPWH/DENR/ MMT	P240,000/ year
	<ul style="list-style-type: none"> ▪ Measurement of ambient concentrations (1999 Philippine Clean Air Act) 	<ul style="list-style-type: none"> ▪ TSP, SOx, NOx 	<ul style="list-style-type: none"> ▪ Construction areas near built up areas (12 points) 	<ul style="list-style-type: none"> ▪ Monthly during active construction period 	Monthly during active construction period	DPWH/DENR/ MMT	P1,400,000/ year ~ P7, 500 per point
	<ul style="list-style-type: none"> ▪ Measurement of ambient level (1978 NPCC Rules and Regulations) 	<ul style="list-style-type: none"> ▪ Noise 	<ul style="list-style-type: none"> ▪ Construction areas near built up areas (12 points) 	<ul style="list-style-type: none"> ▪ Monthly during active construction period 	Monthly during active construction period	DPWH/DENR/ MMT	P1,400,000/ year
	<ul style="list-style-type: none"> ▪ Monitoring of solid waste disposal 	<ul style="list-style-type: none"> ▪ Presence or absence of dumps, waste bins, collection system 	<ul style="list-style-type: none"> ▪ Construction sites and temporary quarters of workers 	Monthly	Contractor		
Biological							
	<ul style="list-style-type: none"> ▪ Site Inspection 	<ul style="list-style-type: none"> ▪ Tree cutting/ balling 	<ul style="list-style-type: none"> ▪ Vegetated areas with ROW 	Before construction	DPWH/DENR/ MMT	P240,000	
Socio-Economical							
	<ul style="list-style-type: none"> ▪ Site inspection 	<ul style="list-style-type: none"> ▪ Worker health and safety 	<ul style="list-style-type: none"> ▪ Construction areas, worker's camp 	Weekly	Contractor		
	<ul style="list-style-type: none"> ▪ Site inspection 	<ul style="list-style-type: none"> ▪ Waste management 	<ul style="list-style-type: none"> ▪ Project site, worker's camp 	Daily	Contractor		

Table 9.2.11 Environmental Monitoring Plan

Project Phase	Method and Scope	Parameter	Location	Frequency	Responsibility	Cost (P)
Operation and Maintenance Period						
Physical						
<ul style="list-style-type: none"> Operation and Maintenance of roads 	<ul style="list-style-type: none"> Measurement of ambient concentrations (1999 Philippine Clean Air Act) 	<ul style="list-style-type: none"> TSP, SOx, NOx 	<ul style="list-style-type: none"> Selected sections of the completed roads (12 points) 	Yearly	DPWH/DENR/ MMT	
	<ul style="list-style-type: none"> Measurement of ambient level (1978 NPCC Rules and Regulations) 	<ul style="list-style-type: none"> Noise 	<ul style="list-style-type: none"> Selected sections of the completed roads (12 points) 	Yearly	DPWH/DENR/ MMT	
Biological						
		<ul style="list-style-type: none"> Tree Planting, Revegetation 	<ul style="list-style-type: none"> Critical Areas along ROW 	Weekly		

The MMT shall implement the environmental monitoring action plan. A monitoring evaluation and reporting system shall be established to enable stakeholders to participate in the process. Where necessary, the system shall be reviewed and updated in relation to actual construction and site conditions.

The initial cost of the establishment of the MMT and finalizing the monitoring plan is estimated at P100,000. Monitoring during construction and operation is initially placed at about P500,000 and P700,000 annually, respectively.

(5) Overall EMMP Implementation and Resource Requirement

The overall EMMP summary including mitigation/enhancement measures, schedule of implementation, estimated investment requirements, institutional responsibilities and guarantees/agreements is shown in Table 9.2.5. The cost computations are rough estimates and need to be verified/ validated during the plan finalization.

(6) Environmental Guarantees, Commitments and Agreements

To ensure the protection of the environment with the project, environmental guarantees, commitments and agreements for the implementation of the proposed EMMP are provided by the proponent along with the stakeholders of the project.

An Environmental Monitoring Fund shall be established by DPWH to support the operation of the MMT and its various monitoring activities. In addition, an Environmental Guarantee Fund (EGF) will likewise be provided as a fund source for any rehabilitation work in case of damages to the existing environment as a consequence of project operation including compensation to affected parties (if any) and implementation of projects to prevent the occurrence of detrimental impacts to the environment.

An Environmental Monitoring Fund (EMF) in the amount of P1,000,000 shall be established and to be used exclusively for monitoring activities during construction and operation and shall be replenished regularly. Initially, an EMF in the amount of P300,000 will be established by DPWH. However, the full amount of P1,000,000 may be spent for monitoring during construction. The allocated amount may be increased depending on the actual conditions and on the assessment of the MMT.

Environmental Guarantee Fund (EGF)

The establishment of an Environmental Guarantee Fund (EGF) is recommended to ensure that adequate funds are allocated for mitigating or rehabilitating any environmental damage that may be brought about by the project. Given the nature of the project, the major environmental damage or disaster that could occur is the

spill or dispersal of toxic materials borne by the vehicles that ply the new road alignment.

A replenishable EGF in the amount of not less than P1,000,000 shall be set-up by DPWH. Of this amount, P6,000,000 shall be established as a Trust Fund and P400,000 as an Environmental Guarantee Cash Fund.

Utilization of the EMF and EGF

The management and utilization of the EMF and EGF shall be in accordance with the guidelines prescribed in the Procedural Manual for DAO 96-37, Revised 2nd Edition. As an interim measure, the Manual shall be used as the basis for the disbursement of either the EMF or EGF. Detailed operating guidelines shall be formulated during the implementation of the project. The Operating Guidelines shall prescribe the management and utilization scheme for the EMF and EGF, as well as the operations, functions and responsibilities of the MMT/EGF Board in relation to the Executive Committee.

(7) Project Commitments, Affirmations and Agreements

The commitment of the stakeholders responsible for the implementation of the environmental management plan is essentially bound by the ECC conditionalities that shall be issued by DENR. This ECC shall be complemented by the contract of the contractors, which shall contain the appropriate environmental management provisions and the memorandum of agreements, which may be forged among the contractor, LGU and the MMT.

