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USAID/El Salvador Tropical Storm Ida Reconstruction Project

Programmatic Environmental Mitigation Plan for Schools

February 2013

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Note:

The author's opinions expressed in this publication do not necessarily reflect the viewpoints of the United States Agency for International Development or of the Government of the United States.

Acronyms

ANDA	National Administration of Aqueducts and Sewers
AMSS	Metropolitan Area of San Salvador
CE	Centro Escolar - School Center
CDE	Consejo Directivo Escolar (School's Directive Board)
EA	Environmental Assessment
PMA	Environmental Mitigation Project
GIS	Geographic Information Systems
GOES	Government of El Salvador
GRAM	GRAM Arquitectos S.A. de C.V.
EAI	Initial Environmental Assessment
MARN	Ministry of the Environment and Natural Resources
MINED	Ministry of Education
R/R	Reconstruction/Rehabilitation
STP	Technical Secretariat of the Presidency
USAID	United States Agency for International Development

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1. Introduction

This document presents a Programmatic Environmental Mitigation Plan for Schools that consists of a qualitative analysis of the potential environmental impacts of each school site (also referred to as school centers – centros escolares [CE]), located in several municipalities of the country. The identification of potential impacts was determined through a review/analysis of the data obtained through a rapid assessments previously carried out at each location in coordination with the Ministry of Education of El Salvador as the government institution responsible for these facilities.

Three levels are considered to determine the order of importance according to potential environmental impacts: 1-Green, 2–Yellow and 3-Red; defined as follows:

- **1-Green:** Low impact levels; in the context of this environmental assessment, this level means that the changes associated with anticipated activities, activity levels or processes will probably result in little or no effect on the quality of the human environment at the program level. These impacts do not require mitigation and are well within the standard, regulatory or policy limits for environmental protection.
- **2-Yellow:** Medium impact levels. This level means that the changes associated with activities, activity levels or processes will probably result in moderate adverse effects on the environment at the program level. These are short-term or low-intensity effects and do not reach a significant level. Medium impacts do not create effects that exceed the standard, regulatory or policy limits for environmental protection.
- **3-Red:** High impact levels means that the changes associated with activities, levels of activity or processes will likely result in adverse effects on the environment according to the conditions of each site. The level of these impacts depends on site conditions, as well as on intensity and duration of changes. These impacts exceed allowable limits of current environmental regulations.

Sites are classified in three potential environmental action scenarios based upon the territory in which the facilities are located. These are: coastal plain, scattered mountains and central plain/metropolitan area of San Salvador.

2. Scope

Based on the analysis of potential environmental impacts for each studied location, this report presents a Programmatic Environmental Mitigation Plan for 20 Schools (CE) damaged by Tropical Storm Ida, which impacted El Salvador in November of 2009.

Information was gathered in this project for 32 schools that require interventions; however, this Programmatic Environmental Mitigation Plan focuses on 20 schools prioritized by the Government of El Salvador and for which it was possible to compile all legal documentation required for USAID financing.

3. Purpose

The purpose of this Programmatic Environmental Mitigation Plan is, for each of the priority projects, to provide intervention guidelines to be taken into account during construction and operation stages.

The design-build Contractor will use the Programmatic Environmental Mitigation Plan and adapt it to each and every school included in its Contract with the purpose of implementing and monitoring all environmental mitigation activities related to the final design and construction process. Socio-economic mitigation activities must, in all cases, include provisions to foster gender equality.

4. Description sites projects

3.1 List of CE projects general

The total number of School projects initially identified by MINED was 32; however, during a prioritization process with the Ministry of Education, the number of school centers was reduced to 20 locations, given that for the rest of schools submitted it was not possible to compile all legal documentation to make viable the execution of works with USAID funding. A list of the original total of school center follows, indicating their territorial scenario.

ID	Location	Municipality	Department	Terrain contour
1	CE Antonio Najarro	MEJICANOS	SAN SALVADOR	Central Plains/ Urban
2	CE República de Francia	MEJICANOS	SAN SALVADOR	Central Plains/ Urban
3	CE El Progreso	SOYAPANGO	SAN SALVADOR	Central Plains/ Urban
4	CE Monseñor Basilio Plantier	SAN SALVADOR	SAN SALVADOR	Central Plains/ Urban
5	CE Dr. Antonio Díaz	SANTO TOMAS	SAN SALVADOR	Mountains scattered
6	Complejo Educativo Claudia Lars	SAN FRANCISCO CHINAMECA	LA PAZ	Mountains scattered
7	CE Cantón San Sebastián Abajo	SAN JUAN NONUALCO	LA PAZ	Coast Plains

ID	Location	Municipality	Department	Terrain contour
8	Instituto Nacional San Luis La Herradura	SAN LUIS LA HERRADURA	LA PAZ	Coast Plains
9	CE Felipe Soto	SANTA CRUZ MICHAPA	CUSCATLAN	Mountains scattered
10	Escuela Parvularia Reynaldo Galindo Pohl	COJUTEPEQUE	CUSCATLAN	Mountains scattered
11	CE Cantón Puertas del Golpe	COJUTEPEQUE	CUSCATLAN	Mountains scattered
12	CE Cantón Ojos de Agua	COJUTEPEQUE	CUSCATLAN	Mountains scattered
13	CE Cantón El Copinol	SAN RAFAEL CEDROS	CUSCATLAN	Mountains scattered
14	CE Cantón Veracruz	EL ROSARIO	CUSCATLAN	Mountains scattered
15	CE Cantón El Paraíso	SAN SEBASTIAN	SAN VICENTE	Mountains scattered
16	CE Dr. Adrian García	SAN ESTEBAN CATARINA	SAN VICENTE	Mountains scattered
17	CE Caserío El Jicaro	SAN ILDEFONSO	SAN VICENTE	Mountains scattered
18	CE San Francisco de la Cruz	SAN ILDEFONSO	SAN VICENTE	Mountains scattered
19	CE Cantón La Primavera	QUEZALTEPEQUE	LA LIBERTAD	Central Plains
20	Instituto Nacional José María Peralta Lagos	QUEZALTEPEQUE	LA LIBERTAD	Central Plains/ Urban
21	CE José Dolores Larreynaga	QUEZALTEPEQUE	LA LIBERTAD	Central Plains/ Urban
22	CE Miguel Ángel García	QUEZALTEPEQUE	LA LIBERTAD	Central Plains/ Urban
23	CE Juana Galán de Quintanilla	QUEZALTEPEQUE	LA LIBERTAD	Central Plains/ Urban
24	CE Colonia Las Margaritas 1 y 2	QUEZALTEPEQUE	LA LIBERTAD	Central Plains/ Urban
25	CE Cantón Chantusnene	SAN JUAN OPICO	LA LIBERTAD	Central Plains
26	CE Dr. Francisco Antonio Lima	JAYAQUE	LA LIBERTAD	Mountains scattered
27	CE Cantón Ojo de Agua	HUIZUCAR	LA LIBERTAD	Mountains scattered
28	CE Pablo Castillo	NUEVA CUSCATLAN	LA LIBERTAD	Mountains scattered
29	CE José María Cáceres	ZARAGOZA	LA LIBERTAD	Mountains scattered
30	CE Playa San Diego	LA LIBERTAD	LA LIBERTAD	Coast Plains
31	Instituto Nacional Puerto de La Libertad	LA LIBERTAD	LA LIBERTAD	Coast Plains
32	Complejo Educativo José Simeón Cañas	CHILTIUPAN	LA LIBERTAD	Mountains scattered

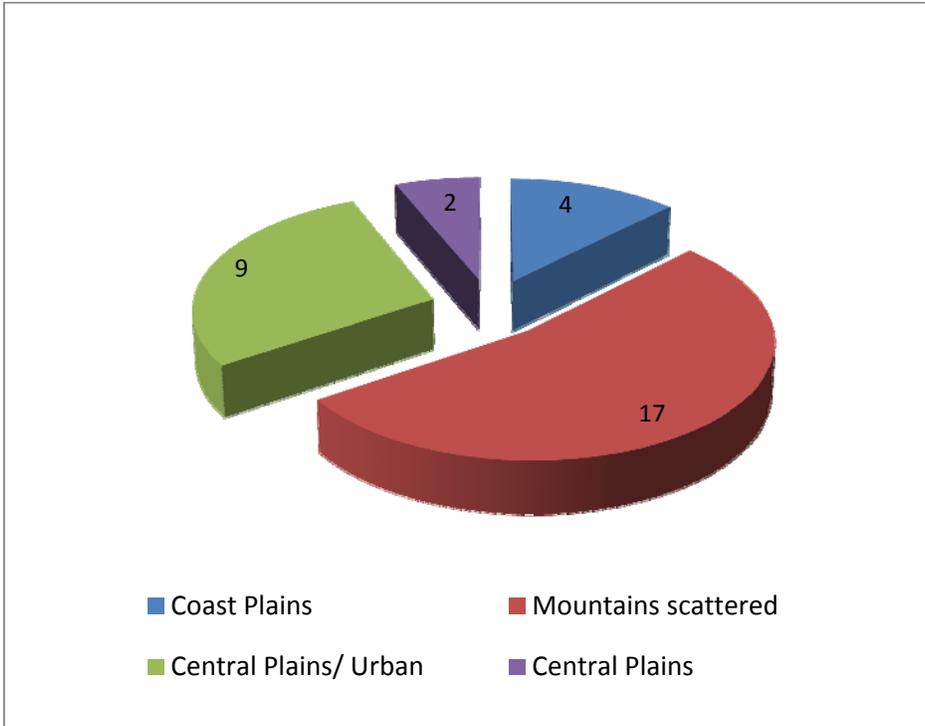
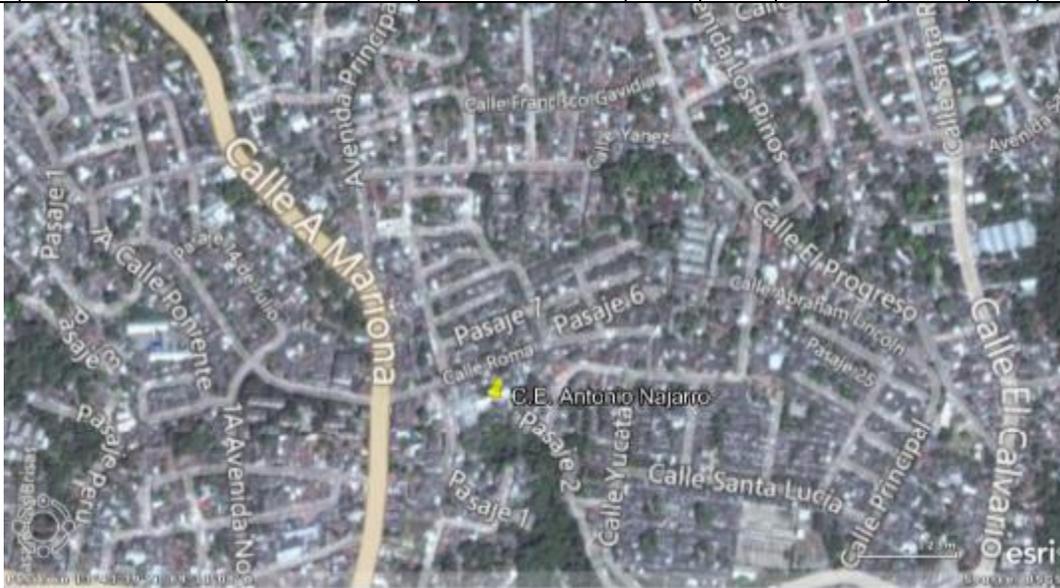


Illustration 1 Quantity of School Center by Territorial relief.

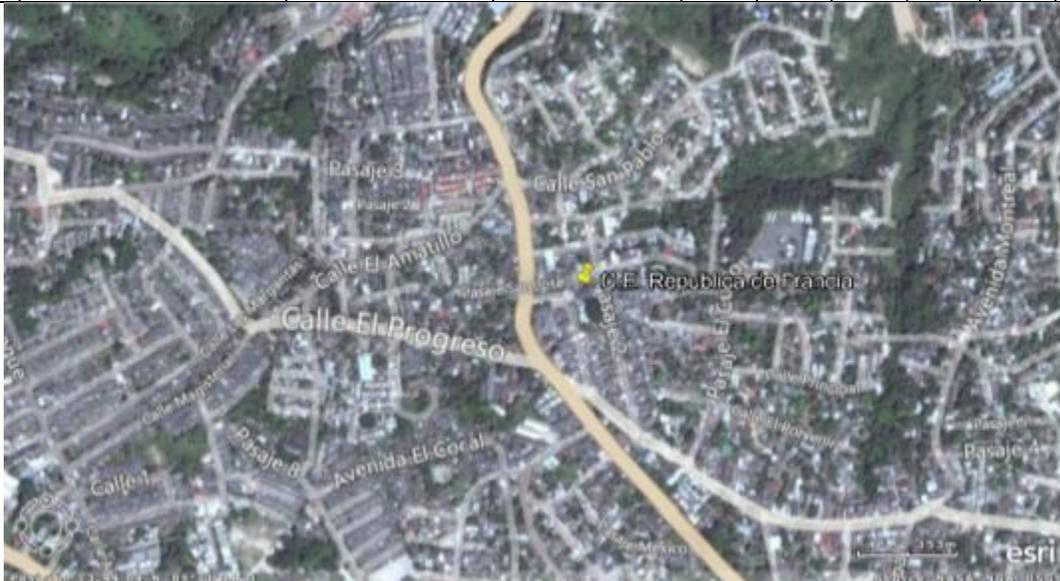
3.3 Location maps and coordinates for 32 projects

The following tables (and graphics) present the geographical coordinates of latitude and longitude (expressed in degrees, minutes and seconds), datum NAD27 of all the locations, using a navigation GPS (Global Positioning System).

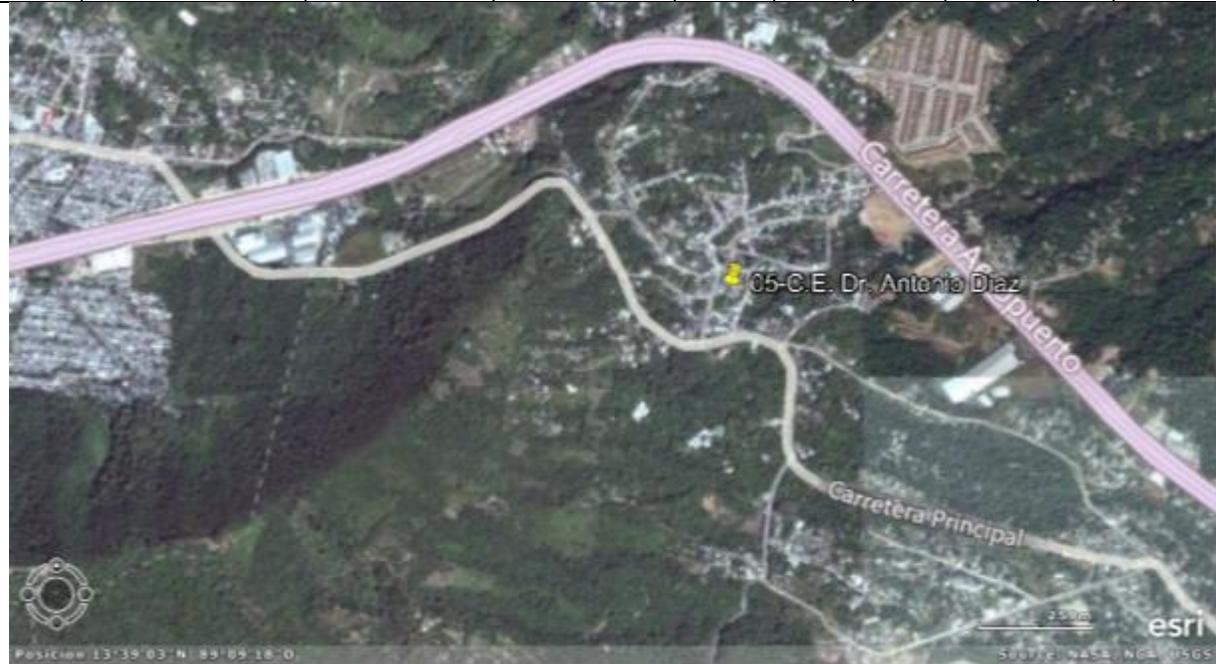
ID	CE Name	Department	Municipality	Latitude			Longitude		
1	CE Antonio Najarro	Mejicanos	San Salvador	13	43	31.325	-89	11	11.214



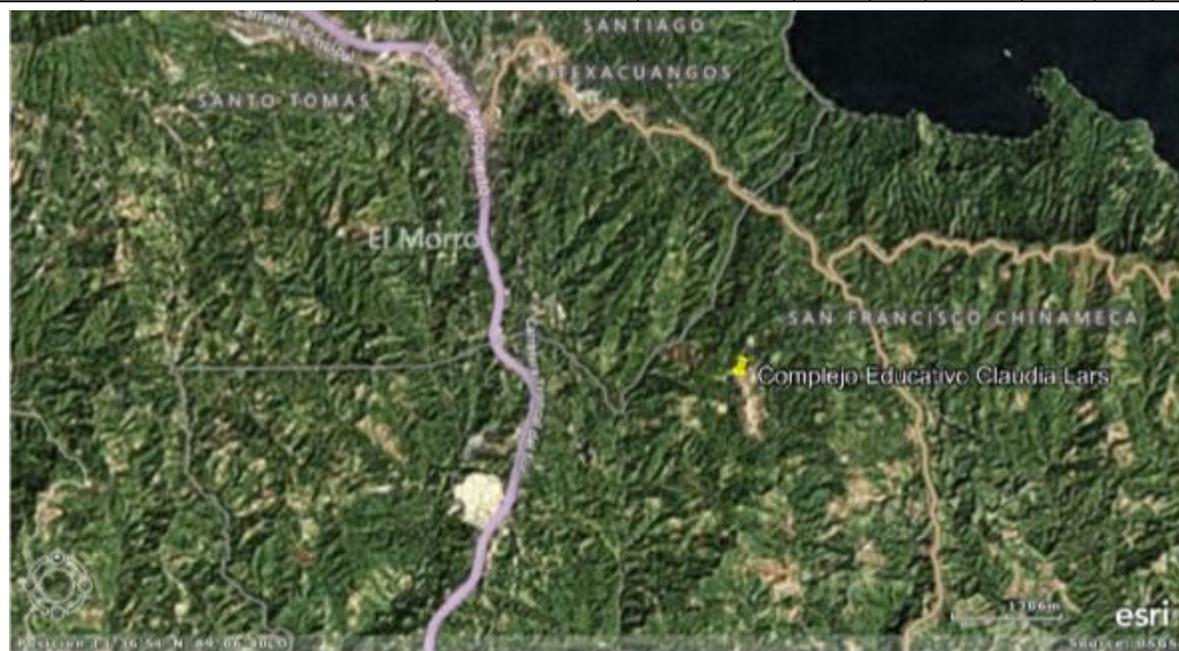
ID	CE Name	Department	Municipality	Latitude			Longitude		
2	CE República de Francia	Mejicanos	San Salvador	13	44	0.41	-89	11	31.552



ID	CE Name	Department	Municipality	Latitude			Longitude		
5	CE Dr. Antonio Díaz	Santo Tomas	San Salvador	13	39	2.868	-89	9	9.159

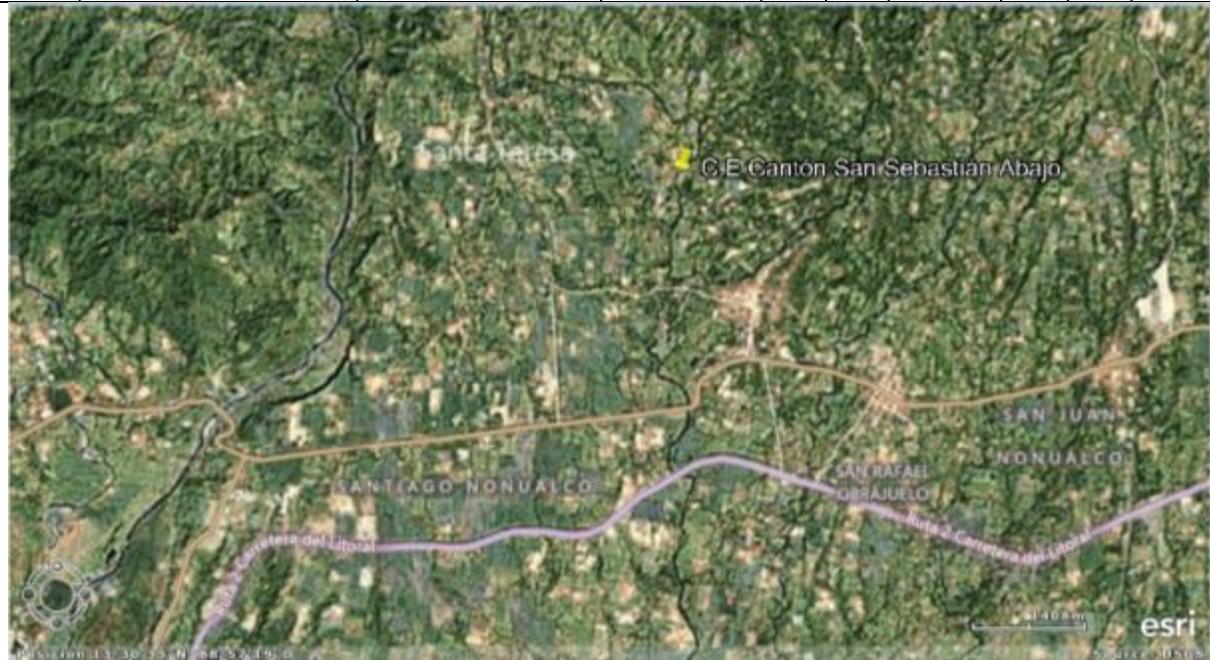


ID	CE Name	Department	Municipality	Latitude			Longitude		
6	Complejo Educativo Claudia Lars	San Francisco Chinameca	Fco. La Paz	13	36	26.836	-89	5	45.842



Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
7	CE Cantón Sebastián Abajo	San Juan Nonualco	La Paz	13	31	33.018	-88	56	50.902



ID	CE Name	Department	Municipality	Latitude			Longitude		
8	Instituto Nacional San Luis La Herradura	San Luis La Herradura	La Paz	13	20	56.006	-88	57	21.383

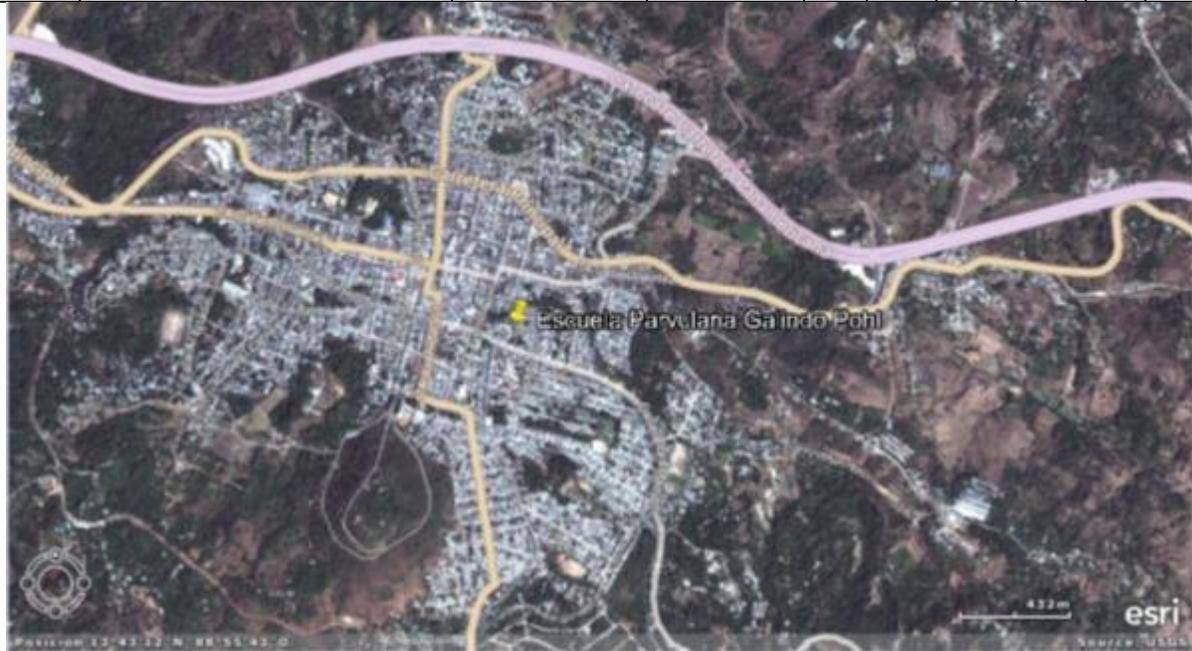


Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
9	CE Felipe Soto	Santa Cruz Michapa	Cuscatlán	13	44	35.236	-88	58	40.049

