Cultural identity in landscape architecture, renovation of Managua's lakeside

Julio Alvarez
Florida International University

DOI: 10.25148/etd.FI14050700

Follow this and additional works at: https://digitalcommons.fiu.edu/etd

Part of the Landscape Architecture Commons

Recommended Citation
https://digitalcommons.fiu.edu/etd/1503

This work is brought to you for free and open access by the University Graduate School at FIU Digital Commons. It has been accepted for inclusion in FIU Electronic Theses and Dissertations by an authorized administrator of FIU Digital Commons. For more information, please contact dcc@fiu.edu.
CULTURAL IDENTITY IN LANDSCAPE ARCHITECTURE,
RENOVATION OF MANAGUA'S LAKESIDE

A thesis submitted in partial fulfillment of the requirements for the degree of
MASTER OF LANDSCAPE ARCHITECTURE
by
Julio Alvarez

2005
To: Dean Juan Antonio Bueno  
School of Architecture

This thesis, written by Julio Alvarez, and entitled Cultural Identity in Landscape Architecture, Renovation of Managua's Lakeside, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this thesis and recommend that it be approved.

__________________________________________
Marta Canaves

__________________________________________
Alice Gray Read

______________________________
Juan Antonio Bueno, Major Professor

Date of Defense: November 22, 2005

The thesis of Julio Alvarez is approved.

__________________________________________
Dean Juan Antonio Bueno  
School of Architecture

__________________________________________
Dean Douglas Wartzok  
University Graduate School

Florida International University, 2005
DEDICATION

I dedicate this thesis to my parents Edgard Solís Martínez and Melba Cabrera de Solís, for their support and understanding throughout my academic education.

In memoriam to my father Julio Álvarez Chamorro and to my grandfather Emilio Álvarez Lejarza, for introducing me to the history of Nicaragua.

And to Managua, the beautiful city where I was born.
ACKNOWLEDGMENTS

I am very grateful to my major professor Juan Antonio Bueno for his knowledgeable guidance, support and understanding throughout the thesis process. I am also grateful to all the people and institutions that provided me with valuable information, support and advice, such as Mario Barahona, Geraldina Gámez, Leonardo Icaza, Gerald Pentzke and Roberto Sánchez Ramírez from the Alcaldía de Managua; librarians from the Biblioteca Roberto Incer Barquero from Nicaragua's Central Bank; Uriel Cardoza from Universidad Nacional de Ingeniería; Michele Molina, Hamlet García and Tony Cotte, from Universidad Católica Redemptoris Mater; professor Camilo Rosales, Francisco Larios, Alan Luedeking, Luis H. Flores, Cinthya Margarita Alvarez de Rivas, Melba Esperanza Alvarez de Pagella, Christian Rivas, César Sandino, Adelmo Sandino and John Angée.

I would like to express my gratitude to editor Jill Baskins (Rome) for providing her valuable time and expertise in editing this thesis.

Thanks to all to those whose name have been inadvertently omitted, but without whose help along the way, this thesis would not have been possible.
This thesis examines a design approach in landscape architecture in which cultural and historical values are reinterpreted in a contemporary urban environment. The site of this project is located in Managua’s lakeside area, which was destroyed by hurricane Mitch in 1998. The lakeside area has been an attraction to Managua’s residents because of its beautiful views and fresh breezes.

The majority of Nicaragua’s population is of indigenous descent; however, Managua’s urban environment is predominantly of European influence. The pre-Columbian heritage of Nicaraguans is hidden in their cultural expressions, such as the names of places and religious rituals.

