Community Planning Workshop Report
Held on March 15-18, 2011
Notre Dame Haiti Program
The Léogâne Planning Workshop

On March 15-18, 2011 a four day planning workshop was held in Léogâne, Haiti. The purpose of the workshop was to bring together approximately 200 community members, government representatives, and international non-profit organizations to begin to develop a vision and plan for the rebuilding of Léogâne.

This workshop was sponsored by the University of Notre Dame along with several other universities and planning organizations from the United States of America. The University of Notre Dame has been actively involved in Haiti for the past twenty years with a focus on eliminating Lymphatic Filariasis (a cause of Elephantiasis). Following the January 12, 2010 earthquake, the Notre Dame compound in Léogâne (Residence Filariose) served as a trauma and medical center and offered temporary lodging for organizations providing relief efforts.

The needs in Léogâne are immense. Approximately 90% of all buildings were destroyed and basic services were disrupted. The people of Léogâne have endured overwhelming emotional, psychological and physical challenges. Initial relief efforts focused on emergency response: providing immediate food, water, medical assistance and temporary shelter. Léogâne has now entered a transitional phase of recovery, with current efforts focused on removing rubble, providing semi-permanent facilities for schools and public services, restoring basic services, and the development of transitional shelters.

There is a need for an overall plan to guide the rebuilding of the city and surrounding community to ensure that Haiti “Builds Back Better”. During the Workshop, it came to light that there are several NGOs and government agencies that have already or are in the process of developing plans. Based on lessons learned from other disasters, it is important that plans are developed with extensive community input and with coordination amongst planning organizations. What is needed is a single “unified” plan for Léogâne.

The involvement in the Workshop was fantastic and we would like to express our appreciation for all of those that participated. This document includes the ideas that were generated by the participants that will hopefully evolve into a plan. There is a great deal of planning that is still needs to be done and we invite you to join us.

This is the beginning of a new Vision for Léogâne.

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Acknowledgements

This planning workshop required the commitment and involvement of many individuals and organizations. It also required many hours of preparation. Many of persons that participated were volunteers who paid for their own travel expenses and accommodations.

We would like to extend a special appreciation to the mayor of Léogâne, Santos Alexis for his support in making this workshop possible and the involvement of his staff.

We would also like to recognize the involvement of the NGOs and government agencies that participated and provided tremendous insight to needs and rebuilding activities in Léogâne.

The workshop planning committee would like to thank Hilda Alcindor and the Faculté des Sciences Infirmières for the generous use of their facilities.

We would also like to express appreciation for the support from the University of Notre Dame who provided the logistical support, residential facilities, meals for all participants and additional funding to make this event possible.

Finally and most importantly, we would like to thank the citizens of Léogâne for their involvement. This was a major commitment on their part for some who are currently living in tents or other difficult circumstances.

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# Acknowledgements

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Introduction

Léogâne, both a city and one of Haiti’s 140 communes, was the epicenter of the January 12, 2010 earthquake. This earthquake resulted in devastating loss of life and property for the people of Haiti, particularly in Léogâne, where approximately 90% of the buildings were critically damaged or destroyed.

Many foreign nongovernmental and nonprofit organizations are working intensely to help rebuild and provide much-needed services; however, frustration is mounting as there is still much that needs to be done. Challenges of property rights, construction standards, bureaucratic red tape, and poor public infrastructure have slowed the progress of redevelopment. Additionally, there has been little coordination between international aid organizations, non-profits, the national and local government, and the community of Léogâne.

While several organizations (local, national, and international), have begun to formulate master plans for the redevelopment of Léogâne, thus far, there has not been an effort to collaborate on a unified plan. The Workshop to Rebuild Léogâne sought to rectify this issue by bringing together nongovernmental organizations, government officials, and community members together to discuss a collective vision for redevelopment.

Over a year has passed since the earthquake. While much of the rubble has been cleared, there are still thousands of Léogâne residents living in inadequate tent encampments. Schools and businesses remain closed or operate at reduced capacities, decreasing opportunities for education and economic development. Existing problems such as limited and unreliable access to health care, clean drinking water, and lack of electricity have been exacerbated by the earthquake’s destruction and current living conditions. To meet the vast and pressing needs of the community, there is a dire need for reconstruction and sustainable development in Léogâne.

This document represents the preliminary results of what was produced during the four day workshop and, going forward, will act as a framework to develop a unified plan on behalf of the people of Leogane and its government leaders.
The conference to Rebuild Léogâne took place between March 15 and March 18 of 2011 in Léogâne at the Faculte des Sciences Infirmieres and the Residence Filariose. The opening session began with remarks made by Jean Marc Brissau, director of the Notre Dame Haiti Program; followed Mr. Alexis, the Mayor of Léogâne. Dr. William DeJong served as the Workshop facilitator. Odnell David, deputy director of FAES and Sadia Kahn, UNHabitat, shared information with the group about various ongoing planning initiatives at the national level. The session continued with a presentation by Steven Bingler from Concordia Architecture, who provided insight regarding post-disaster redevelopment from his work in New Orleans after hurricane Katrina.

The core of the conference’s opening day took place in small mixed groups tasked to envision the future of Léogâne. These groups worked together to identify their priorities for the redevelopment of Léogâne. The most agreed upon community development priorities for Léogâne: **Health, Education, Zoning, and Infrastructure.**

Another important factor that came to the surface during first day’s group sessions, were the assets of the community. Participants identify the following assets of the commune of Léogâne: **People, Agriculture, History, Youth, Art, Culture, and History.**
During days two and three of the Workshop, participants divided themselves into eight focus groups related to their professions, specialties, and interests. The eight focus areas were Culture, Planning & Zoning, Infrastructure, Public Services, Housing, Education, Health, and Economic Development. Over two days spent in these focused working groups, the groups discussed objectives, resources, challenges/problems, solutions, and long and short term steps.

On Friday, each focus group presented their findings to all of the conference participants as well as the many additional community members and government officials who attended for the final session. In addition to the eight focus groups, the final presentation provided recommendations on how to move the process beyond the Workshop and to make sure the findings became a reality. This report includes the compilation of the information and solutions presented by each group as well the suggestion on how to move the process to the formation of an overall unified Léogâne plan.
1.0 Culture

In this historic city, culture is the heart and soul of the community. Gaining an understanding of Léogâne’s culture and history is central to its redevelopment. For this reason, a focus on culture is an appropriate place to begin.

The people of Léogâne proudly value their local culture and history. There is strong *place identity* in Léogâne that should guide rebuilding efforts. Local visual, musical and dramatic arts, public celebrations, cultural practices, and historic preservation all have practical roles to play in immediate and future rebuilding efforts. Local cultural identity should guide community and economic development, planning for infrastructure and public works, housing, education, and urban design.

Léogâne’s history and culture are an important part of Haiti’s national heritage. Léogâne is a national treasure because it was the political center of the indigenous society of Taino Arawak, who inhabited the island before the arrival of Columbus in 1492. Since the colonial period, Léogâne’s economic identity has been tied to sugar cane production and fishing. Architecturally, Léogâne City is classic Caribbean in style, and the surrounding mountains and coast are some of Haiti’s loveliest natural terrain.

Unfortunately, Léogâne’s physical form was devastated by the earthquake in January of 2010, and the region’s economic identity has been overcome by the concentration of population and services in nearby Port-au-Prince. The social fabric of Léogâne has been subject to decades of political upheaval, grinding poverty, disease and the decay of infrastructure. Another important and often overlooked determent to the identity of Léogâne is that its local workforce is continually drained by the need to seek work abroad.

Place identity should embrace much more than historic preservation and the marketing of local crafts. Rebuilding efforts should be framed in terms of a distinct regional identity, rooted in the local culture and ways of life. Talking about the goals of rebuilding, one local artist said, “We need to build a reason to be in Léogâne.” Providing a reason to want to be in Léogâne should guide all rebuilding efforts here.
1.1 Preserve the Culture and History of Léogâne

The epicenter of the January 12, 2010 earthquake was in the Léogâne commune resulting in 90% of existing buildings being destroyed. There are urgent and ongoing needs for housing and health services. Efforts to address these needs should build upon the strengths of local identity. For example, the design of new structures could be informed by the centuries-old wisdom of indigenous building crafts and materials. Natural ventilation systems and inexpensive durable building materials offer strategies for design that should be explored in building new shelters, homes, and other structures. Local residents could be trained to build, maintain, and staff the most urgently needed facilities.

Image 1.1a: Historic buildings in Léogâne

To maximize the success of housing programs, new construction should build upon local social institutions, norms and ways of life. Outside of the urban center in the rural sections of Léogâne, families cluster their homes in traditional lakou, or compounds, on communal lands. These communal lands represent not only cultural history, but also a strategy for resource sharing. The existing lakou should be carefully considered in planning for housing construction, preservation, and community development.

In addition to maintaining traditions and culture in the physical reconstruction of the city, Léogâne’s history must also be preserved through education. As mentioned above, Léogâne was the cradle of the Taino Arawak civilization that flourished in the Greater Antilles until the Spanish conquest of the Caribbean and the Americas. During the colonial period, Léogâne’s sugar cane and coffee plantations contributed to the greatest external source of France’s wealth. The African and Creole slaves who worked the plantations took part in the only successful slave revolt in modern history. They seized their freedom to establish themselves as a free, land-holding, farming society. That history is a key source of identity for the people of Léogâne and indeed all Haitians.

The historical consciousness of this history is largely preserved and passed down through artistic and religious expression: the lyrics of songs, story-telling ritual processions to sacred, historical places, through visual representation and other media. This rich oral, musical and visual tradition is not generally recognized in school curricula. Local school planning should consider including local history in schools. This tradition is further threatened by the dispersal of the people of Léogâne to other cities and countries.
Group Recommendations

A. Integrate Léogâne history and traditions in rebuilding initiatives.

B. Preserve historical styles of architecture

C. Introduce Léogâne arts & history in school curriculum

In preparation for future economic development efforts involving tourism, Léogâne's history and historic sites can be brought into focus in school curricula, and trade school programs could train interpreters and guides in local history and historic sites.

1.2 Rara focused development

Rara is an ongoing series of local celebrations in the communities of Léogâne that culminates in a massive annual festival downtown. Rara celebrations incorporate music, dance, food, races and competitions, poetry and storytelling. Although Rara festivities take place all over Haiti, Léogâne is where Rara originated and where its most spectacular events occur. Haitian citizens living all over the world come to Léogâne for the annual Rara festivities. In much the same way that Mardi Gras is New Orleans’ brand, Léogâne is renowned among Haitians for Rara. A local Rara organization is responsible for coordinating the celebrations. Expanding upon their foundation, Rara should be developed as Léogâne’s year-round, regional brand for marketing to the Haitian diaspora and tourists world-wide.

A. Incorporate Rara in urban design

Over the long history of Rara in Léogâne, certain patterns of use of the urban form have developed. During the annual festival downtown, approximately 37 Rara bands arrive through four entry-points at the edges of the city and wind down long-established routes toward the center of town. Viewing stands line the streets; window, porches and sidewalks hold throngs of participants. The commune's redevelopment can be guided by these patterns: New streets should be designed to accommodate the parades, and public spaces should be rebuilt with Rara events in mind. As the tourism industry is redeveloped, hotels, retail stores, and cafes should be concentrated in Rara spaces.

Image 1.2a: A rara celebration

The Rara celebration, comprised of large dance processions and marching bands often with homemade instruments and hundreds or thousands of dancers/marchers, requires a lot of room. Today many of the streets are unable to handle the high volume of Rara participants and activities.
The streets of Léogâne should be designed to support the Rara bands and the spectators on multiple sidewalk levels. Cafes and hotels should provide views of the Rara activities, and a museum and gift shops could be located in the city center.

With many people traveling to Rara from around the commune, Port-au-Prince and beyond, there is a shortage of parking and public restrooms that should be considered in planning of public spaces. Codes, zoning and ordinances should consider the use of public space for Rara, and the positioning of police services and walk-up medical clinics should plan for Rara activities. After the celebrations, clean-up crews are needed to return the streets to order.

B. Organize a Léogâne tourism office
A regional tourism office, located in downtown Léogâne, could serve as a focal point for organized tours and cultural events throughout the commune. In the past, Haiti has been host to tourists from the US, Europe, Asia, and other parts of the Caribbean, especially for the Haitian diaspora. Prior to the earthquake Haiti was on the agenda for international African-American history tours from the United States. These organizations could be re-engaged and tours built with them in mind. A tourism office could actively market Léogâne cultural activities around Haiti and abroad.

The tourism office could also coordinate Rara tourism by providing housing for visitors, local tours, translators and guides, bus services, and maps of markets and shops where arts and crafts are sold.

C. Integrate Public Art and Urban Design
As mentioned above, Rara bands from all over Léogâne enter the city at four distinct points during the annual Rara festival. These four locations, established by long tradition, are public gathering spaces and markets. Downtown redesign should formalize these “portals”. Murals and other public art works should be encouraged at these gates, and throughout the city.

Image 1.2b: A local muralist at work

1.3 “Sant Katye” (Community Center)
The market is the economic and social heart of the community in Léogâne. In addition to the permanent markets located in the city center; smaller temporary markets appear around the commune during Rara festivities and other gatherings. Suitable spaces are needed to support and encourage these markets, not only as places of commerce, but also as vital links
in the community’s communication, planning and self-government.

Group Recommendation

A. Build “Sant Katye” (Community Centers) in the neighborhoods

In similar manner to the Haitian lakou, each neighborhood should have a “sant katye,” or community-centered multi-use facility. (see Planning & Zoning). Sant Katye can provide central points for informing community members about planning and rebuilding efforts, and encouraging civic engagement. These spaces do not need to be dedicated, full-time markets, but can function as multi-use spaces that alternately support markets, sporting events, Rara and other dramatic and musical performances, celebrations, and events.

1.4 Arts and Artisans Co-ops

Most visual artists have to go to Port-au-Prince for materials to make paintings, sculpture, jewelry, etc. Potters have to go into Port-au-Prince to fire their wares. Since the earthquake destroyed Léogâne’s artists’ homes and studios, they now work in temporary shelters and makeshift spaces. For performing artists, there are no places to rehearse or perform. Léogâne’s artists, artisans and performers have no market for their products, no storage spaces, and few of them have access to business equipment and skills. Artists and artisans need local workshops, storage space, stages, and galleries.

Group Recommendation

A. Create an Artists and Artisans Cooperative

For years, local Léogâne artists have been networking and sharing contacts and resources on an informal basis, but these efforts could be formalized into a not-for-profit Léogâne artists and artisans cooperative, where artists and craftspeople can train, make their work, and sell their products.

Image 1.4a: Local artisan wares

NGO funds could be sought to support the planning and organizing of this cooperative. The artists’ cooperative could serve as a focus for tourism, a cultural magnet, an education center, and support center for individual artists and artisans in selling their products. Children can apprentice at the cooperative during after-school programs, and the coop’s artists and artisans can teach in school art programs.
The cooperative could be a publicly supported not-for-profit enterprise. There are a number of existing artists organizations that could be enlisted in developing the cooperative. Arts and crafts-oriented projects, such as ISRAID’s crafts-training program, might be networked through the cooperative.

1.5 Promoting Léogâne Art and Culture to a World Audience

Léogâne is not yet represented in the international arts retail opportunities available in Port-au-Prince and other parts of Haiti. However, despite poor working conditions and a lack of local markets, Léogâne artists and craftspeople continue working wherever and whenever they can, and for whatever audience is available. This productivity suggests opportunities for economic and community development, education, and increased civic engagement. Training, organizing and marketing Léogâne artists and artisans could promote the development of local networks for selling arts and craft products on the international market.