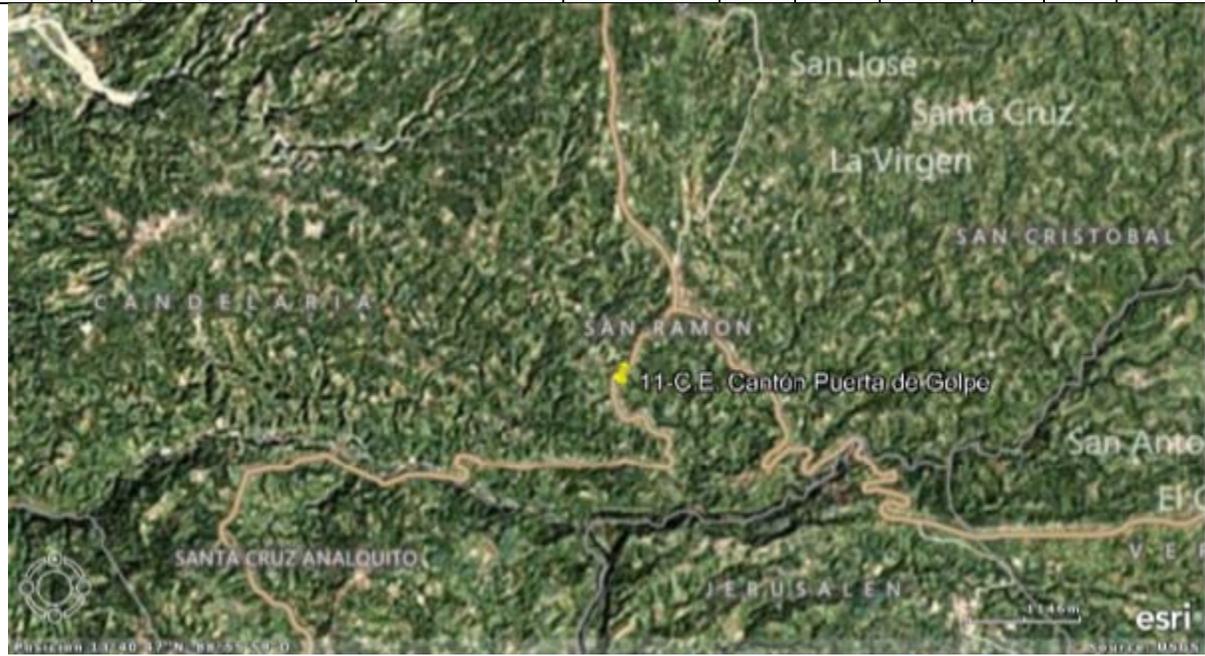


ID	CE Name	Department	Municipality	Latitude			Longitude		
10	E. Parv. Reynaldo Galindo Pohl	Cojutepeque	Cuscatlán	13	43	7.912	-88	55	54.012

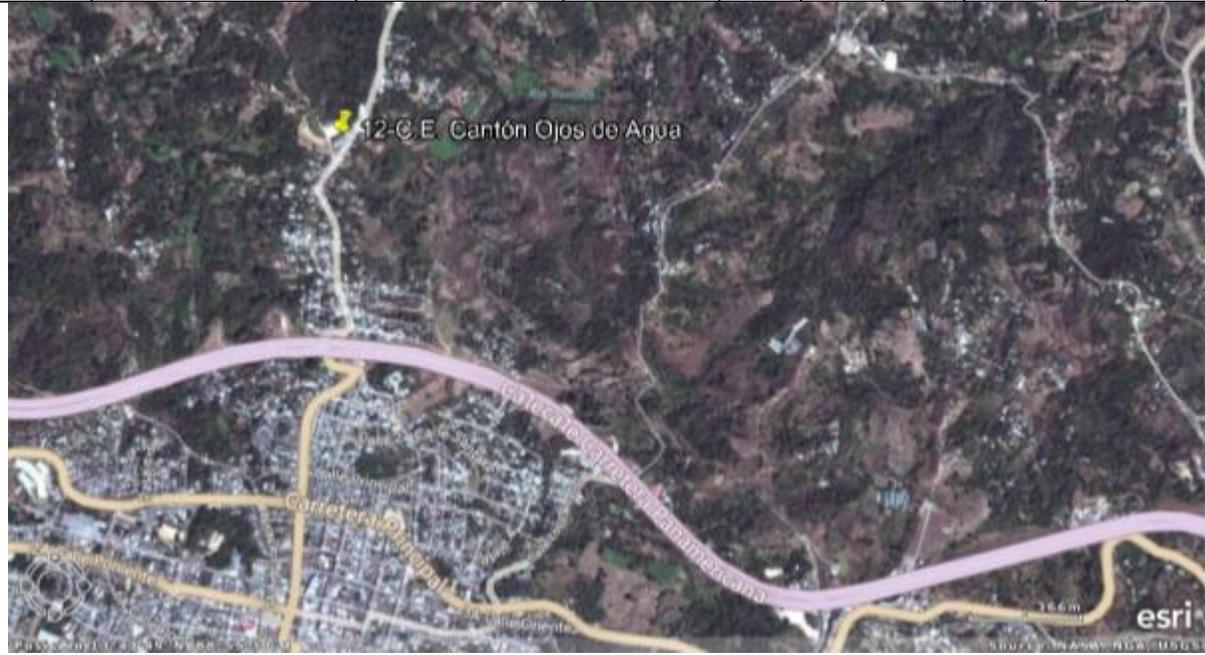


Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
11	CE Cantón Puertas de Golpe	Cojutepeque	Cuscatlán	13	40	23.257	-88	55	56.096

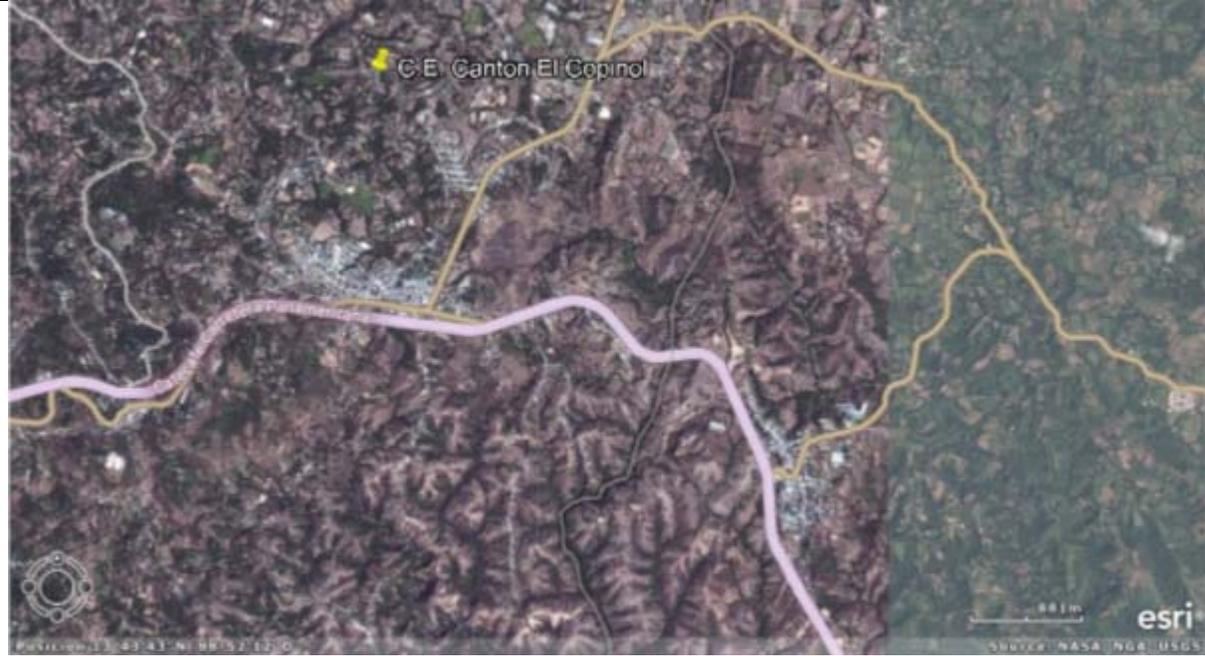


ID	CE Name	Department	Municipality	Latitude			Longitude		
12	CE Cantón Ojos de Agua	Cojutepeque	Cuscatlán	13	44	5.435	-88	55	59.286

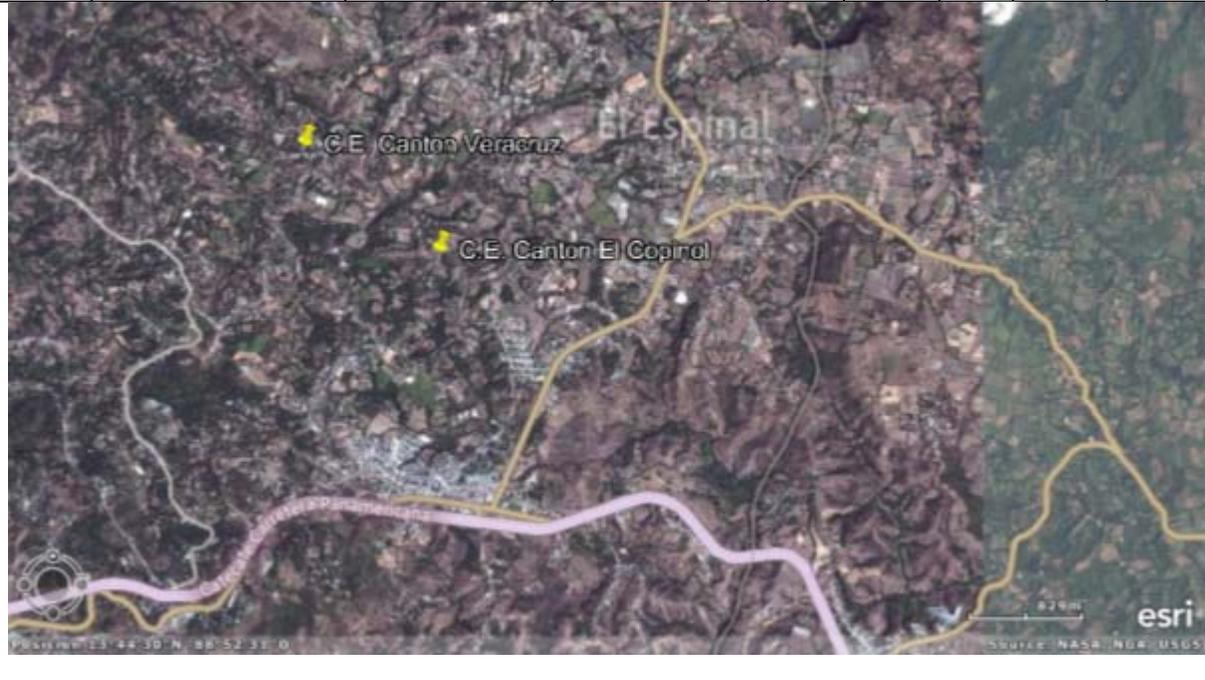


Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
13	CE Cantón El Copinol	San Rafael Cedros	Cuscatlán	13	44	42.324	-88	53	12.136



ID	CE Name	Department	Municipality	Latitude			Longitude		
14	CE Cantón Veracruz	El Rosario	Cuscatlán	13	45	7.496	-88	53	44.955



Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
15	CE Cantón El Paraíso	San Sebastián	San Vicente	13	43	57.645	-88	47	58.186



ID	CE Name	Department	Municipality	Latitude			Longitude		
16	CE Dr. Adrian García	San Esteban Catarina	San Vicente	13	40	55.688	-88	47	19.312



Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
17	CE Caserío El Júcaro	San Ildefonso	San Vicente	13	38	44.725	-88	33	0.571

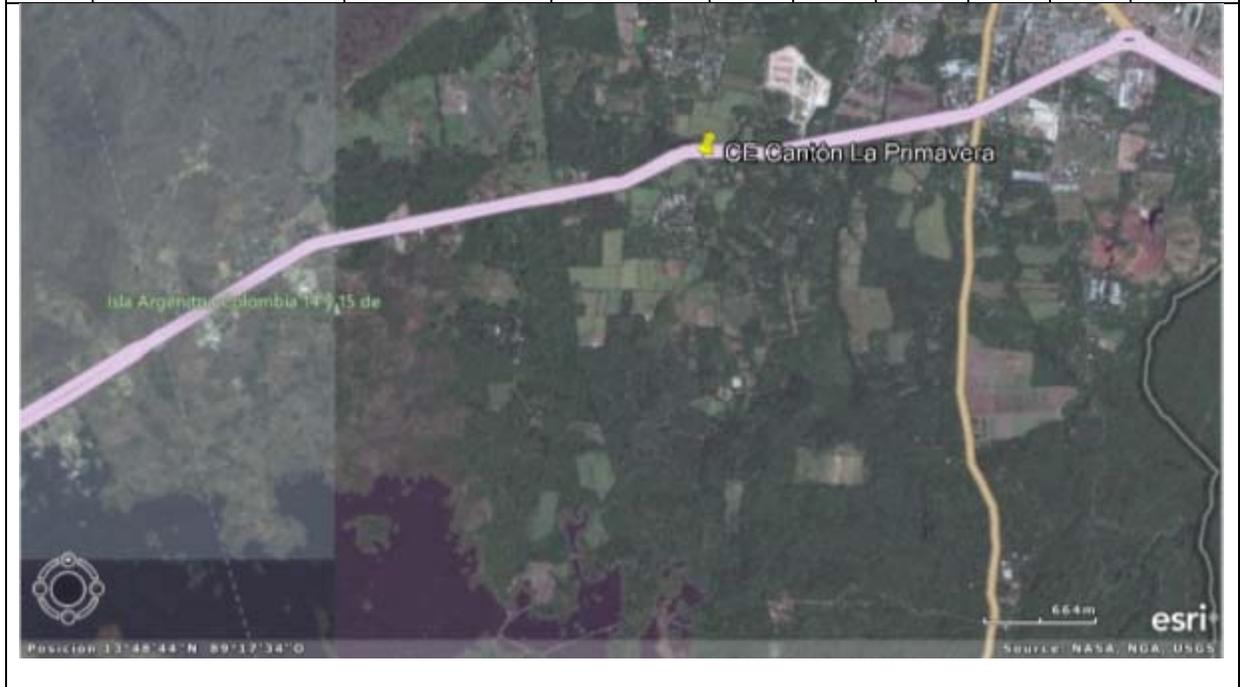


ID	CE Name	Department	Municipality	Latitude			Longitude		
18	CE San Francisco de la Cruz	San Ildefonso	San Vicente	13	38	22.413	-88	36	38.946

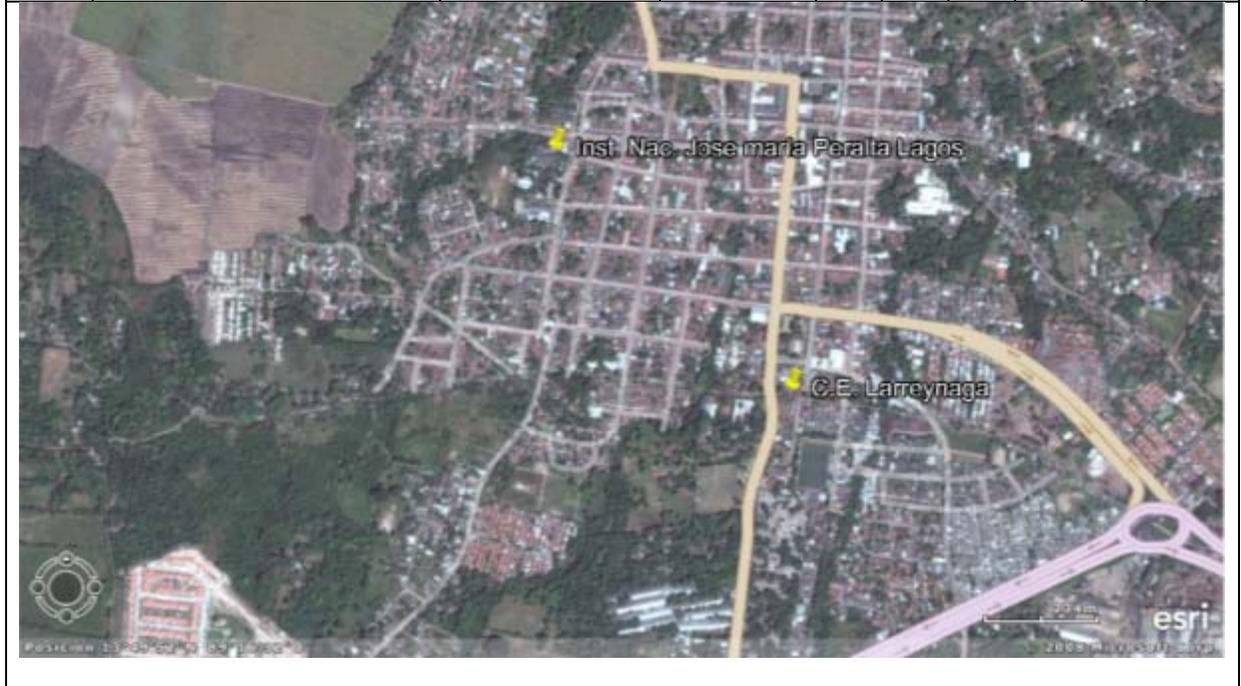


Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
19	CE Cantón La Primavera	Quezaltepeque	La Libertad	13	49	12.248	-89	17	18.48



ID	CE Name	Department	Municipality	Latitude			Longitude		
20	Instituto Nacional José María Peralta Lagos	Quezaltepeque	La Libertad	13	50	0.09	-89	16	36.235

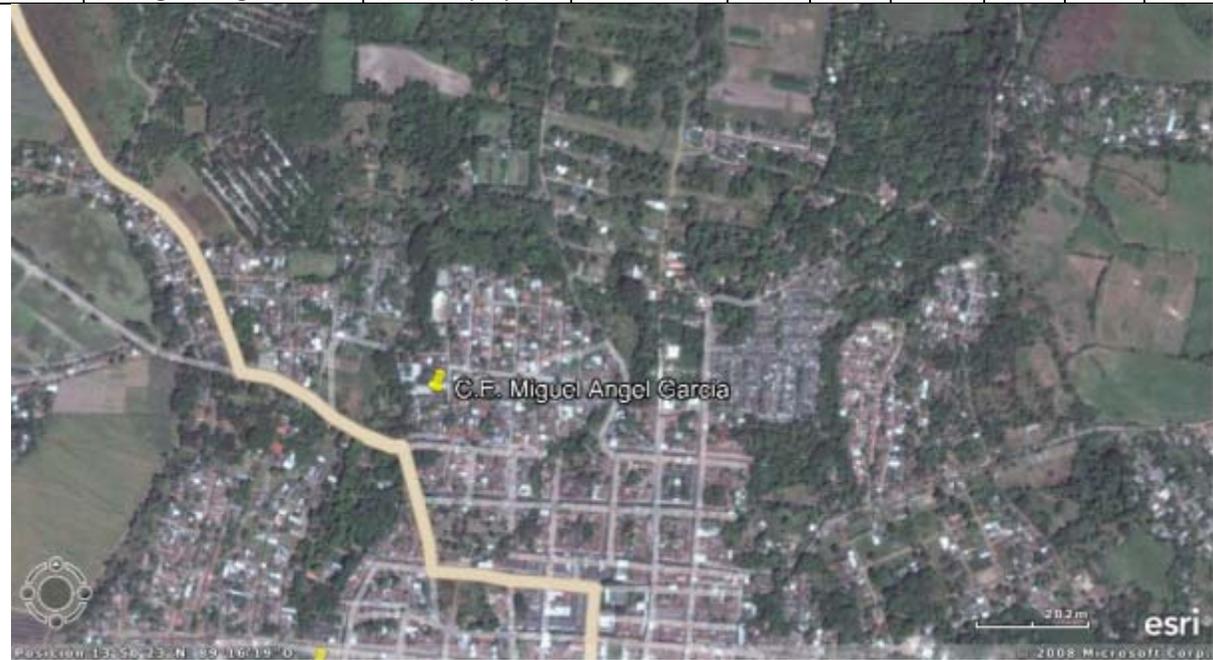


Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
21	CE José Dolores Larreynaga	Quezaltepeque	La Libertad	13	49	44.031	-89	16	20.047

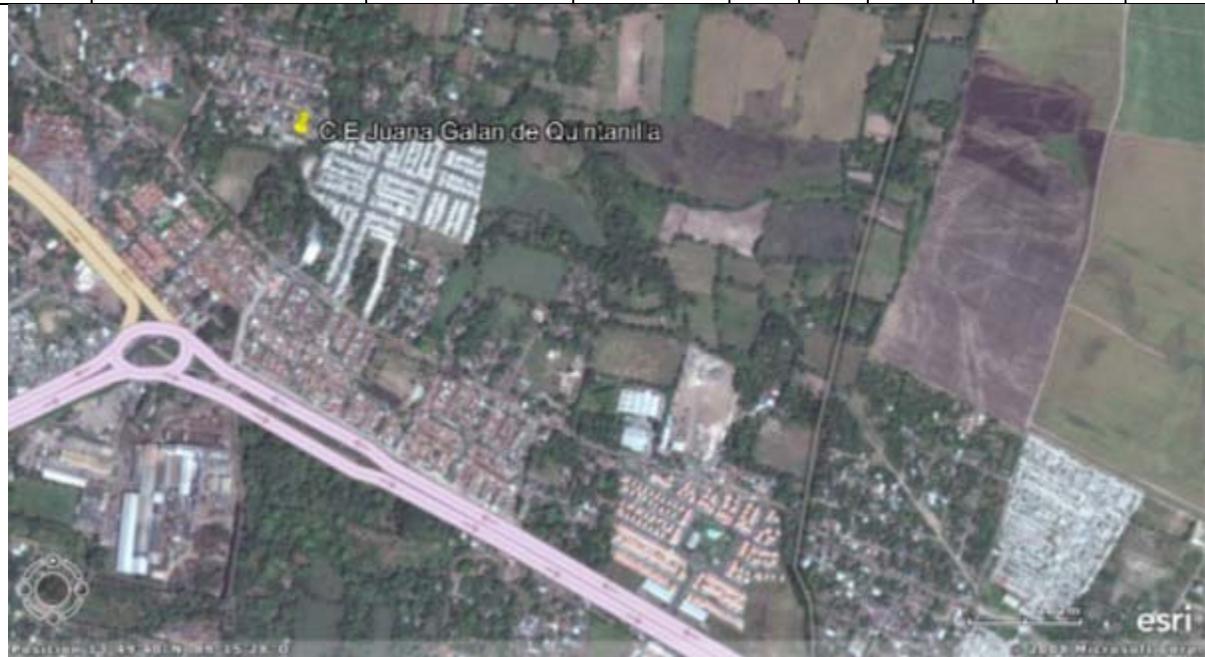


ID	CE Name	Department	Municipality	Latitude			Longitude		
22	CE Miguel Ángel García	Quezaltepeque	La Libertad	13	50	16.085	-89	16	29.247



Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
23	CE Juana Galán de Quintanilla	Quezaltepeque	La Libertad	13	49	47.427	-89	15	46.369