9.3 Progress of the EIS Process

The environmental impact items to be examined under the EIA study was authorized in the Official Scoping Process under the EIS system as well as the scope of work of the EIA study including relevant information to be collected, methodologies to be taken for the impact forecast/evaluation and mitigation measures.

Pre-Scoping Activities: First Level Scoping Meeting as required by EMB-DENR was held on September 14, 2005. Participants of the meeting are listed in Table 9.3.1 and the resultant signed-First Level Scoping Checklist for EIS is shown in Appendix 9.1.

Table 9.3.1 Participants on the First Level Scoping Meeting

Organization	Name	Position
EMB/DENR	Mr. Allen B. Villanueva	Engineer III, DENR/EMB/EIA Division
EIARC	Engr. Antonio Kimo	Civil-Sanitary Engineer, Radian Consulting, INC.
	Mr. Ramon Quebral	Geologist, DENR/MGB
	Mr. Joseph Lalo	Socio-Economics Specialist, Imprimatur Information System INC.
DPWH	Mr. Alvin Madrid	Info System Analyst II, DPWH/PMO-FS
	Ms. Belle Fajardo	Chief Environmental Management Specialist, DPWH/ESSO
JICA Study Team	Mr. Tetsuo Kuyama	Natural Environment Expert
	Ms. Lynn Sison	LGU Coordinator Expert
	Ms. Beluleh E. Pallana	Resettlement Planning Expert

Scoping Process: The official scoping session was held on September 23, 2005 at the Island Cove Resort, Kawit, Cavite as the 3rd stakeholders' meeting. There were a total of 98 participants (inclusive of 7 study team members and 4 project office staff) that attended the meeting. A good cross-section of stakeholders from both the public and private sectors were invited.

A list of stakeholders is given in Table 9.3.2 showing the number of participants that actually attended the meeting. The signed attendance sheets and handouts distributed to participants are shown in Appendix 9.4 as well as the meeting program and the contents of question and answer at the open forum. As explained in the previous sections, the EIA study was conducted through the JICA study. The detailed results of the EIA study were compiled as a draft EIS report as shown in Appendix 9.2.

Table 9.3.2 List of Participants of the Official Scoping Session

Agency/organization	Contact Offices	No. of Participants
DPWH	PMO FS	13
	Planning Service	1
	Regional IV A Office	1
	Environment & Social Services Office (ESSO)	1
DENR	EMB Regional IV-A ²⁾	-
Local Government Units in the Study Area ¹⁾	Barangay Chairpersons	24
	Barangay Policy Makers	17
	Other Barangay Officials	4
	Town Planners, Social Work and Development Officers, and Other Officers	17
Non-Government Organization	Urban Poor Association	1
	International Infrastructure Rural Reconstruction ³⁾	1
	Others (Barangay NGO)	2
Business Sector/Large Property Owners	Ayala Land, Inc	1
	San Miguel Properties, Inc.	2
	Homeowners and others	1
JICA	JICA DPWH Advisory	1
JICA Study Team	Consultant Team	7
	Project Office Staff	4
Total Number of Participants		98

Note: ¹⁾ - Covering LGUs directly affected by the road alignment in the study area (i.e., 6 in Cavite, 2 in Laguna and 1 in Metro Manila).

²⁾ - Representatives could not attend but requested for detailed recording of meeting.

³⁾ - Dual role as NGO as well as property owner in Silang, Cavite.

9.4 Preliminary Resettlement Action Plan

9.4.1 Results of Household Inventory Survey for Resettlement

All potential households to be resettled with 826 households were inventoried along the all alternative alignments with 10 m width of buffer from both side edges of the proposed ROW⁸. Direct interview of the households to be potentially relocated were conducted to collect socio-economic and livelihood information of the households including questions on perception of the project as mentioned in the above section.

Through the survey, survey control number to the housing units was assigned with marking the interviewed households on community spot map and taking photo record of the housing unit. The following items are mainly inquired in the interview.

- Residential conditions: lot size, floor area, duration of occupancy, housing type, housing materials/appearance, tenure status/land status, household income
- Intention of the resettlement: acceptability and preferred relocation site

Based on the inventory survey, the number of households to be potentially affected by the selected road alignments is shown in the following table.

Table 9.4.1 Affected Households on Selected Alignment

Municipality	North-South Road	East-West Road	CALA Expressway	Total
Bacoor	349	0	0	349
Dasmariñas	49	0	0	49
Gen. Trias	0	13	0	13
Imus	13	39	0	52
Silang	0	0	21	21
Tanza	0	3	0	3
Total Cavite	411	55	21	487
Muntinlupa	0	132	0	132