This project provides a new lakeside area for Managua in which cultural identity in landscape architecture is represented in the use of the site and in a rescue of Managua’s residents’ pride in their pre-Columbian heritage. The lakeside renovation was planned using pre-Columbian design methodology and vocabulary to create a functional and environmentally sensitive landscape.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II. SITE PHYSICAL CONTEXT</td>
<td>4</td>
</tr>
<tr>
<td>Geologic and Hydrographic characteristics of the site</td>
<td>4</td>
</tr>
<tr>
<td>Native Vegetation</td>
<td>4</td>
</tr>
<tr>
<td>III. SITE HISTORICAL CONTEXT</td>
<td>7</td>
</tr>
<tr>
<td>Managua's Pre-Columbian Context</td>
<td>7</td>
</tr>
<tr>
<td>The Three Main Migrations from the Valley of Mexico</td>
<td>7</td>
</tr>
<tr>
<td>Site Historical Architecture and Landscape Context</td>
<td>7</td>
</tr>
<tr>
<td>IV. SITE ANALYSIS</td>
<td>16</td>
</tr>
<tr>
<td>The Central Area of Managua Master Plan</td>
<td>16</td>
</tr>
<tr>
<td>Existing Conditions</td>
<td>16</td>
</tr>
<tr>
<td>V. DESIGN CONCEPT</td>
<td>20</td>
</tr>
<tr>
<td>Circular Design Methodology (CDM)</td>
<td>20</td>
</tr>
<tr>
<td>Legibility in Landscape Architecture</td>
<td>20</td>
</tr>
<tr>
<td>Design solution master plan</td>
<td>20</td>
</tr>
<tr>
<td>Lakeside Urban Area Design</td>
<td>20</td>
</tr>
<tr>
<td>Application of CDM</td>
<td>20</td>
</tr>
<tr>
<td>Pre-Columbian Design Vocabulary</td>
<td>22</td>
</tr>
<tr>
<td>Lakeside Native Vegetation Restoration Area</td>
<td>24</td>
</tr>
<tr>
<td>Conclusion</td>
<td>32</td>
</tr>
<tr>
<td>Bibliography</td>
<td>33</td>
</tr>
<tr>
<td>Appendices</td>
<td>35</td>
</tr>
<tr>
<td>FIGURE</td>
<td>PAGE</td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>1. Crowds carry the tiny image while dancing</td>
<td>1</td>
</tr>
<tr>
<td>2. The <em>cacique mayor</em> or main chief</td>
<td>1</td>
</tr>
<tr>
<td>3. Acahualinca steps. Partial view</td>
<td>7</td>
</tr>
<tr>
<td>4. Acahualinca steps. C. 6000 BC</td>
<td>7</td>
</tr>
<tr>
<td>5. Pre-Columbian Nicaragua</td>
<td>8</td>
</tr>
<tr>
<td>6. Zapatera’s monumental statues</td>
<td>9</td>
</tr>
<tr>
<td>7. Jaguar warrior, ceramic vessel</td>
<td>9</td>
</tr>
<tr>
<td>8. Hieroglyphics</td>
<td>9</td>
</tr>
<tr>
<td>9. Lakeside drawing by Squire, c. 1848</td>
<td>10</td>
</tr>
<tr>
<td>10. Market of Managua, c. 1930</td>
<td>10</td>
</tr>
<tr>
<td>11. Old National Palace, c. 1898</td>
<td>11</td>
</tr>
<tr>
<td>12. City hall building or Palacio del Ayuntamiento</td>
<td>11</td>
</tr>
<tr>
<td>13. Future Land Use and Zoning plan, CAMMP</td>
<td>16</td>
</tr>
<tr>
<td>14. Environmental Zoning plan, CAMMP</td>
<td>16</td>
</tr>
<tr>
<td>15. Hieroglyphics representing Monkeys</td>
<td>20</td>
</tr>
<tr>
<td>16. Hieroglyphic representing Aztec god Quetzalcoatl</td>
<td>20</td>
</tr>
<tr>
<td>17. Hieroglyphics from El Muerto Island</td>
<td>22</td>
</tr>
<tr>
<td>18. <em>Chicomóztoc. Historia Tolteca-Chichimeca</em> manuscript</td>
<td>22</td>
</tr>
<tr>
<td>19. Recently discovered hieroglyphics at El Muerto Island</td>
<td>23</td>
</tr>
<tr>
<td>20. Hieroglyphic pattern with seven lobes</td>
<td>23</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>21.</td>
<td>Lakeside vegetation next to La Cervecería building, c.1930</td>
</tr>
<tr>
<td>22.</td>
<td>Lakeside Vegetation at Managua’s west side</td>
</tr>
<tr>
<td>23.</td>
<td>Example of typical trail</td>
</tr>
<tr>
<td>24.</td>
<td>Restored native vegetation will attract wildlife</td>
</tr>
<tr>
<td>25.</td>
<td>Momotombo Volcano. Rainy season</td>
</tr>
<tr>
<td>26.</td>
<td>Momotombo Volcano. Dry season</td>
</tr>
<tr>
<td>27.</td>
<td>Existing waste water distribution plan</td>
</tr>
<tr>
<td>28.</td>
<td>Proposed locations for waste water treatment plants</td>
</tr>
<tr>
<td>29.</td>
<td>Waste water treatment plants, approved locations</td>
</tr>
<tr>
<td>30.</td>
<td>Example of waste water treatment plant</td>
</tr>
<tr>
<td>31.</td>
<td>View of typical waste water treatment plant</td>
</tr>
<tr>
<td>PLATE</td>
<td>PAGE</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>1.</td>
<td>2</td>
</tr>
<tr>
<td>Context</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>3</td>
</tr>
<tr>
<td>Site location</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>5</td>
</tr>
<tr>
<td>Technical data</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>6</td>
</tr>
<tr>
<td>Vegetation</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>13</td>
</tr>
<tr>
<td>Site history</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>14</td>
</tr>
<tr>
<td>Historical lakeside, before hurricane Mitch</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>15</td>
</tr>
<tr>
<td>Old central square inventory</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>17</td>
</tr>
<tr>
<td>Site inventory</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>18</td>
</tr>
<tr>
<td>Present land Use &amp; zoning</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>19</td>
</tr>
<tr>
<td>Opportunities and constraints</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>21</td>
</tr>
<tr>
<td>Circular design methodology</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>25</td>
</tr>
<tr>
<td>Design program</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>26</td>
</tr>
<tr>
<td>Master Plan</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>27</td>
</tr>
<tr>
<td>View toward Chiltepe Peninsula</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>28</td>
</tr>
<tr>
<td>Section “A”. Plaza Juan Pablo II and platform</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>29</td>
</tr>
<tr>
<td>Section “B”. Statue’s court details</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>30</td>
</tr>
<tr>
<td>Statue’s court. Zapatera’s sculptures location</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>31</td>
</tr>
<tr>
<td>Kiosk and paving design details. Large scale sculpture detail</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER I

Introduction

Cultural identity in Landscape Architecture is related to a sense of place perceived in the collective memory of residents. This sense of place is influenced by the natural landscape, the historical use of the site and a symbolic vocabulary derived from people’s history. Collective remembering is related to cultural values and can take various institutionalized, popular and ritualized forms,¹ which are expressed in a spatial context. This thesis examines a design approach in landscape architecture in which cultural and historical values are reinterpreted in a contemporary urban environment. This research will focus on the old center square of Managua, the capital city of Nicaragua (plate 1), which has been repeatedly damaged by natural catastrophes.

The site of this thesis project is located at Managua’s lakeside (plate 2), which was destroyed by hurricane Mitch in 1998. The lakeside has been an attraction to Managua’s residents because of its beautiful vistas and fresh breezes. Residents continue to go to the lakeside to taste food and refreshments in several small and improvised restaurants during afternoons and weekends—new lakeside area development is essential.

Nicaragua’s population is 69% mestizo, the majority of them with a high degree of indigenous blood; 14% white; 5% aboriginal; 8% black, and 4% Zambo.² Although Nicaragua’s ethnic makeup is mixed, Managua’s historic buildings, public squares and parks show mostly European influences, expressed in the neo-Classical and Art Deco styles. The pre-Columbian heritage of Nicaraguans is found in a wide scope of cultural expression, such as many of their words and their accent. It is also found in the name of places, the food and religious rituals.

For example, the most important holiday in Managua is Saint Dominic’s procession, where the image of Saint Dominic is placed on a decorated canoe and carried during part of its journey in back of a truck down the hill through a dusty rural road, probably a former river basin, across the Valley of Managua. Crowds dance throughout the day accompanying Saint Dominic’s image on its way, as it is then hand carried to Managua’s old central area where the procession ends at a church. After a week of festivities, the image is returned to the hills in a similar procession. This procession is an example of the pre-Columbian cultural identity hidden in Nicaraguan traditions—the root of this practice can be traced back in time to an indigenous festivity, when crowds would bring down from the hills the idol of Xolotl (Aztec deity of corn crops, from which the name of Lake Xolotlán is derived) in a canoe, through an old river bed, which is now dry, until they reached the lake, where they threw flowers in a ceremonial path.

The purpose of this research is to explore how landscape design can incorporate symbolical elements that evoke cultural legacy. The project will reinterpret Managua’s cultural

---

¹ Urban Planning and Cultural Identity, p. 10, 3rd paragraph.
⁴ Ibid
identity in a contemporary design that is environmentally sensitive, and will address local administrative plans for future development. The main goal is to provide a new lakeside for Managua in which cultural identity in landscape architecture is represented in the use of the site, while reclaiming the pride of Managua’s citizens in their pre-Columbian heritage.

CHAPTER II
SITE PHYSICAL CONTEXT

Managua is located in the south basin of Lake Xolotlán between latitudes 12° 43' and 12° 7'' North and between longitudes 86° 16' and 86° 40' West (plate 1). Lake Xolotlán’s annual average water level is 38.70 m above the sea level, has a surface of 1025 km² and a maximum depth of 24 m. Its water is contaminated mainly by the city’s sewage drainage, but a project for its rescue started in August 2001 and it is planned to last ten years (Appendix I).

Managua’s minimum rise over the sea level is 42 meter and its maximum is 222 meters at the vicinity of the adjacent hills.