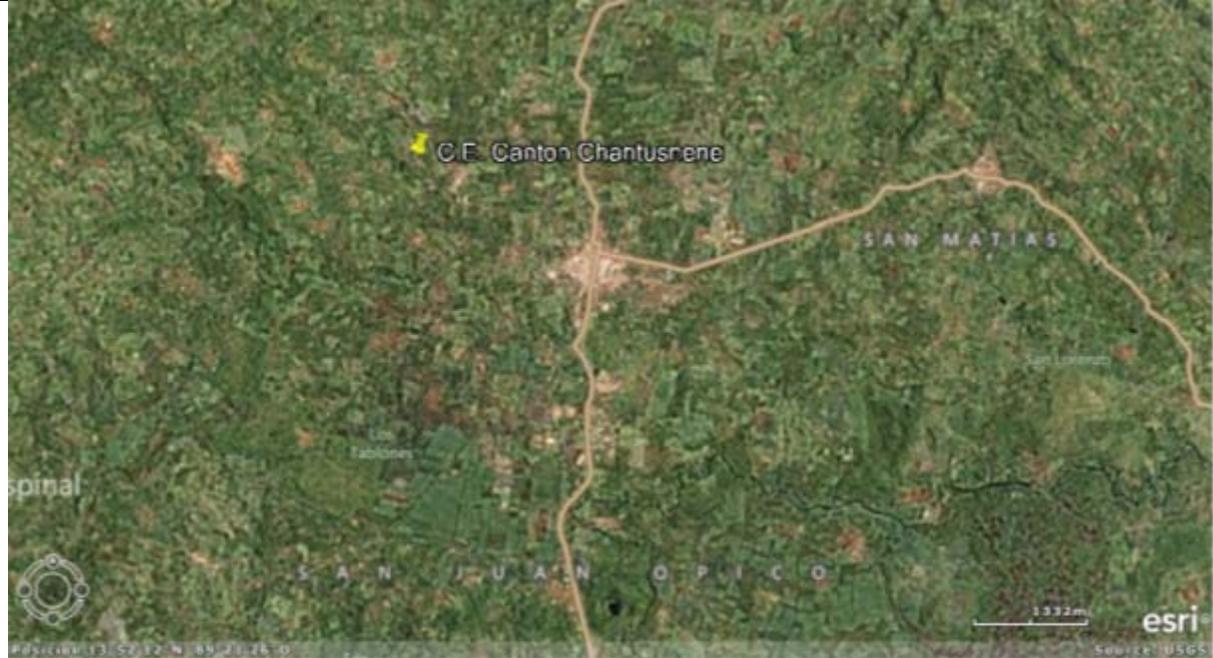


ID	CE Name	Department	Municipality	Latitude			Longitude		
24	CE Colonia Las Margaritas 1 y 2	Quezaltepeque	La Libertad	13	49	15.266	-89	15	33.559



Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
25	CE Chantusnene Cantón	San Juan Opico	La Libertad	13	53	11.666	-89	22	41.431



ID	CE Name	Department	Municipality	Latitude			Longitude		
26	CE Dr. Francisco Antonio Lima	Jayaque	La Libertad	13	40	19.391	-89	26	15.394



Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
27	CE Cantón Ojo de Agua	Huizúcar	La Libertad	13	36	38.272	-89	13	59.046

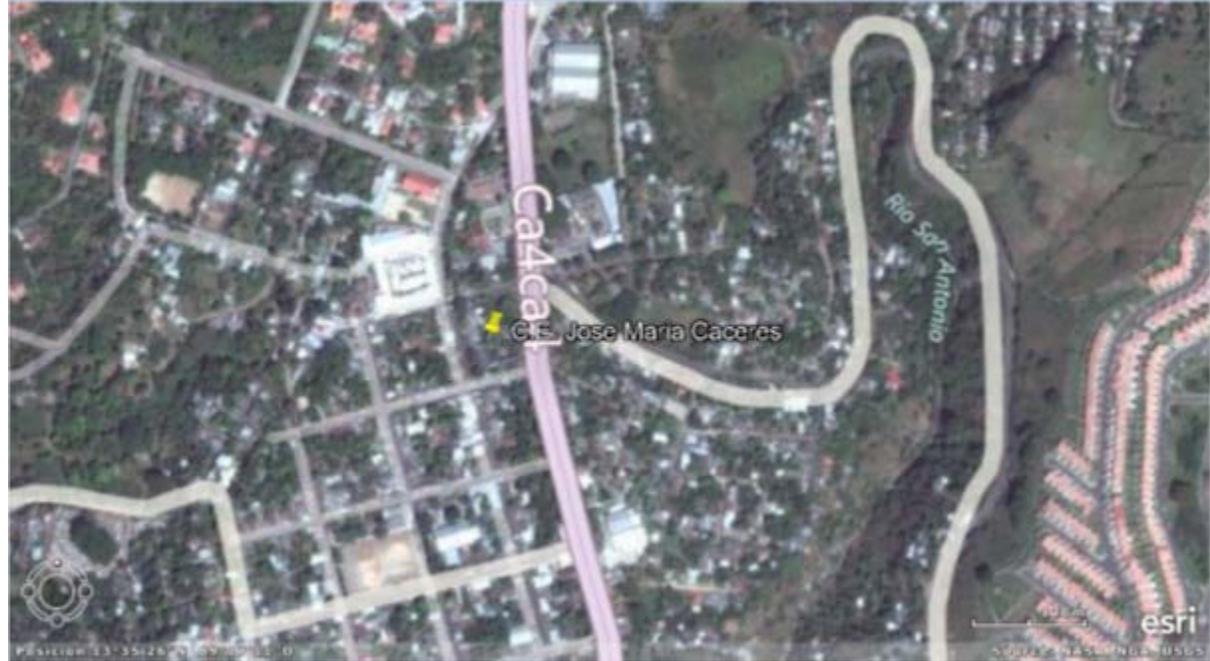


ID	CE Name	Department	Municipality	Latitude			Longitude		
28	CE Pablo Castillo	Nueva Cuscatlán	La Libertad	13	38	44.415	-89	15	48.289

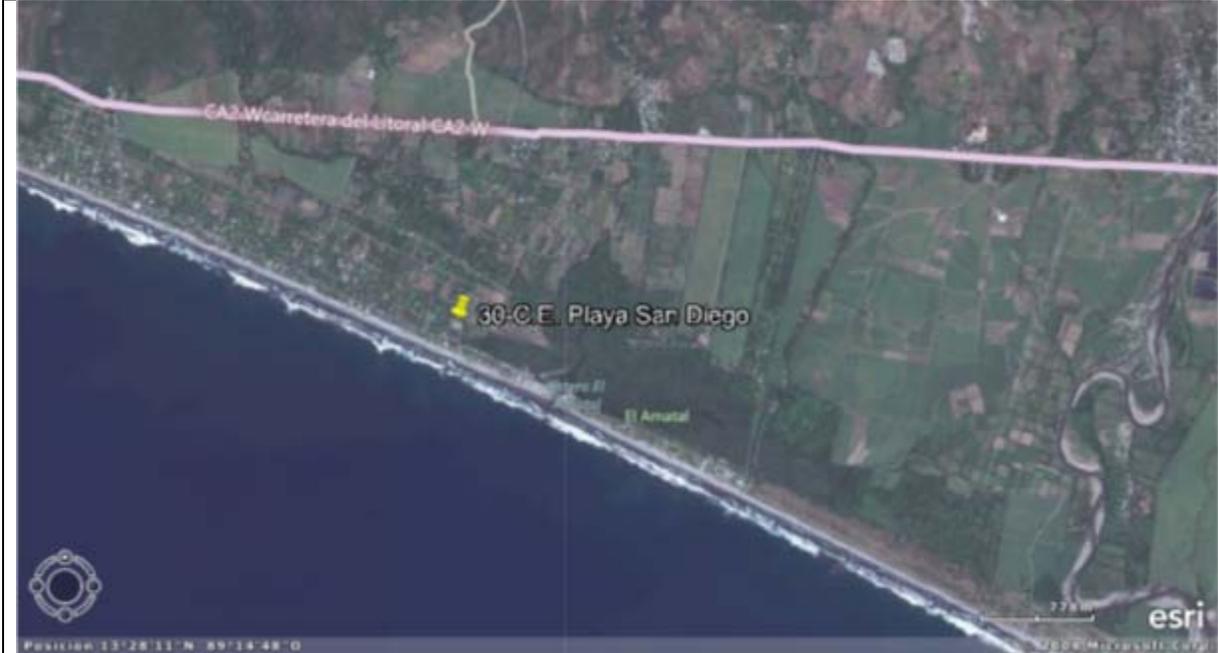


Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude		Longitude			
29	CE José María Cáceres	Zaragoza	La Libertad	13	35	22.021	-89	17	15.664



ID	CE Name	Department	Municipality	Latitude		Longitude			
30	CE Playa San Diego	La Libertad	La Libertad	13	28	8.223	-89	15	25.198

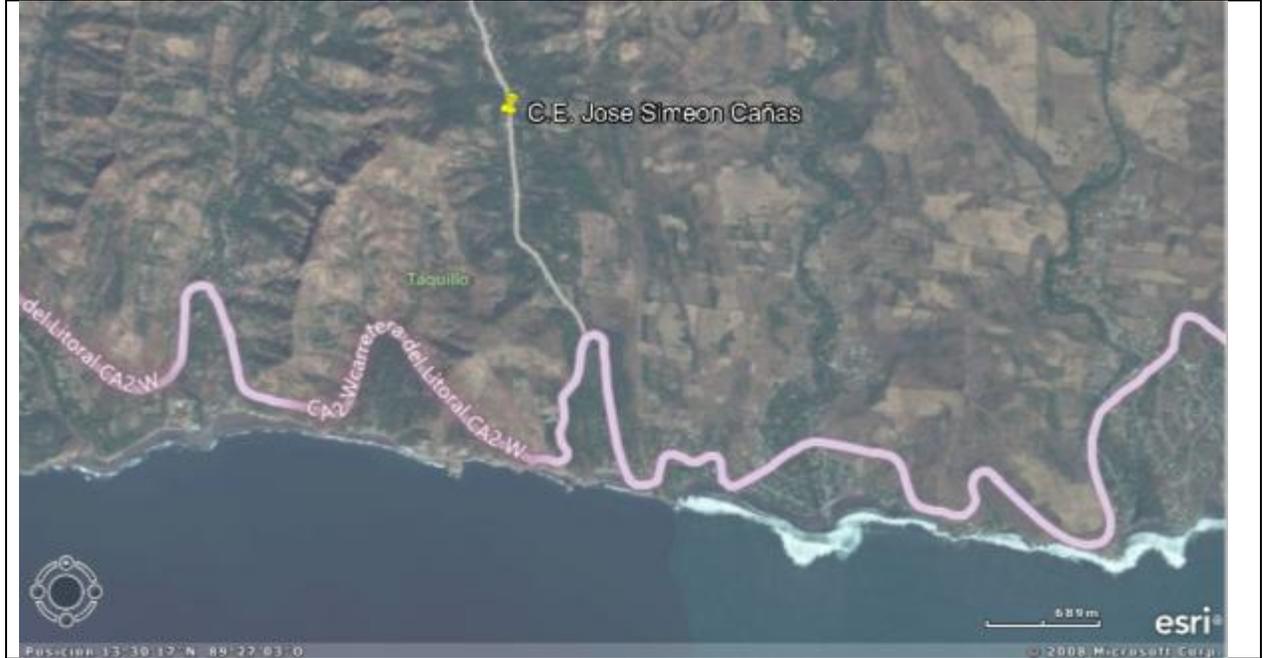


Environmental Mitigation Program for Schools

ID	CE Name	Department	Municipality	Latitude			Longitude		
31	Instituto Nacional Puerto de La Libertad	La Libertad	La Libertad	13	29	5.142	-89	19	49.224



ID	CE Name	Department	Municipality	Latitude			Longitude		
32	Complejo Educativo José Simeón Cañas	Chiltiupán	La Libertad	13	30	53.971	-89	27	26.368



Environmental Mitigation Program for Schools

5. Description of schools, 32 sites locations¹

This section includes details of each school location (accessibility, terrain, status of facilities and public services) for the purpose of a qualitative determination of recommended intervention levels.

5.1. **(CE) Antonio Najarro**, located in the municipality of Mejicanos, department of San Salvador.

Access:

Accessible to all types of vehicles, paved road, urban zone.

Land:

The land area is approximately 3,944.34 m², with an irregular shape and little vegetation (flower boxes); the topography is flat in several terraces. The ground cover is completely impermeable, except for the existing vegetation/flower boxes.



Image 3: View of the Facilities, CE Antonio Najarro.

Status of Facilities:

In general, classroom floors and ceilings/roofing are deteriorated.

Public services:

The services at the location include electrical energy, drinking water supply (ANDA) and phone service. Sewage is discharged into the public sewer network.

5.2. **(CE) República de Francia**, located in the municipality of Mejicanos, department of San Salvador.

¹ Data obtained from information records prepared by the Gram Arquitectos S.A. de C.V. subcontractor, 2012.

Access:

Accessible to all types of vehicles, paved road, urban zone.

Land:

The land area is of approximately 1,632 m², with a rectangular shape and scarce vegetation (flower boxes); the topography is flat in an urban zone. The ground is completely water impermeable, except for the flower boxes of existing vegetation.



Image 4: External view, CE República de Francia.

Status of Facilities:

In general, the floor of the classrooms is in poor condition, the metal doors have rusted areas, dents and failing paint, the bolts are defective, some classrooms do not have windows or the window bars show rust, roof structure is without maintenance, and roofing is in need of replacement. PVC rainwater drainpipes are deteriorated and metal rainwater drainpipes are deteriorated. Certain walls are deteriorated and have not been sufficiently maintained. The ceiling is deteriorated due to the infiltration of rainwater.

Public services:

The location is supplied by electrical energy, drinking water supply (ANDA) and phone service. Sewage is discharged into the public sewer network.

5.3. (CE) El Progreso, located in the municipality of Soyapango, department of San Salvador.

Access:

Access to this CE is through a vehicle alley.

Land:

The land area is of approximately 2,867 m², with an irregular shape; the existing vegetation is scarce, ornamental, scattered inside the area surrounded by a fence; the topography is flat in an urban zone. The soil is of the sandy silt type.



Image 5: View of Facilities, CE El Progreso.

Status of Facilities:

In general, all steel sheet covers are in good condition, the floors are in fair condition with worn areas and with the final step damaged, the paint shows certain deterioration, fading, the roof structure of the classroom modules is in good condition.

Public services:

The location is supplied by electrical energy, drinking water supply (ANDA) and phone service. Sewage is discharged into the public sewer network, there is no rainwater drainage connection, the existing drainage passes through neighboring land, thus impacting neighboring property/upsetting occupants.

5.4. **(CE) Monseñor Basilio Plantier**, located in the municipality and department of San Salvador.

Access:

Accessible to all types of vehicles, paved road, urban zone.

Land:

The terrain has irregular shape with the following approximate dimensions: 94.44 m x 25.8 m x 105.43 m x 33.02 m; the existing vegetation is ornamental and fruit trees of different diameters and heights in the area adjacent to the Acelhuate River; the topography is flat in one single terrace. The soil is of the sandy silt type.



Image 6: Main entrance, CE Monseñor Basilio Plantier.

Status of Facilities:

In general, the roofing are very deteriorated, generating leaks, downspouts are dirty and deteriorated due to garbage accumulation, ceilings and awnings are stained or broken, plaster is in poor condition, as is wall paint, window panes are dirty or stained and in certain cases missing, window guards and doors are rusty and even corroded in certain places, floors have water stains, some skirting board pieces are missing, toilet fixtures are dirty, stained or broken, the collective urinal does not work, the tile in basins is stained and broken, basin faucets are damaged, electrical connections are in poor condition.

Public services:

The location is supplied by electrical energy, drinking water supply (ANDA) and phone service. Sewage and rainwater are discharged into the public sewer network.

5.5. **(CE) Dr. Antonio Díaz**, located in the municipality of Santo Tomás, department of San Salvador.

Access:

Accessible to all types of vehicles, paved road, urban zone.

Land:

The terrain has a trapezoidal shape, with the following approximate dimensions: 17.92 m x 60.32 m x 17.38 m x 19.95 m x 38.25 m.; the existing vegetation is ornamental, with different diameters and heights, scattered in flower boxes; the topography is flat at the center of the terrain, with a change in terrace level from the center towards the eastern adjacent street, with a level difference of approximately 12 meters.



Image 7: Main access to CE Dr. Antonio Díaz.

Status of Facilities:

In general, the electrical and hydraulic facilities have largely failed; there are no access ramps in any buildings. Rainwater downspouts are deteriorated and are not sufficient for the rainwater flow.

Public services:

The site is supplied by electrical energy; drinking water supply (ANDA), there is no phone service. Sewage is discharged into septic tanks, and rainwater is collected internally and drained directly to the street, thus causing problems due to mishandling.

5.6. **Complejo Educativo Claudia Lars**, located in the municipality of San Francisco Chinameca, department of La Paz.

Access:

Accessible to all types of vehicles, paved road, urban zone.

Land:

The land area is of approximately 6,600 m², with an irregular shape, the existing vegetation is varied; the topography includes terraces in the built areas, the rest is sloping. The soil is clayey.



Image 8: View of main facade, CE Claudia Lars.

Status of Facilities:

In general, all roofing is badly damaged, the floors are in fair condition with worn areas and with the final step damaged, paint shows certain deterioration and fading, roof structure has anticorrosive paint and roof leaks are generating rust in the metal structure, the electrical system is in fair condition.

Public services:

The location is supplied by electrical energy, drinking water supply (ANDA), and phone service. Sewage is discharged into septic tanks and rainwater is routed internally towards a collection tank.

5.7. **(CE) Cantón San Sebastián Abajo**, located in the municipality of San Juan Nonualco, department of La Paz.

Access:

Dirt road to the school (1.5 km from the paved road).



Image 9: External view of the facilities, CE Cantón San Sebastián Abajo.

Land:

The land area is of approximately 1,006.50 m², with a rectangular shape, there is little vegetation in flower boxes; the topography is formed by a flat terrace where the buildings are located. The ground is completely impervious due to concrete floors..

Status of Facilities:

In general, all roofing are badly damaged, the floors are in fair condition, with worn areas and with the final step damaged, paint shows certain deterioration and fading, roof structure has anticorrosive paint and roof leaks are generating rust in the metal structure, the electrical system is in a fair state.



Image 10: Internal view of facilities, CE Cantón San Sebastián Abajo.

Public services:

The location is supplied by electrical energy, drinking water supply, there is no phone service. Sewage is discharged into septic tanks and there are no rainwater downspouts.

5.8. **Instituto Nacional San Luis La Herradura**, located in the municipality of San Luis La Herradura, department of La Paz.

Access:

Accessible to all types of vehicles, paved road, urban zone.



Image 11: View of access to facilities of CE Instituto Nacional San Luis La Herradura.

Land:

The land area is of approximately 2,536.07 m², with a rectangular shape, there are scattered ornamental trees of different diameters and heights; the topography is formed by a flat terrace. The soil is of the alluvial type, potentially subject to flooding.



Image 12: View of school facilities school, CE Instituto Nacional San Luis La Herradura.

Status of Facilities:

In general, the electrical and hydraulic facilities are collapsed, lack of access ramp in all buildings and in the school's main access. Rainwater downspouts are deteriorated.

Public services:

The location is supplied by electrical energy, drinking water supply and phone service. Sewage is discharged into two septic tanks; besides, rainwater drains towards the street.

5.9. **(CE) Felipe Soto**, located in the municipality of Santa Cruz Michapa, department of Cuscatlán.

Access:

Accessible by paved road up to the school.



Image 13 : Panorama of existing facilities, CE Felipe Soto.

Land:

The land area is of approximately 6,975.0 m², with an irregular shape, vegetation is mainly herbaceous and bushes, the few existing trees are ornamental in the vicinity of buildings, trees of different sizes are scattered in boundary lines; the topography comprises different terraces, sloping towards boundary lines. The soil is of the sandy silt type.

Status of Facilities:

In general, all roofing is badly damaged, the floors are in fair condition, with worn areas and with the final step damaged, paint shows certain deterioration and fading, roof structure has anticorrosive paint and roof leaks are generating rust in the metal structure, the electrical system is in fair condition.



Image 14: Panorama of infrastructure conditions, CE Felipe Soto.

Public services:

The location is supplied by electrical energy, drinking water supply and phone service. Sewage is discharged into a septic tank; besides, there is no rainwater drainage.

5.10. **Escuela Parvularia Reynaldo Galindo Pohl**, located in the municipality of Cojutepeque, department of Cuscatlán.

Access:

Accessible to all types of vehicles, paved road, urban zone



Image 15: View of main entrance, CE Escuela Parvularia Reynaldo Galindo Pohl.

Land:

The land area is of approximately 1,377 m², with an irregular shape, vegetation is ornamental around the buildings and scattered at the boundaries are trees of diverse sizes; the topography is formed by different terraces. The soil is of the sandy silt type.

Status of Facilities:

In general, all roofing is badly damaged, the floors are in fair condition, with worn areas and with the final step damaged, paint shows certain deterioration and fading, roof structure has anticorrosive paint and roof leaks are generating rust in the metal structure, the electrical system is in fair condition.



Image 16: View of facilities, CE Escuela Parvularia Reynaldo Galindo Pohl.

Public services:

The location is supplied by electrical energy, drinking water supply and phone service. Sewage is connected to the existing ANDA network, and there is rainwater drainage system.

5.11. **(CE) Cantón Puertas del Golpe**, located in the municipality of Cojutepeque, department of Cuscatlán.

Access:

Accessible to all types of vehicles.



Image 17: View of entrance, CE Cantón Puertas del Golpe.

Land:

The land area is of approximately 1,017.30 m², with a rectangular shape, there is no vegetation and the central area is water impermeable with concrete ground cover; the topography is flat at a level below the street.

Status of Facilities:

In general, the electrical and hydraulic facilities are collapsed, lack of access ramp in all buildings and in the school's main access. Rainwater downspouts are deteriorated.



Image 18: View of existing infrastructure, CE Cantón Puertas del Golpe.

Public services:

The location is supplied by electrical energy, drinking water supply and phone service. Sewage is connected to a septic tank that is completely collapsed; besides, there is rainwater drainage towards a natural channel, creating erosion in adjacent land.

5.12. **(CE) Cantón Ojos de Agua**, located in the municipality of Cojutepeque, department of Cuscatlán.

Access:

Accessible to all types of vehicles



Image 19: View of main building, CE Cantón Ojos de Agua.

Land:

The land area is of approximately 1,785.63 m², with irregular shape, the existing main vegetation is ornamental of different sizes and diameters, it is scattered; the topography is formed by terraces with a level difference of 5.60 m with respect to the existing soccer field.

Status of Facilities:

In general, the electrical and hydraulic facilities have failed, lack of access ramps in all buildings and in the school's main point of entry. Rainwater downspouts are deteriorated.



Image 20: View of existing facilities, CE Cantón Ojos de Agua.

Public services:

The location is supplied by electrical energy, drinking water supply and phone service. Sewage is connected to two septic tanks about to collapse; besides, there is internal rainwater drainage through concrete gutters, draining towards two exits, one towards the street and the other one through natural terrain towards the soccer field, producing ground erosion, both are insufficient.

5.13. **(CE) Cantón El Copinol**, located in the municipality of San Rafael Cedros, department of Cuscatlán.

Access:

Accessible to all types of vehicles



Image 21: Main access, CE Cantón El Copinol.

Land:

The land area is of approximately 1,075.47 m², with irregular shape, the main existing vegetation is ornamental, of different sizes and diameters; the topography is flat. The soil is of the sandy silt type.

Status of Facilities:

In general, the floors of the classrooms, multi-use hall and kitchen/warehouse are in fair condition, there is deterioration and fading of wall paint, roofing is deteriorated, thus generating leaks, the roof structure is missing paint and rusty, the lack of windows in the building allows rainwater to enter, there are no wall clamps, electrical system is deficient, the kitchen does not have a chimney, thus generating smoke contamination, door locks are not working.



Image 22: Existing conditions, CE Cantón El Copinol.

Public services:

The location is supplied by electrical energy, drinking water supply and phone service. Sewage is discharged into a septic tank; besides, there is rainwater drainage through concrete gutters, rainwater collectors and concrete tubing that discharges towards adjacent streets.

5.14. **CE Cantón Veracruz**, located in the municipality of El Rosario, department of Cuscatlán.

Access:

Accessible to all types of vehicles



Image 23: Access to school, CE Cantón Veracruz.