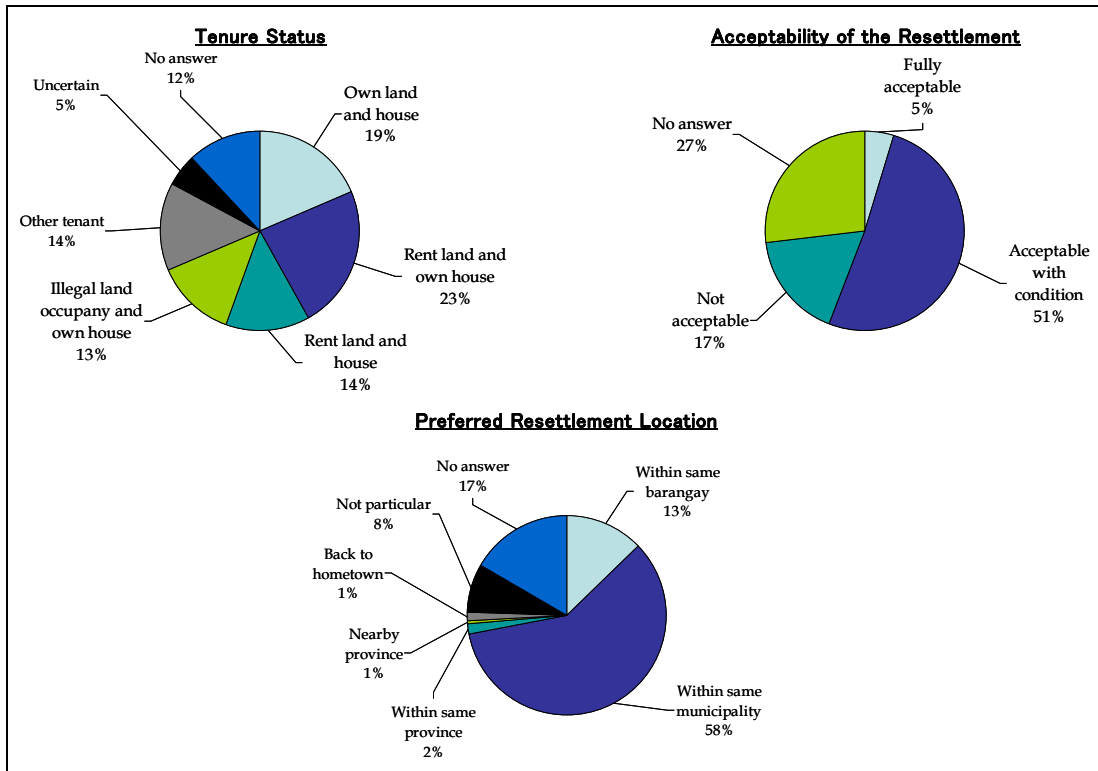
Note: The figures in the table include households on the buffer strip of the road alignment (where 10m width of buffer from both side edges of the proposed ROW was surveyed).

According to the survey, about 40% of the respondents are titled land and/or house owners. At least, 13% of the respondents live on government/private land as informal dwellers. This means, at least, about 100 families will require

⁸ It was supposed in the beginning of the survey that change of the road alignment in the basic design would be made within 10 m width of buffer from both side edges of the proposed ROW for the most of the road sections, considering both natural and social conditions in and around the ROW area, which were known in the beginning of the survey, such as topographical conditions and land availability to be acquired for the project. Errors by surveyors in identification of the ROW boundaries on the site were also considered in the 10-m buffer. In addition, additional survey was conducted in the basic design stage during the JICA study for some road sections where large shift of the alignment was needed to outside of the buffer based on detailed information obtained from detailed examinations by overlaying the road alignment on the aerial photograph as well as from developers and landowners.

“socialized” housing assistance. The survey data indicate that 56% of the respondents are acceptable for the resettlement and more than 70% of the respondents prefer “in-city” or relocation within their own municipalities.

Figure 9.4.1 Acceptability of Resettlement and Preferred Resettlement Location



9.4.2 Summary of the Preliminary Resettlement Action Plan

(1) Preparation of the Resettlement Action Plan (RAP)

A preliminary Resettlement Action Plan (Pre-RAP) has been prepared by DPWH with technical support of the JICA Study Team in the Study. A comparative study of various alternative routes involving (i) North-South Road, (ii) Cavite-Laguna Expressway, and (iii) Daang Hari Road was undertaken in terms of land acquisition, number of households/structures to be affected, resettlement and other compensatory issues to determine the most viable, cost effective and acceptable option.

The Pre-RAP deals with only the selected routes/sections. It is based on Perception Survey and Household Inventory Survey for Resettlement of the households and business owners likely to be affected by the project ROW. Both surveys were carried out between October 2005 and February 2006. DPWH as project executing agency will use the Pre-RAP as a planning tool, prepare a full inventory of land acquisition and affected households/structures, based on Parcellary Survey during detailed design period. While the principles and the resettlement entitlements have been stipulated in this Pre-RAP, the compensation

packages for the affected households/shops and enterprises, including budget, will be revised based on further detailed planning.

In the preparation of the Pre-RAP, the following “12 must to tasks” considered further as shown in the following table.

Table 9.4.2 Twelve “Must Do” Tasks in RAP Preparation

Key Issue	Requirements
1. Determine Number of affected persons, including those requiring relocation	<ul style="list-style-type: none"> ✓ Establish an estimated number of the affected persons ✓ Include both directly and indirectly affected persons
2. Conduct consultation with stakeholders	<ul style="list-style-type: none"> ✓ Inform, consult and involve the stakeholders in the RAP planning process
3. Consider gender planning in resettlement	<ul style="list-style-type: none"> ✓ Women have different needs than men ✓ Consider gender-based differential impacts of resettlement ✓ Develop additional eligibility for social support, services, employment, and means of subsistence for income restoration.
4. Pay special attention to vulnerable groups	<ul style="list-style-type: none"> ✓ The needs of vulnerable groups such as female-headed households, indigenous peoples, elderly, disabled, child labor must be addressed ✓ Provision for social preparation for social vulnerable groups
5. Consider replacement value for lost assets	<ul style="list-style-type: none"> ✓ PAPs should be eligible for replacement value for all lost assets
6. Define eligibility and prepare entitlement matrix to cover all PAPs	<ul style="list-style-type: none"> ✓ Define entitlements and eligibility and how compensation and rehabilitation measures will be structured ✓ Include those without titles and ownership rights
7. Identify resettlement site for site and services development	<ul style="list-style-type: none"> ✓ Identify resettlement sites in consultation with the PAPs ✓ Provide civic amenities and services to the sites
8. Plan for income restoration activities	<ul style="list-style-type: none"> ✓ Include plan for income restoration, particularly for the poor and vulnerable groups
9. Plan for capacity building for resettlement management	<ul style="list-style-type: none"> ✓ Assess organization ability of the EA and plan for capacity building for implementation of RAP ✓ Include provision for staff training for resettlement management
10. Consider needs of host populations	<ul style="list-style-type: none"> ✓ The needs of the host population must be carefully addressed ✓ Include provision for civic infrastructure facilities to enhance carrying capacity of the host populations
11. Prepare valuation of assets and cost estimate/budget	<ul style="list-style-type: none"> ✓ Include costs for land acquisition, resettlement, income restoration, implementation/administrative, and monitoring and evaluation (M&E) costs ✓ Consider replacement costs and include unit cost of all items ✓ Explain how resettlement costs will be financed
12. Establish monitoring and evaluation arrangements	<ul style="list-style-type: none"> ✓ Explain M&E and reporting arrangements ✓ Include provision for external monitoring for A category project

Identification of resettlement sites will likely be finalized at detailed design stage. However, the Pre-RAP considers the scope and needs and contain a very preliminary cost estimates for resettlement sites/services, including income/livelihood restoration.