The Pacific region of Nicaragua where Managua is located has numerous volcanoes, with the huge Momotombo volcano being the major feature in Managua’s surrounding landscape. Managua has also five lagoons of volcanic origin, and the volcanic Chiltepe peninsula is the main landscape feature visible from the site. The soil in the southern basin of Lake Xolotlán is composed of compacted volcanic ash.

Managua sits on a seismic zone and is crossed by numerous quaternary faults, which had caused periodic earthquakes (plate 5, Fig e).

The Nicaraguan Instituto Nacional Forestal classified the natural vegetation of Lake Xolotlán’s basin under the Ecological Region I (Pacific region). The Ecological Region I is mainly that of a deciduous forest, a characteristic of dry tropical zones. It is presently formed of scattered thickets and trees, which are remnants of previous forests. A low annual average rainfall of between 1000 mm and 1250 mm generates this type of vegetation, as well as annual temperatures that range between 26 and 28 degrees centigrade (plate 3, figs b, c and d). The annual relative humidity rate is 74%. Inside Ecological Region I, we also found sub-deciduous forests of tropical semi-moist zones. Managua is located in a transitional area between the typical deciduous forest and a sub-deciduous forest of tropical semi-moist zones. In the lower areas of Managua’s lakeside, where water is almost present at soil level, the semi-moist type of vegetation is replaced by that of a tropical moist forest. This wetland type of vegetation actually found in the lakeside at the eastern outskirts of Managua and on the northwest coast of the Chiltepe peninsula (Appendix II). Only in the highest part of the Chiltepe peninsula where the climate is cooler and the humidity is moderate, does one find an evergreen forest forming the vegetation. The annual average wind speed in Managua’s downtown is 1.25 m/second.

---

9 Saneamiento del Lago de Managua o Lago Xolotlán, p.1
10 Biogeografia de Nicaragua, p. 477
PLATE 3

Climatology

Temperature

Rainfall

Relative Humidity

Managua's Quaternary Faults

Lake Xolotlán's Historic Water Levels 1980-2002

Lago de Managua Niveles Históricos 1980-2002

Legend

Sources:

a. Nicaragua y el mundo, atlas ilustrado.
d. http://rea-weather.com

THESIS

CULTURAL IDENTITY IN LANDSCAPE ARCHITECTURE
Renovation of Managua's lakeside

FLORIDA INTERNATIONAL UNIVERSITY

TECHNICAL DATA

Centimetres

Percentage

Rainfall Relative Humidity
PLATE 4

a. Ecological Regions of Nicaragua

b. c.1914

Ecological Region I

VEGETATION

ZONIFICACION DE LA VEGETACION DE NICARAGUA
Región Ecológica I (Del Pacífico)

Flor de Avispa
(Hibiscus sp)

Flor de Sacuanjoche
Nicaragua’s National Flower
(Plumeria rubra, var alba)

Ecological Region I

LEGEND

a. Biogeografia de Nicaragua, p. 68.
b. Picture by G. Alaniz. Courtesy Luis Flores
d. http://www.pineleros.com
g. Biogeografia de Nicaragua, p. 71.
CHAPTER III
SITE HISTORICAL CONTEXT

Managua’s Pre-Columbian Context

The oldest evidence of the presence of man found in Managua is the Acahualinca steps, which date from approximately 8,000 years ago. They were found on Managua’s west side, close to the lakeside, ten feet below water level in an inferior layer of quarry stone. This depth is divided into five feet of soil and five feet of quarry stone. There are also animal footprints, such as deer, boar and bison. According to Spanish archeologist Joaquín Matilla Vila, those primitive settlers were desperately running toward the lake during the eruption of Masaya volcano. They stepped in fresh volcanic ash that was then covered and preserved by more layers of ashes during the catastrophe.


Scholars can identify at least three main migrations from the Valley of México to the Nicaraguan lakes basin. Nicaragua was a path of commercial and cultural interchange among different pre-Columbian people, from the north of the American continent and from the south as well. Due to the great abundance of prey and fresh water offered by the lakes basins, this area was also an object of dispute and wars among ancient inhabitants.

The Olmecs invaded Cholula around the VIII century. Cholula inhabitants or Chololtecas were Náhuatl speaking peoples who were influenced by Teotihuacán and El Tajín cultures. These people were enslaved by the Olmecs and were forced to pay high taxes to their conquerors. The Chololtecas decided to migrate to the south in order to escape from Olmec domination. They settled mainly in the Pacific coast of Central America. In Nicaragua, they occupied all the area between the lakes and the Pacific Ocean after pushing the Chibcha tribes to the Atlantic Coast. Another important tribe, the Chontales, which means “foreigners” inhabited the east side of Lake Cocibolca (fig 5).

By AD 1000, the city of Tula was one of the most influential urban centers in Central México. It fell during the XII century, due to conflicts between ruling powers and to Chichimeca invasions. After the destruction of Tula, several Tula-Toltec groups settled in the Valley of México, giving birth to the Aztecs, and other groups migrated south. One on these groups, the Nicaraos went to what is today Nicaragua and, after fighting with the Chorotegas

---

11 Apuntes sobre la historia de Managua, p. 25.
14 Historia de Nicaragua, p. 7
15 Acahualinca en el panorama arqueológico de Nicaragua
16 La estatuaria de la Isla Zapatera, p. 19
17 Introducción al habla Nicaragüense, p. 131
18 Náhuatl: Language spoken by the inhabitants of the Anahuac or Valley of México.
19 Ancient Tollan, Tula and the Toltec Heartland, p. XVI
20 Prehistoric Mesoamerica, p. 241
or Cholutecas, the invaders settled in the area between Lake Cocibolca and the Pacific Ocean and on the major islands of this lake, Ometepe and Zapatera. In the XV century, a four-year drought affected the Valley of México. Spanish friar Toribio de Benavente, who visited...

The Nicaraos, who migrated to Nicaragua in the XII century, became the most powerful tribe in the area by the time the Spaniards arrived. Their chief was called Nicaragua: according to philologist Carlos Mántica, Nicaragua or Nic-anahuac means “here is the Anahuac.”

Most Probably, as time passed they mixed with the Chorotegas, who spoke a very similar language. These Nahuatl speaking people left an impressive legacy of monumental statues, mainly in the Island of Zapatera (fig. 6). Art historian George Kubler said that these statues have an elaborate articulation and a powerful expressive character. He also pointed out its ”mature technical skill of metropolitan demand” and paralleled them to the famous Toltec Atlantean statues from Tula (plate 17). Zapatera’s statues were colorful, as were Aztec and Maya pyramids and sculptures. Archelogist Rigoberto Navarro recently found in Zapatera’s statues, evidence of color pigments, such as orange-red pigments derived from iron oxide, and yellow, violet, pink and black pigments derived from crystals. Ancient Nicaraguans also left important hieroglyphics that relates them to their Toltec past, such as the ones in El Muerto Island, which belongs to the Zapatera archipelago.