Land:

The land area is of approximately 2,336.57 m², with irregular shape, the main existing vegetation is ornamental and wood trees of different sizes and diameters; the topography is formed by flat terraces at different slopes. The soil is of the sandy silt type.

Status of Facilities:

In general, classroom floors are in fair condition, windows are damaged, window guards are rusted, roofing is deteriorated, generating leaks, roof structure is unpainted and rusty, doors are unpainted and wall paint is faded.



Image 24: Status of Facilities, CE Cantón Veracruz.

Public services:

The location is supplied by electrical energy, municipal drinking water supply and phone service. Sewage is discharged into a septic tank; besides there is rainwater drainage

through concrete gutters, with only two rainwater exits through concrete collector and gutters towards the outside, which is deficient.

5.15. **(CE) Cantón El Paraíso**, located in the municipality of San Sebastián, department of San Vicente.

Access:

Accessible to all types of vehicles



Image 25: Entrance view, CE Cantón El Paraíso.

Land:

The land area is of approximately 1,218 m², with irregular shape, the existing main vegetation is ornamental of different sizes and diameters; the topography is flat. The soil is of the sandy silt type.

Status of Facilities:

In general, classroom floors are deteriorated and raised, the building does not have windows on its southern side, only a fence with metal supports located where the windows should be; in the northern side, the windows are aluminum and glass, but deteriorated, and window guards are rusty, doors are unpainted and there is deterioration and fading of wall and column paint. The classrooms have wood and plywood divisions in poor condition.



Image 26: View of existing facilities, CE Cantón El Paraíso.

Public services:

The location is supplied by electrical energy, municipal drinking water supply and phone service. Sewage is discharged into a septic tank; besides there is rainwater drainage through concrete gutters, with only two rainwater exits through concrete collector and gutters towards the outside, which are partially obstructed.

- 5.16. **(CE) Dr. Adrián García**, located in the municipality of San Esteban Catarina, department of San Vicente

Access:

Accessible to all types of vehicles



Image 27: View of main access, CE Dr. Adrián García.

Land:

The land area is of approximately 5,505.91 m², with a trapezoidal shape, the main existing vegetation is ornamental of different sizes and diameters, scattered; the topography is flat, in different terraces. The soil is of the sandy silt type.

Status of Facilities:

In general, classroom floors are in fair conditions, with significant damage in the final step of the floor, the ceilings are very stained and damaged by roof leaks, roofing is very deteriorated, generating leaks, there is paint deterioration and fading of the walls, wooden windows are significantly damaged or missing in certain areas, plaster is deteriorated, rainwater downspouts have failed, there are no wall clamps and pests live within the ceiling, electrical system is deficient, the rainwater exit allows for stagnation of rainwater, etc.



Image 28: View of existing facilities, CE Dr. Adrián García.

Public services:

The location is supplied by electrical energy, municipal drinking water supply and phone service. Sewage is discharged into a septic tank; besides there is rainwater drainage through concrete gutters, with only two rainwater exits through concrete collector and channels towards the outside.

- 5.17. **(CE) Caserío El Júcaro**, located in the municipality of San Ildefonso, department of San Vicente

Access:

Access to the school is restricted, and a false gate made of wood and barbed wire must be opened for entry.



Image 29: External view, CE Caserío El Júcaro.

Land:

The land area is of approximately 880 m², with a rectangular shape, the main existing vegetation is ornamental of different sizes and diameters, scattered, the few existing trees are deciduous; the topography is flat with a slight east-west slope. The soil is of the sandy silt type.

Status of Facilities:

In general, internal classroom floors are in fair condition, with significant damage in the circulation aisle, there is no ceiling, the roof cover is metallic, recently installed, but without clamps in contact with the walls, there is wall deterioration and fading, windows are metal frames with rebar grids that need maintenance, the electrical system is deficient. Toilet facilities are totally inadequate, pit-type, roofs and floors are collapsed.

Public services:

The location is supplied by electrical energy, municipal drinking water supply, phone service. Sewage is discharged into a septic tank; besides there is rainwater drainage discharged into concrete gutters, with only two rainwater exits through concrete collector and channels towards the outside, one of them draining towards school land, which is deficient. Erosion can be seen in the substrate surrounding the channels.

5.18. **(CE) San Francisco de la Cruz**, located in the municipality of San Ildefonso, department of San Vicente.

Access:

Accessible to all types of vehicles.



Image 30: External view, CE San Francisco de la Cruz.

Land:

The land area is of approximately 5,000 m², with rectangular shape, the main existing vegetation is ornamental with different sizes and diameters, scattered; the topography is mostly flat, with a slight slope towards the east. The soil is of the clayey silt type.

Status of Facilities:

In general, the floors at the principal's office are in fair condition, ceilings are pretty stained and damaged by roof leaks, roofing is very deteriorated, generating leaks, there is paint deterioration and fading in walls, and the warehouse-kitchen has completely stained walls, windows need cleaning and some glass replacement, electrical system is deficient, the basin in the warehouse-kitchen does not have a water supply, etc.



Image 31: View of internal facilities, CE San Francisco de la Cruz

Public services:

The location is supplied by electrical energy, drinking water supply and phone service. Sewage is discharged into septic tanks; besides, there is water drainage.

5.19. **(CE) Cantón La Primavera**, located in the municipality of Quezaltepeque, department of La Libertad

Access:

Accessible to all types of vehicles.



Image 32: External view, CE Cantón La Primavera.

Land:

The land area is of approximately 3,500 m², with irregular shape, the main existing vegetation is ornamental and there are fruit trees scattered of different sizes and diameters; the topography is slightly flat. The soil is of the sandy silt type.

Status of Facilities:

In general, the concrete floors of the classrooms are in poor condition, with significant damage in the final step of the floor and the wear of time, the ceilings are stained and damaged by roof leaks, the column frames and metal beams are unpainted and rusted, the plywood divisions are deteriorated, roofing is very deteriorated provoking leaks, there is wall paint deterioration; there are no windows, therefore, during the rainy season, water splashes into the classrooms and alleys. The electrical system is deficient.



Image 33: Internal facilities, CE Cantón La Primavera.

Public services:

The location is supplied by electrical energy, community drinking water supply and phone service. Sewage is discharged into septic tanks about to collapse; besides, there is rainwater drainage through concrete gutters, the discharge is through rainwater exits in collection boxes and concrete pipes towards the outside, which is deficient.

5.20. **Instituto Nacional José María Peralta Lagos**, located in the municipality of Quezaltepeque, department of La Libertad

Access:

Accessible to all types of vehicles.



Image 34: View of existing facilities, CE Instituto Nacional José María Peralta Lagos.

Land:

The land area is of approximately 6,305 m², with irregular shape, the main existing vegetation is ornamental; the topography is flat. The soil is of the sandy silt type.

Status of Facilities:

In general, all roofing is severely damaged, floors are in fair condition with worn areas and with the final step damaged, paint shows certain deterioration, fading, roof structure has anticorrosive paint and roof leaks are generating rust in the metal structure, the electrical system is in fair condition but operating.



Image 35: Infrastructure conditions, CE Instituto José María Peralta Lagos.

Public services:

The location is supplied by electrical energy, drinking water supply from the existing network and phone service. Sewage is discharged into a septic tank; besides, there is rainwater drainage.

- 5.21. **(CE) José Dolores Larreynaga**, located in the municipality of Quezaltepeque, department of La Libertad.

Access:

Accessible to all types of vehicles.



Image 36: Main frontal view, CE José Dolores Larreynaga.

Land:

The land area is of approximately 2,051.4 m², with rectangular shape, the main existing vegetation is ornamental; the topography is flat. The soil is of the sandy silt type.

Status of Facilities:

In general, classroom floors are deteriorated.



Image 37: View of facilities, CE José Dolores Larreynaga.

Public services:

The location is supplied by electrical energy, drinking water supply from the existing network and phone service. Sewage is discharged into a septic tank; besides, there is rainwater drainage but with problems in the gutters, which are too narrow, and there are

areas water impermeable with concrete ground cover that do not have sufficient slope for drainage, which leads to water accumulation during the rainy season.

- 5.22. **(CE) Miguel Ángel García**, located in the municipality of Quezaltepeque, department of La Libertad

Access:

Accessible to all types of vehicles



Image 38: Main gate, CE Miguel Ángel García.

Land:

The land area is of approximately 2,982 m², with irregular shape, the main existing vegetation is ornamental with different diameters and heights; the topography is flat. The soil is of the sandy silt type.

Status of Facilities:

In general, classroom floors are deteriorated.



Image 39: Detail of facilities, CE Miguel Ángel García.

Public services:

The location is supplied by electrical energy, drinking water supply from the existing network and phone service. Sewage is discharged into a septic tank; besides, there is rainwater drainage but with gutter problems, which are too narrow, and there are impervious areas with concrete flooring that does not have sufficient slope for drainage, which leads to water accumulation during the rainy season.

- 5.23. **(CE) Juana Galán de Quintanilla**, located in the municipality of Quezaltepeque, department of La Libertad

Access:

Cobblestoned road, accessible to all types of vehicles.

Land:

The land area is of approximately 1,625m², with rectangular shape, the main existing vegetation is ornamental; the topography is flat in the constructed area, there is a slope next to the creek. The soil is of the sandy silt type.

Status of Facilities:

In general, all roofing is badly damaged, floors are in fair condition with worn areas and with the final step damaged, paint shows certain deterioration, fading, roof structure has anticorrosive paint and roof leaks are generating rust in the metal structure, the electrical system is in poor condition.



Image 40: Panorama of internal facilities, CE Juana Galán de Quintanilla

Public services:

The location is supplied by electrical energy, drinking water supply from the existing network and phone service. Sewage is connected to the existing network; besides, there is a rainwater drainage that discharges into the existing creek.

- 5.24. **CE Colonia Las Margaritas 1 y 2**, located in the municipality of Quezaltepeque, department of La Libertad

Access:

By dirt road, 0.30 km from the paved road that leads to the city of Quezaltepeque.



Image 41: External view, CE Colonia Las Margaritas 1 y 2.

Land:

The land area is of approximately 2,029.50 m², with rectangular shape, the main existing vegetation is ornamental; the topography is flat. The soil is of the sandy silt type.

Status of Facilities:

In general, all roofing is badly damaged, floors are in fair condition with worn areas and with the final step damaged, paint shows certain deterioration, fading, roof structure has anticorrosive paint and roof leaks are generating rust in the metal structure, the electrical system is in fair condition.



Image 42: View of the facilities, CE Colonia Las Margaritas 1 y 2.

Public services:

The location is supplied by electrical energy, drinking water supply from the existing network, there is no phone service. Sewage is discharged in septic tanks; besides there is rainwater discharge to the street.

- 5.25. **(CE) Cantón Chantusnene**, located in the municipality of San Juan Opico, department of La Libertad

Access:

Accessible to all types of vehicles.



Image 43: Main frontal view, CE Cantón Chantusnene.

Land:

The land area is of approximately 10,626 m², with irregular shape, the main existing vegetation is ornamental; the topography has a moderate slope. The soil is clayey.

Status of Facilities:

In general, classroom floors are deteriorated.



Image 44: View of infrastructure conditions, CE Cantón Chantusnene.

Public services:

The location is supplied by electrical energy, drinking water supply from the existing network, there is no phone service. Sewage is discharged into septic tanks; there is rainwater discharge to the creek.

5.26. **(CE) Dr. Francisco Antonio Lima**, located in the municipality of Jayaque, department of La Libertad

Access:

Accessible to all types of vehicles



Image 45: View of main entrance, CE Dr. Francisco Antonio Lima.

Land:

The land area is of approximately 2,156 m², with rectangular shape, the main existing vegetation is ornamental; the topography has a moderate slope. The soil is of the sandy silt type.

Status of Facilities:

In general, the electrical system is deteriorated. Likewise all gutters and rainwater downspouts are deteriorated and rusty.



Image 46: View of infrastructure conditions, CE Dr. Francisco Antonio Lima.

Public services:

The location is supplied by electrical energy, drinking water supply from the existing network, there is no phone service. Sewage is connected to the existing network; besides, there is rainwater drainage with problems in the gutters, which are too narrow and the collection boxes are clogged, which leads to accumulation of water during the rainy season.

5.27. **(CE) Cantón Ojo de Agua**, located in the municipality of Huizúcar, department of La Libertad

Access:

Accessible to all types of vehicles.



Image 47: View of main entrance, CE Cantón Ojo de Agua.

Land:

The land area is of approximately 2,156 m², with rectangular shape, the main existing vegetation is ornamental; the topography has a moderate slope. The soil is of the sandy silt type.

Status of Facilities:

In general, classroom floors are damaged in certain areas, there is no ceiling, a rainwater gutter located where the building joins the added pre-school classroom is in very poor condition and needs replacement. The roof structure must be cleaned and painted, roofing is badly deteriorated, wall paint is deteriorated and faded, the lack of windows allows rainwater to splash, and windows have a metal frame and a rebar grid which needs maintenance. All walls that have been added to the building should be demolished or in any case, reinforced, as they appear to have been constructed with little quality control.



Image 48: Condition of facilities, CE Cantón Ojo de Agua.

Public services:

The location is supplied by electrical energy, community drinking water supply, there is no phone service. Sewage is discharged into septic tanks; besides, there is rainwater drainage with problems because the gutters are too narrow and the collection wells are clogged, which leads to water accumulation in the rainy season.

- 5.28. **(CE) Pablo Castillo**, located in the municipality of Nuevo Cuscatlán, department of La Libertad

Access:

Accessible to all types of vehicles.



Image 49: Internal view, CE Pablo Castillo.

Land:

The land area is of approximately 1,403 m², with rectangular shape, the main existing vegetation is ornamental; the topography is flat. The soil is of the sandy silt type.

Status of Facilities:

In general, all roofing is badly damaged, floors are in fair condition with worn areas and with the final step damaged, paint shows certain deterioration, fading, roof structure has anticorrosive paint and roof leaks are generating rust in the metal structure, the electrical system is in fair condition.

Public services:

The location is supplied by electrical energy, municipal drinking water supply, there is no phone service. Sewage is discharged into septic tanks; besides, there is rainwater drainage that discharges towards the street.

5.29. **CE José María Cáceres**, located in the municipality of Zaragoza, department of La Libertad

Access:

Accessible to all types of vehicles.



Image 50: Main external view, CE José María Cáceres.

Land:

The land area is of approximately 2,040 m², with irregular shape, the existing vegetation principal is ornamental; the topography is flat. The soil is of the sandy silt type.

Status of Facilities:

In general, classroom floors are deteriorated.



Image 51: Internal view of facilities, CE José María Cáceres.

Public services:

The location is supplied by electrical energy, municipal drinking water supply, there is no phone service. Sewage is connected to septic tanks, besides, there is rainwater drainage with problems in the gutters, and there are impervious areas with concrete flooring that does not have sufficient slope to drain, which leads to water stagnation in the rainy season.

5.30. **CE Playa San Diego**, located in the municipality and department of La Libertad

Access:

Accessible to all types of vehicles.



Image 52: Detail of main entrance, CE Playa San Diego.

Land:

The land area is of approximately 7,323.26 m², with a rectangular shape, the main existing vegetation is ornamental; the topography is flat. The soil is sandy.

Status of Facilities:

In general, classroom floors are deteriorated, as are the electrical and hydraulic facilities, lack of access ramp in all buildings. Rainwater leaks in all buildings. Rainwater drainage gutters are deteriorated.

Public services:

The location is supplied by electrical energy, drinking water supply from two wells located in Bocana San Diego; there is no phone service. There is no appropriate sewage management; besides, there is rainwater drainage with problems in the gutters, which are not large enough to drain the water. Likewise, the water removal system is inefficient; most of the school floods in the rainy season, approximately 40 - 60 cms.

5.31. **Instituto Nacional Puerto de La Libertad**, located in the municipality and department of La Libertad.

Access:

Accessible to all types of vehicles



Image 53: Panorama of entrance gate, Instituto Nacional Puerto de La Libertad.

Land:

The land area is of approximately 7,302.00 m² with a rectangular shape, the main existing vegetation is ornamental; the topography is flat. The soil is sandy.

Status of Facilities:

In general, the floors of the principal's office are in good shape, the ceilings are badly stained by the leaks in all roofs; the roof cover is quite deteriorated, showing leaks. The metal structure supporting the roof is rusty due to being in the coastal zone. There is paint deterioration and fading of the walls. Glass and aluminum windows are damaged, and glass is missing in parts. The electrical system is deteriorated, the free falling rainwater allows for water stagnation, the toilets are dirty and have water leaks; this maintains the floors with permanent humidity, etc.



Image 54: Detail of existing facilities, Instituto Nacional Puerto de La Libertad

Public services:

The location is supplied by electrical energy, drinking water supply from ANDA, and there is phone service. Sewage is connected to septic tanks; besides, the rainwater is drained through concrete gutters but does not have outlets; therefore, water stagnates and can flood certain areas of the school.

5.32. **Complejo Educativo José Simeón Cañas**, located in the municipality of Chiltiupán, department of La Libertad

Access:

Accessible to all types of vehicles.



Image 55: Internal view of facilities, Complejo Educativo José Simeón Cañas.

Land:

The land area is of approximately 19,500.00 m², with irregular shape. Since the educational complex is located in the sides of a mountain, it includes abundant vegetation, trees of different diameters and heights; however, there are signs of erosion on the property. The topography is flat in the constructed area; the rest of the terrain has a slight slope from East to West. The soil is of the sandy silt type.

Status of Facilities:

In general, the floors and roofing of the classrooms are deteriorated.



Image 56: Detail of status of the facilities

Public services:

The location is supplied by electrical energy, drinking water supply from ANDA, and there is phone service. Sewage is connected to the existing network; besides, there is rainwater drainage that indicates problems with the gutters and natural rainwater runoff. Poor drainage management leads to flooding of should property during the rainy season.

6. Description, environmental characterization

Three territorial scenarios have been established according to existing environmental characteristics: coastal plains, scattered mountains and central valley/Urbano.

The environmental characterization includes:

- Physical Environment: hydrography, geology, land use, susceptibility to landslides
- Biological Environment: Predominant vegetation
- Socio economic and Cultural Environment
-

Following is a list of the 20 priority projects selected by El Salvador Government.

1. CE Cantón San Sebastián Abajo
2. CE Cantón Chantusnene
3. CE Pedro Pablo Castillo
4. CE Dr. Adrian García
5. CE Cantón Ojo de Agua
6. Instituto Nacional. José María Peralta Lagos
7. CE Dr. Francisco Antonio Lima
8. CE Colonia Las Margaritas 1 y 2
9. Escuela Parvularia Reynaldo Galindo Pohl
10. Complejo Educacional Claudia Lars
11. CE Cantón Veracruz
12. Instituto Nacional. San Luis La Herradura
13. CE Felipe Soto
14. CE José Dolores Larreynaga
15. CE República de Francia
16. CE José María Cáceres
17. CE Cantón Ojos de Agua
18. CE Antonio Najarro
19. CE Dr. Antonio Díaz
20. CE El Progreso

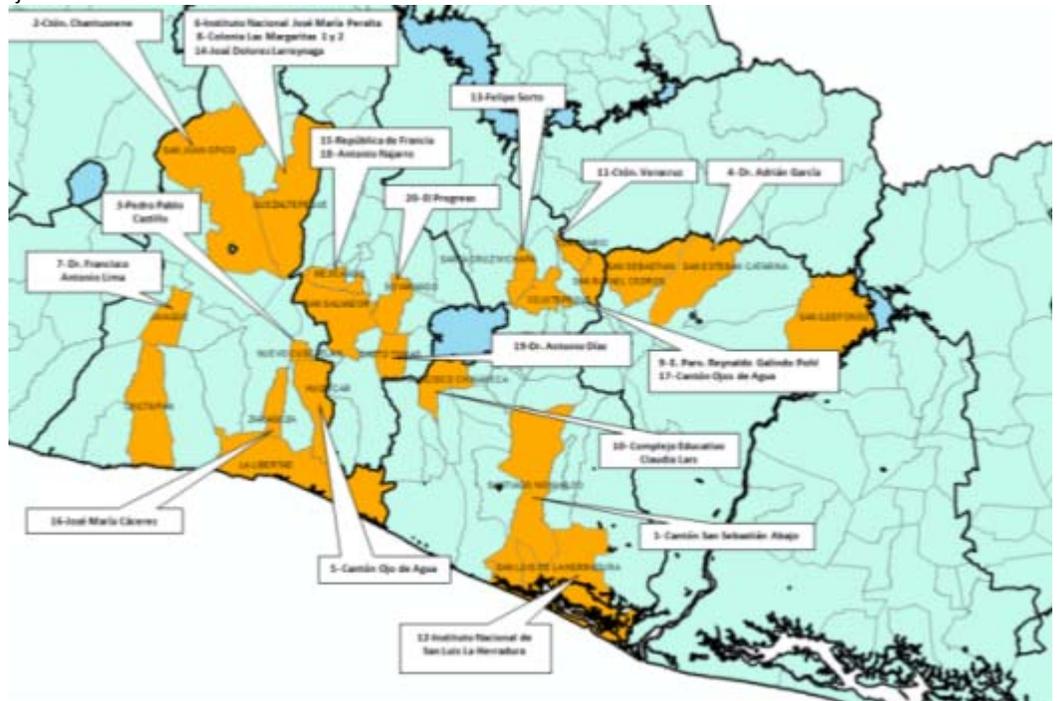


Image 57: Location of 20 priority projects

6.1. Physical Environment

6.1.1. Hydrography

The hydrographic features in the images shown below present the level of susceptibility due to flooding from overflowing rivers and streams, classified in four categories: low, high, moderate and high.

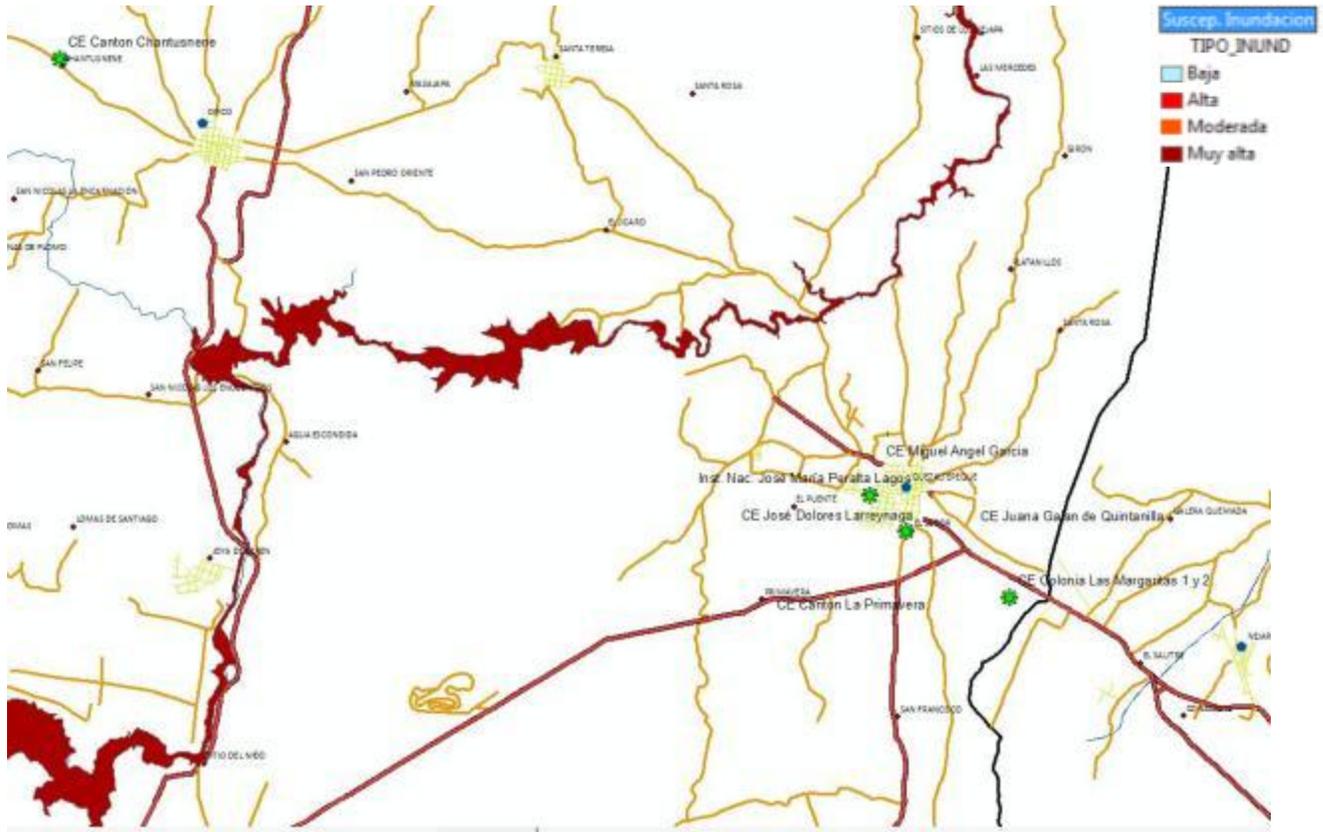


Image 58: Hydrology, projects located in the central plain

The flood potential is low at the sites of the CEs in their area of influence; however, a fact is that the rainwater drainage facilities in each location are insufficient and inefficient due to their age.