(2) Past Experience with Land Acquisition and Resettlement in DPWH Projects

In case of land acquisition, DPWH pays 100% of the value of the property/assets acquired based on “zonal valuation”, which is lower than the market or replacement value. Further, available reports on resettlement implementation in road projects are not very encouraging. For example, the Sixth Road Project funded by the Asian Development Bank (ADB) faced numerous problems, including relocation and compensation dispute and grievances by the affected families. The Project is almost four years behind schedule due to lack of attention to resettlement during early stage of project preparation as well resettlement implementation work.

Similarly, the JBIC Study on the impact of road projects in Metro Manila reported many implemented issues with regard to resettlement management. Key implementation issues include (i) delay in payments of compensation; (ii) loss of jobs; (iii) decline in family income; and (iv) problems at the resettlement staging area prior to resettlement. The highlights of the resettlement programs were the following:

- Security of tenure, particularly by the informal dwellers, at the resettlement site helped improve housing and quality of life in post-resettlement period.
- “In-city” relocation strategy was favorably viewed by the affected families, which enabled the resettlers their jobs/employment and access to basic services.
- No major disruption in social life and schooling for children.

In case of NHA-sponsored “socialized housing”, the frequently cited problems with regard to resettlement are: (i) lack of funds and affordable land for in-city resettlement; (ii) distant or off-city resettlement sites with lack of civic amenities; and (iii) lack of livelihood opportunities at resettlement sites. It is important to take “lessons” from resettlement experience in the Philippines in general and road projects in particular to design plan for resettlement management in the CALA Project.

(3) GOP Laws/Policies

GOP has established laws and regulation with regard to development-induced resettlement. The applicable policies are shown in Table 9.4.3.

Table 9.4.3 Summary of Relevant Policies on Land and Resettlement

Subject	Policy	Description
Eviction and Demolition	RA 7279 known as Urban Development and Housing Act (UDHA)	Observance of just and humane manner in eviction and demolition.
Land Valuation, Compensation and Acquisition	RA 8974	Modes of land acquisition; Procedures in expropriation and compensation.
Resettlement Options	RA 6026	Provides options and assistance to squatters (informal settlers)
Compensation for lost crops	RA 6657 (Comprehensive Agrarian Reform Law)	Compensation for lost crops; Displaced tenants and settlers
Eminent Domain	Circular No. 35 and RA 7160	Allows government to exercise eminent domain on payment of just compensation
Community Participation	Article III Section 10 of 1987 Philippine Constitution	Participation of communities in development initiatives
Gender and Development	RA 7192	Mainstreaming gender concerns in development projects

(4) JICA and DPWH Guidelines

The JICA Guidelines are very specific about resettlement of project-affected persons. The Guidelines require that the affected persons should not be disadvantaged as a result of the project. Further, affected persons must be informed and consulted in all phases of the project and paid replacement value for their lost assets. The JICA Policy also pays special attention to vulnerable groups.

DPWH has adopted some internal guidelines similar to JICA and other donor agencies. The guidelines, known as Land Acquisition, Resettlement and Rehabilitation (LARR) provides the basis for compensation, resettlement assistance, operational procedures and provision for internal and external monitoring.

(5) Resettlement Framework for CALA Project

The Resettlement Framework for CALA Project outlined in Table 9.4.4 are based on the relevant GOP laws/regulations, JICA and DPWH guidelines. The Project Resettlement Framework adheres to the following principles derived from GOP laws and other guidelines mentioned earlier.

(6) Resettlement Strategies/Options

A key objective of the RAP is to ensure that all PAPs receive adequate compensation and assistance to restore their livelihood in post-resettlement period. Particular attention has been paid to needs of the poorest and vulnerable groups to be resettled. Based on the principles and eligibility to entitlements, a resettlement entitlement matrix has been established to guide payments of compensation and RAP implementation. The matrix covers all types of losses – land, housing, shops/enterprises, temporary and/or permanent loss of income sources, transitional allowances, and provision for resettlement on project-sponsored and/or “socialized housing” by NHA. The Pre-RAP contains several relocation options. These include: (i) *balik-probinsya* where PAPs will be given financial assistance to return to their respective provinces; (ii) financial compensation equivalent to replacement value of structures (that is, without deducting depreciation and salvage value). In this alternative, the PAPs will be responsible for finding their own residential area. In other words, they will manage their own resettlement – i.e., “self-relocated”; and (iii) relocation to available government resettlement areas or within private socialized housing developments by NHA.