Nicaraguan aboriginal ceramic clay vessels and artifacts are of high quality. Historian Ricardo Páiz Castillo mentioned that their colors, such as red, ochre, black and white were derived from plants and minerals. Its shapes and decorations are representative of Mesoamerica’s most important myths and imagery.

---

21 Map mainly based in La religión de los Nicaraos, primera parte, El pez y la serpiente, revista de cultura, p. 13
22 Archeology magazine, November/December 2005, Volume 58, Number 6, p. 40
23 Mesoamerican Architecture as a Cultural Symbol, p. 84
24 Introducción al habla nicaragüense, p. 134
25 The Art and Architecture of Ancient America, p.338
26 Los dioses venidos de Zapatera, mitos y realidades, p. 49-51
27 Historia de Nicaragua, p. 18
Site Historical Architecture and Landscape Context

In 1524, Spanish conqueror Francisco Hernández de Córdoba founded the city of León at the northwestern side of Lake Xolotlán, and the city of Granada at the north side of Lake Cocibolca. The rivalry over which city was to become the capital city resulted in a determinant factor for the future importance of Managua.

Spanish historian Diego Fernández de Oviedo visited the aboriginal settlement of Managua in 1527. He described Managua as a long and narrow settlement of huts and orchards aligned with the lakeside, with an extension of about three Spanish leagues. Spanish conquerors usually built their central squares in the same areas where the local tribes had their most significant "squares." In this case the square happened to be in the area called Manahuac, which in Náhuatl means "place where is a great extension of water," according to several scholars. In pre-Columbian times, Manahuac was the area of today's central square and lakeside. This area was affected by the Spanish policy of congregaciones, in which aborigines, scattered through the vicinity, were forced to concentrate into larger settlements where they could be readily controlled and Christianized. The name Managua was later extended to the overall neighboring settlements as they grew and joined together to form a town. It was not until 1720 that this town started to obtain importance when the Spaniards established a military base, due to its strategic location, almost equidistant between León and Granada. Managua's adjacency to the lake was also an advantage for commercial water transportation. In 1751, Agustín Morel de Santacruz, bishop of León, informed the king of Spain about his visit to the town of Managua. In his letter, the bishop described a typical Spanish colonial town with a main church and a cabildo or administrative building in its central square. In 1819 king Ferdinand VII of Spain conceded to the town of Managua the urban title of Leal Villa de Managua. This gave to Managua the right to have its own city hall and some tax exemptions.

In 1821 Central America obtained its independence from Spain. Managua served as kind of refuge to people who were escaping the political tensions that grew between León and Granada. Since 1823, these two cities were in continuous wars disputing the right to be the Capital of Nicaragua. During the first half of the XIX century (c. 1840), coffee crops where introduced in Managua's neighboring hills. These crops created a need for labor and for increasing the infrastructure of the town. During the XIX century coffee crops became increasingly important in Nicaragua due to international demand. In 1846, the Nicaraguan congress signed a decree raising the rank of Managua from a Villa to a City. In 1849,
George E. Squier, an archeologist and diplomat, was sent to Central America by the U.S. government in a diplomatic mission. He published a book on Nicaraguan archeology, culture and landscape. In his book he depicted a view of Managua’s lakeside in which the undulating profile of the Chiltepe peninsula is clearly visible from an open square flanked by huts with wooden fences and colonial houses made probably of *taquezal* (timber frame wall system filled with layers of small stones and mud) and clay roofs. Large trees, palms and thickets form the vegetation, while several canoes sail along the shore. In the right forefront of the picture a low, thick wall seems to enclose a landscaped area with trees, palms and shrubs (fig 9).  

In order to end the wars between León and Granada, in 1852 the Nicaraguan authorities declared Managua as Capital of the Republic, and they called it City of the Peace. In 1852, a two-story colonial house with arcades served as presidential offices on the old central square. In 1860, the first dock of Managua was constructed. In 1881 a new steam ship company started a transportation service between Port Momotombo (near the city of León) and Managua dock (fig 21). During the same year the Market of Managua was constructed with influences from the neo-Classical style. The first Nicaraguan neo-Classical buildings kept the colonial types of plan layout and construction materials. The plan layout, which used to be square or rectangular, had exterior transitional arcaded corridors for sidewalk shade, and interior arcaded courtyards surrounded by corridors and rooms. Construction materials were appropriated for hot, tropical climate. Thick, thermal walls were made out of adobe, *taquezal* or clay brick; columns and beams were made out of wood; and roofs were covered with Spanish clay tile. The neo-Classical style influenced architectural ornamentation on the façade, such as pediment, cornices, striated pilasters, balustrades, arches with keystones and moldings, and also as decorative isolated elements (fig 10).

In 1886, train transportation serviced the tract between Managua and Granada, with a stop in the city of Masaya. In 1893, José Santos Zelaya became president of Nicaragua. The new president was educated in Paris, where he became familiar with the classical architecture of the French Enlightenment. Zelaya built a new National Palace in the French neo-Classical style, with Mansard roofs (fig 11).

The new National Palace and the first cathedral formed a central plaza. In 1898, President Zelaya inaugurated the General Estrada Park (generally called Central Park) next to this plaza. The design of this park was commissioned to the French designer Louis Lairac. The park site was two blocks wide from north to south, with carefully planned walkways with almond and malinche trees for shade. The park was designed with a wooden gazebo in the center of the main walkways, displaced in a north to south axis. This center also served as the point of tangent of several arches, which created secondary walkways. Some walkways were flanked with magenta and violet bougainvilleas, which provided shaded paths. The gazebo...
served also as the bandstand for the official every Thursday and Sunday evening for the enjoyment of citizens. They played waltzes by Johannes Strauss and Nicaraguan composer José de la Cruz Mena. Iron handrails with classic vessels motifs on a low wall base were used to protect areas of decorative plants. The main walkways were flanked by a series of wooden benches. One side of the park boasted a two-story pavilion in the neo-Classical style with a balustrade over the horizontal roof, and large rectangular windows with balconies.

Unfortunately, fire destroyed this romantic pavilion in the 1920s. A wooden, two-storied Swiss-style pavilion was built on the west side of the park, in front of the cathedral. This building had a café, which served refreshments, beer, fine liquors and ice cream to visitors. It had a central room and a corridor facing the lake with tables and chairs. The park was surrounded by iron fence with eight iron gates, which served as pedestrian access to the park. Four of these gates were located at the center of each side of the fence, and the other four at the corners.