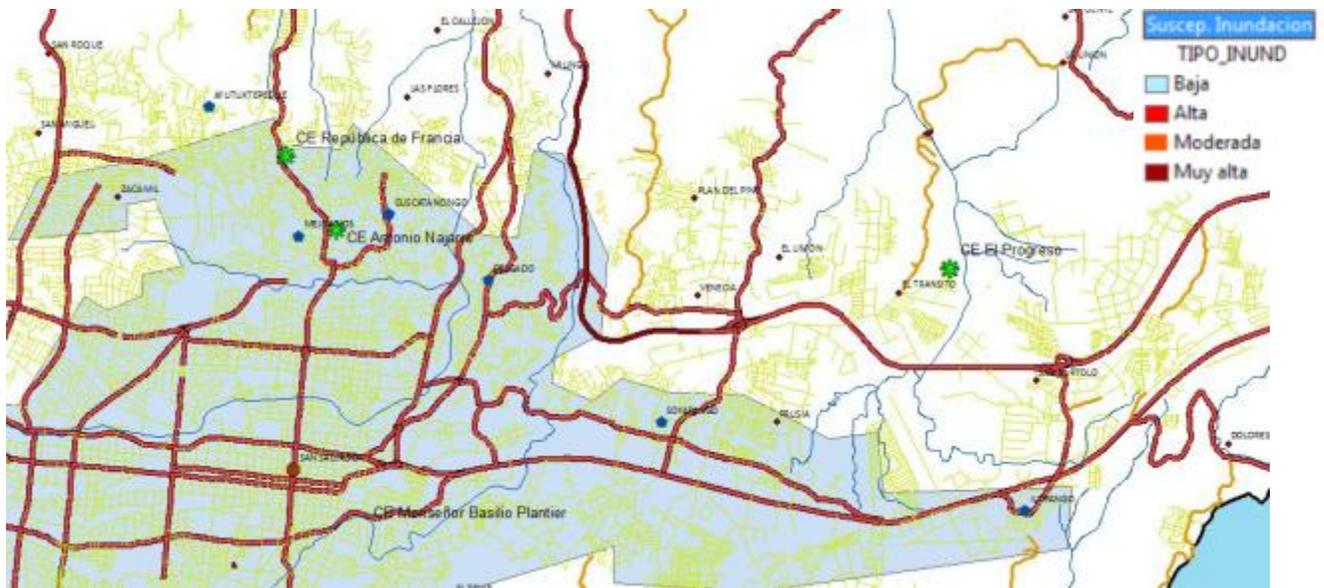


Image 59: Hydrology, projects located in AMSS

Flood potential is low in terms of area of influence.