Table 9.4.4 Project Resettlement Framework

Subject	Outline of Actions
1. Payment of Land	<ul style="list-style-type: none"> • Payment will be given to registered owner with Transfer Certificate Title (TCT) as proof of ownership. Tax declaration receipt is not proof of ownership. • Tax declaration may elevate into full ownership upon application for titling with DENR. Without a TCT, only improvements will be compensated. • Payments will be done after DPWH ROW agents have verified land titles with concerned government agencies. • The price may be negotiated. The last recourse of DPWH is a court case in the event the landowner is not amenable to sell his property at the offered price.
2. Payment of Structure	<ul style="list-style-type: none"> • During feasibility study, directly affected-households and their structures will be identified based on road alignment. In the detailed engineering phase, the structures will be photographed, tagged and estimated to determine the right-of-way cost. • The structures will be paid based on replacement value as of designated cut-off date.
3. Compensation of Trees and Crops	<ul style="list-style-type: none"> • The owners of trees and crops will be compensated based on values in the provincial and/or municipal assessor's office. • There may be trees that have no listed value in the provincial or municipal assessor's office. In these cases, the values of trees and crops in the Dept. of Agriculture or DENR will be the bases of valuation.
4. Partial Effects on Structures and Lands	<ul style="list-style-type: none"> • If only 1/5 or 20% of the house will be affected and still be livable and safe, then only the affected portion of the house will be compensated. If it is not livable, then owner will be compensated for the whole structure. • If partially affected lands are no longer livable or economical viable to sustain existing usage (eg., agricultural or commercial activities), then the whole property will be compensated. • Portions of land actually used or impaired because of the project will be compensated by the project. The original TCT will be subdivided and new titles will be issued in favor of government and owner.
5. Relocation	<ul style="list-style-type: none"> • Relocation is an option for households who own structures but not the land it is built on. DPWH will supply the necessary information about the directly affected households to the municipality based on the data gathered during various stages of the project. • The municipality as part of its counterpart for the project will then prepare a relocation site based on the actual number of households in their municipality who opted for resettlement. • If the directly affected households are not willing to be relocated, their structures will be paid the replacement value and the households will be assisted to transport their families and belongings. • Social surveys are conducted to determine the average family size and income of all directly affected households in order to establish size of lot and their paying capacity. • There will be no forced eviction without court order. • The next step will be disclosure activities where dislocated households will be informed about their relocation options and compensation. The objective of this disclosure is to avert the need for forced eviction by providing acceptable compensation. • The foreign funder will not release any amount for the construction unless DPWH has resolved the right-of-way issues and has paid the affected owners 100% of the compensation, to be compensated at least a month before actual construction can begin.
6. Alignment	<ul style="list-style-type: none"> • As a rule, the road alignments proposed by DPWH will try to avoid structures particularly those providing public services such as schools and hospitals. Proposed road alignments veered away from structures that are very expensive such as main transmission lines for electricity.
7. Public Hearing	<ul style="list-style-type: none"> • Public hearing and barangay consultations required by the DENR as part of the EIS process are to be conducted to inform the affected residents and to elicit the views, concerns and issues on the proposed project.

Subject	Outline of Actions
8. Land Valuation	<ul style="list-style-type: none"> • If the offered price for the properties is perceived to be low and the landowner asks for a better price, DPWH will commission an independent appraiser to determine the replacement cost. As a last recourse, DPWH can file expropriation through the power of eminent domain of the state. However, to prevent this legal eventuality, consultations are undertaken to thresh out issues and concerns of directly affected households.
9. Compensation of Tenants	<ul style="list-style-type: none"> • The legal tenant of the land will be paid based on the Comprehensive Agrarian Reform Law. • In cases wherein the tenant will be dispossessed from the land he tills, the prescribed compensation to be given to the tenant is equivalent to 1 year income from the harvest based on average of past 3 years. The total amount should not be less than P15,000/ha.
10. Inherited Land	<ul style="list-style-type: none"> • DPWH will compensate the heirs with legal proof of land ownership.
11. Transparency	<ul style="list-style-type: none"> • The residents will be given updates during the various stages of the project through stakeholders' meetings, focus group discussions, consultations, etc. • In the detailed engineering stage, the households to be affected will be positively identified. Before actual relocation, consultations and coordination will be done with the affected parties, barangay and municipal officials. • Disclosure meetings will be held, which will provide detailed valuation for the land or structure to the directly affected owners.

(7) Implementation Framework and Budget

DPWH will be in charge of the implementation of the project and the execution and coordination of land acquisition and resettlement. ESSO will provide technical guidance and support in the implementation of the RAP and will be responsible for the following resettlement activities: (i) oversee the RAP implementation; (ii) submit of RAP budget plans (to include compensation, relocation costs, operation) for approval of allocation of needed resources by DPWH central office; (iii) ensure the availability of funds and the proper accounting of expenses; (iv) guide the RICs in their tasks, such as the verification of PAPs, final inventory of affected assets, and information dissemination; (v) amend and/or revise RAP in case of problems identified during the internal and/or external monitoring of its implementation; (vi) in collaboration with its counterpart in the region, following-up with concerned DPWH Regional Office the processing of compensation claims of PAPs; (vii) monitor the actual payment of compensation to PAPs; and (viii) prepare periodic supervision and monitoring reports on RAP implementation for submission to PMO and the funding institution. The estimated cost for land acquisition and resettlement is P2,320 million.

(8) Monitoring and Evaluation

RAP implementation shall be monitored both internally and externally. The Executive Agency (EA) and ESSO will be responsible for internal monitoring. ESSO will prepare quarterly reports and submit to the funding agencies. The reports shall contain progress made in RAP implementation with particular

attention to compliance with the principles and matrix set out in the RAP. Independent monitoring expert/agency shall be hired by the EA with donor(s) concurrence. The expert/agency shall carry out external monitoring bi-annually. The EA shall prepare a post-construction evaluation report on the resettlement process and detail the extent to which the compensation paid and other measures have enabled PAPs to maintain or enhance their pre-project social and economic living conditions.

(9) Draft Outline of the Pre-RAP

A draft Pre-RAP has been prepared and presented in Appendix 9.3. The following is an outline of its contents.