At the community level, formal organizations working in Léogâne to train artisans include the Dan Dan Craft Cooperative, sponsored by ISRAID, and informal artists’ networks include CAAH (Cooperative Artists ak Artisanats Haitienne) and Haitian Promotion and Production (HPP). Operations like these could serve as seeds for a larger regional network of cooperative training and resource-sharing.

**Group Recommendations**

**A. Connect with NGOs promoting the arts**

In the short term, local Léogâne arts networks should be connected with NGO’s already marketing Haitian arts and crafts. For example the Clinton Bush Foundation and Fairwinds Trading make micro-loans to Haitian artisans. Fairwinds has placed Haitian crafts in Anthropologie stores in the US, and BrandAid Haiti and Fairwinds have worked with Macy’s Department stores to create “Haiti Rooms” online and in stores.

**B. Develop a Léogâne website for the arts**

At one point prior to the earthquake, the University of Notre Dame sponsored a website operated by HPP, to market the work of local fine artists. An artist’s cooperative...
could be re-established to operate and expand this website for marketing the full range of Léogâne arts, crafts, and tourism-oriented activities such as Rara.

C. Maximize the use of public art

D. Establish Léogâne arts & artisans tours to expand international sales.
   In the past, a gallery show of works by Haitian artists was organized and toured the United States, and Léogâne art was represented. An expanded multi-discipline traveling festival version could be organized, including Rara music, dance, painting and sculpture, and spoken word performance.

E. Provide educational opportunities for artists
   Training and education is needed so that local entrepreneurs can market and manage their own operations and supply chains. Operating in overseas markets will require language and business training.

1.6 Sports Programs

There are many athletes and sports teams in Léogâne despite the lack of facilities and equipment. In Haiti, sports are not only a source of entertainment and camaraderie, but are also a means of economic development. A city which hosts sporting events keep the proceeds from ticket sales.

Soccer is easily the most prominent sport in Léogâne. There are already many organizations that can help facilitate the growth and success of the sport, including four (three men's and one woman's) professional teams. Other sports such as basketball, running, weightlifting, martial arts, tennis, and volleyball also have a following in the city.

Image 1.6a: An informal soccer game in Léogâne

The Léogâne soccer stadium, which was barely adequate before the earthquake, is currently home to a large tent encampment which could remain there for some time. Not having a home stadium requires the Léogâne soccer teams to travel to other cities in Haiti and prevents the community from both participating in the matches and receiving the economic benefits associated with hosting a game. Thus, the Léogâne soccer teams operate at a net loss.

Other sports which have been gaining popularity over the years have very few facilities in which to play. The one basketball court in Léogâne is a half-finished tennis court next to the mayor's office. It is currently being used as municipal space. Some private schools have sports facilities, but they do not allow the community to use these facilities even outside of school hours.
C. Rebuild the soccer stadium

1.7 Local Entertainment Entrepreneurs

There are a number of entrepreneurial entertainment activities that should be encouraged and supported in rebuilding efforts. Entertainment entrepreneurs set up informal ‘cinemas’ in their homes, charging a small fee for admission. Entrepreneurs also make money by arranging *bals*, or dance parties in yards and streets.

**Group Recommendation**

A. **Incorporate cinemas and other performance spaces in the master plan**

The development of neighborhood infrastructure and public space should support entertainment venues. Local codes and ordinances should also be established to encourage these events. Public or semi-public cinema spaces can also serve as venues for Léogâne’s local dance and theater troupes.

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**Group Recommendations**

A. **Create Partnerships to support sports programs.**

Currently the Notre Dame soccer team is looking to coordinate other NCAA teams in US and possibly related sports programs to support the rebuilding of the soccer stadium and the soccer program.

B. **Seek Sponsorships**

Léogâne teams require funding so they can compete nationwide and internationally. The current professional teams operate solely on donations and interest is fading fast.

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*Image 1.6b: Léogâne’s Soccer Stadium*
2.0 Planning & Zoning

Planning and zoning are critical to post-disaster reconstruction and development. Historically, Léogâne has developed in an organic way, expanding based on the availability of land and natural resources. This trend has continued following the January 2010 earthquake, as individuals and organizations build wherever possible in order to meet the pressing needs of their families and communities.

This organic and sometimes haphazard development, along with the destruction of the recent earthquake, has led to a number of challenges that need to be addressed during reconstruction. In order to address the challenges in both the city and the commune of Léogâne, a comprehensive planning process must occur and zoning regulations must be established. Planning and zoning will ensure that new construction is less vulnerable to natural disaster and has a minimal impact on the environment. It will also promote development that reinforces the strength of existing local communities through the planned inclusion of infrastructure and social and public services.

The commune of Léogâne is geographically diverse. To undertake the task of planning and zoning in Léogâne, it is important to understand the various geographic areas and address the issues that are relevant to each. Five land categories exist along the transect that runs through the Commune of Léogâne from the mountains to the coast: Mountainous, Alluvial Plains, Coastal, Urban, and Watershed (Refer to Image 2.0a).

2.1 Sant Katye

There are numerous existing neighborhoods in the commune of Léogâne that act as semi-independent communities (See Image 8.1a). In most of these communities, social services and economic opportunities are limited. People living in these communities travel long distances to the city of Léogâne to receive services, access markets, and participate in the urban economy.

Planning for future development in Léogâne should focus on providing social services and fostering economic development on the community level. This is possible through the creation of “nodes” of development located in Sant Katye, or “Neighborhood Centers”.

Image 2.1a: Existing Communities
<table>
<thead>
<tr>
<th>Mountainous</th>
<th>Alluvial Plain</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
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<td><img src="image2.png" alt="Alluvial Plain Category" /></td>
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</table>

<table>
<thead>
<tr>
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<th>Watershed</th>
<th>Cultural Intersections</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4.png" alt="Costal Category" /></td>
<td><img src="image5.png" alt="Watershed Category" /></td>
<td><img src="image6.png" alt="Cultural Intersections Category" /></td>
</tr>
</tbody>
</table>

*Image 2.0a: Land Categories in Léogâne*
Group Recommendation

A. Develop Sant Katye as neighborhood centers of redevelopment

Sant Katye will be centers for infrastructure, social services, and amenities (See Image 3.1b). Each Sant Katye should include a school, market, health center, business incubator and resource center, multi-purpose field, and other public amenities such as a library, computer lab, and museum. They may house distribution centers for propane gas and solar based energy and garbage reclamation areas. Aligning community services and resources in Sant Katye will provide local access and allow for interaction between services. For example, students at the school are in close proximity to a recreation field, health services, and the community library. This integration will stimulate community life and promote further development.

2.2 Governance

Léogâne is one of three communes that make up the West Department of Haiti. The Mayor of Léogâne represents the entire commune, not simply the city. Within the geographic boundaries of the Léogâne commune, the land is further divided into thirteen sectors. Within each sector, there are a number of Katye, or “neighborhoods”. These geographic boundaries are not strongly related to the shape and type of urban fabric. As stated above, future development should be focused on the neighborhood level.

Group Recommendation

A. Publicize codification of new zoning regulations

Regarding the codification or acknowledgement of new laws, it is required that any maps or other materials created as part of a codified planning and zoning code be published in the newspaper. Historically, when laws have been passed that dealt with geographic issues, accompanying maps were not published in the newspaper; therefore residents were not made aware of new regulations.

2.3 Other Planning Efforts

During the workshop, a number of existing planning efforts by varied organizations and individuals were identified and recognized as critical resources. Image 8.3a delineates these efforts.
### RESOURCES | LÉOGANE

<table>
<thead>
<tr>
<th>LÉOGANE PLANNING STRUCTURE</th>
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</thead>
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<tr>
<td>Ministry of Education</td>
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<tr>
<td>Quartier Arrondissement (Justice System)</td>
</tr>
<tr>
<td>Daniel Arbour &amp; Associates (Technical Planning)*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER LÉOGANE PLANNING EFFORTS</th>
</tr>
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<tbody>
<tr>
<td>Germany</td>
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</table>

<table>
<thead>
<tr>
<th>OTHER RELEVANT PLANNING EFFORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Youth and Civic Action</td>
</tr>
<tr>
<td>Group contracted to create planning toolkit for Haiti {Andrew Charles}</td>
</tr>
</tbody>
</table>

Daniel Arbour & Associates (as IRI) to create regional arrondissement plan as well as urban Léogâne specific plan

**Image 2.3a: Léogâne Planning Efforts**
2.4 Urban Sprawl

Léogâne has developed without master planning or zoning regulations. Like other urban areas around the globe, central Léogâne has become plagued by sprawl. This is a huge challenge in Haiti as there is not adequate infrastructure to support large populations in urban areas.

**Group Recommendation:**

A. **Establish construction codes & zoning regulations**
   
   As the people of Léogâne face the challenges of reconstruction after the earthquake, construction codes need to be adopted and zoning regulations should be put in place. Planning and zoning can help reduce urban sprawl, while construction codes will ensure that new structures are safe for occupancy.

2.5 Deforestation

Deforestation is a critical issue in Léogâne, as it is in many areas of Haiti. It has become particularly severe in the mountainous region, as people remove trees to clear land for agriculture and to create lumber and charcoal. Most Haitians rely on charcoal for their cooking needs on a daily basis. To meet the high demand for charcoal, people cut down trees in the mountainous region to be processed into charcoal and sold in local markets. As a result, forests have rapidly depleted (See Image 8.4a) and mountain communities that supply wood as a fuel source are economically dependent upon this market.

**Group Recommendations:**

A. **Plant fruit bearing trees**
   
   The planting of fruit bearing trees would help reverse the damages of deforestation. These trees are less likely to be removed for lumber and charcoal because they provide other valuable resources. Once they have matured, the roots will help absorb storm water and prevent soil erosion.
B. Establish designated charcoal forests
In order to continue the production of charcoal and maintain the livelihoods of those who depend on the charcoal market, designated charcoal forests should be established. These forests should be located in areas where the storm water and erosion would have minimum negative impact.

C. Establish designated farming areas
There should also be designated farming areas to avoid deforestation for agriculture in areas that are particularly vulnerable to flooding and erosion. Additional resources and training are needed to support mountain agriculture. New farming techniques may allow for more efficient land use, thus reducing the need to clear additional forest. Increasing the productivity of the mountain agriculture industry would also help reduce the economic dependence upon harvesting wood for charcoal.

D. Increase the use of butane/propane gas
Another solution that would reduce the dependency upon wood for fuel is the provision of butane and/or propane gas for cooking. This solution is particularly viable for urban businesses such as bakeries that are large consumers of charcoal. In order to make this solution a reality, a safe and reliable delivery mechanism needs to be established.

2.6 Infrastructure Planning
Léogâne planning and zoning must give consideration to the development of infrastructure. While this topic is addressed in detail in the Infrastructure section above, this section will briefly address the varying infrastructure needs in different land categories. Many infrastructure issues can be addressed through the development of the Sant Katye.

Group Recommendations:
A. Establish a plan for storm water: flooding, Drainage, and erosion
Flooding is a frequent and severe problem in Léogâne, especially during the rainy season. Storm water runoff comes down from the mountains, worsening erosion in the watershed area, and flooding the rivers in the watershed and the alluvial plains. As explained above, these problems are exacerbated by deforestation. There is an insufficient drainage system that fails to prevent flood waters from rising both in the alluvial plains and the urban core of Léogâne.

Image 2.6a: River flooding caused by stormwater
In addition to the deforestation solutions presented above, planning and forming a water drainage system would alleviate the problems associated with flooding.

B. **Restore electricity and communications**
   There is a lack of electrical power and communications infrastructure in Léogâne. This problem is particularly evident in the mountainous regions and the alluvial plains. In the mountainous regions, electrical power should be provided through community based solar power and small power generation centers.

   In the alluvial plains, where cellular telephones have become prolific, there is a need for zoning regulations for the network of cell towers. Additionally, as a part of Sant Katye development, village-based communications centers should be established. These centers would include emergency and administrative services and public computer labs (an idea that is also referred to in the Education section of this report).

C. **Provide for potable water**
   Limited access to potable water is a critical issue, particularly in the mountainous regions where drinking water available for purchase is less common. The construction of rain catchment systems will help meet the need for potable water. Central water wells with energy pumps should also be included in the development of the Sant Katye.

D. **Improve roads and transportation**
   The roads in the commune of Léogâne are inadequate and frequently in poor condition. In the mountains and alluvial plains, a lack of roads and transportation services makes the exchange of goods between rural and urban areas more difficult. It also limits access to healthcare, which is particularly problematic during emergencies. In urban Léogâne, narrow and unpaved roads impede transportation and the delivery of goods. Public transportation is limited because there is no transit center for buses or ferry service between Léogâne and Port au Prince.
E. Establish a sewage system
In the alluvial plains and urban areas of Léogâne, a sewage system is needed. Refer to the Infrastructure section for more information.

2.7 Public and Social Services

Léogâne does not currently have sufficient infrastructure to house social and public services. Other sections of this report address these issues in further detail, but it is necessary to note that all planning for future development in Léogâne must include consideration of infrastructure related to these services.

Group Recommendations:

A. Establish adequate public services
Public services such as Police and Fire require infrastructure to house operations. A garbage collection service should be established, which will require a system for collection and a garbage dumping location. In the alluvial plains, garbage and sewage services should be available at the village centers. Additionally, there is no space available in the Léogâne cemetery. Land should be allotted for the development of a new burial ground.

B. Provide adequate social services
Consideration must also be given to health and education infrastructure. Community health clinics should be developed in each of the thirteen sectors of Léogâne. Educational opportunities should also be available locally. Standards for educational infrastructure must be established as a part of the zoning process to regulate school locations and sizes.

C. Create recreational opportunities
Within both the urban and rural areas of Léogâne, land must be allotted for the development of recreational spaces. A network of parks and green spaces should be developed, along with sport fields and stadiums for public events. Beaches should be emphasized as areas for recreation and leisure. Administration will be needed to support and maintain these areas.

2.8 Planning for Economic Development

In order to stimulate economic development in each land category of Léogâne, specific planning and regulations are needed.
**Group Recommendations:**

A. **Establish commercial regulation in the city**
   Currently, urban businesses are subject to very few regulations. Zoning should include requirements for regulated scheduling and operations of street vendors. Because some businesses such as dry cleaners produce a large amount of pollution, environmental regulations are needed to address this issue.

![Image 2.8a: Street vendors in downtown Léogâne](image)

B. **Create economic opportunities in the Coastal Region**
   There are a number of opportunities for development in the coastal region. Currently, there is not a port in Léogâne and the beaches are not used as an asset. The development of a port should be considered as a possible stimulus for economic development in Léogâne. Additionally, beaches should be featured and marketed as tourist destinations. These topics are addressed further in the Economic Development section.

C. **Preserve land for agricultural production**
   The preservation and development of agriculture is a priority in the mountainous region, alluvial plains, urban core, and coastal region. As mentioned above, new farming technologies are needed in the mountains to reduce the impact of deforestation. Within the city, urban agriculture should be developed as a source of sustenance and income for urban families.