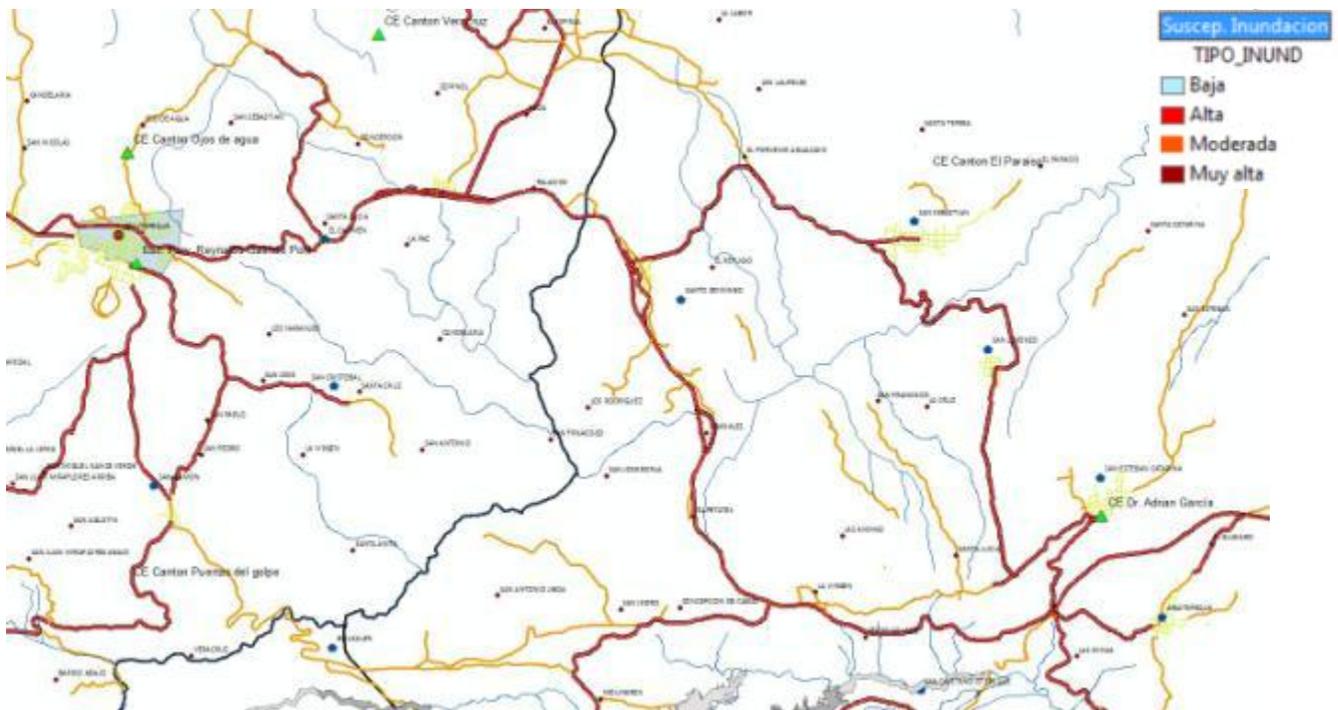


Image 60: Hydrology, projects located between scattered mountains

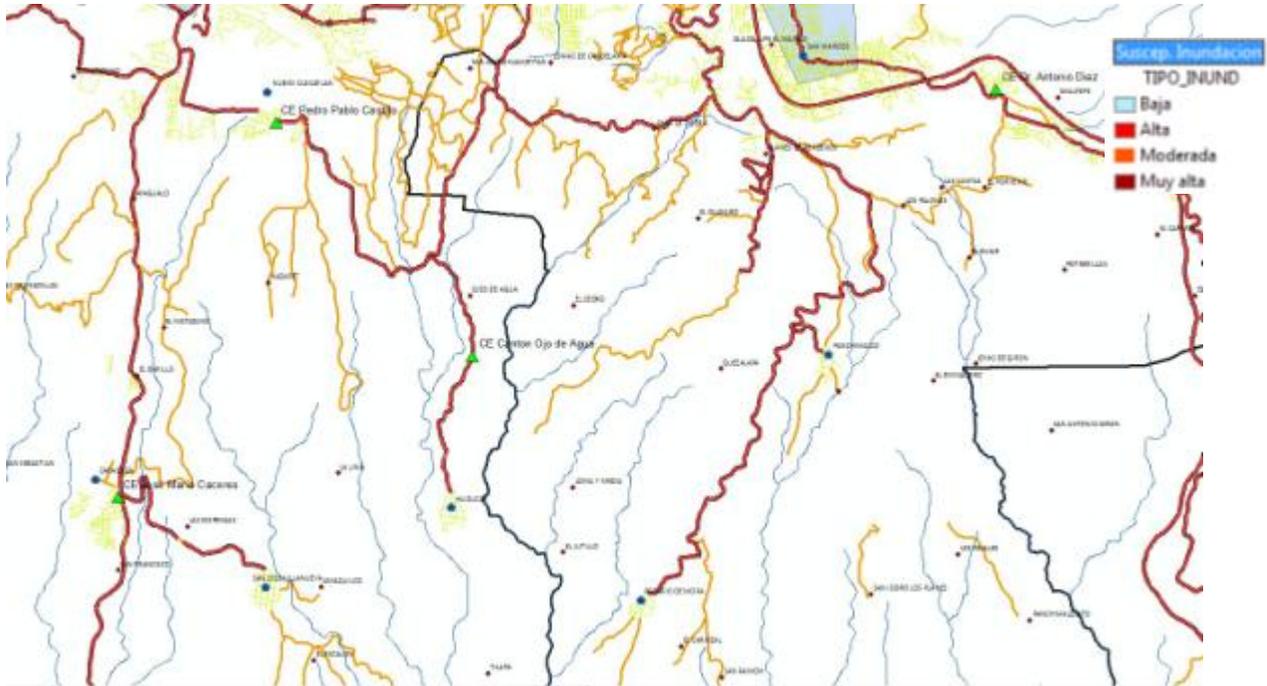


Image 61 : Hydrology, location of projects between scattered mountains

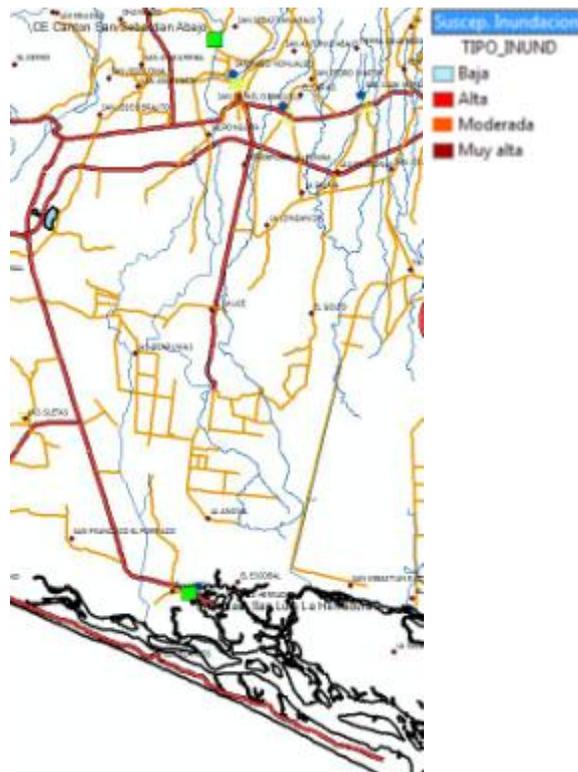


Image 62: Hydrology, location of projects in coastal plain

6.1.2. Geology and location of faults

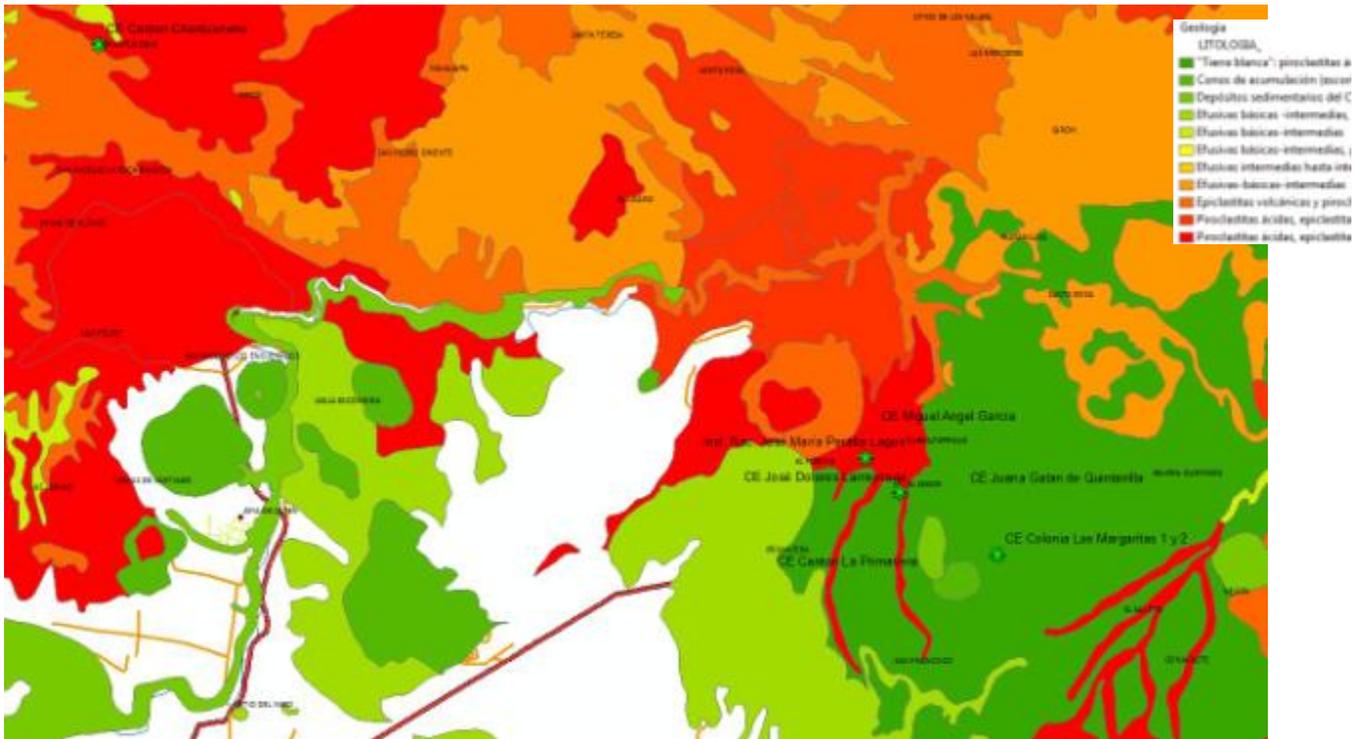


Image 63: Geology, projects located in the central plain



Image 64: Geology, projects located in central plain in AMSS

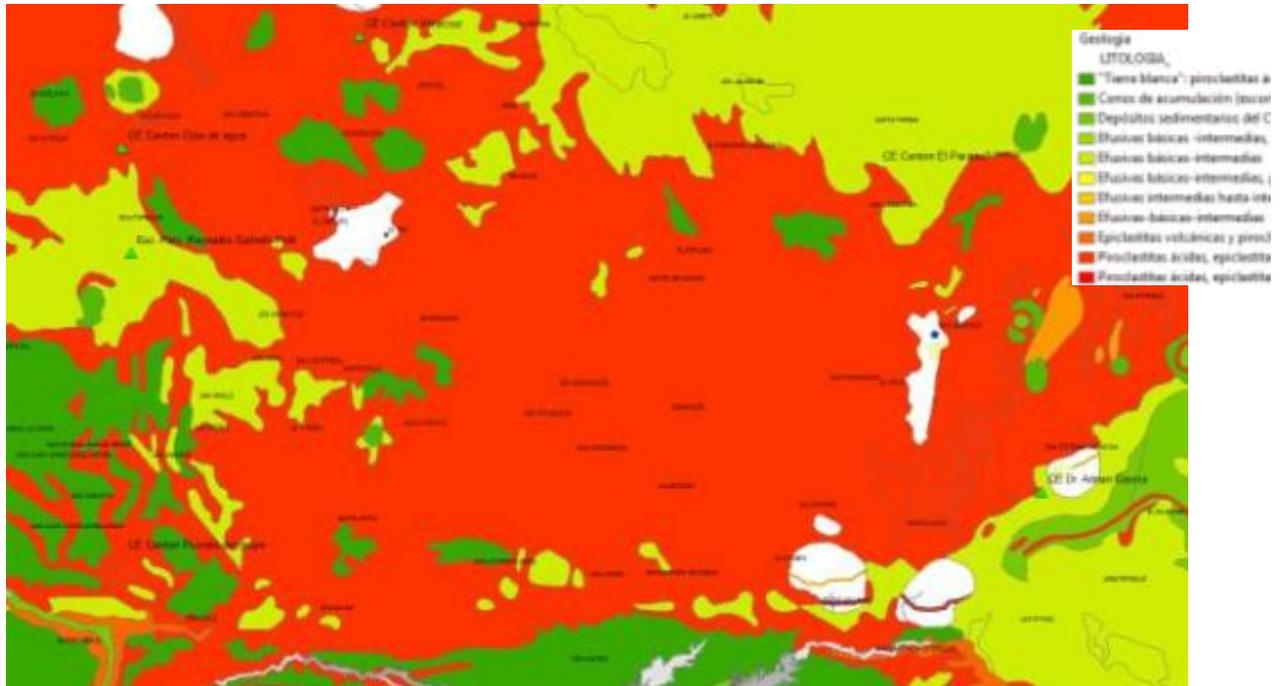


Image 65: Geology, location of projects between scattered mountains

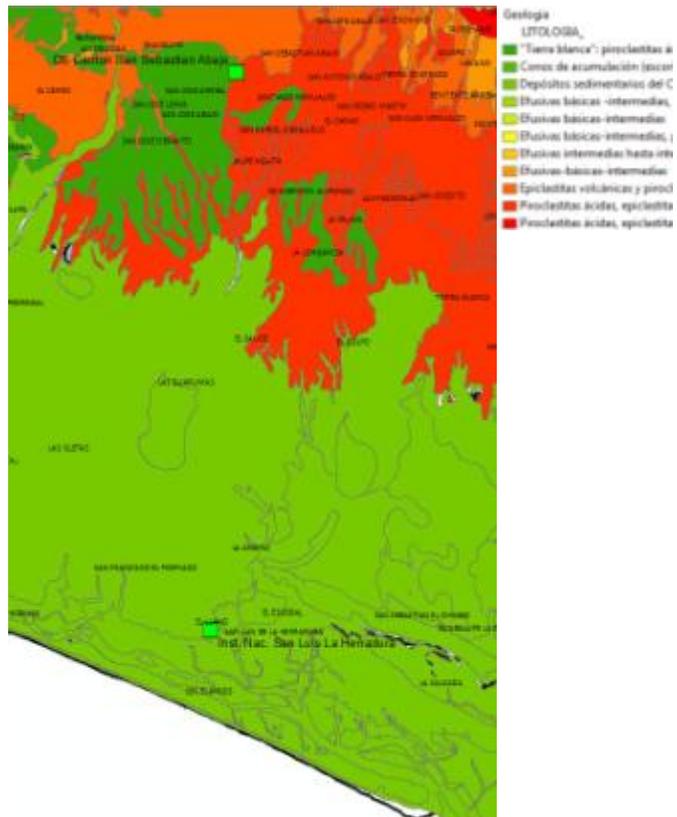


Image 66: Geology, location of projects in coastal plain

Environmental Mitigation Program for Schools



Image 67: Geological faults, location of projects in central plain

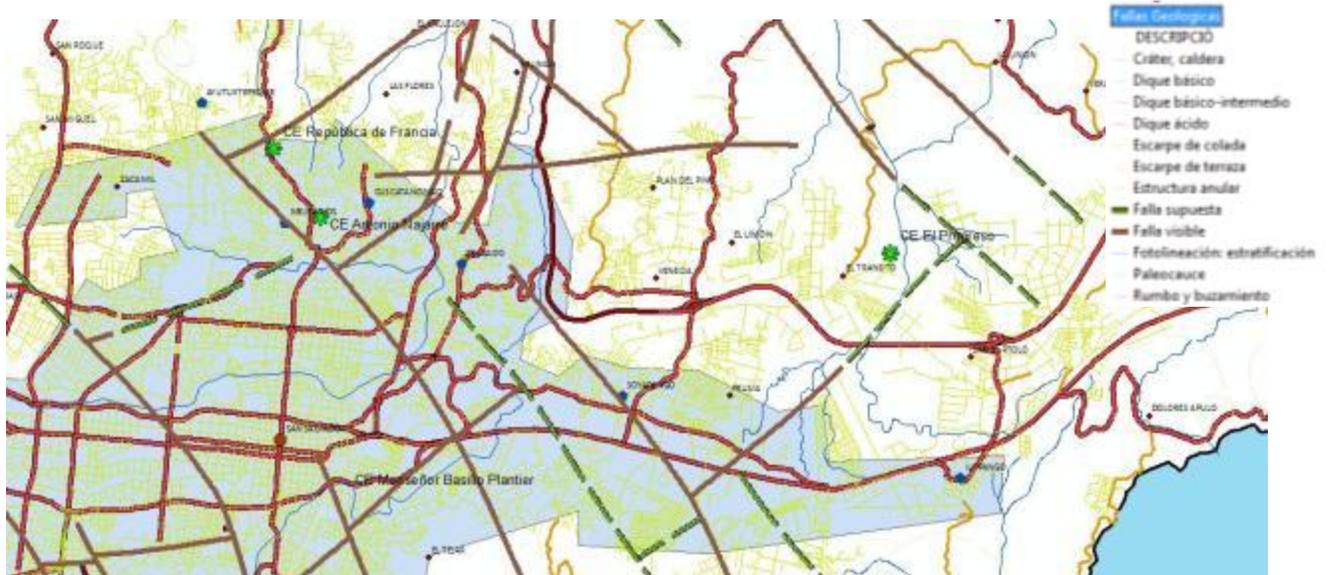


Image 68: Geological faults, location of projects in AMSS

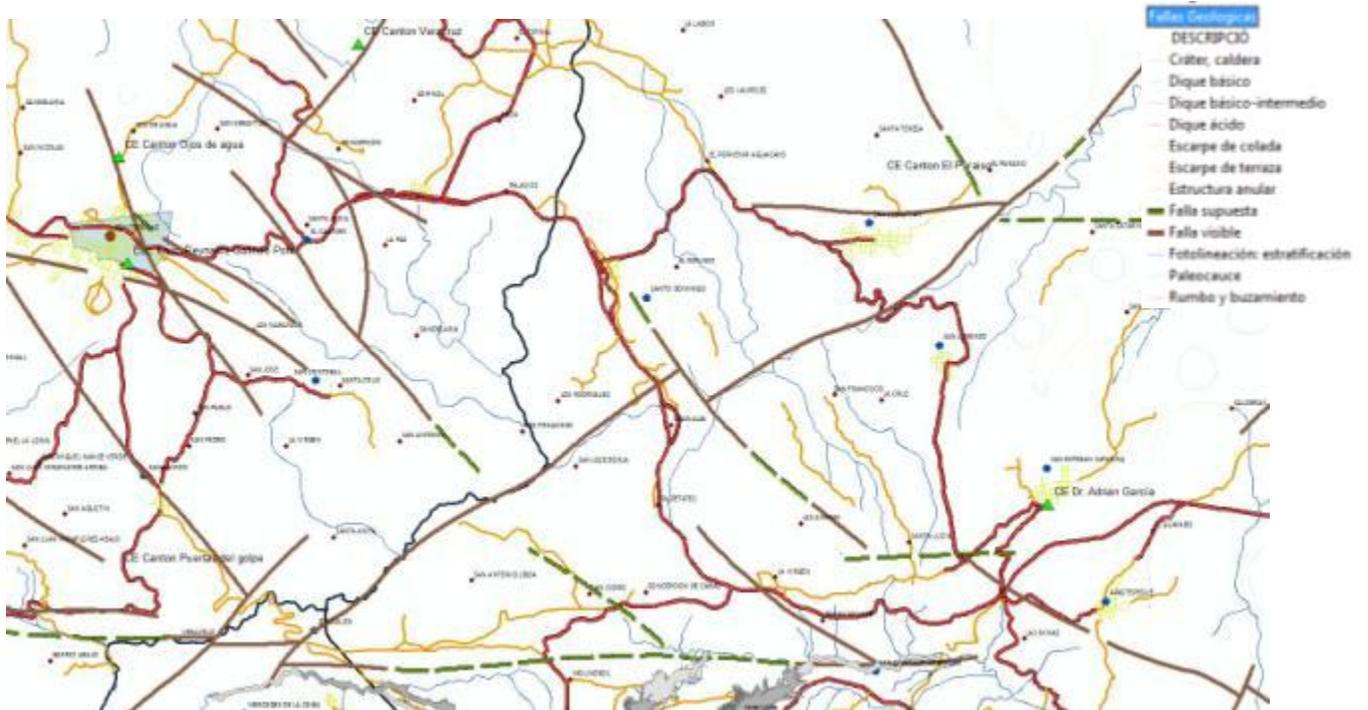


Image 69: Geological faults, location of projects between mountains



Image 70: Geological faults, location of projects between mountains

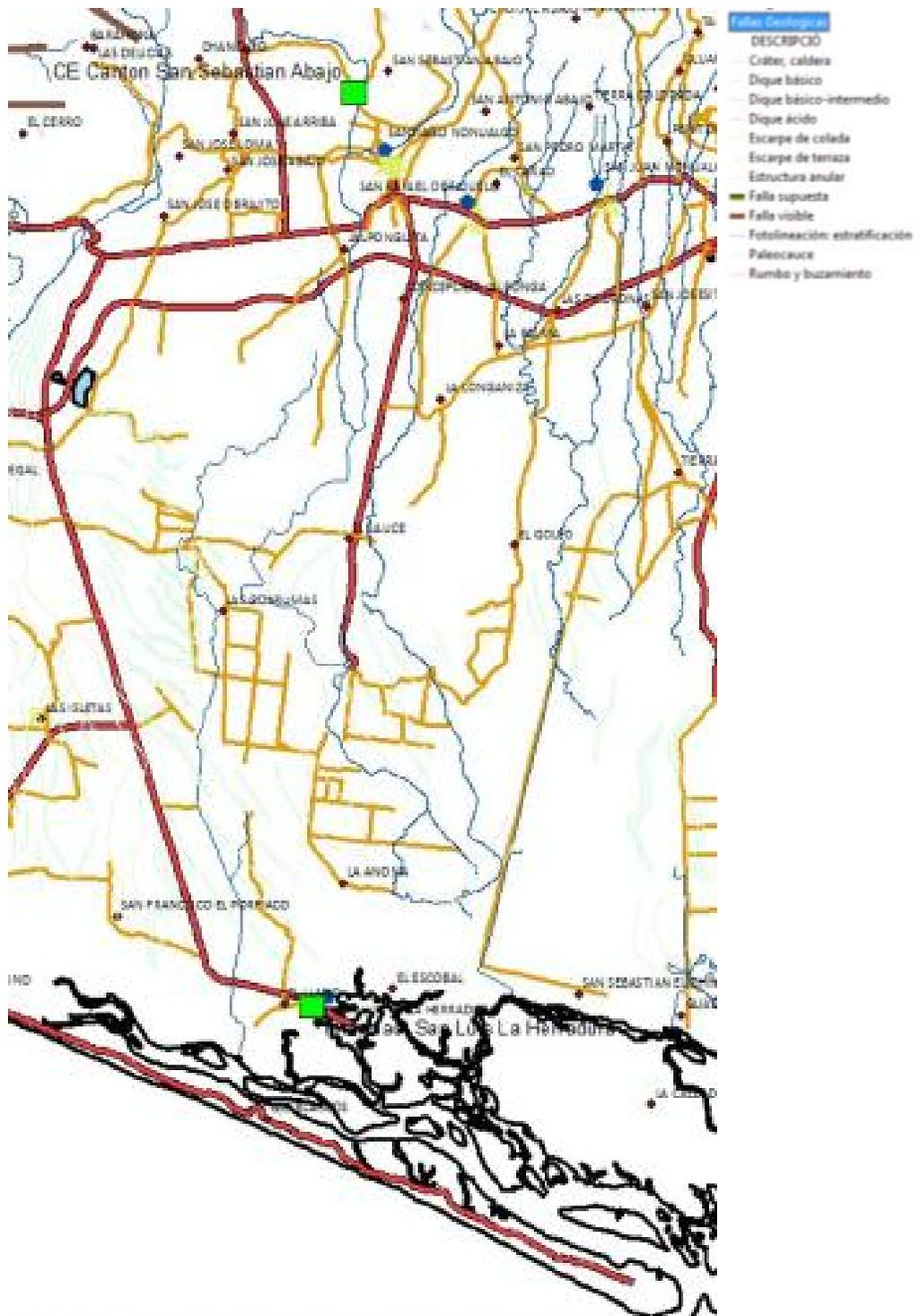


Image 71: Geological faults, location of projects in coastal plain

6.1.3. Land use

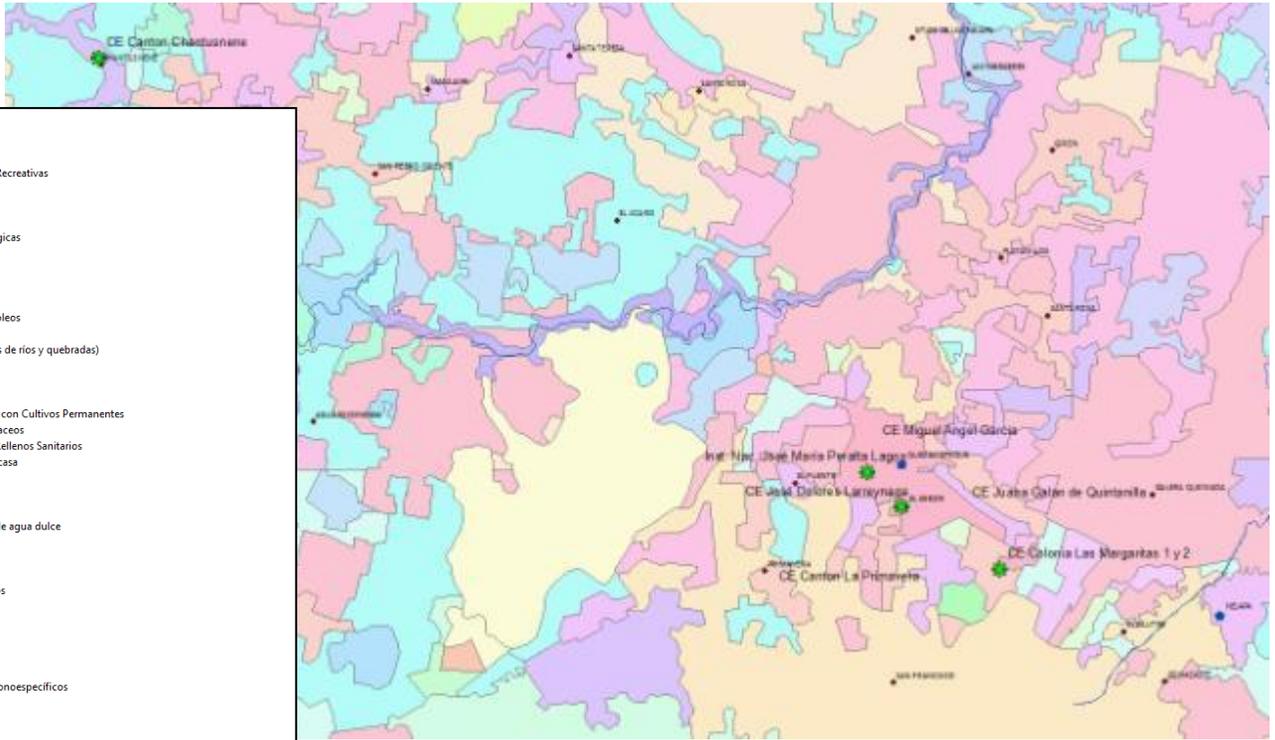


Image 72: Land use, location of projects in central plain

- Uso del Suelo
- OCUPACIÓN_
- Instalaciones Deportivas y Recreativas
- Morralen en potreros
- Aeropuertos
- Arboles Frutales
- Áreas Turísticas y Arqueológicas
- Bosque Caducifóleos
- Bosque Mixto
- Bosque Siempre Verdes
- Bosque de Mangle
- Bosque mixto semi caducifóleos
- Bosques de Coníferas
- Bosques de Galería (a orillas de ríos y quebradas)
- Café
- Caña de Azúcar
- Cultivo de Piña
- Cultivos Anuales Asociados con Cultivos Permanentes
- Cultivos Permanentes Herbáceos
- Escombreras, Vertederos y Rellenos Sanitarios
- Espacios con Vegetación Escasa
- Estuarios
- Granos Básicos
- Hortalizas
- Lagos, lagunas y lagunetas de agua dulce
- Lagunas costeras y esteros
- Mares y océanos
- Marismas interiores
- Mosaico de Cultivos y Pastos
- Otros Cultivos Irrigados
- Palmeras Oleíferas
- Pastos Cultivados
- Pastos Naturales
- Perímetro Acuicola
- Plantaciones de bosques monoespecíficos
- Plataneras y Bananeras
- Playas, dunas y arenales
- Praderas Pantanosas
- Roccosidad, lavas
- Ríos
- Salineras
- Sistemas Agroforestales
- Tejido Urbano Continuo
- Tejido Urbano Discontinuo
- Tejido Urbano Precario
- Terrenos principalmente agrícola, pero con importante espacios de vegetación natural
- Vegetación Arbustiva Baja
- Vegetación Arbustiva Costera

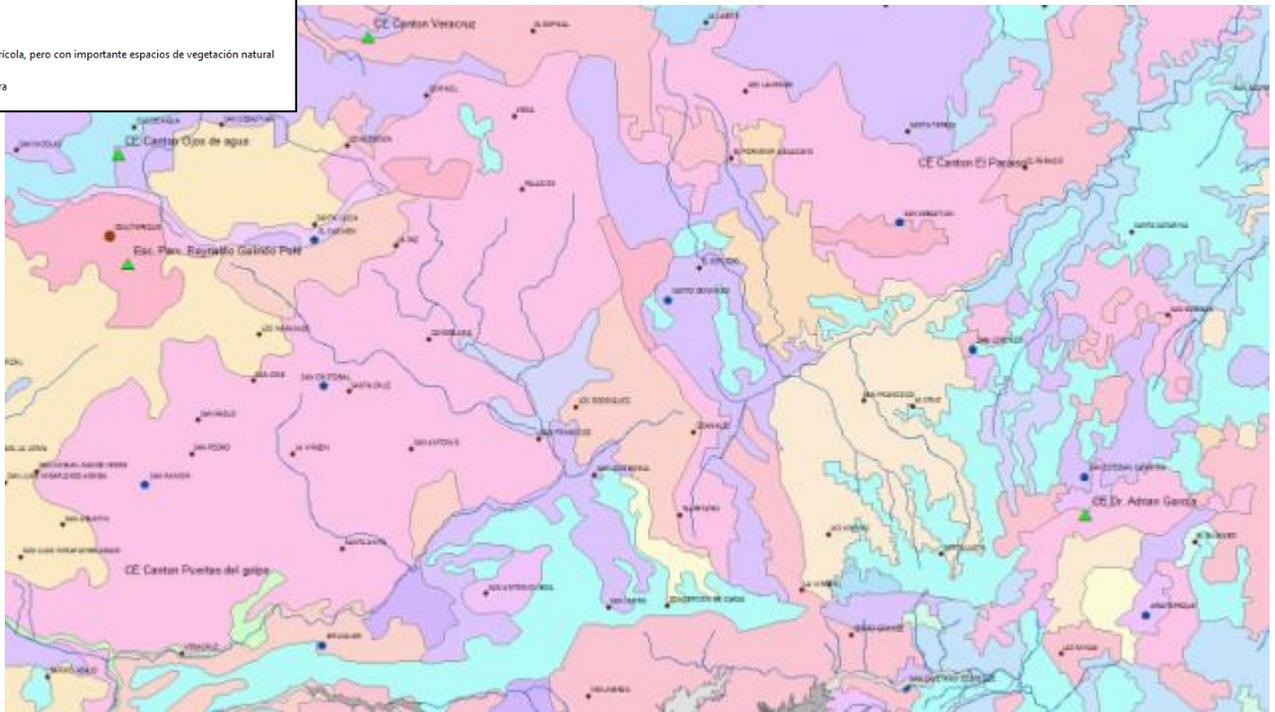


Image 73: Land use, location of projects between mountains

6.1.4. Susceptibility to landslides

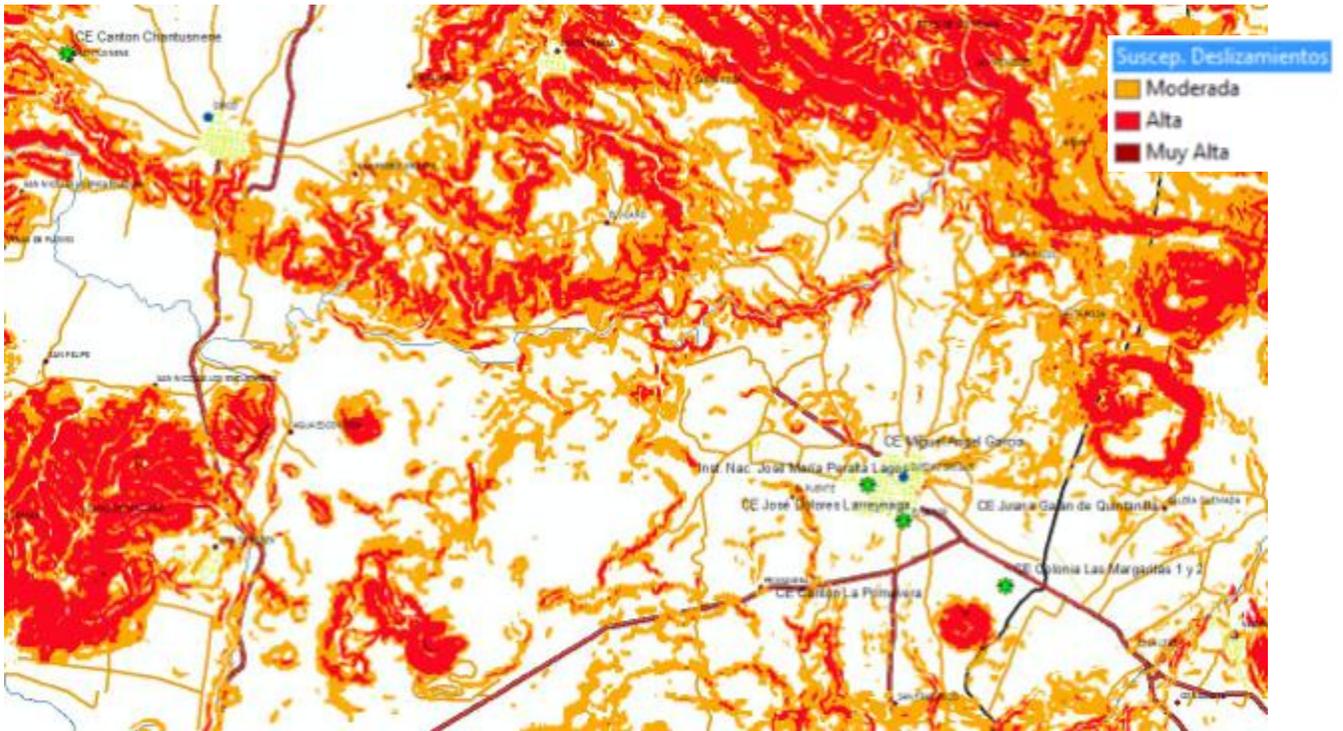


Image 74: Susceptibility to landslides, location of projects in central plain

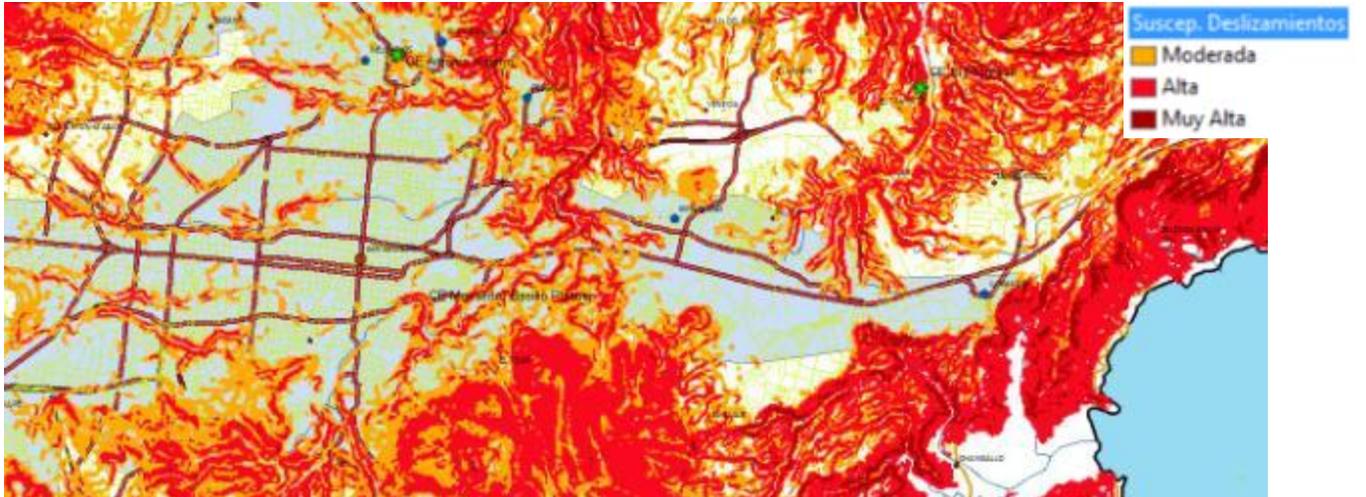


Image 75: Susceptibility to landslides, location of projects between mountains

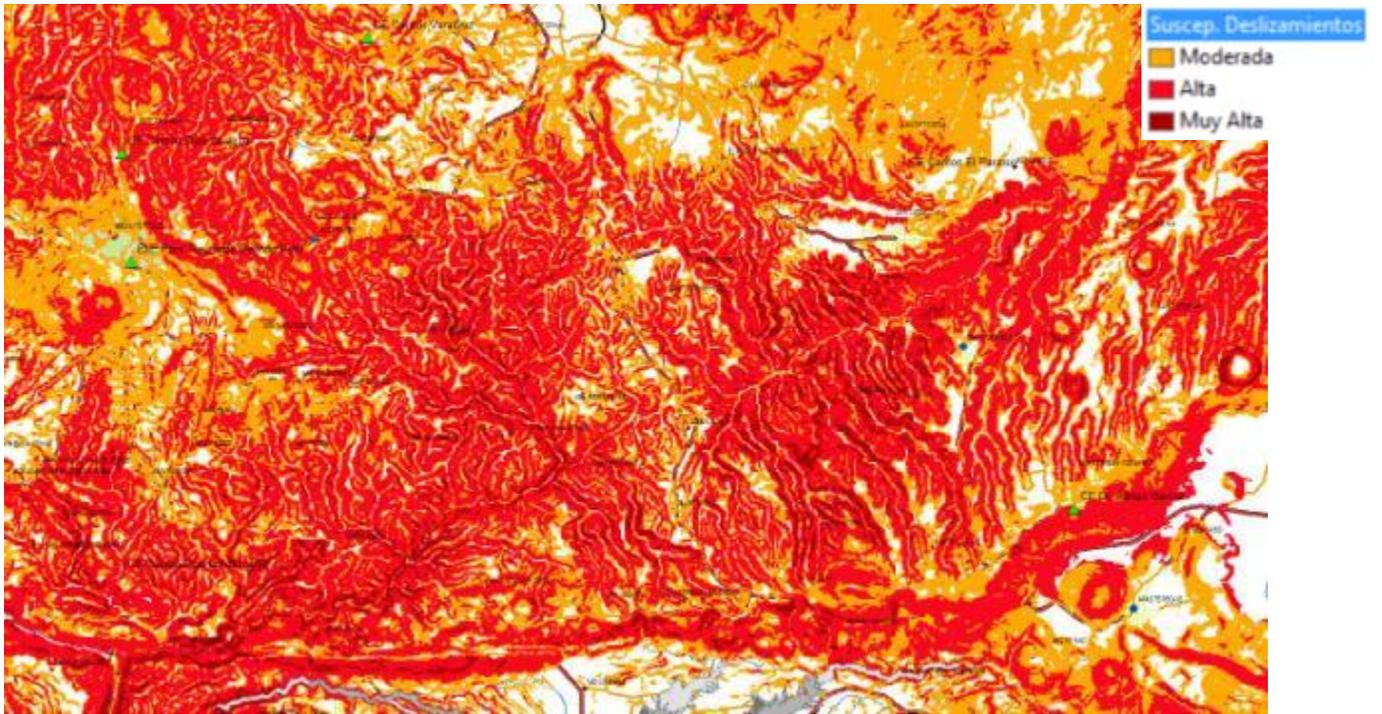


Image 76: Susceptibility to landslides, location of projects in AMSS

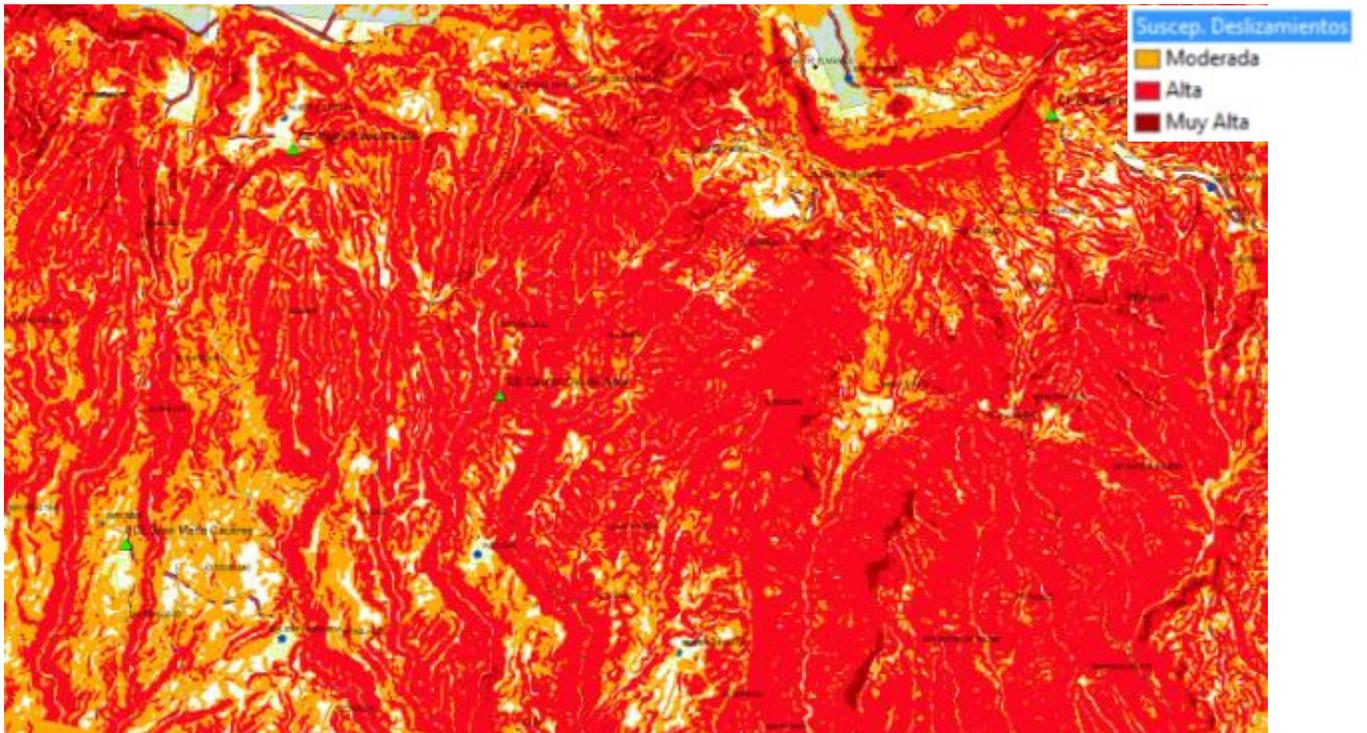


Image 77: Susceptibility to landslides, location of projects between mountains

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Image 78 : Susceptibility to landslides, location of projects in coastal plain