Table 9.4.5 Outline of the Preliminary RAP

<p>Chapter 1: The Project</p> <ul style="list-style-type: none"> • <u>Introduction</u>: brief introduction to the project and various components, including benefits of the project construction. • <u>Project data and Impact</u>: three major components – describe those with regard to length/width, ROW etc (table – project component and LA requirements; table – households and commercial/business enterprises (CBEs) requiring relocation.) • <u>Objectives of the RAP</u>: describe the major objectives – identification of impacts; assessment of losses and development of mitigation measures; plans for resettlement implementation. • <u>Guidelines on LAR</u>: follow RAP laws/regulations, DPWH policy/practices; JICA guidelines and “best practices” in resettlement derived from various donor funded projects in the Philippines. <p>Chapter 2: Review and analysis of SES data</p> <ul style="list-style-type: none"> • <u>Project area</u>: describe the project area with respects to local socioeconomic aspects, transportation, economy, ecology and general environment/settlement pattern; use census data as reference when required. • <u>Land use and settlement pattern</u>: discuss land use pattern – agriculture, industrial, etc.; nature of settlements and housing by types (provide a map of the area; use table with regard to type of housing etc.) • <u>Methodology/study processes</u>: describe the methodology of various studies – perception/social – and instruments used; problems, if any, associated with the administration of the surveys and how they were resolved; describe the database thus created. • <u>Socio-economic profiles of the PAPs</u>: broad overview of the PAPs with respect to demography, education etc. (use tables); <u>must</u> include <u>tables</u> on tenure status of households/CBEs on the ROW; occupational background of the head of households/CBE owners. • <u>Gender Impacts and Dimensions</u>: describe differential gender impact of the project, if any; role of women in household economy/income and decision-making process; how dislocation and relocation will affect household and household structure, if any. • <u>Directly/Indirectly affected persons</u>: define the concepts and present the overview impact of the project with regards indirect impacts; provide tables. • <u>Types of Losses</u>: Identify in very clear terms the various types of losses in details; this is critical to develop compensation principles/packages and eligibility. • <u>Perception of the PAPs about the Project</u>: use of data from perception study with regard to acceptability of the project and various concerns raised during stakeholders meeting; use tables. <p>Chapter 3: The Policy Framework</p> <ul style="list-style-type: none"> • <u>RP Laws/Regulations</u> describe RP laws and regulation with regard to development-induced relocation and resettlement; DPWH practices in the roads/highway sector; review and identify inadequacies of the current policies to deal with project impacts. • <u>Project Resettlement Framework</u>: No involuntary resettlement policy in the Philippines; main principles of the “socialized” housing program – NHA policy framework; consider international/donor-funded project experience in the Philippines and include necessary <u>improved</u> provisions, if necessary; highlight the major principles. • <u>Project Compensation Policy and Entitlements</u>: define the policy with regard to losses; discuss eligibility of the PAPs; include all relevant items/losses to be covered by the compensation policy; relocation/resettlement assistance; housing and income restoration; special attn to the vulnerable groups; establish an entitlement matrix (by types of losses, entitlements, and eligibility). • <u>Define key terms used in the RP</u>: this is critical to bring clarity to the process; include PAPs, LA; entitled persons; structures – households/CBE; resettlement assistance; compensation; relocation; resettlement; project affected communities; host communities; vulnerable groups etc. • <u>Outstanding Tasks</u>: list any outstanding preparatory tasks to be completed during detailed design and prior to project implementation – for example, further verification of the AP list and confirmation of the list; disclosure; development of the resettlement sites etc. <p>Chapter 4: Relocation and Resettlement Plan</p> <ul style="list-style-type: none"> • <u>Scope of displacement and resettlement</u>: provide table with regard to number of PAPs/CBEs requiring resettlement by
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project components

- Relocation choices: PAPs may prefer different options – for example, self-relocation; assisted relocation to project-sponsored sites by NHA; other options: discuss implications of various options
- Resettlement assistance – includes a broad range of choices – reestablishment of businesses; income/restoration of income/livelihoods; shifting allowances; other assistance
- Gender planning – should focus on the needs of women in resettlement and special assistance/mitigation measures; employment opportunities.
- Resettlers-host relationship: sharing common property resources developed in resettlement sites; role of NHA/project EA
- Income/Livelihood Restoration Program – aiming economic and social development of the resettlers; community-based program for training and restoration of livelihood
- Re-establishing common property resources affected by the project
- Resettlement costs/budget: itemized costs of all affected assets (based on replacement/market value); explain the valuation methods and practices in the Philippines; compensation cost for land, structures; businesses, loss of employment; other indirectly affected costs; development resettlement sites/services; hiring of NGOs for RP implementation; administrative and monitoring/evaluation costs etc.

Chapter 5: Community Participation and RP Implementation Framework

- Disclosure and Consultation with PAPs- meetings held at the barangay/community levels; provide documentation of meetings (in tables) – when, where held and issues discussed and concerns raised by the PAPs and how these were reflected in the policy formulation
- Steps to enhance community participation – identify various steps to be taken by the EA for further disclosure and participation of the affected people in the implementation process
- Resettlement organization and framework – establish a flow chart highlighting the various agencies/persons responsible of specific tasks and deliveries; the organization must include the following: role of DPWH; NHA; role of PMO/Resettlement field offices; training/capacity building for DPWH staff; role of NGO in the implementation program, particularly income restoration/social development activities; resettlement advisory committees; grievances redressal committees; resettlement databank and MIS; time-bound implementation plan of various aspects of the resettlement plan

Chapter 6: Monitoring and Evaluation

- Supervision, monitoring and evaluation – define roles and responsibilities
- Internal monitoring – indicators/methodology and responsibility
- External monitoring – hiring and scope of external monitoring
- Reporting requirements – quarterly monitoring system
- Resettlement performance evaluation by third party at the end of the project

(10) Outstanding Tasks in the Further Project Stage

Due to the preliminary level of project planning and design, the draft Pre-RAP is considered a planning tool only. There are gaps and outstanding tasks that have to be addressed by DPWH after the feasibility study is complete. These include, among others, updating of the inventory of affected households and assets, inventory of affected businesses, identification of relocation sites and related implementation issues, income and livelihood restoration measures for vulnerable groups. A brief list of outstanding work and processes are presented below.

1) Zoning amendments

The proposed road alignments and their ROW will have to be indicated in the zoning plan and ordinance and development guidelines should be prescribed for the affected parcels:

- The proposed ROW should be integrated in any proposed development, considering that CALA Expressway will have limited access
- That developments abutting the proposed national highways roads be required an easement of 5m that will facilitate off-road parking, loading and unloading

- Proposed intersections should at least be spaced 200 m apart along the proposed national highways to allow travel at design road speeds.
- Proposed development applications within the ROW shall be required a waiver on improvements which should stipulate their agreement to demolish said improvements at no cost to the government. Financial compensation for temporary easements may be designed and authorized, until such time that the project is approved and ROW acquisition can be paid.
- Additional FGDs have to be conducted for women-headed households, senior citizens, people with disability, informal settlers and tenants, and the youth who make up the vulnerable groups.