   In the alluvial plains, modernized farming practices, regulations, and better transportation would improve the agricultural industry. Up-to-date machinery, irrigation systems, and fertilizers will increase production and efficiency. Sugar plants should be subject to regulations regarding noise, air, land, and water pollution. A product exportation network should be established and regulations regarding exportation should be put in place. A network of agricultural roads should also be developed in the alluvial plains to facilitate transportation of goods. Finally, an urban growth boundary should be established to preserve agricultural land. A similar boundary should be established in the coastal region to protect mango groves.
3.0 Infrastructure

Infrastructure (Water, Sanitation, Storm Drainage, Roads & Electricity) is the basic physical structures and facilities needed for the operation of a society. After the January 12, 2010 earthquake, much of the limited infrastructure in Léogâne was damaged or destroyed. Since that time, various NGOs have been working to provide clean drinking water, rubble/trash removal, and road repairs on an emergency/as-needed basis. Little work has been started on permanent long-term structures and facilities that will provide continual service to the people of Léogâne.

Several organizations, however, have been working on plans to address various infrastructure needs. The Japan International Cooperation Agency (JICA) is beginning initiatives to provide water to several schools, extend a new water network throughout the town, and pave some of the roads within the City of Léogâne. The United Nations Development Programme [UNDP] has been providing debris removal and is working to set up a recycling plant. This plant will not only contribute to waste management, but will also provide much-needed jobs. The UNDP is working to increase the capacity of the municipal government by providing funding for various public work positions. Additionally, a number of international organizations are working to restore electricity and improve other infrastructure systems.

Drexel University’s Drexel Engineering Cities Initiative (DECI), has been working on an extensive analysis/report entitled "Supporting Haitian Infrastructure Reconstruction Decisions with Local Knowledge: A focus on water and sanitation issues in Léogâne". This report is based on two workshops they held in 2010. Their work involved a detailed investigation of water and sanitation issues, needs and objectives in Léogâne with the goal “to formulate useful recommendations that might guide decisions about how reconstruction funds earmarked specifically for water and sanitation projects could simultaneously address economic, ecological, and social equity goals in Haiti.”

With the three main land categories (Mountains, Alluvial Plain and Urban) different goals/strategies are needed depending on the area served. The various needs must be addressed in the different infrastructure plans that are prepared for each neighborhood center (Sant Katye).
3.1 Governance

The bureaucracy of the governing authority is causing major delays in the implementation of various plans and projects. There currently is no central authority for the gathering and distribution of data regarding development. As a result, there are multiple plans being created by various disconnected groups. Additionally, government mandated zoning regulations are needed to help determine the necessary capacity of water, sanitation, and electricity systems.

**Group Recommendations:**

A. **Improve coordination and communication for ongoing and planned projects**
   Local, national, and international organizations working on various infrastructure projects such as those mentioned above must communicate regarding their project objectives and capitalize upon opportunities for collaboration.

B. **Establish a Léogâne reconstruction committee**
   National and international aid organizations, along with the national and local government, have undertaken efforts to address infrastructure issues in the city and commune of Léogâne. Coordination and communication are two of the most difficult aspects of this undertaking. This situation is complicated by the central government ministries which do not have the capacity to make decisions in a timely manner. There is a need for a formalized local Léogâne reconstruction authority which is empowered to make decisions and move forward on projects.

3.2 Potable Water System, Sanitation & Stormwater Drainage

Based on reports and additional surveys compiled during the Rebuilding Léogâne Workshop, prior to the 2010 earthquake the primary source of drinking water in Léogâne was through Public taps/standpipes and Wells (bucket and pumps). Problems associated with these water sources included long queues, conflicts, bad taste, dirty appearance and potential to cause sickness.

![Image 3.2a: Pump well](image-url)
Based on the surveys of over 170 participants, nearly half (48%) of those surveyed used a decentralized water source to obtain drinking water prior to the January earthquake. When asked what they would like to have, however, over 75% said they would prefer a centralized system, such as piped water.

<table>
<thead>
<tr>
<th>Water Source</th>
<th># Using</th>
<th>% Using</th>
<th># Who Want</th>
<th>% Who Want</th>
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</thead>
<tbody>
<tr>
<td>Centralized</td>
<td>59</td>
<td>32.6%</td>
<td>137</td>
<td>75.7%</td>
</tr>
<tr>
<td>Decentralized</td>
<td>87</td>
<td>48.1%</td>
<td>28</td>
<td>15.5%</td>
</tr>
<tr>
<td>Combination</td>
<td>18</td>
<td>9.9%</td>
<td>0</td>
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</tr>
</tbody>
</table>

Table 3.2a: Water Sources

Over half of the Léogâne residents surveyed (64.6%) used a decentralized sanitation system, such as a latrine, before the earthquake. Many of these same respondents (73% of them) would prefer a different method of sanitation. The sanitation option most often chosen had a flush/pour system.

<table>
<thead>
<tr>
<th>Sanitation System</th>
<th># Using</th>
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<th># Who Want</th>
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<td>16</td>
<td>8.8%</td>
<td>117</td>
<td>64.6%</td>
</tr>
<tr>
<td>Decentralized</td>
<td>117</td>
<td>64.4%</td>
<td>39</td>
<td>21.5%</td>
</tr>
<tr>
<td>Either possible</td>
<td>2</td>
<td>1.1%</td>
<td>11</td>
<td>6.1%</td>
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<tr>
<td>No sanitation system</td>
<td>36</td>
<td>19.9%</td>
<td>0</td>
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</tr>
</tbody>
</table>

Table 3.2b: Sanitation system

The main problems associated with the water, sanitation & drainage systems were a lack of assistance, limited water access, lack of equipment and material, temporary quick fixes that do not last, deforestation, and corruption.

The most frequently mentioned idea amongst local interviewees was that the government should take responsibility for water and sanitation. Secondly, they identified working together as an important part of the solution. Beyond this, the key areas they identified to work on included reducing charcoal demand, repairing the piped water system, and finding technical solutions/assistance.

Haitian professionals also identified various ideas clustered as “self efficacy” as crucial solutions, meaning that they emphasized that Haitians were capable of doing things for themselves. The key priority areas they mentioned included river channeling to control flooding, reducing charcoal use, and decentralization. In both cases, the key consensus is the recognition of a link between flooding caused by deforestation (which led to the destruction of the old piped water system) and the need to reach an integrated solution to the water problem in which Haitians themselves would take the lead. The professionals secondarily emphasized education, people’s knowledge, public participation, and grassroots activism, as ways to achieve these ends.

When asked about the willingness to pay for the improved water and sanitation service the majority of respondents responded in the affirmative.

See DECI Report for additional information on the assessment of the Water, Sanitation & Drainage issues, needs and goals.
**Group Recommendations:**

A. **Protect the environment**
   Protection of the environment is critical in the city and in the plain, from the mountaintops down to the valleys. A monitoring committee should be formed to plant more trees.

B. **Improve and increase public access to water and sanitation systems**
   Repair and extend the quantity of pipes bringing water into people’s homes, dig artesian wells, build public fountains with potable water, promote hygiene, and build modern bathrooms in each home. Each community should have its own water system. Both public and private toilet facilities should be constructed and people should be required to pay for the service.

C. **Promote clean water**
   This can be done by protecting water sources, treating the water, and building canals for irrigation purposes.

D. **The following action items are recommended:**
   1. **Determine the regulatory requirements** and review process required by DINEPA for new water systems, sanitation systems and drainage facilities.
   2. **Establish a central Data Collection department** for the Léogâne commune for information required for the design of the master infrastructure plans.
      a. Rainfall Data
      b. Topographic Survey
      c. Soil Survey
      d. Potable Water Sources
      e. Percolation Rate of Soil for Sanitary Leach Fields
      f. Plans created or in progress by other organizations
      g. Mapping of all existing systems (wells, water networks, etc.)
   3. **Prepare a Watershed Study** for the entire Leogane drainage area to determine existing drainage deficiencies and recommended improvements (i.e. new/revised flood channels, stormwater detention ponds, reforestation areas, etc.)
   4. **Establish zoning areas for stormwater channels,** floodplains and buffer areas that prohibit development.
   5. **Develop Master Water, Sanitation & Stormwater Drainage Plans** for the urban core of Leogane.
   6. **Develop Water, Sanitation & Stormwater Drainage plans for the individual neighborhood centers** (Sant Katye) based on the varying needs of each neighborhood working with the neighborhood leaders.
   7. **Seek funding** for the collection of data, preparation of studies and plans, and the implementation of the proposed infrastructure.

### 3.3 Roads

The construction of a reliable road network is critical to the future economic development of Léogâne. Both civic leaders and government representatives assert that the present road layout with minor additions is satisfactory to meet the current needs of the commune. The biggest issue concerning roads is not the layout but rather that the roads are in a state of disrepair. Currently, JICA (Japanese Development Agency) plans to begin paving the streets in the core of downtown Léogâne in the summer of 2011. It is not known at this time whether the
earthquake that occurred in Japan this spring will cause a revaluation of these plans. Further efforts may be needed to find an alternative source of funding for road reconstruction. Consideration needs to be given to the timing of this work in how it relates to the rebuilding of the other components of infrastructure mentioned above.

A critical element that needs to be considered is the material to be used in road reconstruction. Many participants in the planning workshop expressed concern that repaving the entire network of existing roads in asphalt would result in Léogâne losing much of its unique architectural character since the core of the old city's roads were built using interlocking pavers.

There is a lack of coordination of current efforts to improve infrastructure in the Léogâne commune. An example of this problem is that the timing of road paving is not being scheduled in coordination with the laying of both water and sewer lines. The roads should be the last segment of work completed. Originally it was thought that the sewer and water lines could be installed in the shoulders adjacent to the roads after paving had occurred. Upon investigation, this idea is not feasible given the lack of space separating the existing buildings and the roads. A better solution would be to lay the new lines and then pave the roads.

Storm water managements must also be considered prior to road reconstruction. Léogâne has experienced severe flooding on several occasions in the past several years. In many instances, this flooding is intensified by debris damming the water flow in existing roadside ditches. If the roads and adjoining ditches are repaired at their existing elevations without any consideration given to their maintenance and flow capacities, the city is destined to experience flooding in the future.

**Group Recommendations:**

A. **Support JICA’s efforts to rebuild roads in Léogâne.**

B. **Plan roads in the overall master plan that will meet current and future needs.**

C. **Consider the construction of a Transportation Center**
   One addition to the existing road network that needs to be considered is the construction of a transportation center/bus depot in downtown Léogâne that would help eliminate the congestion experienced at the cities entrance.

D. **Incorporate the use of appropriate material, such as pavers, in road reconstruction.**
The United Nations Development Program is considering funding the construction of a plant to manufacture street pavers from the disposed rubble of collapsed structures throughout the city. The efforts of the UNDP need to be made known to the other organizations planning work within the city.

E. Establish coordination between the various NGOs, international aid organization, and government agencies

The appropriate implementation of infrastructure projects is critical so that it does not become necessary to redo construction projects. Without forethought and coordination, a road may be repaired only to be dug up again for the installation of sewer and storm management systems. The need for road construction, sewage systems and flood management will require coordination amongst NGOs and international aid organizations. Given that many organizations, from varying cultural and language backgrounds, are volunteering to perform separate tasks, there is a great opportunity for confusion. To avoid chaos, it is important that the local and national governments exert their influence to coordinate infrastructure construction activities. The local populace will need to insure that this occurs.

3.4 Electricity

For economic growth to occur in Léogâne, a reliable source of electrical power needs to be established. The organization mandated by the Haitian government to provide electrical service throughout the country is EDH, the Haitian Electrical Company. While the remnants of existing electrical grids can be found in the town of Léogâne, the system has not functioned since the January 10, 2010 earthquake. As in the rest of the country, power to the grid was intermittent before the earthquake, with usage limited to only a few hours per day. The primary source of electricity for the region is a gas turbine plant built by the Venezuelan government located in the town of Carrefour, approximately 20 miles due east of Léogâne.

Image 3.4a: Existing electric pole in Léogâne

In developed countries, electrical grids are interconnected in all areas that are served. This interconnectivity allows for a more efficient use of resources. The production and associated costs of incremental increases in power during the course of a day can be balanced out. An interconnected grid also allows for a more reliable power system. The system does not have to go into blackout if one power source fails because other sources are available to supplement the system.
Currently, the only sources of power for the residents of Léogâne are solar panels and private gas generators. With an expected demand of 60 megawatts for the Léogâne region, neither of these sources of power will be adequate to supply the needed power. It is expected that while solar power will be an effective alternative in supplying limited amounts of power in the outlying rural sections of the Léogâne commune, it will not be able to provide the magnitude required in the more densely populated areas. The national government is currently promoting a plan to connect Léogâne to a national grid that is already under construction in other regions of the country. The scheduled date for the completion of this grid in Léogâne is unknown. Once completed, the grid would allow for a more reliable source of power for the region given that multiple sources of generation would be available.

The electrical distribution system as it presently exists in Léogâne is in need of drastic repair and will not be able to function in its post earthquake state. A complete redesign of the system is necessary. It is estimated that the cost to rebuild the system will be in the range of $21 million U.S. This estimate was provided by GasEner, an energy consulting/design company located in the Dominican Republic.

The plan to rebuild the power generation and distribution system should take into consideration potential economic development, zoning regulations, and educational improvements. Each of these areas will foster demand for electrical services in the commune and future demand must be considered as part of any grid design effort.

Given Léogâne’s proximity to Port au Prince and its location adjacent to the sea, the commune is well-positioned for future economic growth. One element that needs to be established for this growth to be realized is the supply of reliable electrical power. It is critical that continued political pressure be placed on the national government to insure that the planned upgrades to the grid are in fact implemented. This pressure needs to come from the residents as well as the business leaders of the Léogâne commune.

**Group Recommendations:**

A. Reconstruct the electrical grid
The reconstructed grip must be able to supply sufficient power generation and distribution to meet the current and projected future needs of Léogâne.

B. Eliminate the pilfering of power
Throughout Haiti, power is regularly stolen from the grid by residential users by placement of a conducting wire over the power lines that run adjacent to the public streets. These wires are then run to the various residents allowing the user to bypass the metering system. This obviously impedes the ability of EDH to operate as a viable business. Since the practice is widespread throughout the country, a cultural shift will have to occur for a successful electrical system to be developed. An educational program, regulations, and procedures should be established and enforced to eliminate the pilfering of power. A public information campaign needs to be conducted to educate the populace on the need to prohibit the pilfering of power.

C. Invest in sustainable alternatives
Sustainable solutions for the generation of electricity, such as solar power, should be considered.
4.0 Housing

Haitian housing trends are predicated on cultural (privacy, security) and environmental requirements (hurricane and flooding), subject to practical constraints related to the lack of native resources, income, education and lack of government oversight. Due to widespread poverty, most Haitian families cannot afford quality materials or the services of professional construction teams. Haiti also has the highest import taxes in the Western Hemisphere, implying that the general population cannot rely heavily on imported materials. Sadly, indigenous construction materials are quite limited. The island has slowly become 95% deforested, making construction grade wood as expensive as steel. As a result, most housing in urban areas in Léogâne employ a combination of reinforced concrete columns, often without beams, and unreinforced masonry walls as their primary structural system for both single and multi-story homes. The high cost of imported steel implies that the amount of reinforcement used in construction is often compromised. Walls are constructed using unreinforced concrete masonry units (CMU), hand pressed locally using sand and cement, with wide ranging quality again proportional to cost.