This new construction was located in the area of the old central square. Between the General Estrada Park and the lakeside, Zelaya built the Obelisk Park (today's Rubén Darío Park) to commemorate the turn-of-the-century. The government promoted a plan for planting trees in all the Managua's neighborhoods. During Christmas of 1902, President Zelaya inaugurated the new electric public lighting service.37

The neo-Classical style continued to be dominant in Managua's institutional construction, because of its relationship with the democratic ideals from ancient Greece and republican Rome. In 1927, during the presidency of Juan Bautista Sacasa the new City Hall of Managua was built with modern materials, such as concrete and iron (fig 12). Its main portico was constructed with the façade of a Greek temple (most likely inspired by the Parthenon) with pediment, friezes and Doric columns. It was set over a stepped platform flanked by thick, low walls. Several years later, these thick low walls served as pedestals for two neo-Classic female marble figures. The lateral porticoes were designed in the manner of a Roman temple front, with smooth Tuscan style columns. Between porticoes a crisscross handrail runs over the platform. The original horizontal skyline of this building was broken when a second story was added over the main structure, leaving the porticoes as projecting pavilions. The new story columns were thinner than the lower ones and the roof had a parapet.

In 1931 a strong earthquake devastated Managua. The National Palace and the Central Market were destroyed, though the Municipal Palace survived. In 1939, during the presidency of General Somoza Garcia, the Central Park was renovated. Architect Victor Savater and sculptor Ernesto Brow38 were commissioned to design a new music pavilion for the park, which was called the Temple of the Music (plate 8, fig a) The new design was influenced by the Art Deco style. It had the shape of a drum with nine robust and protruded main columns from floor to top holding a thick circular beam. Each face of the thick beam, between columns displays a symbolic sculpted panel in high relief representing the most important historical events, such

37 Breve historia del Parque Central de Managua

38 Proyecto, rescate de los monumentos públicos de la ciudad de Managua.

fig. 11 Old National Palace, c. 1898. fig. 12 City hall building or Palacio del Ayuntamiento.
as episodes of indigenous resistance to the Spanish conquest; an important battle in which English pirates were defeated in the XVII century; the declaration of Central America independence from Spain in 1821; the main battle in which Californian filibuster William Walker was defeated by the Nicaraguan army in 1856, and depictions of agricultural machinery symbolizing the country’s economic development. On top of the Art Deco pavilion roof was placed a sculpture of the goddess of music. The pavilion was surrounded by artistic water fountains and lighted bollards in the form of classic jars. Four female marble statues representing: Progress, Commerce, Industry and The Republic were placed at the pavilion four corners. Two of those statues were later placed at the City Hall on the low wall pedestals, flanking the main portico staircase.

The city was reconstructed in the same location after the 1931 earthquake. The imported metal structure of the new neo-Classical cathedral, which was under construction during the tragedy, survived the seismic event. The new National Palace was constructed in neo-Palladian style (plate 8, fig i). A horse racing track was constructed during the late 1930s in the area where the Rubén Darío theatre is found (plate 5). A new cabaret named Copacabana and the Casino Olímpico were constructed to the east of the racing track. Their structure was protruding over the lake (plate 5, fig e). The International style became popular in private buildings and residences. The modern Rubén Darío theatre was built in the late 1960’s and became an important reference and point of attraction to the lakeside area (plate 7, fig f). In 1972, yet another earthquake devastated Managua. This time Managua was a much larger city with a population of 500,000 inhabitants. Even though new institutional and commercial buildings were constructed with concrete an iron, most of the city residences and older buildings where constructed of *taquezal*. Historian Emilio Alvarez Montalván defines the use of this construction technique, which was commonly used before the 1972 earthquake, as “the culture of *taquezal*”.39 Unfortunately, this type of construction was not seismic resistant. Almost all the downtown area surrounding the central square was destroyed and not reconstructed. Since 1972, the city started growing in the periphery of its old center. The central square was shifted to different areas of the city. Poor people moved to the destroyed area where the wealthier used to live. The neo-Classical cathedral was severely damaged. Managua did not have a cathedral until the early 1990s, when President Violeta Chamorro donated land in the outskirts of the city to the Catholic Church, for its construction. Mexican architect Ricardo Legorreta designed this new cathedral with Islamic influence, and the Cardinal-Archbishop of Managua Miguel Obando inaugurated it in 1992. Some efforts have been done during the last ten years to revive the old city center. In 1992, a new lakeside area was constructed, that had a series of platforms for walks, refreshments kiosks, benches and trees (plate 4). The neo-Palladian National Palace was renovated and turned into a museum. In 1998, hurricane Mitch raised the water level of Lake Xolotlán by twelve feet (plate 3, fig f), and the lakeside was again destroyed. In 2000, President Arnoldo Aleman, who had the intention of reviving the old center, constructed the new presidential house in the same lot where the Club Social de Managua, a neo-classical building, used to be before the last earthquake (plate 5, fig a). Architect Alejandro Cardenal designed the new Presidential house in post-Modern style with neo-Classical influence, with the purpose of resembling the neo-Palladian National Palace (plate 7, fig e). Architect Nelson Brown pointed out the fact that unfortunately once again, the view to the lake was blocked from the central square. A large

---

39 Emilio Alvarez Montalván, Honorary President of the Academia de Geografía e Historia de Nicaragua, interview by researcher, 24 December 2005.
PLATE 7

OLD CENTRAL SQUARE INVENTORY

Lake Xolotlán

0 250 500 1000 Feet

LEGEND

a. Rubén Dario monument
b. Managua's century obelisk
c. Central Park Sandinista mausoleums
d. Frixione Park
e. Central Park pavilion and
f. Managua's century obelisk
g. New Presidential House
h. Old cathedral
i. Old National Palace or Palace of Culture

CULTURAL IDENTITY IN LANDSCAPE ARCHITECTURE
Renovation of Managua's lakeside

THESIS

Presented by Julio Alvarez  FLORIDA INTERNATIONAL UNIVERSITY
musical fountain filled out the open space of this historical square. A huge piazza called Plaza de la Fe Juan Pablo II was constructed to the northeast of the old central square to commemorate the pope’s visit. In January 2005, during the presidency of Enrique Bolaños, the mayor of Managua inaugurated an acoustic shell designed by American architect Glenn Small. This sculptural acoustic shell was planned to serve as a stage for Plaza de la Fe during concerts or political meetings (plate 8, fig. c). The Plaza de la Fe, which is in front of the lakeside area, is an important landscape element in this thesis proposal (plate 8, fig. d).

CHAPTER IV
Site Analysis

The site is located within the boundaries of the Reglamento del Área Central de Managua or the Central Area of Managua Master Plan (CAMMP), as defined by the City Hall regulations booklet published in April 1995. In the Present Land Use and Zoning plan (plate 9) and the Future Land Use and Zoning plan (fig. 13), which is part of CAMMP, most of the site area has been destined for parks and recreational areas. In the Quaternary Faults map (plate 3, fig. e) and in the Environmental zoning plan (fig. 14) from CAMMP, the seismic risk zones of the site are charted. The environmental Zoning plan also shows a historical flood risk line at the lakeside. The lakeside infrastructure was destroyed by hurricane Mitch in 1998, as previously mentioned. Presently, a series of improvised shelters are standing over the ruins, where vendors offer beverage and food service to tourists and residents. There are no benches where visitors can sit and enjoy the views of the lake. The green, undulating crest of the Chiltepe peninsula, like a mythical Aztec serpent mountain rising from the waters, continues to be the most attractive landscape feature visible form the lakeside. There are no places for social communication apart from the seats offered by the commercial kiosks to their clients. There are no safe walkways for strolling, nor are there shade trees in the area. The coast is lined by rubble from the destroyed infrastructure and polluted by garbage left by pedestrians.