6.2. Biological Environment

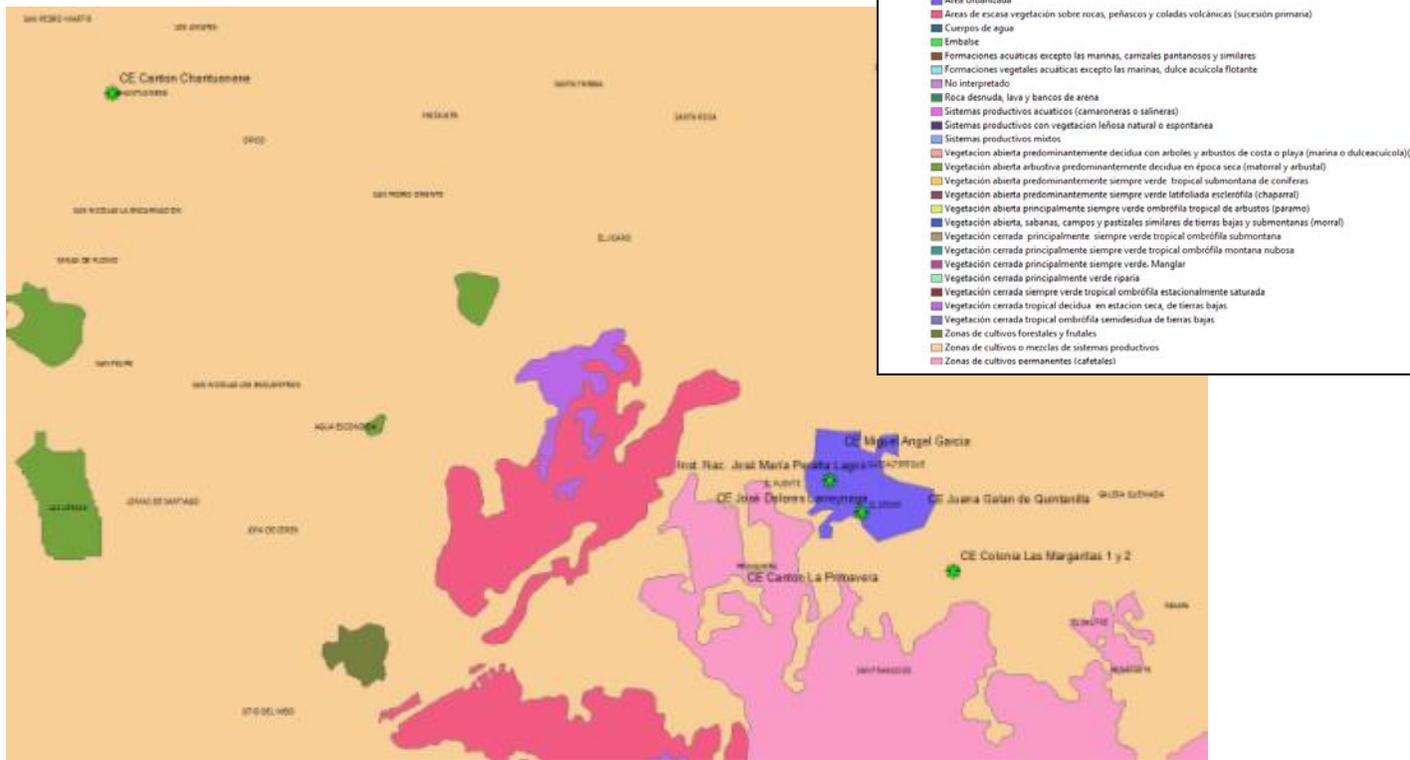


Image 79: Prevailing vegetation, location of projects in central plain



Image 80: Prevailing vegetation, location of projects in AMSS



Image 81: Prevailing vegetation, location between mountains



vegetación	DESCRIPCIO
[Blue square]	Área Urbanizada
[Red square]	Áreas de escasa vegetación sobre rocas, peñascos y coladas volcánicas (sucesión primaria)
[Green square]	Cuerpos de agua
[Light green square]	Embalse
[Dark green square]	Formaciones acuáticas excepto las marinas, carrizales pantanosos y similares
[Light blue square]	Formaciones vegetales acuáticas excepto las marinas, dulce acuícola flotante
[Purple square]	No interpretado
[Dark green square]	Roca desnuda, leña y bancos de arena
[Pink square]	Sistemas productivos acuáticos (camaroneras o salineras)
[Dark purple square]	Sistemas productivos con vegetación leñosa natural o espontánea
[Light purple square]	Sistemas productivos mixtos
[Light orange square]	Vegetación abierta predominantemente decidua con árboles y arbustos de costa o playa (marina o dulceacuícola)(zona ecotona)
[Light green square]	Vegetación abierta arbustiva predominantemente decidua en época seca (matollar y arbustal)
[Yellow square]	Vegetación abierta predominantemente siempre verde tropical submontana de coníferas
[Light green square]	Vegetación abierta predominantemente siempre verde latifoliada esclerófila (chaparral)
[Light green square]	Vegetación abierta principalmente siempre verde ombrófila tropical de arbustos (páramo)
[Light green square]	Vegetación abierta, sabanas, campos y pastizales similares de tierras bajas y submontanas (morral)
[Light green square]	Vegetación cerrada principalmente siempre verde tropical ombrófila submontana
[Light green square]	Vegetación cerrada principalmente siempre verde tropical ombrófila montana nubosa
[Light green square]	Vegetación cerrada principalmente siempre verde. Manglar
[Light green square]	Vegetación cerrada principalmente siempre verde riparia
[Light green square]	Vegetación cerrada siempre verde tropical ombrófila estacionalmente saturada
[Light green square]	Vegetación cerrada tropical decidua en estación seca, de tierras bajas
[Light green square]	Vegetación cerrada tropical ombrófila semidesidua de tierras bajas
[Light green square]	Zonas de cultivos forestales y frutales
[Light green square]	Zonas de cultivos o mezclas de sistemas productivos
[Light green square]	Zonas de cultivos permanentes (cafétales)

Image 82: Prevailing vegetation, location of projects in coastal plain

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6.3. Socioeconomic and Cultural Environment

There is a total projection of 729,031 inhabitants² in those municipalities where priority projects are located. Sub-totals are as follows:

No	School name	Municipality	Department	Population		Total
				Men	Women	
1	CE Cantón San Sebastián Abajo	La Paz	Santiago Nonualco	19,177	20,710	39,887
2	CE Canton Chantusnene	La Libertad	San Juan Opico	35,550	38,730	74,280
3	CE Pedro Pablo Castillo	La Libertad	Nuevo Cuscatlán	3,280	3,617	6,897
4	CE Dr. Adrian García	San Vicente	San Esteban Catarina	2,729	2,932	5,661
5	CE Cantón Ojo de Agua	La Libertad	Huizúcar	7,028	7,437	14,465
6	Instituto Nacional José María Peralta Lagos	La Libertad	Quezaltepeque	24,915	27,728	52,643
8	CE Colonia Las Margaritas 1 y 2	La Libertad	Quezaltepeque			
14	CE José Dolores Larreynaga	La Libertad	Quezaltepeque			
7	CE Dr. Francisco Antonio Lima	La Libertad	Jayaque	5,409	5,649	11,058
9	Esc. Parv. Reynaldo Galindo Pohl	Cuscatlán	Cojutepeque	23,571	26,744	50,315
17	CE Cantón Ojos de Agua	Cuscatlán	Cojutepeque			
10	Complejo Educativo Claudia Lars	La Paz	San Francisco Chinameca	3,631	3,756	7,387
11	CE Cantón Veracruz	Cuscatlán	El Rosario	2,002	2,218	4,220
12	Instituto Nacional San Luis La Herradura	La Paz	San Luis La Herradura	9,992	10,413	20,405
13	CE Felipe Soto	Cuscatlán	Santa Cruz Michapa	5,584	6,206	11,790
15	CE República de Francia	San Salvador	Mejicanos	64,509	76,242	140,751
18	CE Antonio Najarro	San Salvador	Mejicanos			
No	School name	Municipality	Department	Population		Total
				Men	Women	
16	CE José María Cáceres	La Libertad	Zaragoza	10,684	11,841	22,525
19	CE Dr. Antonio Díaz	San Salvador	Santo Tomas	12,151	13,193	25,344
20	CE El Progreso	San Salvador	Soyapango	111,234	130,169	241,403
TOTALS				341,446	387,585	729,031

² Data from: "Almanac 262, Status of Human Development in the municipalities of El Salvador 2009", PNUD, FundaUngo, 2009

6.4. Gender

A situation of gender inequity is still prevalent in El Salvador. In rural areas, where this is more pronounced, women are often expected to devote their time to homecare activities without remuneration, to be dependent and to be submissive to men's decisions. (Universidad Nacional, 2010).

National statistics showing inequity can be seen in areas like Illiteracy (5.5% for men and 9.1% for women), average time devoted to domestic work (2.0 hours/day for men and 4.3 hours/day for women) and average wages (\$260/month for men and \$230/month for women). (DIGESTIC, 2007)

Processes to revert this situation intensified in the 1990's, with many efforts to create awareness and empower women made by UN Organizations, Cooperation Agencies, NGOs, the Government and other organizations (UNDP, 2004).

Results are being achieved, from the Government side, with the implementation of "Ciudad Mujer" Women Development Centers in La Libertad, San Salvador, Santa Ana and Usulután; however continuous participation of many more sectors is necessary for changes to take root at a cultural level.

7. Legal and environmental considerations

7.1. United States regulations

The amended Foreign Assistance act of 1961, Section 117, requires that the impact of USAID's activities on the environment be considered and that USAID include environmental sustainability as a central consideration in designing and carrying out its development programs. This mandate is codified in Federal Regulations (22 CFR 16) and in USAID's Automated Directives System (ADS) Parts 201.5.10g and 204, which, in part, require that the potential environmental impacts of USAID-financed activities are identified prior to a final decision to proceed and that appropriate environmental safeguard are adopted for all activities.

7.2. El Salvador regulations

✓ Constitution of the Republic of El Salvador

According to Art. 1, "El Salvador recognizes the human person as the origin and objective of the activity of the State, which is organized towards the attainment justice, legal security and common welfare".

Consequently, it is the State's duty to guarantee that the inhabitants of the Republic enjoy freedom, health, culture, economic welfare and social justice".

According to Art. 117, "The protection, restoration, development and use of natural resources are declared as being of social interest. The State will create the economic incentives and will provide the necessary technical assistance for the development of adequate programs.

The protection, conservation and improvement of natural and environmental resources will be the subject of special laws.

According to Art. 119, "The construction of housing is declared as being of social interest. The State will make efforts so that the greatest number of families become the owners of their housing. It will promote that all owners of rustic farms provide hygienic and comfortable housing to resident workers, and adequate facilities for temporary workers. To that effect, it will facilitate the necessary means to small owners".

✓ Environmental Law (abbreviated LMA in Spanish)

The Environmental Law will be taken into account, as mentioned in Article 21, letter "L":

"CHAPTER V: ENVIRONMENTAL ASSESSMENT SYSTEM", referring to the activities, works or projects that require an environmental assessment: letter L, "Urbanization projects, constructions, developments or works that could provoke a negative environmental impact".

✓ Special Regulations of Technical Rules of Environmental Quality

This Executive Decree No. 40 of May 31, 2000, published in Official Gazette No. 63, Volume 346, develops the rules and precepts contained in the LMA.

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Chapter III "Air Quality"; Section I Emissions from Fixed or Stationary sources, Art. 13, establishes that those responsible for activities, works or projects of those established in Art. 21 of the Law, that carry out construction, earth and road work, among others, susceptible to produce dust emissions, will apply the corrective measures established in the Environmental Permit to control dust emissions, in order to maintain in the zone the concentrations of total suspended particles within the limits established in the air quality standard (Art. 9).

What is established in Chapter IV related to Residual Waters (Art. 20 and 22) must also be taken into consideration.

✓ Special Regulations on the Integral Handling of Solid Waste

In Chapter I, "About storage"; Specifications for temporary storage, Art. 5.- In those cases where temporary collective storage locations for solid waste are established in residential buildings, they must comply, in a minimum grade, with the following specifications:

- a) Temporary storage systems must provide for ease of cleaning and access;
- b) Ventilation, water supply, drainage and fire control systems must be adequate;
- c) The design must consider the restriction to the access of unauthorized persons and animals; and
- d) The sites will be designed to facilitate the separation and recovery of materials with recycling potential.

Provisions related to containers, Art 6.- Containers for the temporary storage of solid waste must comply with the following minimum requirements:

- a. Be adequately located and covered;
 - b. Have adequate capacity to store the volume of solid waste generated;
 - c. Be built with waterproof materials and with the necessary resistance for their end use;
 - d. Have adequate maintenance; and
 - e. Have identification related to the use and type of waste.
- ✓ Health Code

Relevant to the social assistance of the Ministry of Public Health and Social Assistance: Responsibilities of professionals, technicians, ancillary personnel, hygienists and assistants in Art. 33, urban environmental sanitation and in Art. 56, drinking water (Art. 62), urbanization (Art. 96), sanitary fixtures (Art. 106). The resolution of MSPAS is shown in Annex No. 7.

✓ Municipal Code

In Title III, About Municipal Competence; Single Chapter, Art. 4, establishes that it is a duty of municipalities to watch over environmental sanitation, urban and rural development plans, solid waste management, programs related to health and the fight against diseases, increase and protection of renewable resources (numbers 1, 5, 9 and 10).

8. Stages and main activities in each reconstruction project

The project construction process has typical activities grouped in three stages; a list follows with the main activities considered for the identification of significant impacts in a qualitative manner.

1. Site

1.1. Drainage

1.2. Soil stability

Social security environment

2. Construction

2.1 Clearing, weeding and demolition

2.2 Removal of vegetation

1. Temporary impact on basic services

2. Temporary disposal of clearing debris

3. Excavation and land grading

4. Construction of works for drinking water supply, residual water and rainwater

5. Repair and installation of electrical facilities

3. Operation

✓ Generation of residual water

✓ Generation of common solid waste

✓ Use of circulation roads of access to every project

9. Assessment of potential impacts

Potential environmental impacts are considered at three levels: 1-Green, 2 –Yellow and 3- Red. These are defined as follows:

- **1-Green:** Low impact levels; in the context of this environmental assessment, this level means that the changes associated with anticipated activities, activity levels or processes will probably result in little or no effect on the quality of the human environment at the program level. These impacts do not require mitigation and are well within the standard, regulatory or policy limits for environmental protection.
- **2-Yellow:** Medium impact levels. This level means that the changes associated with activities, activity levels or processes will probably result in moderate adverse effects on the environment at the program level. These are short-term or low-intensity effects and do not reach a significant level. Medium impacts do not create effects that exceed the standard, regulatory or policy limits for environmental protection.
- **3-Red:** High impact levels means that the changes associated with activities, levels of activity or processes will likely result in adverse effects on the environment according to the conditions of each site. The level of these impacts depends on site conditions, as well as on intensity and duration of changes. These impacts exceed allowable limits of current environmental regulations.

The following tables show the rating of each project based upon the evaluation data identified previously in this report.

No	CE Name	Main impacts and risks	Impact rating
1	CE Cantón San Sebastián Abajo, Santiago Nonualco, La Paz.	<ul style="list-style-type: none"> • AT THE LOCATION The waste water produced by the CE’s kitchen is discharged into the channel, generating bad odors. The sewage absorption well of the septic tank. • DURING CONSTRUCTION <u>Demolition:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. Tree cutting: no tree cutting is foreseen. Subsoil perforations: in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. <u>Landscaping:</u> minor excavation work will be carried out, which is not anticipated to generate significant impacts. Preparation of components of the building: Produces noise, 	2

No	CE Name	Main impacts and risks	Impact rating
		<p>suspended particles (dust, paint, fumes); construction waste, etc., water and energy demand.</p> <p><u>Risks for the school community:</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction.</p> <ul style="list-style-type: none"> DURING OPERATION <u>Demand of utilities:</u> (water, electricity, fuel) Reduction of water and energy sources. Sewage disposal: from the sanitary services and from the kitchen-warehouse. Generation of common waste: there is collection of common waste. 	
2	CE Cantón Chantusnene, San Juan Opico, La Libertad.	<ul style="list-style-type: none"> AT THE LOCATION Drainage of waste water evacuated superficially. Superficial rainwater drainage. Lack of terrace retention works. DURING CONSTRUCTION <u>Demolition:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. <u>Tree cutting:</u> tree cutting is not foreseen. Subsoil perforations: in the prior stage and during the design and construction phase, ground perforations will be made; these produce noise. <u>Landscaping:</u> minor excavation work will be carried out, which does not generate significant impacts. <u>Preparation of the components of the building:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste etc., water and energy demand. <u>Risks for the school community:</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction. DURING OPERATION Demand of utilities: (water, energy, fuel) Reduction of water and energy sources Generation of common waste: there is solid waste collection service. 	2

No	CE Name	Main impacts and risks	Impact rating
3	CE Pedro Pablo Castillo, Nuevo Cuscatlán, La Libertad	<ul style="list-style-type: none"> • AT THE LOCATION Floods are generated due to the defective gutters. This harms neighbors. A perimeter wall exists, but in poor condition. • DURING CONSTRUCTION <u>Demolitions:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation such as parapets of flower boxes and 1 perimeter wall. <u>Tree cutting:</u> no tree cutting foreseen. Subsoil perforations: subsoil perforations will be made in the prior stage and during the design and construction phase; these produce noise. <u>Landscaping:</u> minor excavation work will be carried out, which does not generate significant impacts. <u>Preparation of the components of the building:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste etc., water and energy demand. <u>Risks for the school community:</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction. • DURING OPERATION Demand of utilities: (water, energy, fuel) Reduction of the sources of water and energy. Sewage disposal: Generation of common waste: there is collection of common waste. 	2
4	CE Dr. Adrian García, San Esteban Catarina, San Vicente.	<ul style="list-style-type: none"> • AT THE LOCATION Wall is out of plumb horizontally, generating a potential danger for the persons circulating inside and outside of the facilities of the school. • DURING CONSTRUCTION <u>Demolitions:</u> There are very significant risks for the demolition of the whole module of building 1, which comprises classrooms, principal's office, warehouse, vice-principal's office and CRA. <u>Tree cutting:</u> there is cutting of trees of diameters or heights foreseen which could imply a risk. Subsoil perforations: in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. <u>Landscaping:</u> major work will be carried out, implying significant impacts within the school due to the construction of classroom 	2

No	CE Name	Main impacts and risks	Impact rating
		<p>modules and for the construction of perimeter walls and protections to stabilize the terrain, which will be risky.</p> <p><u>Preparation of the components of the building:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste, etc., water and energy demand.</p> <p><u>Risks for the school community:</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction.</p> <ul style="list-style-type: none"> DURING OPERATION Demand of utilities: (water, energy, fuel) Reduction of water and energy sources. Sewage disposal: Generation of common waste: there is collection of common waste. 	
5	CE Cantón Ojo de Agua, Huizúcar, La Libertad.	<ul style="list-style-type: none"> AT THE LOCATION There is a slope in the northern side of the terrain of approximately 8.0 mts.; there is currently a masonry and concrete block wall, which has cracks and a small portion damaged. DURING CONSTRUCTION <u>Demolitions:</u> There will be significant demolitions at the school, in the kitchen, temporary classrooms, cistern, booth, perimeter walls, water tank and metal walls. <u>Tree cutting:</u> there is cutting of trees of diameters or heights foreseen which could imply a risk. The trees and bushes located within the area to be intervened will be cut. <u>Subsoil perforations:</u> in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. Landscaping: minor excavation work will be carried out, which does not generate significant impacts. <u>Preparation of the components of the construction:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste etc., water and energy demand. <u>Risks for the school community:</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction. DURING OPERATION <u>Demand of utilities:</u> (water, energy, fuel) Reduction of sources of water and energy. Generation of common waste: there is collection of common waste. 	2

No	CE Name	Main impacts and risks	Impact rating
6	<p>Instituto Nacional José María Peralta Lagos, Quezaltepeque, La Libertad.</p>	<ul style="list-style-type: none"> • AT THE LOCATION Overflowing of the adjacent creek. Threat from the accumulation of waste water and rainwater which provokes an environment for the growth of vectors. • DURING CONSTRUCTION <u>Demolitions:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. <u>Tree cutting:</u> there is cutting of trees of diameters or heights foreseen which could imply a risk. Subsoil perforations: in the prior stage and during the design and construction phase, there will be sub-soil perforations which produce noise. <u>Landscaping:</u> minor excavation work will be carried out, which does not generate significant impacts inside the school, but major work will be carried out for the construction of perimeter walls and protections to stabilize the terrain which is risky. <u>Preparation of the components of the building:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste, etc.; water and energy demand. <u>Risks for the school community:</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction. • DURING OPERATION <u>Demand of utilities:</u> (water, energy, fuel) Reduction of water and energy sources. <u>Sewage disposal:</u> Generation of common waste: there is collection of common waste. 	2
7	<p>CE Dr. Francisco Antonio Lima, Jayaque, La Libertad.</p>	<ul style="list-style-type: none"> • AT THE LOCATION The town's rainwater drainage is discharged into a creek in the southern side of the school. • Existence of temporary classrooms in the recreation area <p>DURING CONSTRUCTION</p> <p><u>Demolitions:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. Demolition of ramps and damaged parts of sidewalks.</p> <p><u>Tree cutting:</u> there is cutting of trees of diameters or heights foreseen which could imply a risk.</p> <p><u>Subsoil perforations:</u> in the prior stage and in the design and construction phase, ground perforations will be made, producing noise.</p> <p><u>Landscaping:</u> There will be filling, slopes and wall construction that</p>	2

No	CE Name	Main impacts and risks	Impact rating
		<p>will stabilize the terrain.</p> <p><u>Preparation of the components of the construction:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste, etc.; water and energy demand.</p> <p><u>Risks for the school community:</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction.</p> <ul style="list-style-type: none"> • DURING OPERATION Demand of utilities: (water, energy, fuel) Reduction of water and energy sources. <u>Generation of common waste:</u> there is collection of common waste. 	
8	<p>CE Colonia Las Margaritas 1 y 2, Quezaltepeque, La Libertad.</p>	<ul style="list-style-type: none"> • AT THE LOCATION There is a threat of accumulation of waste water and rainwater, which provoke a growing environment for vectors. • DURING CONSTRUCTION <u>Demolitions:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. <u>Tree cutting:</u> there is cutting of trees of diameters or heights foreseen which could imply a risk. <u>Subsoil perforations:</u> in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. <u>Landscaping:</u> minor excavation work will be carried out, which does not generate significant impacts within the school. <u>Preparation of the components of the building:</u> Produces, noise, suspended particles (dust, paint, fumes); construction waste, etc.; water and energy demand. Risks for the school community Construction work could represent risks for the school community, the school does not have sufficient space for ongoing school functions during construction. • DURING OPERATION <u>Demand of utilities:</u> (water, energy, fuel) Reduction of water and energy sources. Sewage disposal: <u>Generation of common waste:</u> there is collection of common waste. 	2

No	CE Name	Main impacts and risks	Impact rating
9	Escuela Parvularia Reynaldo Galindo Pohl, Cojutepeque, Cuscatlán.	<ul style="list-style-type: none"> • AT THE LOCATION Overflowing of adjacent creek. The northern part of the terrain slopes strongly towards the creek; there is no wall and it is full of weeds, which deteriorates the draining system. • DURING CONSTRUCTION Demolitions: there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. Demolitions of ramps and damaged parts of sidewalks. Tree cutting: there is cutting foreseen of trees of diameters or heights which could imply a risk. Subsoil perforations: in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. Landscaping: There will be filling, slopes and construction of protective walls that will stabilize the terrain. <u>Preparation of the components of the building:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste etc.; water and energy demand. Risks for the school community: Construction work could represent risks for the school community, the school does not have sufficient space for ongoing school functions during construction. • DURING OPERATION Demand of utilities: (water, energy, fuel.)Reduction of water and energy sources. Generation of common waste: there is collection of common waste. 	2
10	CE. Claudia Lars, San Francisco Chinameca, La Paz	<ul style="list-style-type: none"> • AT THE LOCATION Lack of retention work in terraces, since the adjacent terraces of certain neighbors are at a greater height, thus generating landslides towards the recreation areas (court). Superficial drainage of waste water produces bad odors and it is the environment for vector growth; the superficial drainage of rainwater produces ground erosion and exposure of tree roots. • DURING CONSTRUCTION <u>Demolitions:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. <u>Tree cutting:</u> there is cutting of trees of diameters or heights foreseen which could imply a risk. <u>Subsoil perforations:</u> in the prior stage and in the design and construction phase, ground perforations will be made, producing 	2