The construction of a home progresses as funds become available and is designed in the absence of a municipal building code. This leads to an incremental construction model, and implies that homes can take a significant amount of time to complete. Low income, single story housing is generally built with unreinforced masonry load bearing walls, lack any ring beam to tie the system, and are often topped with a wood-framed, corrugated metal roofing system (see Fig. 4.0a). Middle and high income housing (see Fig. 4.0a) affords the provision to add floors later, as funds become available, so flat concrete slabs often serve not only as floors but also as roof systems in many multi-story homes. Such incremental construction practices result in high variability in materials and workmanship and creates vulnerabilities in some multi-story homes.

Not only has CMU become a critical element in housing for security and privacy, but it also serves an important role in construction of middle and high income systems. Due to the deforestation issues, the availability of wood for formwork is quite limited; therefore building CMU walls first adjacent to rebar cages anchored in the slab or foundation has an important practical implication: it effectively provides “formwork” for up to two sides of a column. The formwork for the remaining sides of the column is planked with available scrap wood. Due to this construction practice, it is fairly common for the size of the CMU blocks to dictate the size of the concrete columns used, regardless of the lateral or even gravity demands of the structure.

The tropical climate of Haiti also plays an important role in residential housing design, as the island is subject to tropical

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**Figure 4.0a: Photos of existing structural systems in Léogâne**
storms, creating high resistance requirements against rain, strong winds, and flooding. This, as well as the aforementioned economic constraints, further justified the heavy concrete and masonry construction. Unfortunately, while these practices may have proven effective against strong winds, they result in significantly greater seismic mass during earthquakes, generating not only larger forces but also constituting significantly heavier debris. Furthermore, cultural preferences toward privacy and security also play a pivotal role in residential housing design with respect to building envelopes and partitioning. Security concerns further support the use of CMU for the building envelope and lead to the common practice of either vented decorative concrete bricks or iron bars for windows and iron gates for doors. In reference to privacy, Haitian families have a preference toward homes with defined spaces and rooms. Such Haitian cultural preferences are again significant to note as interior partitioning using CMU has been a major contributor to the failures observed in the January 2010 Earthquake, making the need for an alternate partitioning system paramount to a culturally-viable housing model.

Any recommendations for residential housing must be sensitive to the expectations and cultural requirements of the population being served, as documented by field surveys conducted during the workshop. The most critical of these cultural expectations, which has serious implications for issues of sprawl, is that the majority of Haitians prefer single story housing with multiple rooms (at least 3) and oppose the notion of multi-family (apartment-style) housing. This is largely attributed to both technical capacity and limitations of the pre-existing systems as well as Haitian cultural preferences to be “close to the ground.”

Before providing any suggestions for moving forward it is important to understand the vulnerabilities associated with the previous construction practices that led to many of the failures in the 2010 earthquake. Based on the field reconnaissance in Léogâne, the following recurring failure mechanisms can be identified:

- Shear Failures: Rigid CMU walls or even ironwork over openings that is sufficiently stiff to attract seismic forces but with insufficient strength to resist them, transferring significant shear forces to adjacent columns upon failure
- “Short Column” Effect: Partial height infill CMU walls in concrete frames significantly reduced the effective length of the columns, a factor not accounted for in their design
- Flexible Diaphragms: Flat plates lacked sufficient diaphragm action to engage columns and form an effective lateral system in homes with elongated floor plans.

Contributing factors to the above failure mechanisms are:

- Columns not sized for strength but for constructability (match depth of CMU), inadequately detailed/confined
- Excessive Mass: reinforced concrete floor/roof systems, CMU used for all partitions
- Poor materials (concrete mixed from smooth river rock, beach sands), often separation of large aggregates from the mix in casting
- Incremental construction, causing significant variation in material quality and workmanship

\[1\] The Creole-language survey tool is available for public use and can be used to collect more attitudinal data to insure that expectations for housing across the demographic spectrum is assembled.
It is also important to note that in order to achieve the ultimate goal of empowering the nation of Haiti to rebuild with the proper knowledge and training to avoid similar devastation in future earthquakes, all recommendations must include an education and training program that operates within the exiting modalities of construction. The first is the skilled foreman model, where one person has formal training from a university and instructs the rest of the team. This model works well, however because of the value placed on such expertise, these construction teams are too costly for most residential construction, and instead are used mainly in commercial projects. The second model is an apprentice model, where the trade is passed down through generations of a family. This model was more evident in the wealthier residential construction in Léogâne (Fig. 4.0b). Finally, the last model employs a master builder, one person in a community that helps everyone to build their homes. This was the most prominent theme in the poorer areas and therefore is used widely in Haiti. The master builder is rarely formally trained, but has some idea of construction technique either through their own experience or experience passed down by family and friends. Particularly with respect to residential construction, the latter two modalities will be most prevalent.

4.1 Immediate Housing Options

Given the functional requirements of Haitian urban housing, there are three primary structural systems one can consider as viable: load bearing walls, confined masonry and moment-resisting frames. Each of these systems can employ a variety of materials for their structural and non-structural elements, as summarized in Table 4.1A. Some of these are available currently in Haiti, some can be seeded through future economic development, while others are not viable for local production and would be exclusively imported. It should be noted that one of the most versatile elements in current Haitian construction is the Concrete Masonry Units (CMU). According to a government survey prior to the earthquake, these elements are used in walls in 79% of all urban construction. Furthermore, 76% of single-story construction employs CMU in its walls and in the case of multi-story construction, it is the dominant wall material (used in 97% of such buildings).
### TABLE 4.1A SPECTRUM OF OPTIONS FOR RESIDENTIAL HOUSING SYSTEMS

<table>
<thead>
<tr>
<th>STRUCTURAL SYSTEMS</th>
<th>SYSTEM MATERIAL CHOICES</th>
<th>PARTITIONING CHOICES</th>
<th>ROOF SYSTEMS</th>
<th>FLOORS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Load Bearing Walls</strong></td>
<td>CMU</td>
<td></td>
<td>Metal</td>
<td>Concrete Mat/Slab</td>
</tr>
<tr>
<td></td>
<td>Brick</td>
<td></td>
<td>Concrete Slab</td>
<td>Wood Plank</td>
</tr>
<tr>
<td></td>
<td>Earthen</td>
<td></td>
<td>Plywood</td>
<td>Stone</td>
</tr>
<tr>
<td></td>
<td>Stone</td>
<td></td>
<td>with finish</td>
<td>Compacted Earth</td>
</tr>
<tr>
<td></td>
<td>Wood</td>
<td></td>
<td>Manufactured Panels</td>
<td>Manufactured Panels</td>
</tr>
<tr>
<td></td>
<td>Manufactured Panels (thick)</td>
<td></td>
<td>Bamboo</td>
<td>Plywood</td>
</tr>
<tr>
<td></td>
<td>Trash Re-Use</td>
<td>N/A</td>
<td>Grass</td>
<td>Metal Decking</td>
</tr>
<tr>
<td><strong>Confined Masonry</strong></td>
<td>CMU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brick</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frames</strong></td>
<td>Wood</td>
<td></td>
<td>Woven Thatch</td>
<td>Concrete Mat/Slab</td>
</tr>
<tr>
<td></td>
<td>Concrete</td>
<td></td>
<td>CMU</td>
<td>Wood Plank</td>
</tr>
<tr>
<td></td>
<td>Light Steel</td>
<td></td>
<td>Brick</td>
<td>Stone</td>
</tr>
<tr>
<td></td>
<td>Bamboo</td>
<td></td>
<td>Drywall</td>
<td>Compacted Earth</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Trash Re-Use</td>
<td>Manufactured Panels</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Manufactured Panels</td>
<td>Plywood</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Grass</td>
<td>Metal Decking</td>
</tr>
</tbody>
</table>

Notes: Those in bold already exist in Léogâne and surrounding areas prior to earthquake.
In order to assess the viability of the various housing options, each proposed system was scored based on various dimensions listed in Table 4.1B. Scores in each of these dimensions were weighted by an importance factor informed by local Haitians engaged in the workshop. The weighted scores were summed to quantify the most viable systems in Léogâne presently, from the perspective of constructability, sustainability and hazard resilience (see Figure 4.3).

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Community Feedback</th>
<th>Proposed Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Sustainability of Materials</td>
<td>Essential</td>
<td>2</td>
</tr>
<tr>
<td>Cost of Materials</td>
<td>Unimportant</td>
<td>1.5</td>
</tr>
<tr>
<td>Mode of Construction</td>
<td>Essential</td>
<td>1</td>
</tr>
<tr>
<td>Construction Expense</td>
<td>Unimportant</td>
<td>1.2</td>
</tr>
<tr>
<td>Construction Time</td>
<td>Important</td>
<td>0.25</td>
</tr>
<tr>
<td>Hurricane Resilience</td>
<td>Important</td>
<td>1.5</td>
</tr>
<tr>
<td>Seismic Resilience</td>
<td>Essential</td>
<td>1.5</td>
</tr>
<tr>
<td>Suitability for Codification</td>
<td>Essential</td>
<td>0.5</td>
</tr>
<tr>
<td>Necessity for Quality Control/Oversight</td>
<td>Important</td>
<td>1</td>
</tr>
<tr>
<td>Security/Safety</td>
<td>Essential</td>
<td>1.75, 1.25</td>
</tr>
<tr>
<td>Durability</td>
<td>Important</td>
<td>1</td>
</tr>
<tr>
<td>Cultural Acceptance</td>
<td>Unimportant</td>
<td>2</td>
</tr>
</tbody>
</table>

Notes: Security and safety were weighted differently in urban zones (1.75) versus rural zones (1.25), as the collective mentality in the rural areas of the commune reduces the risk of theft and crime.

Rubric (in excel format) for scoring systems is available to evaluate other options not included in Table 4.1B. Note that scoring across individual dimensions requires some expertise and is subjective.
The current situation in Léogâne supports the systems summarized in Table 4.1C. These are largely load bearing and confined masonry systems employing CMU, because this is the most widely available local material in recent decades, which builds upon current practices and skill sets and meets the cultural and environmental needs of the community. As long as these types of construction are carried out properly and with higher quality materials, they are more than capable of being resistant to both hurricanes and earthquakes, though it remains questionable that privately financed home construction would have the financial resources to do so. However, it is important to note that if these systems are to be employed, there is a serious need for educational and vocational training and oversight to ensure that these systems are employed properly. It must be stressed that lack of quality of materials or the finances to procure them, sound construction practices, and supervision will lead to houses that are just as vulnerable as the homes that were destroyed during the earthquake. A brief commentary is provided for each of these systems. It should be noted that with respect to roofs, while organic roofs would be the prevailing choice, as shown by the scoring in Figure 4.1a, water penetration is a serious concern and their appropriateness for urban implementations is highly questionable. In all cases, ground floors should employ concrete slabs with potential tile finishing (for aesthetic reasons), since it builds on existing expertise and has good durability and environmental resilience. Again according to the governmental survey, 64% of single story and 69% of multi-story homes used this as its ground floor system.
TABLE 4.1C IMMEDIATELY-IMPLEMENTABLE PERMANENT HOUSING OPTIONS

<table>
<thead>
<tr>
<th></th>
<th>Low Income</th>
<th>Middle Income</th>
<th>High Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Structural</td>
<td>Load Bearing CMU</td>
<td>Confined Masonry with CMU infill</td>
<td>Moment Resisting Frame with CMU infill</td>
</tr>
<tr>
<td>System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested Roofing</td>
<td>Metal</td>
<td>Metal</td>
<td>Concrete Slab or Metal (based on personal preference)</td>
</tr>
<tr>
<td>System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested Floor</td>
<td>Concrete Slab</td>
<td>Concrete Slab</td>
<td>Concrete Slab</td>
</tr>
<tr>
<td>System</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Entirely dependent on availability of quality materials, proper training and oversight, and funding to implement properly

Group Recommendations:

A. Low-Income Housing Option: Load Bearing CMU

Although these systems are present in Léogâne (see Figure 6.1) and did sustain damage in the earthquake, due to their small size, single story modality and usually light metal roof, they generally did not experience total collapse. This system is fundamentally limited to single story developments with relatively small square footage, normally divided into four rooms.

To enhance the performance of this system, future implementations should employ a ring beam at the top of the perimeter walls to tie the system together and seek to reinforce the CMUs. Unfortunately, the system does not lend itself well to retrofits to accommodate utilities, so access for utilities must be incorporated in the initial construction process.

B. Middle-Income Housing Option: Confined Masonry with CMU Infill

Although the progressive construction practice in Léogâne mimics confined masonry, it performed very poorly in the earthquake and led to most of the fatalities. These practices must be dramatically improved (requiring training and codification) to achieve the requisite seismic resilience this system is capable of delivering, including reinforcement of walls, keying of blocks, and inclusion of beams to tie the system. Since these systems have been seismically engineered throughout the developing world, they certainly would be a natural next step for Haitian reconstruction due to the pre-existing pools of masons. This would of course necessitate that higher quality masonry be available in the market, as well as adequate quantities of reinforcing steel.
When executed properly, the system has the flexibility to support multi-story construction and larger square footage homes, though it should be cautioned that if the floor plans become too large, the system will not be able to adequately engage the perimeter elements or carry the larger seismic demands. Again since the masonry is part of the lateral resistance of this structural system, access for utilities must be incorporated in the initial construction process.

C. High-Income Housing Option: Reinforced Concrete Frames with CMU Infill

Buildings in Léogâne that properly implemented this system (such as the Notre Dame Residence Filariose) performed extremely well in the earthquake. The major issue with this system is the need for formwork to erect free-standing reinforced concrete frames and again completely presumes budget for engineered design, skilled construction including quality formwork, and larger quantities of reinforcing steel. However, if these pre-requisites can be met, the system has flexibility to accommodate wide ranging floor plans and numerous stories safely for both hurricanes and earthquakes. Also since the partitions and walls are not load bearing, utility access can be easily retrofitted if need be.

D. Low and Middle Income Roofing Option: Metal

Metal roofing is being widely employed and is currently preferred in urban settings for single-story housing because of an aversion to concrete slabs after the earthquake. A previous governmental survey determined that 74% of rural and 63% of urban houses employ this system in Haiti. Furthermore, metal roof systems were used 82% of the time in single story homes. Although thermal properties are not favorable and it has susceptibility to rain penetration and loss in hurricanes, the lightweight nature of these roofs does reduce the seismic vulnerability of residential housing. Performance can be improved by enhancing the anchoring (hurricane straps) and fastening schedule to improve resistance to wind.