The best part of the site is the new Plaza de la Fe and its sculptural acoustic shell, but shade trees and pedestrian corridors are lacking, as is a relationship with the surrounding landscape and lakeside. The high platform behind the acoustic shell is out of place; it is at an odd, angled relationship with respect to the Plaza de la Fe and it does not have meaningful architectural character. Several views of existing conditions are displayed in Site Inventory (plate 8). A list of opportunities and constrains (plate 10) is also part of this site analysis. The old central

40 Reglamento del área central de Managua, p 65, 69, 75 and 77.
41 Ibid, p. 69.
42 Ibid, p. 75.
LEGEND

- RESIDENTIAL
- COMMERCIAL
- INSTITUTIONAL
- PARKS AND GREEN SPACES
- NATURAL RESERVE
- OPEN SPACE OR EARTHQUAKE RUINS
- LAKE OR LAGOON
- PROJECT SITE
- CENTRAL AREA OF MANAGUA (AS DEFINED BY MANAGUA'S CITY HALL)
OPPORTUNITIES
- To create green areas for relaxation and social communication.
- To provide areas for enjoyment of views.
- To restore shoreline vegetation for aesthetic and ecological improvement.
- To provide pedestrian and bicycle amenities.
- To plant canopy trees for shade.
- To provide lighting hierarchy.

CONTRAINTS
- Absence of visual and tactile stimuli.
- Poor temporary food and beverage shelters.
- Poor pedestrian corridors.
- Natural vegetation is disturbed in shoreline.
- Lack of canopy trees for shade.
- Site area is subject to seismic events and occasional floods.
- Lack of parking spaces.
- Lack of urban furniture.
square is the most important urban landmark close to the site, attracting tourists and residents to the area. An inventory of its main buildings and parks is displayed in plate 7.

CHAPTER V

Design Concept

This thesis proposes a new design for Managua’s lakeside inspired in the citizen’s pre-Columbian heritage, which is hidden in their cultural identity expressions. The design will appeal to the collective memory of residents by providing amenities to allow for the enjoyment of the lake’s views, such as the mythical serpentine profile of the Chiltepe peninsula. A lakeside urban area is provided with amenities for the recreational use of the site: areas of native vegetation patches will work as stepping-stones creating transitions to the lakeside native vegetation restoration area, which will combine to enhance the environmentally sensitive character of the landscape.

Lakeside Urban Area

Architect Antonio Prado Cobos called Circular Design Methodology (CDM) the ancient method applied by the Maya, Aztec and Inca in their design process. Prado Cobos stated in his research that CDM worked through the use of center points, circumferences, concentric circles and arches in a harmonic and hierarchical relationship as the basic matrix for the tracing of figures or for the hidden geometry that guides the plastic composition. Pre-Columbians used a straight and/or a circular main axis to articulate their design (plate 11, fig e). In many Nicaraguan aboriginal hieroglyphics, sculpture and ceramic vessels the researcher found evidence of the application of the CDM (figs 15 and 16). See plate 11, fig. d. The aesthetic aspect of the project focuses on a rescue of pre-Columbian design vocabulary interpreted in contemporary landscape architecture.

Legibility is an important consideration in this design – a legible landscape presents a clear organization. For American urban planner Kevin Lynch legibility is “the ease with which parts may be recognized into a coherent pattern”. Movement through legible space is led by the proper articulation and treatment of paths, nodes and edges. In the design of Managua’s lakeside legibility was achieved through the application of CDM. This method was applied using Plaza de la Fe obelisk as the center point. The layout is articulated by a straight main axis and by a circular axis to achieve coherence. Paths or clear routes of movements whether vehicular or pedestrian, are mainly organized through these axes or through the main center

---

43 El creador Maya, p. 172-199

44 The Image of the City, p. 12.
My design proposal for Managua's Lakeside is inspired by Nicaragua's main pre-Columbian heritage. Architect Antonio Prado Cobos called Circular Design Methodology (CDM) the ancient method applied by the Maya, Aztec and Inca in their design process. Prado Cobos stated in his research that CDM worked through the use of center points, circumpherences, concentric circles and arches in an harmonic and hierarchical relationship as the basic matrix for the tracing of figures or for the hidden geometry that guides the plastic composition.

a. Maya king K'an Hok' Chitam II
   Toniná, México. VIII century.

b. Aztec goddess Coyolxauhqui
   Tenochtitlán, México. XVI century

c. The Great Aztec Calendar Stone
   Tenochtitlán, México. XVI century

d. The Aztec Cross at El Muerto island
   Zapatera archipelago, Nicaragua.
   Probably XV century.

e. Application of CDM in the site, by the researcher
The two main axes and secondary axes cross or are tangent to nodes or important points of interest along paths (plate 12). Edges or features providing borders are clearly defined by the coastline and the strong character of the landscape treatment.

The pre-Columbian design vocabulary was taken mostly from the hieroglyphics of El Muerto Island, those already known by scholars since the XIX century (figs 8, 15, 16 and 17), and those recently discovered (figs 19 and 20). The latter ones display an overall pattern of spirals and undulated forms, which may represent Aztec stellar serpents. There is one figure with seven lobes around a defined center (fig 20), which is similar to Aztec codices representations of Chicomóztoc (Seven Caves). A comparable figure, but with only five lobes is a well-known Aztec-Toltec representation of planet Venus.\(^45\) In this project Chicomóztoc’s symbol displayed in Historia Tolteca-Chichimeca manuscript (fig 18) was used as an inspiration for the design of a relaxation and sculpture court. A new platform in harmony with the surrounding landscape is proposed to replace the old one adjacent to the acoustic shell. This platform is handicap-accessible from a spiral ramp and it is intended for relaxation and enjoying of the view. The base of the platform will be used as a public water station, storage and dressing rooms for events performed in the acoustic shell, while kiosks for food and beverage offer views of the lake. The new ferry dock also has a platform where people can sit and enjoy the view. Hard surfaces are provided for multi-purpose use, such as play-and-park during festivities. Parking lots are added on both sides of Plaza de la Fe. The built area of the site is planted with shade trees, such as oaks and mahoganies, and palms, shrubs and grass extensions are also provided. One of the special landscape features is a native flower garden.