No	CE Name	Main impacts and risks	Impact rating
		<p>noise.</p> <p><u>Landscaping</u>: minor excavation work will be carried out, which does not generate significant impacts within the school, but major work will be carried out for the construction of perimeter walls and protections to stabilize the terrain, which will be risky.</p> <p><u>Preparation of the components of the building</u>: Produces noise, suspended particles (dust, paint, fumes); construction waste etc., water and energy demand.</p> <p><u>Risks for the school community</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction.</p> <ul style="list-style-type: none"> • DURING OPERATION Demand of utilities: (water, energy, fuel) Reduction of water and energy sources. Sewage disposal: Generation of common waste: there is collection of common waste. 	
11	CE Cantón Veracruz, El Rosario, Cuscatlán.	<ul style="list-style-type: none"> • AT THE LOCATION The waste water produced by the kitchen of the school is discharged into the channel, generating bad odors. The absorption well for sewage of the septic tank. • DURING CONSTRUCTION <u>Demolitions</u>: there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. <u>Tree cutting</u>: there is no tree cutting foreseen. Subsoil perforations: in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. Landscaping: minor excavation work will be carried out, which does not generate significant impacts. <u>Preparation of the components of the building</u>: Produces noise, suspended particles (dust, paint, fumes); construction waste etc.; water and energy demand. <u>Risks for the school community</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction. <p>DURING OPERATION Demand of utilities: (water, energy, fuel). Reduction of water and energy sources. Sewage disposal: from sanitary services and from the</p>	2

No	CE Name	Main impacts and risks	Impact rating
		kitchen/warehouse. Generation of common waste: there is generation of common waste that is incinerated in the premises.	
12	Instituto Nacional. San Luis La Herradura, San Luis La Herradura, La Paz.	<ul style="list-style-type: none"> • AT THE LOCATION Allows traffic of persons foreign to the institution. Collapse of gutters and rainwater drainage. The lack of a perimeter wall allows the direct passing of the affluent from the street located north of the terrain. Gutters are not sufficient for water drainage. Septic tanks to not appear to be cleaned or maintained. • DURING CONSTRUCTION <u>Demolitions:</u> there will be significant demolition. Tree cutting: The palm trees and other trees within the area of intervention will be cut. <u>Subsoil perforations:</u> in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. <u>Landscaping:</u> minor excavation work will be carried out, which does not generate significant impacts. <u>Preparation of the components of the building:</u> Produces noises, suspended particles (dust, paint, fumes); construction waste etc.; water and energy demand. <u>Risks for the school community</u> Construction work will be significant; therefore, the school community will not be able to stay in the facilities during construction. • DURING OPERATION <u>Demand of utilities:</u> (water, energy, fuel). Reduction of water and energy sources. Sewage disposal: Generation of common waste: there is collection of common waste. 	2
13	CE Felipe Soto, Santa Cruz Michapa, Cuscatlán.	<ul style="list-style-type: none"> • AT THE LOCATION Landslides, danger for all persons that circulate outside of the school since the perimeter wall is not complete. Drainage of rainwater is superficial, with ponding. • DURING CONSTRUCTION <u>Demolitions:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. Tree cutting: there is cutting of trees of diameters or heights foreseen which could imply a risk. Subsoil perforations: in the prior stage and in the design and 	2

No	CE Name	Main impacts and risks	Impact rating
		<p>construction phase, ground perforations will be made, producing noise.</p> <p><u>Landscaping:</u> minor excavation work will be carried out, which does not generate significant impacts within the school, but major work will be carried out for the construction of perimeter walls and protections to stabilize the terrain, which will be risky.</p> <p><u>Preparation of the components of the building:</u> Produces noises, suspended particles (dust, paint, fumes); construction waste, etc.; water and energy demand.</p> <p><u>Risks for the school community</u></p> <p>Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction.</p> <ul style="list-style-type: none"> • DURING OPERATION <p>Demand of utilities: (water, energy, fuel). Reduction of water and energy sources.</p> <p>Sewage disposal:</p> <p>Generation of common waste: there is collection of common waste.</p>	
14	CE José Dolores Larreynaga, Quezaltepeque, La Libertad.	<ul style="list-style-type: none"> • AT THE LOCATION <p>The waste water produced by the cafeteria of the school is discharged towards the street, generating bad odors.</p> <p>Current inadequate use of railway facilities (used by the poor).</p> <p>Temporary classrooms over the area of the BKB court.</p> <ul style="list-style-type: none"> • DURING CONSTRUCTION <p><u>Demolitions:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation.</p> <p>Tree cutting: there is no tree cutting foreseen.</p> <p><u>Subsoil perforations:</u> in the prior stage and in the design and construction phase, ground perforations will be made, producing noise.</p> <p><u>Landscaping:</u> minor excavation work will be carried out, which does not generate significant impacts.</p> <p><u>Preparation of the components of the building:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste etc., water and energy demand.</p> <p><u>Risks for the school community</u></p> <p>Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction.</p> <ul style="list-style-type: none"> • DURING OPERATION <p>Demand of utilities: (water, energy, fuel.) Reduction of water and</p>	1

No	CE Name	Main impacts and risks	Impact rating
		energy sources. Sewage disposal: Generation of common waste: there is collection of common waste.	
15	CE República de Francia, Mejicanos, San Salvador	<p>AT THE LOCATION</p> <ul style="list-style-type: none"> • Presence of gangs in the zone, specifically in the green area south of the school. <p>DURING CONSTRUCTION</p> <ul style="list-style-type: none"> • Demolitions: there will be demolition of the staircases of building no. 4 to allow the construction of an access ramp to the second level. • <u>Tree cutting</u>: there is no tree cutting foreseen. • <u>Subsoil perforations</u>: in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. • <u>Landscaping</u>: minor excavation work will be carried out, which does not generate significant impacts. • <u>Preparation of the components of the building</u>: Produces noise, suspended particles (dust, paint, fumes); construction waste etc.; water and energy demand. • Risks for the school community: Construction work could represent risks for the school community, the school does not have sufficient space for ongoing school functions during construction. <p>DURING OPERATION</p> <ul style="list-style-type: none"> • Demand of utilities: (water, energy, fuel). Reduction of water and energy sources. • Sewage disposal: • Generation of common waste: there is collection of common waste. 	1
16	CE José María Cáceres, Zaragoza, La Libertad.	<ul style="list-style-type: none"> • AT THE LOCATION Water ponding generates the environment for vector growth. Generation of bad odors and environment for vector growth. Hazards for the persons entering the classrooms, since they can provoke a fall. • DURING CONSTRUCTION <u>Demolitions</u>: there will be significant demolitions. <u>Tree cutting</u>: The palm trees within the area of intervention will be felled. <u>Subsoil perforations</u>: in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. <u>Landscaping</u>: the level of the school will be raised 1.00mt.; this will generate significant impacts due to the movements of removal 	2

No	CE Name	Main impacts and risks	Impact rating
		<p>and filling materials.</p> <p><u>Preparation of construction components:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste etc.; water and energy demand.</p> <p><u>Risks for the school community</u></p> <p>Construction work will be significant; therefore, the school community will not be able to remain in the facilities during construction.</p> <ul style="list-style-type: none"> DURING OPERATION Demand of utilities: (water, energy, fuel). Reduction of water and energy sources. Sewage disposal: Generation of common waste: there is collection of common waste. 	
17	<p>CE Cantón Ojos de Agua, Cojutepeque, Cuscatlán</p>	<ul style="list-style-type: none"> AT THE LOCATION The waste water produced by the cafeteria at the school is drained superficially. This is a hazard for the persons circulating in the facilities of the school. Since there are no retention walls, the terrain is eroding. The lack of a wall in the main access provokes landslides of school terrain towards the main street. This level drop provoked the closing of the pedestrian access to the school; currently access is through the vehicle access. Hazard for the student population, since persons that are foreign to the school can enter through this area to the school, using the creek that is North of the soccer field as a garbage disposal location. There is also a potential accident risk that a student falls into the creek. This rainwater discharge is provoking ground erosion and a natural drainage is forming. Due to the collapse of one of the septic tanks, 8 washing sanitary modules are not being used. They generate an unhealthy environment and soil contamination. They represent a risk for the circulation of students in the septic tank area and in the collector box. Generation of bad odor and unhealthy environment. It represents a focus of infection and vector creation. DURING CONSTRUCTION Demolitions: There will be no significant demolitions with the exception of the intervention in certain components of the constructions for their adaptation. <u>Tree cutting:</u> there is no tree cutting foreseen. <u>Subsoil perforations:</u> in the prior stage and in the design and 	2

No	CE Name	Main impacts and risks	Impact rating
		<p>construction phase, ground perforations will be made, producing noise.</p> <p><u>Landscaping</u>: minor excavation work will be carried out, which does not generate significant impacts.</p> <p><u>Preparation of the components of the building</u>: Produces noise, suspended particles (dust, paint, fumes); construction waste etc., water and energy demand.</p> <p><u>Risks for the school community</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction.</p> <ul style="list-style-type: none"> • DURING OPERATION Demand of utilities: (water, energy, fuel). Reduction of water and energy sources. Sewage disposal: Generation of common waste: there is collection of common waste. 	
18	CE Antonio Najarro, Mejicanos, San Salvador	<ul style="list-style-type: none"> • AT THE LOCATION There is a boundary wall in the Eastern side of the school where the adjacent community discharges its waste water into the school premises. Deficient rainwater drainage system. There is a collapsed perimeter wall in the south side of the school. There is a creek at in the south side of the school which has large flow during the rainy season, since it collects rainwater throughout its course. There is a vault underneath the court of the school, which discharges in the creek located in the southern side. • DURING CONSTRUCTION Demolitions: There will be no significant demolitions with the exception of the intervention in certain components of the constructions for their adaptation. <u>Tree cutting</u>: there is no tree cutting foreseen. Subsoil perforations: in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. <u>Landscaping</u>: minor excavation work will be carried out, which does not generate significant impacts. <u>Preparation of the components of the building</u>: Produces noise, suspended particles (dust, paint, fumes); construction waste etc.; water and energy demand. <u>Risks for the school community</u> Construction work could represent risks for the school community; 	1

No	CE Name	Main impacts and risks	Impact rating
		<p>the school does not have sufficient space for ongoing school functions during construction.</p> <ul style="list-style-type: none"> DURING OPERATION Demand of utilities: (water, energy, fuel). Reduction of water and energy sources. Generation of common waste: there is collection of common waste. 	
19	CE Dr. Antonio Díaz, Santo Tomás, San Salvador.	<ul style="list-style-type: none"> AT THE LOCATION Hazards for the persons that circulate within the premises of the school and for neighbors, since there have been landslides and erosion in the southern side of the terrain due to the lack of mitigation work. Perimeter walls adequate structure, it currently moves when pushed. The septic tank is about to collapse, cleaning or maintenance have never been carried out. The rainwater discharge is becoming a focus of infection and vector creation, since the water in the rainwater discharge is being withheld. DURING CONSTRUCTION <u>Demolitions:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. <u>Tree cutting:</u> there is no tree cutting foreseen. Subsoil perforations: in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. <u>Landscaping:</u> minor excavation work will be carried out, which does not generate significant impacts. <u>Preparation of the components of the building:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste etc.; water and energy demand. <u>Risks for the school community</u> Construction work could represent risks for the school community; the school does not have sufficient space for ongoing school functions during construction. DURING OPERATION Demand of utilities: (water, energy, fuel) Reduction of water and energy sources. Sewage disposal: Generation of common waste: there is collection of common waste. 	2

No	CE Name	Main impacts and risks	Impact rating
20	CE EI Progreso, Soyapango, San Salvador	<ul style="list-style-type: none"> • AT THE LOCATION Landslides in the terrain; hazards for the persons that circulate within the facilities of the school, but mainly for those living at the bottom of the slope. Drainage of rainwater towards adjacent land, provoking ground erosion and the formation of a natural channel. • DURING CONSTRUCTION <u>Demolitions:</u> there will be no significant demolition with the exception of the intervention in certain components of the buildings that will remain for their adaptation. <u>Tree cutting:</u> there is cutting of trees of diameters or heights foreseen which could imply a risk. <u>Subsoil perforations:</u> in the prior stage and in the design and construction phase, ground perforations will be made, producing noise. <u>Landscaping:</u> minor excavation work will be carried out, which does not generate significant impacts within the school, but major work will be carried out for the construction of perimeter walls and protections to stabilize the terrain, which will be risky. <u>Preparation of the components of the building:</u> Produces noise, suspended particles (dust, paint, fumes); construction waste etc., water and energy demand. <u>Risks for the school community</u> Construction work could represent risks for the school community, the school does not have sufficient space for ongoing school functions during construction. • DURING OPERATION Demand of utilities: (water, energy, fuel) Reduction of water and energy sources. Sewage disposal: Generation of common waste: there is collection of common waste. 	1

10. Master Mitigation Identification Plan

Following is a description of mitigation measures for the priority group of 20 projects, considering that potential impacts are classified and identified as low and medium.

Typical sub-activities proposed, impact description and mitigation measures are shown in the following table:

#	Sub – activity or component	Impact description	Mitigation Measures
1	Component 1 – Site		
1.1	Drainages	Facilities deteriorated due to lack of maintenance, generation of leaks and potential deterioration of the soil.	Improvement or rehabilitation of infrastructure for the management of rainwater, provision of basic services of drinking water, electricity and phone service; it must be guaranteed during the construction and operation that high-quality materials and construction methods able to withstand new climatic events have been incorporated.
1.2	Slope management	Instability of slopes within and outside of the project	Establishment of slopes with their respective surface run-off work: road and walkway gutters, energy dissipators, shoulders and their re-vegetation. If shoulders are considered, their width must be a function of the number and/or height of the slopes to be established and the width of the withdrawal zones when adjacent slopes are projected, the final design of slopes must be supported with specific technical surveys.
1.3	Social security of the environment	Dangers due to the presence of criminal groups outside of the facilities	Sites must be provided with adequate fences and locks.

#	Sub – activity or component	Impact description	Mitigation Measures
1.4	Safety provisions	Inadequate drainage installations (mainly walkway gutters) in schools and play areas generate high risk of falls and accidents for students	All exposed drainage gutters must be built with sufficient width and rounded edges to prevent falls (MINED provides design specifications to address this issue). All open areas (with the exception of otherwise required for standard sport courts) must be planted with lawn.
2	Component 2 – Construction		
2.1	Land cleaning and clearing	Generation of dust and noise from the use of machinery and equipment	Application of water irrigation to reduce dust at least three times a day.
2.2	Earthworks and demolition	Generation of solid waste (excavation material, rubble, etc.)	About the management of common solid waste, clearing material (debris, rubble, etc) and of other solid waste to be generated during the construction and operation, the type of waste must be indicated, as well as the volume to be generated, the authorized location for the disposal of the material (if applicable), a proposal of environmentally feasible management . Asbestos waste material must be submitted to special management.
2.3	Use of Machinery and Equipment	Potential lack of occupational safety within the project and its vicinities.	Provision of personal protection equipment at the works, establishment of work schedules and highway safety mechanisms in project access roads.
2.4	Establishment of camp	Increase in personnel outside the area of the Project, potential larger demand of services at the location	Provision of basic services for construction personnel without detriment to neighbors' living standards. Provisions and signaling for pedestrian-specific circulation zones. Site specific adaptation and follow-up of the Community Involvement and Gender Plan provided by CDM Smith. Relevant Health and Hygiene information must be available at all worksites, including information and prophylactics to prevent and control sexually transmitted diseases.

#	Sub – activity or component	Impact description	Mitigation Measures
3	Component 3 – Operation		
3.1	Residual water management	Improper management of ordinary residual waters (sewage and greywater).	In cases of management of ordinary residual waters (sewage and greywater) that do not connect to the existing network, an environmentally adequate proposal must be submitted for their management, which must include information relative to their location, area to be used, capacity, technical specifications of the system, discharge point, quality of the effluent and of the treated water and foreseen maintenance, among others. Sewage and greywater must be discharged in one single piping network.
3.2	Generation of solid waste	Improper management in the collection and final disposal of the solid waste generated during the operation could generate contamination sources to the detriment of student health.	Implementation of a comprehensive solid waste management program with support from school center authorities and parents, enabling the commercialization of the solid waste generated with companies authorized for collection.
3.3	Cooking facilities	Usage of inefficient wood-based stoves generates air pollution due to inefficient combustion, economic impacts due to dependence on firewood, and promotes deforestation	Implementation of fan-assisted efficient wood-based stoves must be implemented (a local patent for “turbococinas” is available).

#	Sub – activity or component	Impact description	Mitigation Measures
3.4	Rainwater collection and usage	Lack of rainwater usage increases economic impacts due to higher potable water usage.	Collection of rainwater and usage in sanitary systems must be implemented. Collected rainwater must be filtered (using sand filters) to retain suspended solids from roofs. Since no potabilization processes are foreseen, filtered rainwater must be conducted separately from potable water to prevent human consumption and used exclusively in toilets.

The application of this is important, depending in the environmental characteristics of the locations as classified in the following table:

No.	Project name	Municipality	Department	Environmental Zoning		
				Coastal plain	Scattered mountains	Central plain/urban
1	CE Cantón San Sebastián Abajo	La Paz	Santiago Nonualco	□		
2	CE Cantón Chantusnene	La Libertad	San Juan Opico			*
3	CE Pedro Pablo Castillo	La Libertad	Nuevo Cuscatlán		Δ	
4	CE Dr. Adrian García	San Vicente	San Esteban Catarina		Δ	
5	CE Cantón Ojo de Agua	La Libertad	Huizúcar		Δ	
6	Instituto Nacional. José María Peralta Lagos	La Libertad	Quezaltepeque			*
7	CE Dr. Francisco Antonio Lima	La Libertad	Jayaque		Δ	
8	CE Colonia Las Margaritas 1 y 2	La Libertad	Quezaltepeque			*

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No.	Project name	Municipality	Department	Environmental Zoning			
				Coastal plain	Scattered mountains	Central plain/urban	
9	Escuela Parvularia Reynaldo Galindo Pohl	Cuscatlán	Cojutepeque		Δ		
10	Complejo Educativo Claudia Lars	La Paz	San Francisco Chinameca		Δ		
11	CE Cantón Veracruz	Cuscatlán	El Rosario		Δ		
12	Instituto Nacional. San Luis La Herradura	La Paz	San Luis La Herradura	□			
13	CE Felipe Soto	Cuscatlán	Santa Cruz Michapa		Δ		
14	CE José Dolores Larreynaga	La Libertad	Quezaltepeque			*	
15	CE República de Francia	San Salvador	Mejicanos			*	
16	CE José María Cáceres	La Libertad	Zaragoza		Δ		
17	CE Cantón Ojos de Agua	Cuscatlán	Cojutepeque		Δ		
18	CE Antonio Najarro	San Salvador	Mejicanos			*	
19	CE Dr. Antonio Díaz	San Salvador	Santo Tomas		Δ		
20	CE El Progreso	San Salvador	Soyapango			*	
<u>Symbols</u>				TOTAL	2	11	7
□ Coastal plain							
Δ Between mountains							
*Central plain/AMSS							

Table 1 Priority Project classification by environmental zone

The projects located in the coastal plain have as their main element of vulnerability, the possibility of flooding; those located among mountains are susceptible to landslides, and those located in the central plain and AMSS, the impact is on access roads during the construction stage.

11. Master evaluation, monitoring and environmental follow-up

#	Description of Mitigation Measures	Party Responsible	Monitoring Methods			Estimated Cost	Results			Recommended adjustments
			Indicators	Method	Frequency		Monitoring date	Problems found	Mitigation effectiveness	
Component 1 – Location										
1	Improvement or rehabilitation of infrastructure for the management of rainwater, provision of basic services of drinking water, electricity and phone service. It must be guaranteed during the construction and operation that high-quality materials and construction methods able to withstand new climatic events have been incorporated.	CDM SMITH-GRAM SCHOOL	Incorporate in the design	Graphic	Once		1			
							2			
							3			
							4			
2	Establishment of slopes with their respective surface run-off work: gutters, energy dissipators, shoulders and their re-vegetation. If shoulders are considered, their width must be a function of the number and/or height of the slopes to be established and the width of the withdrawal zones when adjacent slopes are projected, the final design of slopes must be supported with specific technical surveys.	CDM SMITH-GRAM SCHOOL	Incorporate in the design	Graphic	Once		1			
							2			
							3			
							4			
3	Provision of security mechanisms in the vicinity of the facilities through adequate fences and locks.	CDM SMITH-GRAM SCHOOL	Incorporate in the design	Graphic	Once		1			
							2			
							3			

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#	Description of Mitigation Measures	Party Responsible	Monitoring Methods			Estimated Cost	Results			Recommended adjustments
			Indicators	Method	Frequency		Monitoring date	Problems found	Mitigation effectiveness	
							4			
Component 2 – Construction										
1	Application of water irrigation to reduce dust at least three times a day.	MINED	Leasing of facilities to relocate students	Visual	Once		1			
							2			
							3			
							4			
2	About the management of common solid waste, clearing material (debris, rubble, etc) and of other solid waste to be generated during the construction and operation, the type of waste must be indicated, as well as the volume to be generated, the authorized location for the disposal of the material (if applicable), a proposal of environmentally feasible waste management . Asbestos waste material must be submitted to special management.	Contractor	Verification by CDM SMITH supervision	Visual	Weekly		1			
							2			
							3			
							4			
3	Provision of personal protection equipment at the works, establishment of work schedules and highway safety mechanisms in project access roads.	Contractor	Verification by CDM SMITH supervision	Visual	Weekly		1			
							2			
							3			
							4			

#	Description of Mitigation Measures	Party Responsible	Monitoring Methods			Estimated Cost	Results			Recommended adjustments
			Indicators	Method	Frequency		Monitoring date	Problems found	Mitigation effectiveness	
4	Provision of basic services for construction personnel without detriment to neighbors' living standards. Provisions and signaling for pedestrian-specific circulation zones. Site specific adaptation and follow-up of the Community Involvement and Gender Plan provided by CDM Smith. Relevant Health and Hygiene information must be available at all worksites, including information and prophylactics to prevent and control sexually transmitted diseases.	Contractor	Verification by CDM SMITH supervision	Visual	Weekly		1			
							2			
							3			
							4			
Component 3 – Operation										
1	In cases of management of ordinary residual waters (sewage and greywater) that do not connect to the existing network, an environmentally adequate proposal must be submitted for their management, which must include information relative to their location, area to be used, capacity, technical specifications of the system, discharge point, quality of the effluent and of the treated water and foreseen maintenance, among others.	CDM SMITH	Verification by CDM SMITH supervision	Visual	Monthly		1			
							2			
							3			
							4			

#	Description of Mitigation Measures	Party Responsible	Monitoring Methods			Estimated Cost	Results			Recommended adjustments
			Indicators	Method	Frequency		Monitoring date	Problems found	Mitigation effectiveness	
2	Implementation of a comprehensive solid waste management program with support from school center authorities and parents, enabling the commercialization of the solid waste generated with companies authorized for collection.	Local actors (Teachers, CDE, NGOs of the Ministry of Education, Mayor's Office, etc.)	Verification by CDE and CDM SMITH supervision (up to the finalization of the contract)	Visual	Monthly		1			
							2			
							3			
							4			
3	Implementation of fan-assisted efficient wood-based stoves must be implemented (a local patent for "turbococinas" is available).	Contractor	Verification by CDM SMITH supervision	Visual	Weekly		1			
							2			
							3			
							4			
4	Collection of rainwater and usage in sanitary systems must be implemented. Collected rainwater must be filtered (using sand filters) to retain suspended solids from roofs. Since no potabilization processes are foreseen, filtered rainwater must be conducted separately from potable water to prevent human consumption and used exclusively in toilets.	Contractor	Verification by CDM SMITH supervision	Visual	Weekly		1			
							2			
							3			
							4			

12. References

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