E. High Income Roofing Option: Concrete Slab

This system has not been in widespread use since the earthquake because of the local perception that the slabs were responsible for so many deaths. This system was previously quite popular since it provided the provision for the addition of future stories. In fact, according to the above mentioned governmental survey, 71% of multi-story homes employ the use of concrete slab roofs. Unfortunately, proper construction of slabs requires extensive formwork, enough reinforcing steel, and continuous pours across the entire structure, which creates a very labor intensive process. Certainly the mass of this floor system does create seismic vulnerability, but if implemented in conjunction with a proper lateral system where the system is tied together by elements other than the slab, then the slab depth can be reduced. Furthermore, as the incorporation of CMU into the slab has no structural advantages and could even create vulnerabilities, it should be avoided. Such provisions will be necessary, as this remains the only option for multi-story homes.
F. Implementation

Since these housing models employ existing skill sets and materials already available locally, they are capable of being implemented by displaced families who have the financial means to do so. Generally this will be middle or, more likely, high-income citizens. While ideally codification, permitting and inspections oversight processes would be helpful at this stage, it is not realistic to expect short-term implementation of major policy changes. As such, the following recommendations provide an interim solution over a 5 year horizon:

1. Coordinate with NGOs to identify innovative solutions to proof of land ownership within the city and speed the delivery of temporary housing to IDPs; insure that this plan also provides renters communes sheltering IDPs that had no land ownership rights and rented prior to the earthquake (Life Cycle = 1 year)
2. Transition temporary housing to semi-permanent housing through cladding upgrades (Fig. 6.4), without perpetuating complacency that keeps IDPs in semi-permanent housing permanently (Life Cycle = 5 years)
3. Use open design competitions and crowd sourcing to develop construction plans for the three systems above, designed for typical floor plans and with adequate resistance to both earthquakes and hurricanes, and make them freely available to the public as open-sourced documents (Life Cycle = 50 years)
4. To counter the challenges presented by deforestation, make available, for each of the standardized systems, multiple sets of re-usable formwork (metal, fiberglass, etc.) that can be rented at no charge
5. Draft design specifications for each of the systems discussed above, including appropriate detailing and construction techniques, that can serve as the basis for future building codes and standards.
6. In coordination with NGOs, make available training programs for local engineers and construction teams (ranging from master builders to skilled...
It should be noted that the communal approaches advocated in (3) and (4) admittedly necessitates a shift in mindset toward a communal approach to building and shared resources that is foreign to many urban Haitians; however, there is precedent in a pre-existing concept of Konbit used in rural areas to achieve infrastructure needs in a cooperative setting.

4.2 Future Housing Options

While the previous section provides immediately-implentable options, there should be care in advocating solely these construction modalities for all Haitian urban housing, as many do not have the resources to invest in making these systems effective against earthquakes. These systems were advocated in the short term simply because they are the only locally sustainable construction practices. For many other possible housing models shown in Figure 6.3, the lack of native resources and industries to manufacture engineered materials in country led to punitive scoring in the evaluation process due to the heavy reliance on imported materials. However, many of these systems could be dramatically more affordable, easier to construct and seismically more resilient if these technologies could be introduced into the free markets. This can only be accomplished by identifying and seeding new industries to produce new construction materials locally, particularly if these can be green construction technologies that harness the agricultural strengths of the commune.

**Group Recommendations:**

A. **Alternate Partitioning**

Considering that CMU is a staple construction material but also creates considerable vulnerabilities in earthquakes, the immediate focus should be to identify alternative partitioning elements. For example, simple manufacturing processes that can be locally established can convert waste to recyclables into compressed panels. One of the most attractive options is to do so using agricultural waste to generate either structural panels (thicker panels that can be used for roofing or floor slabs) or non-structural boards (thinner panes similar to drywall in US construction practice). Such an alternate partitioning system will alleviate some of the issues presented by CMU, which will still be used in fencing of property boundaries, etc.

B. **Alternate Structural Systems**

If CMU is no longer used and walls are treated as non-load-bearing partitions, then structural frames will need to be erected to carry both the gravity and lateral loads. Given the local capacity, reinforced concrete frames are an obvious choice; however, with the CMU removed from the construction sequence and lumber in short supply, considerably more formwork will be required to erect free-standing moment resisting frames. As previously discussed in Section 6.2.1, this may be addressed by reusable, communal formwork developed appropriately for standard designs. Ideally, several sets of these standard forms would be made available to facilitate simultaneous construction at multiple sites. Interestingly, the overall cost of homes, in terms of construction time, may be reduced. After the frame is constructed, workers simply affix/attach the thinner non-structural panels to partition the rooms and clad the
structure with thicker non-structural panels to deliver the necessary security and the laborious process of masonry construction for every wall is eliminated.

The size of concrete columns and beams and their amount of reinforcement will need to be greater than what was documented in Léogâne prior to the earthquake. For lower-income families lacking the resources to do so, alternate materials such as bamboo can be also explored, given that the climate of Haiti is well suited to support this crop and the growing cycle is relatively fast. Bamboo was already being grown in Léogâne prior to the earthquake and given the area’s rich agricultural base, this could provide another industry that could help spur the local economy. Bamboo-framed homes have already been implemented and proven their seismic resilience in Columbia and other parts of Latin America and Asia.

C. Technology Adoption

The aforementioned solutions represent of course new technologies or typologies and will require a certain level of education/exposure to achieve any level of buy-in by the community. To facilitate this, public demonstrations of new wall systems alongside CMU walls, vocational training and marketing will all be necessary. Additionally, prototypes of each typology or structural system should be demonstrated (with engineering services donated) in each Lakou or downtown neighborhood. Ideally, the prototype can serve as a community center or perhaps headquarters for a partnering NGO in the community.

The introduction of new housing models into Léogâne will require many of the same steps discussed in Section 4.2, but also supplemental technology adoption activities. There is an important element of historical context and cultural preference that must be included in these technology adoption activities to build consumer confidence. For example, CMU, despite the vulnerabilities it presented, is a familiar and secure building material in the eyes of the community. Therefore, when introducing any new construction materials, their performance against CMU must be demonstrated to build the consumer confidence for this solution to compete in the open market. Moreover, when introducing organic materials for framing or cladding/partitioning, it is important to reference historical architecture prior to deforestation and note historical systems that survived the 2010 Earthquake as evidence that this construction style, while not used currently, has roots in Haiti. As a result, the following actions would need to be executed for each new housing technology introduced:

1. Use open design competitions and crowd sourcing to develop construction plans for new system, designed for typical floor plans and with adequate resistance to both earthquakes and hurricanes, and make them freely available to the public as open-sourced documents
2. Build consumer trust through public demonstrations that show the performance of new system alongside traditional masonry construction
3. Lower technology adoption barriers by selecting sites for prototype deployments at the neighborhood or Lakou level; use prototypes as community centers or when possible, partner with NGOs focused on permanent housing to seed new system in bulk deployments
4. Enhance the capacity to produce locally alterative building materials through seeding of new industries and development of an effective and culturally-appropriate business/marketing plan
5. If the new system employs reinforced concrete framing, make available multiple sets of re-usable formwork that can be rented at no charge
6. Draft design specifications for each of the systems discussed above, including appropriate detailing and construction techniques, that can serve as the basis for future building codes and standards
7. In coordination with NGOs, make available training programs for local engineers and construction teams (ranging from master builders to skilled mason teams) to demonstrate the applications of these standards for any new system introduced in this prototyping model.

It should be noted again that the communal approaches advocated in (1) and (5) build upon a pre-existing concept of Konbit used in rural areas to achieve infrastructure needs in a cooperative setting.

4.3 Enhancing Capacity for Future Development

While a number of technical recommendations have been presented in Section 4.0 to provide more resilient and sustainable housing, many of the challenges facing private redevelopment are non technical in nature. And although they require a considerable shift in economic and regulatory infrastructure, they must be addressed in a comprehensive master plan in order to improve the reliability of private developments.

Group Recommendations:

A. Establish Micro-Financing
One of the primary issues is resource constraints, not only in forcing Haitians to use lesser quality materials, but also in encouraging progressive construction that unfolds over years with variable quality control. Therefore, the quality of private construction in the future can be enhanced considerably if financing were available to families.

B. Establish Regulatory Process for Construction
While resource constraints were clearly a factor in the vulnerability of the housing stock in Léogâne, the situation was certainly not aided by the lack of any building code or oversight on construction processes. In fact, the lack of even basic systems to document land ownership has...
created significant barriers to getting even temporary shelters into the hands of those in most need. As a result, local participants in the workshop expressed an overwhelming desire for regulations on any type of construction (Fig. 4.3a). Of course acknowledging the limited capacity of local government, such regulatory oversight seems difficult to achieve in the near-term; however, it would be preferential in the long-term to implement:

- Public records that document land ownership rights
- Permitting process that enforces zoning regulations that can control the threat of sprawl into vital agricultural areas, while recognizing the cultural aversion to multi-family housing and the vulnerability of multi-story construction
- Building codes that include minimum life safety requirements
- Training and certification program for local builders
- Quality control standards for building materials, especially masonry used in load bearing systems
- Inspection/oversight process to insure code enforcement

Interestingly, with respect to the zoning process, the evaluation tool whose dimensions were reported in Table 4.1B provides a tool that can be used by the community to encourage or discourage certain development practices, through the adjustment of the weights and the establishment of minimum scores necessary for a permit to be issued. The zoning process could even elect to “tax” those with the luxury to build larger, multi-story homes, generating revenue for public works while also discouraging construction modalities that are more seismically vulnerable.
5.0 Public Services

There is a large list of public services which are needed in Léogâne. Several of these services have been addressed in previous sections of this report. Some services are currently provided but need improvement. Others are not provided and need to be established.

Most public services in Haiti are provided by the national government through various ministries. There appears to be a constant conflict between the needs and desires of the local communities and the delivery of services by national ministries.

According to various workshop participants, there are laws that call for a greater decentralization of public services. However, most of this legislation has not been observed or implemented. Nearly all of these recommendations call for a much stronger form of local government to provide services. Correspondingly, revenue sources will need to be developed to support these services.

5.1 Police

The current national civilian police force in Haiti was created in 1995 after President Jean-Bertrand Aristide disbanded the Haitian military. They are trained in modern policing techniques and with modern equipment. The UN has plans to expand this force from 8,500 trained officers to 14,000 within the next few years. The police are currently understaffed and due to their primary focus on the city center, there is very little police protection in the rural areas. Currently there is a system of ASEC and CASEC which serve rural areas. Previous rural systems of police protection are characterized as having been corrupt. There appears to be greater trust of police in Léogâne than in other areas of the country, however, there is still concern about the need to increase and eliminate bribery.

There is also a need for improved communications and transportation. Some residents are not aware of the phone number to contact the police. Even if they are successful in reaching the police, there is a lack of emergency response vehicles such as police cars and motorcycles.

**Group Recommendations:**

**D. Create a municipal police force**

1. Form a Léogâne police department
2. Hire properly trained personnel
3. Pay police officers adequate wages
4. Improve the 114 emergency communication system
5. Securing proper vehicles and equipment

**E. Develop a system of police operations to serve the rural communities**

1. Establish police substations
2. Develop a system for police patrols
3. Strengthen the ASEC and CASEC community based system in rural communities
5.2 Fire

There are no fire services within the commune of Léogâne. In fact, the closest fire department is located in Port-au-Prince. If a fire does occur in Léogâne, people must rely on their neighbors and buckets as there is not an adequate water system or water pressure in the commune. There are also no paramedics or other emergency response systems to support persons in need of on-site medical attention.

The group discussed various options for providing fire protection:
- Option 1: A paid fire department
- Option 2: A volunteer fire department

Both options include the need to develop a fire station which has fire trucks, tanker trucks, water storage, access to water storage facilities, communications systems, hoses and equipment, and a building to put all of the equipment.

A paid fire department has professionally trained fire fighters which are paid employees. A volunteer fire department is run by community members who are trained to fight fires. In the event of an emergency, an alarm is sounded and these volunteer fire fighters respond to the call.

**Group Recommendations:**

**A. Develop an Interim Volunteer Fire Department**
It is suggested that a volunteer fire department be established in Léogâne and later converted to a paid system. This might be coordinated through organizations like the Rotary Club in cooperation with cities in other developed countries.

**B. Establish a permanent professional fire department**
This is a long-term objective. As a professional fire department is formed, the responsibility of overseeing this force should become the responsibility of the Léogâne municipal government.

**C. Construct a fire station in Léogâne.**
A fire station should be constructed in the City of Léogâne.
1. This should be a paid, full-time fire department
2. The fire station should be located to provide emergency services in the shortest amount of time.

**D. Establish regional volunteer fire stations**
A professional fire department should be able to meet all fire needs in central Léogâne but will have difficulty bringing services to rural areas. For this reason, it is recommended that volunteer fire stations be strategically
located in the rural areas of Léogâne in order to provide fire protection to the entire commune.

E. **Develop an emergency communication system**
   An emergency communication system should be developed throughout Léogâne.

F. **Re-establish water system**
   The central City of Léogâne needs a system that provides adequate water pressure if reliable fire protection services are going to be provided. In rural areas a system of water storage facilities should also be developed.

5.3 **Transportation**

Transportation is important for people to move throughout the city, between the city and rural communities and well as from city to city (especially from Léogâne to Port-au-Prince.)

One of Haiti’s most recognized symbols is the Tap Tap, the privately run and brightly decorated share taxis that can be seen throughout the commune and country. Tap taps generally run between major towns and intersections on the major roads. There are no designated stops so there is a constant movement of people off and on the tap taps. For the moving of people between specific destinations that are not on main thoroughfares, there is also the system of moto-taxis which can take people throughout the city for relatively low fares.

A major concern for the current transportation system in Léogâne is the large number of accidents which result in personal injury, damage to personal property and even death. There is little organization to traffic flow and traffic control.

**Group Recommendations:**

A. **Regulate the private transportation system**
   Establish a procedure for licensing transportation providers and provide regulations that focus on:
   1. Minimizing accidents
   2. Vehicle maintenance and safety
   3. Safety of passengers
   4. Following traffic laws

B. **Develop a Bus Terminal/Transportation Center for Léogâne**
   This center may be located close to the entrance of the city but developed in such a manner which improves organization, aesthetics and the flow of traffic.
C. Improve traffic control

Improve signage [one-way streets, stop signs, traffic signals, speed limits, etc] is needed to create a safer system for pedestrian [walkers] and bicycles.

5.4 Waste and Sanitation

There is no system for trash collection or disposal in Léogâne nor are there dumps to dispose of garbage. The piles of trash which line the city streets disrupt traffic flow and cause drainage problems which contribute to flooding. This is also a major health and sanitation issue as waste and stagnant water can lead to mosquito and water borne diseases. One of the few ways that citizens are reducing the amount of trash in Léogâne is through burning, which is a major health concern especially with the high prevalence of plastic waste which emit deadly fumes when burned. One of the most obvious issues related to the lack of waste management services is the negative impact it has on the image of the city. The large amounts of trash negatively impact the aesthetics of the city along with smell, air quality, and environment.

**Group Recommendations:**

A. Create a waste collection system

Enter into a long term contractual arrangement with a private sector firm to provide for trash collection and disposal

1. Establish a fee based structure
2. Make trash removal a requirement and enforce the regulations
3. Develop a landfill that meets environmental considerations
4. Provide oversight to private provider to insure they are following best practices
5. Establish fees, system for collection and enforcement

B. Reduce the need for trash collection

Focus on consumptions which
- Reduces the amount of trash
- Minimizes the amount of trash
- Allows for reusable materials
5.5 Public Markets

Within the central city of Léogâne, access to goods is fairly easy if one heads to the central market. Although the market seems to lack any organization, there are inherent clusters of vendors organized by the goods they are selling, such as meat, fresh fruit, charcoal, etc. There are many small vendors spread throughout the city and commune who provide a majority of the goods to the people.

There is a need to provide adequate markets for vendors to sell goods. There is also a need to reduce or eliminate the vendors along city streets and highways.

Image 5.5a: A market in Léogâne

Group Recommendation:

A. Create markets throughout the City
   1. License vendors to provide better controls and as a source of revenue
   2. Provide locations for market which are near population centers. These could be by types of vendors [food, clothing, electronics, etc] or more of general market.
   3. Determine size of markets to avoid creating other problems: theft, disruption of traffic control, negative environmental impact, etc.
   4. This should also be tied into the local culture of Léogâne. See Cultural Section

5.6 Libraries and Internet Access

The public library, which was located near the entrance to the city, was destroyed in the earthquake. This was an excellent community resource and there is a great need to rebuild a public library.