\(^{45}\) Ancient Tollan, Tula and the Toltec Heartland, p. 96

\(^{46}\) Nicaraguan Antiquities, plates 37-39.

fig 19. Recently discovered hieroglyphics at El Muerto Island. Picture by the researcher, 2005

Lakeside Native Vegetation Restoration Area

Native vegetation will be restored in almost two-thirds of the site on the lakeside west coast (plate 12). The native vegetation of this area was devastated by human hands. In the past it was the area that connected commercial ships and the railroad, and also it became affected by sediments and contamination caused by Managua’s black waters.

As mentioned earlier, Managua is located in a transitional area between the typical deciduous forest and a sub-deciduous forest of tropical semi-moist zones. In the lower areas of Managua’s lakeside, where water is almost present at soil level, the semi-moist type of vegetation is replaced by that of a tropical moist forest. The typical vegetation transition: Water, swamp, marsh and upland will be restored along the proposed lakeside area.

Trails for the resident’s appreciation of the native vegetation and views are provided, as well as parking for visitors.

48 Picture taken from http://www.manfut.org/managua
49 Picture taken from http://www.nps.gov/centralamerica/nicaragua/activities.shtml
50 Picture taken from http://www.downtheroad.org/.../a11Nicaragua.htm
50 Nicaragua, Images of Yesterday and Today, p. 60.
PLATE 14

CULTURAL IDENTITY IN LANDSCAPE ARCHITECTURE
Renovation of Managua’s Lakeside

Presented by Julio Alvarez  FLORIDA INTERNATIONAL UNIVERSITY

LEGEND

VIEW TOWARD CHILTEPE PENINSULA
PLATE 15

SECTION "A" THRU PLAza JUAN PABLO II AND URBAN SITE AREA

KEY PLAN

SECTION THRU STEPPED PLATFORM BLOW UP

SECTION THRU STREET BLOW UP

CULTURAL IDENTITY IN LANDSCAPE ARCHITECTURE
Renovation of Managua's lakeside

Presented by Julio Alvarez  FLORIDA INTERNATIONAL UNIVERSITY

SECTION "A" AND BLOW UPS
PLATE 17

SCULPTURE COURT

Zapatera’s Statues

a, b and c. Bovallius renderings.
Modern reproductions of Zapatera’s statues
will be displayed in Statues Court.
Examples of color concrete paving design

Kiosk's floor: 30' x 30'

Examples of color concrete paving design

Hieroglyphic at ElMuerto Island

Sculpture protrudes over lake

**TYPICAL FOOD AND BEVERAGE KIOSK**

**LARGE SCALE SCULPTURE**

---

**LEGEND**

| a. | Vernacular dwellings at León, c. 1852.
|----|--------------------------------------
| b. | Indigenous hut at Matagalpa, c. 1915.
| d. | American Indian Design & Decoration, p. 52.
| f. | The Grammar of Ornament, P. 65.}

---

**CULTURAL IDENTITY IN LANDSCAPE ARCHITECTURE**

Renovation of Managua's lakeside

Presented by Julio Alvarez

FLORIDA INTERNATIONAL UNIVERSITY
Conclusion

This new lakeside landscape design complements Managua's old central square by unveiling the cultural inheritance of Nicaragua and introducing it to a contemporary urban environment.

This was achieved through the implementation of pre-Columbian design methodology, and through the use of meaningful pre-Columbian vocabulary in its landscape features. The native vegetation restoration of almost two-thirds of the site achieves an environmentally-sensitive goal in protecting the shores and preserving the historical landscape of Managua's lakeside for future generations.
Bibliography


*Government Documents*


Alcaldía de Managua, Reglamento del Área Central de Managua, División General de Urbanismo, Managua, 1995.

Alcaldía de Managua, Proyecto, Rescate de los monumentos públicos de la ciudad de Managua, por Roberto Sánchez Ramírez, Asesor de Asuntos Históricos y Turismo, Managua, 2004.

Alcaldía de Managua, Saneamiento del Lago de Managua o Lago Xolotlán, exposición por Mario Barahona Solís, Director de Planificación Estratégica, Managua, 2001.

Instituto Nicaragüense de Recursos Naturales y del Ambiente, Flora Arborescente de la Ciudad de Managua y sus Alrededores, Servicio Forestal Nacional, Sección de Ecología Forestal, Managua, 1983.

Journals

Jorge Pérez de Lara, “Temple of the Sun, Celebrating 100 years of excavation at Mexico’s Teotihuacán”, Archeology, Volume 58, Number 6, November/December 2005, p. 37.

Miguel León Portilla, “Religión de los Nicaraos, análisis y comparación de tradiciones culturales Nahuas, primera y Segunda parte”, El pez y la serpiente, revista de cultura, 15, Verano 1975, p. 5-52.

Miguel León Portilla, “Religión de los Nicaraos, análisis y comparación de tradiciones culturales Nahuas, tercera parte y conclusión”, El pez y la serpiente, revista de cultura, 16, Invierno 1975, p. 11-62.
APPENDIX I

Lake Xolotán's Rescue Plans.

Lake Xolotán's annual average water level is 38.70 m above the sea level, has a surface of 1025 km² and a maximum depth of 24 m. Its water is contaminated mainly by the city's sewage drainage, but a project for its rescue started in August 2001 and it is planned to last ten years. The project's first stage started with the installation of 17300 meters of pipes in 20 waste water treatment plants located in Managua's urban core. The project's second and third stages focuses in the lakeside rescue and in the treatment of Lake Xolotán's waters.

The following illustrations were provided by the Alcaldía de Managua, Department of Planning.

fig 27 Existing waste water distribution plan.

fig 28 Proposed locations for waste water treatment plants.

fig 29 Waste water treatment plants, approved locations.

fig 30 Example of waste water treatment plant.

fig 31 View of typical waste water Treatment plant.

---


53 Saneamiento del Lago de Managua o Lago Xolotán, p.1

APPENDIX II

Ecological Region I Native Vegetation

The Ecological Region I is mainly that of a deciduous forest, a characteristic of dry tropical zones. It is presently formed of scattered thickets and trees, which are remnants of previous forests. The following list of plants represents its native vegetation.