2) Parcellary Survey

This should be done to validate excess property that may have to be compensated, because the property that will be acquired may exceed 20% of the landholding and the remaining property will no longer be viable for its current use.

3) Survey of commercial improvements

The business losses of commercial improvements will have to be separately surveyed.

4) Survey of utilities

There should be a survey of electric posts, water pipe mains, irrigation canals and private subdivision developments that will be affected.

5) Call-back Surveys

Field interviewers in close coordination with barangay officials should return to those who refused to be interviewed in the first household survey and FGDs in order to complete the cost estimates for the RAP.

6) Setting of cut-off dates

Since the ROW alignments are almost final, the cut-off dates should be determined and property developers be informed so that they can integrate these road projects into their development plan.

7) Security of ROW alignments

Coordination with LGUs should be undertaken to secure ROWs from further encroachment. Minimum financial assistance to the barangay council may be negotiated for their security services.

8) Evaluation of alternative relocation sites

The private socialized housing projects will have to be evaluated as to availability and costs. The site selection, development etc. must be undertaken in consultation with the affected persons/communities and LGUs.

9) Coordination with BIR-zonal valuation as the 1998 zonal valuation needs updating.

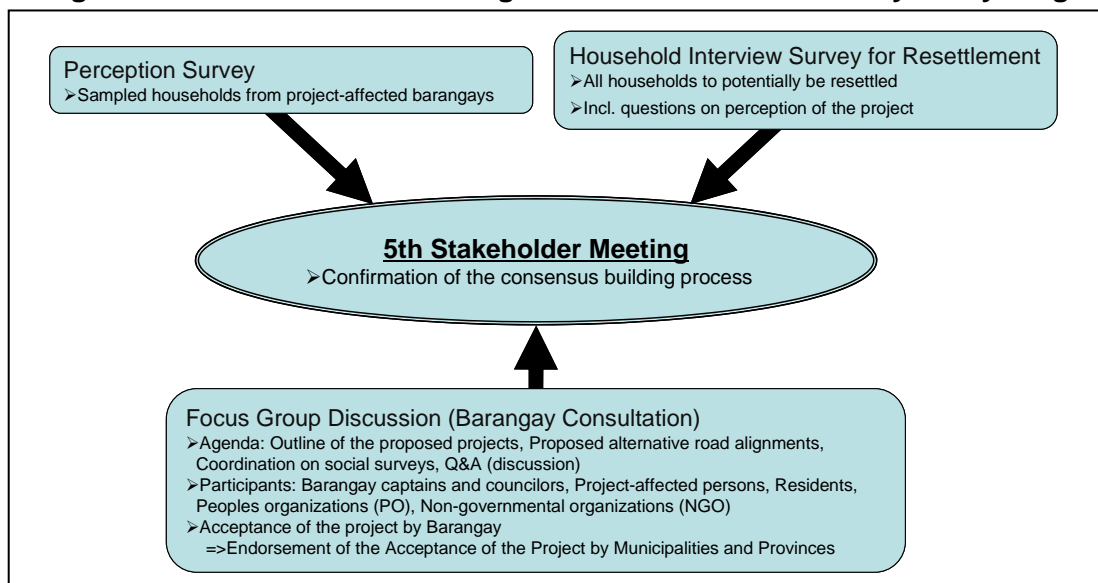
10) Coordination with livelihood agencies to develop plans regarding livelihood assistance.

9.5 Consensus Building Process for Implementation of the Proposed Projects

The project took on several paths for building consensus among the various levels of identified stakeholders. These were in the following forms: (a) stakeholders' meetings; (b) barangay consultations and focus group discussions; (c) household interviews for both directly and indirectly affected households; (d) meetings with local government units' policy making body; (e) meetings with development councils and cluster groups on the municipal and regional levels.

Appropriateness of the consensus building process for implementation of the proposed projects were confirmed after explanation of the process during the 5th Stakeholders' Meetings held in Laguna on March 14 and in Cavite on March 15, 2006 as well as the during the 4th Steering Committee Meeting on March 20, 2006.

Figure 9.5.1 Consensus Building Confirmed at the Feasibility Study Stage



9.5.1 Stakeholders' Meetings

As designed, the project has a total of eight stakeholders' meeting scheduled for disseminating vital project findings and for soliciting timely reactions to project milestones. Among others, the meetings proved to be a valuable source of project inputs for directing study efforts. The topics discussed during the meetings are outlined in Table 9.5.1 and the detailed account of each proceedings is presented in Appendix 9.4. Participants to the meetings ranged from governmental officials from local government units and national government agencies concerned as well as representatives from large property owners/developers, project affected parties (both directly and indirectly affected residents), business groups, and non-government organizations.