There was also discussion regarding internet access in Léogâne. Widely available internet access has the potential to change the future of the city. Free or low cost internet could have dramatic impact on:

- The delivery of educational services. Schooling on-line
- Providing reading materials as an alternative to the library
- Improve communications within the community as well as to the world
- Dramatically improve economic development
**Group Recommendations:**

A. **Construct a new public library in Léogâne**

B. **Establish a city-wide free Wi-Fi zone**
   - Develop free Wi-Fi access for residents and businesses in Léogâne though a partnership with cellular and international foundations

**5.7 Public Amenities**

In the past, the main entrance to the city was a significant landmark with boulevards, palm trees, and public spaces. Today the signage to the city is in ruins, vendors have taken over the roadsides, and buses and tap taps cause congestion and pollution.

An auditorium is located near the main entrance to the city. The building has been unused for over 20 years. It is believed that the auditorium was never fully completed.

Adjacent to the auditorium is a large outdoor public pool. Like the auditorium, the pool has not been in use for over 20 years. This could be restored as a recreation area.

The stadium is also located near the entrance to the city. Today the stadium is a tent camp for persons displaced by the earthquake. The stadium is in disrepair.

The city square has the potential to be the focal point of the city. Many significant buildings on the square have been damaged or destroyed, including the mayor’s office and St. Rose Catholic Church. The city square could be redeveloped as a social, cultural, economic, and governmental hub. This would be a prime location for churches, retail stores, and restaurants and could be used to hold festivals, concerts, and informal gatherings.
**Group Recommendations:**

A. **Redevelop the main entrance to the city**
   Rebuild the entrance to the city to create a significant statement about the city.
   1. Restore signage
   2. Improvements to the boulevard
   3. Relocate vendors, busses, and tap taps to create a more pedestrian friendly setting

B. **Restore the auditorium**
C. **Restore the public pool**
D. **Restore the stadium**

E. **Redevelop the city square**
   This has the potential to become a vibrant social, cultural, governmental and economic center of the city

![Image 5.7c: Aerial view of the stadium (bottom left), auditorium (top center), and public high school (bottom right). A pool is located in southwest corner of the school property.](image)

![Image 5.7d: City square](image)

**5.8 Parks and Recreation**

There are limited parks and playground areas in the Léogâne commune. Most of the open spaces in the City are now covered with tents. There is a need for playgrounds, soccer fields and other sports and recreation facilities. As 58% of the persons living in the region are less than 18 years old, it is likely that increased recreational opportunities would be embraced.

**Group Recommendation:**
A. Incorporate a network of parks and public spaces throughout the city and the region as part of the overall land use master plan.

5.9 Cemeteries

There is no space left in the cemetery located near downtown Léogâne; therefore, additional space is needed.

**Group Recommendation:**

A. Develop additional cemeteries a part of the overall land use master plan

Images 5.8a and 5.8b: Léogâne city cemetery. Image 5.8b shows a mass grave and earthquake memorial.
6.0 Education

Education is the foundation for developing an engaged citizenry in a democratic society. Schools play critical roles in the lives of children, contributing to their intellectual, moral, social, spiritual, and physical development. The primary purpose of schools is to prepare children to meet their full potentials and positively contribute to the future of Haiti.

In order to perform these important functions, schools require support from families, neighborhoods, local and national government, and churches. Families make critical decisions that impact children’s school attendance. Neighborhoods establish the environment for children to pursue education. The state government implements policies to guarantee that all children have access to quality education. And finally, churches offer motivation and inspiration to become educated.

On a national level, the education sector in Haiti suffers from a number of systematic challenges such as limited government capacity, high private costs, and low quality of education. The symptoms of this troubled system include low enrollment, retention, and literacy rates (see Table 6.0a).

<table>
<thead>
<tr>
<th>Rate</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary school enrollment (Ages 6-12)</td>
<td>50% - 63%</td>
</tr>
<tr>
<td>(Salmi, 2000; UNICEF, 2000-2007; World Bank, 2005)</td>
<td></td>
</tr>
<tr>
<td>Retention (Primary school students who reach 5th grade)</td>
<td>32% - 43%</td>
</tr>
<tr>
<td>(Salmi, 2000; World Bank, 2005)</td>
<td></td>
</tr>
<tr>
<td>Adult Literacy</td>
<td>53% - 62%</td>
</tr>
<tr>
<td>(Salmi, 2000; UNICEF, 2000-2007)</td>
<td></td>
</tr>
<tr>
<td>Youth Literacy (15 – 24 years)</td>
<td></td>
</tr>
<tr>
<td>Male:</td>
<td>76%</td>
</tr>
<tr>
<td>Female:</td>
<td>87%</td>
</tr>
<tr>
<td>(UNICEF, 2000-2007)</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.0a: National education statistics in Haiti

Léogâne, like the rest of Haiti, struggles with many of these educational issues. However, the education sector in Léogâne also has a number of assets and available resources. These assets include:
• An education system overseen by a regulated Ministry of Education, which has established a standardized curriculum and well-defined objectives: to train citizens and local producers to be capable of supporting themselves and the country. The current system provides students who attend school with a wealth of knowledge and produces well-trained, successful professionals who contribute to societies all over the world.

• The private sector, which invests heavily in education and helps to compensate for the lack of capacity in the public education system (85% of schools are privately operated).

• Skilled people of Léogâne who are capable of being trained.

• Foreign aid organizations and personnel who are willing to lend support to the education system in Léogâne.

• Teachers who are willing to educate the children of Léogâne and share their knowledge despite a lack of instructional tools.

• Children who are eager to attend school and willing to share school materials with other students.

• Parents who are willing to make sacrifices so that their children can attend school.

The available resources must be capitalized upon in order to face the numerous challenges of improving education in Léogâne.

During the planning workshop, the education focus group identified several challenges and potential solutions. The group found that the educational issues in Léogâne fall into four categories; two categories are related to school infrastructure and two are related to the education system. These four categories are the Léogâne School Network, Individual School Facilities, Policy and Governance, and Programming, Curriculum, and Instruction (See Table 6.0b).

<table>
<thead>
<tr>
<th>School Infrastructure</th>
<th>Education System</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Léogâne School Network</td>
<td>• Policy and Governance</td>
</tr>
<tr>
<td>• Individual School Facilities</td>
<td>• Programming, Curriculum and Instruction</td>
</tr>
</tbody>
</table>

Table 6.0b: Education Challenge and Solution Categories

The challenges and solutions related to each category are discussed in four sections below. In each section, a vision for development is presented, challenges are identified, and potential solutions to these challenges are discussed. Many of these solutions include suggestions of short- and long-term steps for action to be taken by particular individuals or organizations.

At the conclusion of the workshop, participants in the Education group enthusiastically volunteered to continue to work in four committees to address the goals outlined below. To successfully build upon the momentum generated by this workshop, participants would benefit from further facilitation of leadership development and capacity building. With further
training, community members could become empowered to develop existing resources to address educational problems at the local level. Encouraging participants’ initiative to enact the solutions proposed here would promote a sustainable problem-solving process that could lead to local self-sufficiency.

6.1 Léogâne School Network

Participants in the education workshop envision a network of schools in Léogâne with sufficient facilities to meet the educational needs of all students, in both the city and rural areas.

Current challenges that must be faced in order to reach this goal include:

- The existing public schools in the city and rural areas do not have sufficient capacity to provide free or low-cost education to all students.
- There are too many children in each classroom.
- There is very limited land available for the construction of schools that would meet new construction standards. New standards require larger classroom sizes and additional support facilities, which means that larger sites are needed.
- There is not a university in Léogâne; therefore, students have to travel to Port au Prince to attend university. Whether they commute or relocate to Port au Prince, this travel exposes students to additional safety risks.
- There are no schools for children with physical and learning disabilities.
- There is only one high school in Léogâne which does not have the capacity to serve all of the potential secondary school students in the area.
- There are no professional (vocational) schools in the rural areas of Léogâne.

Group Recommendations:

A. Establish a program of school construction

Over 200 schools in the Léogâne Commune were destroyed in the January 12, 2010 earthquake. Even prior to the earthquake, nearly all school facilities and sites were inadequate and did not meet minimum standards. A massive effort is needed to rebuild the educational infrastructure in Léogâne.

Image 6.1a: A crowded classroom in a temporary school in Léogâne
In order to meet the educational needs of all students in Léogâne, it is necessary to construct multiple high schools in the community and more public schools in the city and in rural areas, particularly the area of Deslandes. This is a long-term goal that will require additional government responsibility, large amounts of capital for construction, and continued funding to pay well-qualified teachers.

When complete, the additional facilities will help to reduce the number of students in each classroom and provide education to a larger percentage of the children in Léogâne. In the short term, temporary public high schools should be established in each section where current public school teachers can offer their services teaching high school courses.

B. Develop professional/vocational schools
Modern and professional schools should be established in both the downtown and rural areas of Léogâne. To develop a network of professional schools will require coordination with and support from the city government, school administrators, and international organizations who are already working in the area of capacity building. Skilled local people will need to be identified as potential leaders and teachers of professional schools. A coordinating committee will need to select locations and find affordable, available space for the development of professional schools.

C. Create a system for Student Transportation
Before local schools are available in each community, it is necessary to provide transportation from rural areas to downtown Léogâne for primary and secondary school students who do not have local access to education. Government representatives and parents should work together to plan transportation routes. It will also be necessary to improve road conditions (see Infrastructure report 3.3) to make transportation routes safe, which will require the collaboration of the government.

D. Create multi-use human resource centers.
The Planning & Zoning section of this report discusses creation of “nodes” of development located in Sant Katye, or “Neighborhood Centers”. The Sant Katye would be centers for social and community development services. Their locations would be determined by existing neighborhood identities. In both the urban and rural areas of Léogâne, the Sant Katye should include multi-use education and human resource centers.
E. Establish a university in Léogâne

To facilitate this project, the first step will be to establish a good system of planning and coordination between the state and all involved parties. These groups will need to work together to plan the project, acquire land, and seek funding. The education focus group proposes a university location near the main entrance of Léogâne and adjacent to Highway 2. This location is ideal because there is a large open area, easily accessible from the main access road to Léogâne, and not in a flooding zone.

6.2 Individual School Facilities

Each school in Léogâne should have all of the facilities necessary to contribute to the intellectual and physical development of children.

This vision is currently impeded by the following challenges:

- There is a lack of infrastructure in public schools
- Most schools do not have facilities such as language labs, computer labs, chemistry labs, infirmaries, playing fields, and recreational centers.
- Many schools do not have potable water and restrooms
- Classrooms are often too small and do not have adequate ventilation which negatively affects student’s health and ability to learn.
- There are too many children in each classroom.

Group Recommendations:

A. All schools should have libraries

In each school, a library should be constructed and equipped. This is a long-term project that will require planning by the government and nongovernmental organizations working on school construction. These parties should work with school directors to plan and raise money for library construction. In the short term, a large municipal library should be built for use by multiple schools and existing school libraries should be supported with the provision of additional books and resources. Finally, school directors, teachers, and parents should encourage students to use the libraries.

B. All schools should have access to potable water

In the short-term, schools should obtain potable water containers by building relationships with organizations working on water safety (DINEPA). Communities should support schools that have already installed containers to help them continue the provision of potable water. Over
time, school directors and NGOs should work with the government to establish safe drinking water sources at every school and provide means to maintain these systems.

C. **All schools should have toilet facilities**

Toilet facilities should be constructed at every school. New schools should be built on sites with sufficient space for permanent toilets. At both new and existing schools, latrines or standard toilets should be constructed with financial support from the government and/or nongovernmental organizations. If construction of permanent toilets is not an immediate possibility, schools need to install mobile toilets. In order to ensure that these toilet facilities are maintained, school directors should hire supervisors to clean and maintain the toilets and parents need to teach their children how to correctly use and care for the toilets.

Image 6.2a: Temporary toilet facilities at a school in Léogâne

D. **Ensure adequate classroom ventilation and recreational space**

Well-ventilated classrooms and adequate outdoor play space should be constructed at each school, including recreation and play fields. Because many schools do not have the space or resources to accomplish this goal, school staff and community members should seek partnerships with other organizations and individuals with financial resources. These groups should form partnerships then work in collaboration with the government to raise sufficient funds, obtain ample and attractive land, and purchase the necessary materials to build these facilities.

E. **Construct student health care facilities**

Future school facility development should include a nurse’s room at every school so that students can receive medical care during school hours when needed. Although many schools do not currently have designated spaces for medical care, initial steps can be taken to meet the first aid needs. Schools should acquire first aid materials and hire well-trained individuals to provide health care services. In the long term, nurse’s rooms should be included in the design and construction of new schools. At existing schools, space should be allotted or constructed for nurse’s rooms. Financial resources are needed to build these spaces, supply materials, and pay health professionals. In order to secure funding for these projects, school directors and community members can create and present school health plans to NGOs and the health ministry (MSPP).

F. **Develop technology labs and internet access in schools**

Science laboratories and computer labs with internet access should be established in each school. This is a long-term project that will require support and cooperation
from the government, school directors, parents and NGOs. These parties should work together to find funding and space to build and equip these facilities. Schools will need to hire additional staff or designate current staff members to maintain the computer labs and equipment. Until it is possible for each school to have these facilities, the government should build a large municipal computer room where children from multiple schools will have access to computers and the internet. This could be a part of the municipal library proposed above.

6.3 Policy and Governance

All students should have access to quality education at minimal or no cost. Teachers and administrators must have all of the necessary tools and support to accomplish this goal.

Current educational policy and governance challenges include the following:

- The cost of tuition in private schools is very high. Cost is the primary barrier to education in Léogâne because most students do not have access to public schools and many families cannot afford private education.
- There is a lack of communication and support between the national office of the Ministry of Education and the district school offices in Léogâne.
- Many teachers are unqualified for their positions and there are limited opportunities for professional development.
- Teachers and school directors are not adequately compensated and are rarely paid in a timely manner. They do not receive insurance coverage for themselves or their families.
- Students and families pay high prices for books and uniforms and frequently do not receive books from distribution centers on time.

Group Recommendations:

A. Establish a system of free or low cost education.

Providing a system for free public education and/or tuition assistance is the central core issue to expanding educational opportunities to all in Léogâne and in Haiti. This will require a major commitment on the part of the
central government and the international community. However, expanding the availability and quality of education is core to the future economic development of the country.

B. **Expand teacher training**
A system of training and continued professional development must be established in order to produce and reinforce well-qualified teachers. This system should ensure that all teachers are well-trained and will require the support of the ministry of education and education-focused nongovernmental organizations. The system should include a professional school and a program that educates school directors and teachers to train other teachers.

C. **Increase parental involvement**
Parents must be involved in their children’s education. Parents are responsible for ensuring that their children receive an education and therefore should require them to attend school and complete their homework. Parents also need to ensure that students are healthy and well-fed so that they can be focused and prepared to learn. Frequent communication between parents, students, and teachers is needed for all parties to be informed and held accountable. The government can help in this regard by issuing policies that require student attendance.

There is also a need for educational opportunities for parents. Many parents are undereducated or illiterate, which makes it difficult for them to assist in their children’s education.

D. **Increase support for the district offices in Léogâne.**
The national office of the Ministry of Education should support the local district office in Léogâne by increasing funding for operations, building infrastructure, and hiring additional staff (specifically, additional school inspectors). Inspectors should be provided with transportation to the schools under their supervision so that they can regularly monitor educational performance.