**Dry tropical zone**

<table>
<thead>
<tr>
<th>Guayacán</th>
<th>Guaiacum sanctum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brasil</td>
<td><em>Haemathoxylon brasileto</em> Karst.</td>
</tr>
<tr>
<td>Escobillo</td>
<td><em>Phyllostylon brasiliensis</em> Cap</td>
</tr>
<tr>
<td>Nacascolo</td>
<td><em>Caesaipinia coriaria</em> (Jacq.) Willd.</td>
</tr>
<tr>
<td>Cornizuelo</td>
<td><em>Acacia collinsii</em> Safford</td>
</tr>
<tr>
<td>Cortez</td>
<td><em>Tabebuia chrysanthra</em> (Jacq.) Nicholson</td>
</tr>
<tr>
<td>Laurel macho</td>
<td><em>Cordia gerasanthus</em> L.</td>
</tr>
<tr>
<td>Laurel macho</td>
<td><em>Cordia alliodora</em> (Ruiz &amp; Pav.) Cham.</td>
</tr>
<tr>
<td>Chinche</td>
<td><em>Zanthoxylon culantrillo</em> H.B.K.</td>
</tr>
<tr>
<td>Parate-hay</td>
<td><em>Piptadenia flava</em> (Spreng.) Bent.</td>
</tr>
<tr>
<td>Talalate</td>
<td><em>Gyrocarpus americanus</em> Jacq.</td>
</tr>
<tr>
<td>Jifocuabo</td>
<td><em>Bursera simarouba</em> (Jacq.) Sarg</td>
</tr>
<tr>
<td>Pintacordel</td>
<td><em>Achatocarpus nigricans</em> Triana</td>
</tr>
<tr>
<td>Jicarillo</td>
<td><em>Plocosperma buxifolium</em> Benth</td>
</tr>
<tr>
<td>Guatuzo</td>
<td><em>Neea psychotroides</em> Donn. Smith</td>
</tr>
<tr>
<td>Sombra de armado</td>
<td><em>Bumelia pleitoschasia</em> J.D. Smith</td>
</tr>
<tr>
<td>Quebracho</td>
<td><em>Lysiloma</em> sp.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cimarra</td>
</tr>
<tr>
<td></td>
<td>Aromo</td>
</tr>
<tr>
<td></td>
<td>Guanacaste blanco</td>
</tr>
<tr>
<td></td>
<td>Guanacaste de oreja</td>
</tr>
<tr>
<td></td>
<td>Guácimo de molenillo</td>
</tr>
<tr>
<td></td>
<td>Guácimo de terneroro</td>
</tr>
<tr>
<td></td>
<td>Chocoyito</td>
</tr>
<tr>
<td></td>
<td>Sardinillo</td>
</tr>
<tr>
<td></td>
<td>Madrono</td>
</tr>
<tr>
<td></td>
<td>Chiquirin</td>
</tr>
<tr>
<td></td>
<td>Chaperno negro</td>
</tr>
<tr>
<td></td>
<td>Espino Negro</td>
</tr>
<tr>
<td></td>
<td>Jobo lagarto</td>
</tr>
<tr>
<td></td>
<td>Jocote jobo</td>
</tr>
<tr>
<td></td>
<td>Jocomico</td>
</tr>
<tr>
<td></td>
<td>Cacao de mico</td>
</tr>
<tr>
<td></td>
<td>Sangredrado</td>
</tr>
<tr>
<td></td>
<td>Cagalera</td>
</tr>
<tr>
<td></td>
<td>Cerito</td>
</tr>
<tr>
<td></td>
<td>Manzano de playa</td>
</tr>
<tr>
<td></td>
<td>Palo de rosa</td>
</tr>
<tr>
<td></td>
<td>Ninciguiste</td>
</tr>
<tr>
<td></td>
<td>Copalchi</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jacquinia aurantica Ait</td>
</tr>
<tr>
<td></td>
<td><em>Acacia famesiana</em> (L.) Willd.</td>
</tr>
<tr>
<td></td>
<td><em>Albizzia caribaea</em> (Urban) Britt. &amp; Rose</td>
</tr>
<tr>
<td></td>
<td><em>Enterolobium cyclocarpum</em> (Jacq.) Griseb</td>
</tr>
<tr>
<td></td>
<td><em>Luehea candida</em> (DC.) Mart.</td>
</tr>
<tr>
<td></td>
<td><em>Guazuma ulmifolia</em> Lam</td>
</tr>
<tr>
<td></td>
<td><em>Diospyros nicaraguensis</em> Standl.</td>
</tr>
<tr>
<td></td>
<td><em>Tecoma stans</em> (L.) H.B.K.</td>
</tr>
<tr>
<td></td>
<td><em>Calycophyllum candidissimum</em> (Vahl.) DC</td>
</tr>
<tr>
<td></td>
<td><em>Myropernum fructescens</em> Jacq.</td>
</tr>
<tr>
<td></td>
<td><em>Lonchocarpus minimiflorus</em> Donn. Smith</td>
</tr>
<tr>
<td></td>
<td><em>Pisonia macranthocarpa</em> J.D. Smith</td>
</tr>
<tr>
<td></td>
<td><em>Sciadodendron excelsum</em> Griseb</td>
</tr>
<tr>
<td></td>
<td><em>Spondias mombin</em> L.</td>
</tr>
<tr>
<td></td>
<td><em>Ximena americana</em> L.</td>
</tr>
<tr>
<td></td>
<td><em>Morisonia americana</em> L.</td>
</tr>
<tr>
<td></td>
<td><em>Pterocarpus rohrii</em> Vahl.</td>
</tr>
<tr>
<td></td>
<td><em>Celtis iguanaea</em> (Jacq.) Sarg.</td>
</tr>
<tr>
<td></td>
<td><em>Casearia corymbosa</em> H.B.K.</td>
</tr>
<tr>
<td></td>
<td><em>Crataeva tapia</em> L.</td>
</tr>
<tr>
<td></td>
<td><em>Hemiangium excelsum</em> (H.B.K.) A.C. Smith</td>
</tr>
<tr>
<td></td>
<td><em>Zizyphus guatemalensis</em> Hemsl</td>
</tr>
<tr>
<td></td>
<td><em>Croton niveus</em> Jacq.</td>
</tr>
</tbody>
</table>
Tropical moist forest zone

This type of vegetation is located in the lower areas of Managua’s lakeside, where water is almost present at soil level.

Mangle blanco  Bravaisia integerrima (Spreng.) Standl.
Almendro de río  Andira inermis (W. Wright) H.B.K.
Zapotón de agua  Pachira aquatica Aubl.
Chilamate de río  Ficus maxima Mill
Matapiojo  Trichilia hirta L.
Tempisque  Masticodendron caprín var. tempisque (Pitt.) Conq.
Panamá  Sterculia apetala (Jacq.) Karst
Guarumo  Cecropia peltata L.
Ceiba  Ceiba pentandra (L.) Gaertn
Genizaro  Piptocellobium saman (Jacq.) Benth
Cedro amargo  Cedrela odorata L.
Ojoche  Brosimum alicastrum Swartz

Prosopis juliflora (Sw.) DC.
Achatocarpus nigricans Triana
Bactris minor Jacq.
Bactris balanoides (Oerst.) Wendl.
Trichilia havanensis Jacq.
Sapindus saponaria L.
Albizia guachapele (H.B.K.) Little
Bumelia pleistochasia J.ID. Smith
Guazuma ulmifolia Lam.
Chlosophora tinctoria (L.) Don.
Muntingia calabura L.
Pithecellobium dulce (Roxb.) Benth.
Crataeva tapia L.
Annona glabra L.
Inga spuria H. & B. ex Wild
Diphyysa robinioides Beth.
Acrostichum aureum L.
Glicidio sepium (Jacq.) Steud
Thouinidium decandrum (Humbl. & Bonpl.) Radik
Solanum erianthum D. Don
Parkinsonia aculeata L.