Table 9.5.1 Stakeholders' Meetings

No.	Study Phase	Main Subjects	Period	Number of Participants
1st	Preparation of Scenarios	<ul style="list-style-type: none"> • Study Outline • Past, Ongoing & Future Transport Projects • Scope of Stakeholders • Schedule & Objectives of Future Stakeholder Meetings 	March 17, 2005	70 (held at 1 place)
2nd	Evaluation of Scenarios	<ul style="list-style-type: none"> • Alternative Development Scenarios • Environmental Framework: Social and Natural Environment • Alternative Scenarios for Regional Transport Network 	June 16, 2005	81 (held at 1 place)
3rd	Preparation of Optimum Project Plan	<ul style="list-style-type: none"> • Outline of Alternatives • Alternative Measure in Zero Option • Scope and Evaluation Methodologies for Environmental and Social Considerations Study (EIA Level) • Obtain Opinion on Concerned Environmental Impacts (This meeting was also applied for the Official Scoping Session under the EIS Process) 	Sept. 23, 2005	98 (held at 1 place)
4th		<ul style="list-style-type: none"> • Results of Evaluation on Alternatives • Progress and Interim Results of ESC Study (EIA Level) • Study Framework on Preparation of Optimum Project Plan 	Dec.7 (Cavite) Dec.8 (Laguna) Dec.12 (Muntinlupa), 2005	115 (held at 3 places)
5th		<ul style="list-style-type: none"> • Results of ESC Study (EIA Level) • Implementation Arrangements of the Project • Mutual Consent on Optimum Project 	March 14 (Laguna) March 15 (Cavite), 2006	168 (held at 3 places)
6th	F/S	<ul style="list-style-type: none"> • Outline of F/S • Follow-up of ESC Study (EIA Level) • Explanation of Resettlement Policy 	June 2, 2006	115 (held at 1 place)
7th		<ul style="list-style-type: none"> • Progress of the F/S • Explanation of Framework of RAP 	July 18 to August 29, 2006	259 (held at 7 places)
8th		<ul style="list-style-type: none"> • Results of F/S • Mutual Consent on Framework of RAP • Further Arrangement and Requirement for Implementation 	Sept. 8, 2006	134 (held at 1 place)

9.5.2 LGU Consultations and Focus Group Discussions

An integral part of the consensus building activity of the project is the barangay consultations, which were conducted for all potential project-affected barangays along the proposed road alignments. Focus group discussions (FGDs) were held

for all affected barangays and these were attended by the barangay captains and councilors, project-affected persons including potential residents to be relocated by the proposed project, peoples organizations (PO), and Non-governmental organizations (NGO). A total of 58 barangay consultations were conducted covering 49 barangays in Cavite Province, 7 barangays in Laguna Province, and 2 barangays in Muntinlupa City of Metro Manila.

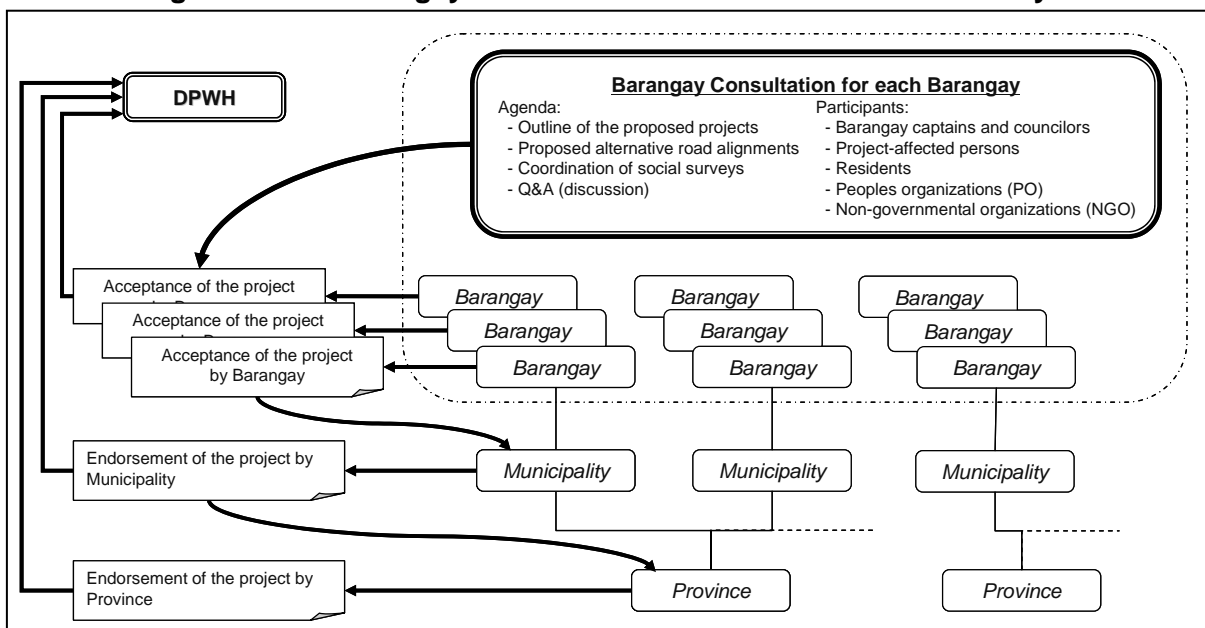
In the barangay consultations, outline of the proposed project was explained by a DPWH officer and a local social expert hired by the JICA Study Team. At the same time, coordination for the social surveys was sought. Some issues and concerns raised by the participants are shown below.

Table 9.5.2 Some Issues and Concerns Raised in the Barangay Consultations

- Is the alignment final?
- Will there be compensation for affected assets? When?
- Is there a ready relocation site?
- How will existing business establishment be compensated?
- Will there be alternative income source in the relocation site?
- What documents are needed as proof of ownership?

After the barangay consultations, concerned barangay offices were requested to issue resolution or endorsement for the project to indicate their acceptance of the proposed projects. With the endorsements from the barangays, municipal consultations were then held to discuss specific road projects for each municipal. In turn, their support was manifested in their signed resolutions submitted to DPWH. Higher up the institutional ladder are the provincial governments with their resolutions as well. This bottom-up approach to garnering consensus from all levels of local governments is depicted in Figure 9.5.2.

Figure 9.5.2 Barangay Consultations and Issue of Resolution by LGUs



9.5.3 Status of LGU and Development Councils Resolutions

Figure 9.5.3 presents samples of resolutions from the barangay level to the provincial level of the local government units. The resolutions of the provinces are then presented to the Regional Development Council of Region IV for a project endorsement on the regional level. This would complete the circle of consensus for the project from local governments for submission to DPWH as basis for project prioritization and for submission to EMB-DENR as proof of social acceptance of the project under the EIS system. All resolutions submitted were shown in Appendix 9.5.

Figure 9.5.3 Sample of Resolutions Issued by LGUs

- Resolution of Municipality
 - General Trias, Cavite
- Resolution of Barangay
 - Talaba III, Bacoor, Cavite

- Resolution of Province of Cavite
 - Resolution of Province of Cavite