### 6.4 Programming, Curriculum, and Instruction

The programs, curriculum, and instructional practices that are integrated into the education system must contribute to the intellectual, physical, moral, and social development of the children in Léogâne.

A number of challenges must be faced in order to improve program, curriculum, and instruction. These challenges include:

- The current curriculum has not been recently reviewed or updated.
- There is a lack of teachers in public schools.
- Programs which address the physical, arts, and technology education have not been implemented.
- In public schools, children do not receive their instructional materials on time at the start of the school year.
Group Recommendations:

A. Implement school fitness programs
   Fitness programs such as EPS (Physical and Sports Education) should be implemented in every school. Physical education needs to be a part of the curriculum. Schools should have qualified coaches and a system of inter-school competition should be established and promoted. Athletic competitions would provide opportunities for students to interact with students from other schools. In public schools, the government is responsible for implementing these activities. In private schools, the school owners should take responsibility. A long-term goal of the physical education program is to produce competitive athletes who will represent Haiti on the international level.

B. Implement school health programs
   School health programs are also needed in each school. This solution is directly related to the previous proposal of establishing a nurse’s rooms in each school. In addition to the necessary physical space and materials, schools should also have medical records for each student. The school nurse may offer health classes, teaching students about health issues such as hand-washing. The government should take responsibility for the implementation of this program. In the future, a specialized children’s hospital should be established in Léogâne.

C. Establish school meal programs
   Meal programs should be established to provide food to every student each day, thereby ensuring that children receive at least one meal per day. The government and NGOs should support these food programs by providing funding and/or food. Central storage facilities should be built to store food for multiple schools.

D. Provide supplies and instructional materials
   In order to effectively teach and learn, teachers, and students must have adequate supplies and instructional materials. In public schools, these materials should be provided by the government and should comply with the education system. A well-controlled distribution center should be established to store and allocate supplies. When needed, teachers should be provided with training to use instructional materials.

E. Implement technology education programs
   Technology education programs such as ITAP (Introduction to Technology and Productive Activities) should be
introduced at each school. This will provide students with the necessary skills to obtain employment. Technology courses should be a required part of the curriculum and qualified technicians should be hired to teach these courses. Both the government and private school directors are responsible for implementing these programs.

F. Implement additional educational programs:
The following educational programs should also be implemented:
   - Cultural Education to promote visual and performing arts
   - Civic Education
   - Literacy Programs for young adults in rural areas who did not have educational opportunities as children.

G. Review school curriculum
   Government representatives should review the current curriculum and make modifications as needed to meet the stated objectives of the education system.
7.0 Health

Quality health care services should be available and easily accessible to all of the people in Léogâne. There are 215,000 people living in the Léogâne Commune: 125,000 people in Léogâne Village and 90,000 in the other 14 sections. Currently, economic and geographic barriers, limited health care facilities and personnel, and a lack of coordination prevent many citizens of Léogâne from accessing and receiving health care services.

In order to ensure equitable and quality health services, future development of the health care industry should address these challenges and consider both curative and preventative measures. Proposed solutions must be feasible (it can happen), viable (it can work), and sustainable (it can continue). During the workshop, a team of medical professionals discussed health care challenges and identified possible solutions. This group’s findings are presented in the following sections.

7.1 Access to Health Care

Geographic and economic barriers prevent rural families from accessing quality health care, with dire consequences. Over 7% of children will not reach their 5th birthday. Transportation is expensive; roads are poorly maintained, so people walk long distances to get to health centers. Arriving there, they often find that “stock outs” of supplies & equipment and/or that they cannot afford the payment required. Health personnel find absence of formative supervision and all services are closed on weekends.

Economic barriers are the largest challenge in receiving adequate healthcare. Private medical services are very expensive and most people in Léogâne cannot afford them. Many NGOs are currently providing free services will likely leave by 2012. Community health workers scattered across the area provide minimal free preventative services.

The expense of child delivery serves as one example of the economic barriers to health care. The cost of delivering a baby by a traditional attendant is roughly US $13. This is an inexpensive but low quality option that is not particularly clean and does not include modern delivery techniques. For a woman to receive clean and modern childbirth services, she must pay between US $100-200 at a private institution or to hire a private doctor which is prohibitively expensive for the majority of the population. Doctors Without Borders currently provide quality delivery services free of charge, but they plan to leave the Léogâne area within 2 years.

Another example of the economic barriers related to healthcare is access to prescription medicines. Because of the high cost and limited availability of quality prescription medications, the only option available to many poor patients is to purchase medications from street vendors. These products are often outdated or fraudulent, and the vendors selling the drugs generally have no training, often cannot even read the prescription, and cannot discern proper dosages.

Geographic locale of health centers/ dispensaries seems to be influenced more by preference of health providers than by study of population distribution and needs. This is true in both
urban and rural areas. In remote areas, some “lokalite’s” are more than one-two hours walk from a health facility. When a patient arrives, the service provider may be absent (may be the result of inadequate planning or supervision). In the case of medical and obstetrical emergencies, this can be catastrophic.

**Group Recommendations:**

A. **Distribution of Health Centers**
   Logical distribution of health centers/dispensaries across a terrain should be distributed so that mothers are no more than ½ to- 1 hour away (when walking) to a health center or dispensary that could treat and/or refer her to a better equipped center.

B. **Ambulance Services**
   Currently, there are no ambulance services in the commune of Léogâne. An ambulance service system should be developed. At least four ambulances are needed and would require well-trained emergency technicians and a telecommunication system/dispatch center (Refer to Section 5.4).

C. **Access to maternal and newborn care**
   There is a desperate need for increased access to maternal and newborn medical care in Léogâne. A decentralized system of care for mothers and children in rural areas should be developed. The workshop recognized that the Ministry of Health of Haiti would like to see a health center in each “section rurale”, but this may not be feasible. Instead, the group studied the map of rural sections and with the help of Haitian doctors, suggested three rural centers and suggested two or three “sections rurales” that would be better served with an MCH Center/clean delivery site, staffed by auxiliary nurse midwives 24/7.

7.2 **Health Care Facilities**

Currently, the health care facilities that exist in Léogâne is quite limited, particularly in regard to the number of beds available. There are currently 7 hospitals in Léogâne; however one of them is temporary (Doctors Without Borders). In these hospitals, there are only 126 beds, 50 of which will be lost when Doctors Without Borders leaves Léogâne in two years. Services and facilities available in these seven hospitals are described in Table 7.2a.
There are a number of essential facilities lacking in the current health care system of Léogâne. The following solutions describe the facilities that should be established in order to meet the health care needs of all the people in Léogâne.

- maternal and child health center
- pharmaceutical/hospital supply center
- community health coordination center that maps out all community health activities and has ongoing education.
- outlying health centers with capacity to provide clean delivery services

### Group Recommendations:

#### A. General Hospital

It is recommended to complete the plan for a large General Hospital and to implement all activities to build and staff it 24 hours/day, seven days/week. A large General Hospital supplemented by outlying centers need to have at least 100-200 beds, and nursing staff to cover 24 hours/day 7 days per week. Nursing auxiliaries, nurse midwives and auxiliary nurse midwives are essential (currently there are none). Any plans for the above should be in collaboration with Hilda Alcindor, Dean of Léogâne’s school of nursing, who can estimate nursing and service needs for a large general hospital.

#### B. Create Maternal and Child Health Centers

With at least 550 births/mo. (6,600/yr.) there will be a continuing need for outlying obstetrical and child-spacing services. The planning group recommends maternity centers in at least three distant rural sections like Oranger and Petit Harpon. Such centers must have electricity, water and sanitation services appropriate to a maternity unit. Each should provide maternal and child outpatient care and be staffed 24/7 by nurse midwives or nurse-midwife-auxiliaries. A training center for the latter in Léogâne is suggested.

#### C. Create a Pharmaceutical Depot/Hospital Supply Center

Léogâne is totally dependent on Port au Prince for supplies, yet it serves a population large enough to merit a supply center, one that could help nearby communes in case of disaster. It is recommended that a Pharmaceutical depot/Hospital Supply center be planned for and implemented in Léogâne, in keeping with the Ministry of Health’s plan for decentralization.

It is noted that “Stockouts” are very frequent, and can be disastrous. With this and disaster-preparedness in mind, there is a felt need for a well supported supply chain, for both pharmaceutical and hospital/clinic supplies.
D. Create a Trauma Center
Currently, there is no trauma center in Léogâne; most cases are treated at local hospitals or referred to Port au Prince. The need is growing due to accidents brought in from the major national highway as well as accidents involving more than 400 “motor bikes” that serve as taxis in the commune. No safety training is given to the drivers, who also fail to use helmets or any protective road gear. The local Camejo hospital is preparing a plan for such a trauma center.

E. Create Psycho-Social Health Center
Health professionals and local teachers observe that many Léogâne citizens are still suffering from untreated PTSD. Hilda Alcindor, Dean of Léogâne’s Episcopal University School of Nursing, has added an appropriate course in her curriculum so that future graduates are trained in therapy, including group therapy and counseling. A qualified psychologist arrives weekly to carry out such training, and provides some professional advice. He finds the needs overwhelming, and has joined others in recommending that a mental health center be built and staffed in Léogâne as a beginning step to meet widespread mental health needs in this commune.

F. Create Facilities in Outlying Areas
Identify and initiate Dispensary and Health Care Centers in the neglected sections of Léogâne. Three to four health centers with beds and obstetrical delivery services in key outlying areas are recommended, such as:
- “12ieme Section Rurale” (Cormier) with outlying services such as immunization, growth monitoring counseling, filariasis/malaria control in Palmiste a Vin, Gros Morne, and Fond Oie, where a dispensary is also needed (one destroyed by earth quake)
- “14ieme Section Rurale” (Trouin) with one outlying dispensary in Petit Harpon
- “6ieme Section Rurale” (Oranger) with outlying dispensaries in Opack, Beau Sejour, and Citronnier.

7.3 Community Health Care Services
Fixed health center services are insufficient to meet current needs. WHO states that in Haiti, largely due to neonatal deaths, inadequate detection and early treatment of infections as well as underlying malnutrition, child mortality rates remain high. Maternal mortality rates (over 600 per 100,000 live births) are highest in the western hemisphere. Leogane also has one of the highest infection rates in the nation for Lymphatic Filaria, a leading cause of elephantiasis where as many as 82% might be infected. HIV/AIDS cases must walk for miles to treatment sites and are not followed by any of the community health workers. To combat these death rates requires not only fixed facilities, but an army of outlying community health workers. It is recommended to reinforce the identification, recruitment and training of health workers to serve as resident home visitors and “accompagnateurs” for AIDS/TB cases. Currently, such CHW’s rarely have on site supervision, and are hampered by an erratic supply chain. Women MCH workers (“monitrices”) are being retrained to get door to door coverage in neglected “sections rurales” by an NGO known as “Kori Ti Moun” that also sponsors outlying nutrition rehabilitation sites known as “ti foyers”.
**Group Recommendations:**

A. **Expand Community Health Care Resources**
   Community health care resources now include both curative and preventive services, but there are rarely if ever meetings to assure coordination, nor are reports required that would allow a supervisor/coordinator to better plan for coverage. Supervision does not come from local dispensaries, as it could, but rather from Léogâne. Primary health care services in any given area should have local participation and coordination; not just supervision from distant towns. Local citizenry should be involved.

B. **Home based services**
   It is recommended that in order to improve coverage, door to door registration of under fives, with distribution of home based hand carried health records be re-instituted. The home based, hand carried women’s health record that would be recognized by all health providers, who would be trained to update it whenever they see female patients. Such a record would carry key telephone numbers that would be empowering to women, such as the equivalent of the “911” number, plus the telephone number of neighbors, an AIDS hotline, and the like.

C. **Midwives**
   Ministry of Health sponsored training of Granny Midwives (“Matronnes”) is no longer encouraged due to inadequate results. Instead, implementation of the use of clean delivery sites with trained auxiliary midwives is recommended; NGO’s are asked to assist in implementation. “Midwives for Haiti”, an NGO is already training these and plans to come to Léogâne this summer.

D. **National Reference Center for Lymphatic Filariasis**
   Continue to promote the center and support Hopital Saint Croix in their treatment and prevention of the manifestations of the disease.

7.4 Coordination

Although there are regular OCHA (UN sponsored) coordination meetings, these tend to report only ongoing services such as numbers of cases seen/services provided. No document puts together the long term plans of the various health institutions. For example two MCH centers are being planned by two different NGO’s, each seemingly unaware of what the other is planning. Mobile team clinics may duplicate services in the same areas; there is no central “clearing house” that helps them coordinate, or be challenged to serve in more neglected areas. There is no coordinative registration in a central office where one could find information for coordination. Coverage for immunization/MCH services is hampered by stock-outs, lack of follow-up by supervisors, and lack of coordination. Ministry of Health guidelines for door to door registration of children under 5 and women in reproductive age groups seems to be ignored; instead services have reverted to serving a self-selected population that “shows up” at assembly posts or dispensaries.

**Group Recommendations:**

A. **Strategic Planning**
The need for strategic planning based on existing data and other findings is acute. It seems that one could reorganize the system of community health so that it is more structured, better supervised, and able to forward information to the Ministry of Health. Each health institution’s strategic plan for the future should be shared with others for coordinative purposes and sharing of resources.

B. Coordination Center
It is recommended that there be a Léogâne Commune Medical Health Coordinative Center that is kept up to date with availability of key services across the Commune. A constantly updated map where all facilities are located, with clear identification of where new health centers or facilities are most needed should be available to all, and should be consulted before any new facilities are planned. Local citizenry has a right to expect that any service provider is not only “registered” but approved and informed by the Regional Medical Director of the MSPP. The center should include ambulance and telecommunication services and have a triage officer who would take original calls.

C. Cellules de Coordination
It is recommended that one restore community based activities where local citizens participate and volunteer. Older citizens reported that in Léogâne there used to be “Cellules de Coordination” where citizens could come together to voice concerns to the Minister of Health and others.

7.5 Personnel

There is an inadequate supply of nurses and auxiliary staff for current facilities and those planned. The services of nursing students in Léogâne goes a long way to fill the gaps, but there should be more staff, especially in the face of a plan for a large general hospital. It is recommended that a committee headed by someone like Hilda Alcindor, Dean of the School of Nursing, begin a strategic plan to address these needs.

The current health care system in Léogâne includes the following personnel:
- 60 Community Health Workers
- 76 Nutrition and Lactation Counselors
- Rural Dispensaries with Nurses Aids and Mobile Clinic teams that serve the rural area.
- An estimated 200 rural health workers known as “Agents de Sante” (not equally distributed)
- Help overcome barriers to equitable distribution of health care
- Nutrition educators (“monitrices”)
- Red Cross workers and others bring immunization services, growth monitoring/counseling, and general community mobilization services to the rural population. More recently these have been trained in cholera prevention and oral rehydration therapy.

Ideally there would be at least 1/2000 population; these would be “resident home visitors” in areas where they were identified, recruited, and have practical training. However, their services may be lagging as evidenced that before the earthquake many children were not properly immunized (estimated 33% coverage for measles vaccination in some areas). Of 35 dispensary workers, only 5 stated they had
adequate supplies to promote child spacing. Despite the fact that there is a cholera epidemic, many of the above workers had no “sachets” of oral rehydration salts, although they could teach the proper usage.

**Group Recommendations:**

**A. Train more Professional Level and Mid Level Health Care personnel**
Midlevel workers/supervisors are needed, especially auxiliary nurse midwives so that outlying centers could include maternity services. It is recommended to initiate training for such mid level health workers in partnership existing institutions that could provide practicum. “Midwives for Haiti”, an MSPP approved NGO, has already begun such a plan.

**B. Partner with NGOs and other organizations for resources and training**
The group recommended that NGO’s active in health should, with the approval and help of the Regional Medical director, create partnerships so that resources & training could be shared and approved. Regular planning meetings should include review of strategic plans of each institution, to assure coordination.

**7.6 Special Programs**

Many disease oriented special health programs have benefitted Léogâne’s people, such as the yaws elimination campaign in the 1950’s, malaria control programs in the 1960’s, and current activities to prevent cholera in the face of recent epidemic.

**Group Recommendations:**

**A. Disease Elimination Initiatives**
There are a number of disease-specific special programs that complement the health care institutions in Léogâne. These programs include:

- Lymphatic Filariasis control program (Univ. Notre Dame) that distributes anti filarial medications (diethylcarbamazine and Albendazole) to non pregnant population age 2 and above
- The TB/AIDS initiatives
- Cholera treatment centers (health institutions, Save the Children and others)
- Nutrition Treatment/prevention programs: Children’s Nutrition Program of Haiti(CNP) (and other initiatives) to rehabilitate malnourished children and train their caretakers;
- Maternal and Child health initiatives with other NGO’s

**B. Rural Health Programs**
There is a need for health care programs that would provide equity in coverage for members of the rural populations. In addition to establishing more health care centers in rural areas, a system of community health education, communication, and finances are needed to support new and existing outlying health centers. While there are currently 150 rural health workers (ratio 1/600), the distribution of these workers is erratic.
Participants felt that current activities for rural health workers need review to improve continuity of care between curative and preventive services. For example, home based/hand carried health record-cards for children (the “Carnet de Sante”) need to be explained to doctors, nurses, and mobile teams who often ignore them in the face of a population that is ever more mobile. Haitian mothers go from one clinic to another; each clinic establishes a separate health record kept in its archives; the departing mother is left with nothing in her hands to testify to the next provider what treatment her child received. Similarly, home based, hand carried health records for women, approved by the Ministry of Health, are a great need. Cell phone communication by rural health workers for earlier referral of cases is an unexplored adjunct that deserves trial in rural Haiti.
8.0 Economic Development

The January 12, 2010 earthquake decimated the economic system in Léogâne. This has significantly impacted the ability to produce goods and conduct business. Unemployment was high prior to 2010; however, well-paying jobs have become even more scarce.

Economic development has been hampered by the lack of electricity, limited availability of raw materials, destruction of the vast majority of buildings, lack of communication, poor transportation networks, and inadequate banking system. Nearly every facet of the infrastructure needed to support economic development has been destroyed or is lacking in one form or another.

This has significantly impacted the ability of individuals to earn an income to provide for their basic sustenance. Struggling to support themselves and their families, most citizens of Léogâne do not have the additional means necessary to invest in the rebuilding of homes, shops, and businesses.

The poor state of the economy has also significantly impacted the ability of the local and national government to raise funds through traditional means such as income or property taxes.

On the other hand, there are opportunities available for economic development in Léogâne. There is a significant amount of international aide that is pouring into the country to assist in rebuilding efforts. Currently, much of this money is dedicated to temporary or transitional solutions, but soon the focus will change to permanent redevelopment.

In the next several years there should be uplift in the economy through all of the rebuilding efforts. These efforts will likely span the next 5-10 years.

The people of Léogâne are very intelligent and creative. These traits should be encouraged and facilitated in order to create more jobs in the Léogâne commune.

The central city of Léogâne has the greatest population concentration and largest number of resources. Therefore, economic development should be focused there. There is also a need for development in the rural areas of the commune.

8.1 Agriculture

Image 8.1a: Agricultural field in Léogâne
Sugar cane is the traditional crop of Léogâne. It is the main resource for many stable businesses around the commune including clarin, rum, molasses, raw sugar, and various other foods and beverages. Sugar cane can also be used in producing biofuel. Although this is not currently being undertaken in Haiti, it could become a major product in the future. There are also many fruits, such as bananas and mangoes, which grow in the Léogâne commune that could be produced and exported at a higher level. Mango exportation is a promising opportunity, as there are many varieties of mango which are not common outside of the country and therefore, could be sold as specialty goods in the United States.

![Image 8.1b: Agricultural goods for sale at the market in Léogâne](image)

Although agriculture is a large resource for Léogâne, many of the practices utilized by farmers and those making agricultural products have not changed in decades or even centuries. This means that production levels are far below that of other countries producing similar goods.

The city center of Léogâne is less than 20 miles from Port-au-Prince, and although it often takes over an hour and a half to travel the distance, the proximity to the capital city puts Léogâne in a prime position to export goods. Port-au-Prince currently imports most of its food products; therefore, the capital city is a strong potential market for the agribusinesses of Léogâne.

Business growth appears feasible in the poultry, soap, and sugar industries. These industries should be supported and invested in.

**Group Recommendations:**

**A. Create Agricultural Support Centers**

Agricultural support centers should be formed in the mountainous and agricultural-based regions of Léogâne. Development consultancy and implementation company Chemonics has been awarded the implementation contract for WINNER, a USAID program to fortify agricultural capacity in Haiti through localized development. Chemonics should be contacted by the Civilian Economic Committee to bring part of this capacity building to Léogâne.

These support centers could supply educational opportunities, heavy farming machinery, fertilizer, seeds, and best practices instruction to local farmers. The centers will also help facilitate improved market access. Contact with Chemonics should be managed by Haitians.
empowered through their own Civilian Economic Committee.

B. Increase capacity in agricultural products
Increasing production capacity in other agricultural products such as chicken and soap production should be considered. With a large amount of land devoted to agricultural production, it is important that goods resulting from this production be promoted.

C. Support a Salt Harvesting Production Facility
Léogâne as a coastal city is ideal for harvesting salt. The Lymphatic Filariasis program has a salt fortification plant in Port au Prince and is making plans to expand a salt production and a second salt fortification plant in Leogane in the next year.

8.2 Transport and Travel

Compared with much of Haiti, Léogâne has relatively good roads, facilitating the transportation of goods. At the same time, transportation between Léogâne and Port Au Prince, other Haitian cities, and international markets need to be improved and expanded.

Group Recommendations:

A. Consider developing a local airport with small cargo and tourist travel services
A small local airport within the commune would allow for passengers and goods to avoid the travel and delays associated with travel to and from Port-au-Prince.

B. Develop Port at Ca Ira with small ship accessibility to import and export from La Gonâve

C. Establish reliable ferry service to Isle de La Gonâve
Currently NGOs use ports further down the coast.
D. Create a toll road to Port Au Prince
The Civilian Economic Committee should begin contacting companies such as Macquarie Bank Skanska immediately. A toll road will create a self financing, secure, and well-maintained transport route from Léogâne to Port Au Prince.

8.3 Tourism

Léogâne’s proximity to the Caribbean, diverse natural landscape, rich history and culture provide many economic opportunities for tourism. Currently, however, Leogane does not have the infrastructure or resources to support the tourism industry. In order for tourism to be successful it requires a deliberate focus of time, energy and resources.

Group Recommendations:

A. Maintain clean beaches to attract tourism
Maintaining a clean beach will be vital to attract tourism. A major environmental effort will be required to establish Léogâne as a destination resort community.

B. Promote RaRa to encourage tourism
Rara, a seasonal activity occurring during lent, has a prominent role in energizing the economy of Léogâne. During this time there is an increase in sales of food and beverages as well as many crafts associated with Rara. If Rara was promoted as a tourist event similar to Carnival, it has the potential attract substantial amounts of monetary support to businesses in Léogâne (refer to Culture section).
C. Create new hotels in the Léogâne area
   1. Hotel / Hostel at Ca Ira to support ferry service to La Gonâve.
   2. Hotel in Downtown Léogâne to cater to Rara tourists (residents of Haiti and Haitian Diaspora).

8.4 Industry

There are many self employed vendors throughout the commune but very few large employers that are able to provide sustainable economic growth. Attracting major employers will require creating a climate and environment that is conducive to meeting the needs of large employers. This will require a concerted effort of providing basic infrastructure, safety services, reliable financial structure, communication/ technology, transportation, as well as education and training.

**Group Recommendations:**

A. Create a special economic zone to attract international organizations.
   A Special Economic Zone should be considered to attract foreign investment and international corporations. A viable financial system is also needed.

B. Provide adequate infrastructure to support the needs of business and industry.
   Previous sections of this report include recommendations for water, flood control, roads, electricity, and communications systems. All of these are essential to attracting foreign investment and major corporations.

C. Provide basic municipal services
   Basic services such as police and fire as well as adequate housing, and sanitary systems are essential to attracting new businesses.

D. Public Works
   Public works programs, as part of the reconstruction efforts, are likely to provide short term employment, supplying living wages and capital for growth. It will be important to leverage this in developing long-term sustainable business opportunities.

E. Improve the educational system and increase the overall literacy rates
   Industry requires an educated workforce. This requires basic literacy as well as professional/vocational training. The recommendations stated in the Education section of this report need to be implemented.

8.5 Governance and Policy

There are massive issues with unresponsive or incapable government institutions to approve and promote business development. It takes an estimated 5 years to buy land from the State, 638 days to register a property, and 204 days to open a business.

The lack of a competent property title system is a major challenge to sustainable and stable economic growth. Land ownership is unclear and often disputed which makes growth and development difficult.
**Group Recommendations:**

A. **Organize as Citizens to diligently push toward policy change.**
   A Civilian Economic Committee, or Chamber of Commerce, should be formed immediately to advocate for business interests throughout the entire Léogâne region, and help maneuver initiatives through public offices. This will require vision and diligence. This group will actively promote Léogâne businesses by supporting local tourism and business. They will also form connections with government officials to lobby on behalf of more efficient economic policy.

B. **Advocate for land reform, new title system, and increased access to capital.**
   Lobbying efforts to increase government support of business should be organized and carried out. Policy allowing faster business creation and a more fluid business environment is needed. A responsible property title system would help property mobilization.

C. **Financing**
   Financing for capital investment or ongoing business operations is not available. Banks lend to the government and bourgeoisie, and not to average private citizens. Cash management is also a difficult challenge especially for agricultural businesses are mostly seasonal and require unique types of financial assistance.
9.0 Follow-up

Effective local leadership is needed to implement the recommendations in this report. Consideration should be given to increasing the capacity of the existing government and/or developing new leadership structures.

The local government struggles to provide much-needed public services. The lack of governmental capacity has become even more evident and problematic in the aftermath of the January 12, 2010 earthquake. Nearly all of Léogâne’s infrastructure has been damaged or destroyed. The government does not have the ability to provide essential public services such as water, sewage, electricity and trash removal. They also lack the financial and human capital necessary to effectively plan, execute, and manage the massive number of projects that are needed. To help rectify this problem, existing government departments should be strengthened and new departments, such as Planning and Zoning, should be created.

Another major challenge for the city is to develop a local revenue source to support public services. It is not a current cultural norm to pay fees for public services. In the past, public funding has come from local property taxes, but this funding source was all but eliminated when 90% of all structures were destroyed in the earthquake. Redeveloping sources of local revenue may be the most critical component to developing a viable long term future.

**Group Recommendations:**

A. **Expand capacity of the municipal government to increase their ability to manage projects and provide essential services.**

   Based on the magnitude of the need and the current level of expertise, the local government does not have the capacity to meet present challenges. UNDP, CETA, ATIP, and several other international organizations have established the promotion of municipal capacity as their mission and priority. It is important that the organizations involved coordinate on this effort.

B. **Establish a Sister Cities program with the City of Léogâne.**

   There are many possible partnerships which could be developed between Léogâne and cities in North America, Europe and Asia. Cities in developed countries can assist Léogâne with the expertise needed to create a more viable municipal government.

C. **Consider outsourcing essential services**

   Consideration should be given to outsourcing to private companies the delivery of essential services that local government is not equipped to provide. These services range from planning and design, construction administration, and finance to trash removal.
D. Conduct a study on revenue sources and long-term sustainability.
A study should be commissioned to determine possible future revenue sources for ongoing and sustainable operations. The tax base of the municipality has been decimated. In the short-term, there is the revenue from external aid, however, long-term financial plans need to be developed.

E. Create a community based Coordinating Committee to provide overall and ongoing leadership for the planning, development and implementation reconstruction activities in Léogâne.
There are many governmental, nongovernmental, and international aid organizations as well as other public, private and non-profit entities that are attempting to assist in the redevelopment efforts in Haiti. The high level of response for assistance is encouraging, but there is a great deal of frustration within the community and amongst organizations. Overall communication and coordination is lacking. This has caused delays in the implementation of projects, duplication of efforts and neglect of other critical needs.

There is rapid turnover of volunteers and transitions in government at each election. Long term continuity in Léogâne can only be provided by the community itself. To provide overall all coordination, a community based Coordinating Committee should be established. This group needs to include the leadership of the municipal government and other community based organizations. At the conclusion of the four day workshop initial discussions were held to develop this organization.

9.1 Unified Master Plan
Several post recovery plans have been or are in the process of being developed for Léogâne, Haiti. These plans, which have been primarily focused on the built environment, were produced by the Japanese International Cooperation Agency (JICA), Citizens United for the Reconstruction of Léogâne (CURL), and other international organizations. Two additional planning processes are currently being initiated by ATIP and FAES [Fonds D’Assisntance Economique Et Social].

On March 15-18, 2011, a REBUILDING LÉOGÂNE PLANNING WORKSHOP was organized by a consortium of planning and development organizations to assess the status of current conditions with respect to planning, implementation and development. Participants in the four-day event included two hundred citizens, urban planners and representatives from government agencies and non-governmental organizations. The outcome is an early stage summary of preferences related to the physical, cultural, social, economic, organizational and educational challenges and opportunities associated with the recovery and future prosperity of the Léogâne Commune. A follow up convening was held on April 19, 2011 to explore opportunities for alignment of the various planning programs and consultants. Included in this meeting were representatives from UN/Habitat; UNDP; Japanese International Cooperation Agency (JICA); Fonds D’Assistance Economique et Sociale (FAES); ATIP; Citizens Unified for the Reconstruction of Léogâne (CURL) and Notre Dame University. It is important that these planning groups continue to coordinate their activities.
A **unified** strategy to connect the planning, implementation and development of all aspects of recovery and rebuilding in the Léogâne Commune is critically important. It is proposed that a Unified Planning, Implementation and Development Alliance [UPIDA] be formed to provide the expertise, tools and processes needed to insure that this integration and unification takes place.

It is also critical that the local community is empowered to contribute broad community input to the united plan through organizations such as CURL.

Over the next weeks and months, the Unified Planning, Implementation and Development Alliance [UPIDA] intends to expand their current planning, implementation and development network to include additional strategic partners. The goal of the alliance will be to create an on-the-ground nexus of community planning and building where all of Léogâne’s physical, cultural, social, educational, organizational and economic resources will be leveraged for the recovery and future prosperity of all Commune residents.

Creating a **unified** approach is critical and essential to the reconstruction of Léogâne. Without it there will be significant duplication, loss of time and waste of resources.

![Image 9.1a: CURL office](image-url)
10.0 Appendices

10.1 Contact Info

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