

THE FLOATING GARDENS IN MEXICO XOCHIMILCO, WORLD HERITAGE RISK SITE

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Abstract

The UNESCO declared Xochimilco a World Heritage Site in 1987, but at present, the nomination is in risk, because the authenticity and integrity values of the chinampa area of Xochimilco are in decrease of agricultural-lacustrine production; the uncontrollable urban spread of Mexico city , 23 millions inhabitants, and the purchase of communal land for house building; disappearance of channels to build bridges and vehicular accesses to cultivation areas; the construction of an urban instead of agricultural infrastructure; the drainage from many houses and green houses is discharged into the channels; between other problems that to allow the chinampas disappear from the valley of Mexico and with their disappearance, our conception of the lacustrine city, which evokes the last living memory of the prehispanic landscape.

The chinampas in Mexico City are a highly productive landscape developed around 1265 to increase the available arable land by encroaching on lakes of Chalco and Xochimilco that surrounded Tenochtitlán, Capital of the Aztec Empire.

The word "Chinampa" derives from the Nahuatl (Aztec language) Chinamitl (reed fence) and pan (over the).

Chinampas were built in the water in the vicinity of the lake shores by delimitating an area of up to 330 ft by 26 ft with stakes, which were later interwoven with dead reeds, to form an underwater fence, and finally, the enclosed space was filled with alternate layers of rock, aquatic vegetation, natural waste and lake bottom soil.

Is recommendable that UNESCO move to Xochimilco on to the World Heritage Risk List.

Key words: *Cultural landscape, history, destruction, big city*

1. The present situation

In 1987 the United Nations Educational, Scientific and Cultural Organization UNESCO acknowledged the Chinampas landscape of Xochimilco¹ as a World Heritage Site, which

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1 Clavijero, Francisco Javier, Historia Antigua de México, (México: Editorial del Valle de México, S. A; 1853), 281. Xochimilco, this beautiful city, the largest after the main courts of the Valley of Mexico, was founded in the margin of the Chalco Lagoon, more than twelve miles from the main city. Its population was numerous, its temples many,

therefore constitutes a world heritage whose protection is under the charge of international society having the duty to cooperate with the Mexico state. Juan Chong mentioned that World Heritage Sites belong to all the towns of the world, independently of the territory where they are located.

The UNESCO states that to be on the World Heritage List is not the end of the site’s history, this matter is rather important as it represents a commitment to maintain and to preserve the characteristics and qualities that gave origin to the nomination and justified its original inscription on the List.

The preservation of World Heritage Sites is not solely the responsibility of the Member State and the international community, but of everybody in the maintenance of the universal and authenticity values. In the case of Xochimilco, the authorities and society in general must collaborate, collectively, to safeguard and preserve the lacustrine landscape with its original chinampas agricultural system; chinampas, or camellones, or sementeras or tajones, the word chinampa is of Aztec origin, it comes from chinamitl which literally means “hedge or enclosure of canes”.

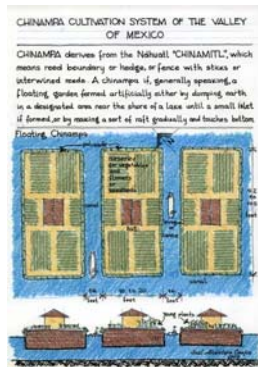


Illustration 1: Chiampa’s cultivation system

It is important to teach society, and in particular young people, that this important landscape will disappear if we do not act to care for it, or if we continue ignoring its universal value as has been happening.

The work between man and nature is an intimate relationship between cultural heritage and the natural environment. The chinampas landscape testifies to the evolution of social creativity, the imaginative and spiritual vitality of the Mexica-Aztecs.

Xochimilco should keep its present nomination as a World Heritage Site under the category of cultural heritage, and not search for a new declaration under a different category. This will not be possible, because in 1987, when it attained World Heritage Site Protection, 2,845 acres of chinampas and cultural heritage in Xochimilco existed. However, today only 570 acres survive between cultural and natural heritage; only 62.5 acres of chinampa vestiges and 87 mile of channels remain.

The protection of these 62.5 acres of chinampas with Special Protection Laws is an urgent matter. It is also important to word a Landscape Master Plan for recovering the lacustrine agricultural vocation of the land and avoid urban land or tourism uses, just as the authorities are planning an upgrade of the Urban Development Plan for Xochimilco.

It is a sensible step for Xochimilco to move on to the World Heritage Risk List, for the reason that the urban expansion factors threaten the characteristics that determined its original nomination on the World Heritage List. The World Heritage Committee to establish that.....

their buildings were magnificent, and particularly in the lagoon its beautiful floating gardens (chinampas). This is what the word Xochimilco means: Gardens and flower fields

the cultural heritage registered in the World Heritage List whose protection demands extraordinary resources to preserve its universal values by virtue of the present Convention..... *The Committee will always be able, in the event of urgency, to make a new inscription on the World Heritage Risk List and give it an immediate circulation.* 2

The World Heritage Risk List exists to notify international society about the conditions putting adverse pressures on the worldwide characteristics, which allowed the Site's initial inscription as a World Heritage Site, and for measures to then be taken to safeguard the site in question.

The UNESCO recognizes that a nomination on the World Heritage Risk demands that the Committee sets up a meeting with the Member State involved and then adopts a Conservation Program or Landscape Master Plan of the Site. *They will perform immense efforts to restore the universal value of the site and to allow its retirement from the World Heritage Risk List as soon as possible.* 3

The characteristic that permitted Xochimilco's nomination on the World Heritage List was its original agricultural-lacustrine system, and it is necessary to take strong measures to ensure its conservation.

2. The most important problems

The Xochimilco Ecological Plan, made in 1987, provoked the expropriation of 2,577 acres; private enterprises and individual owners took possession of these communal lands. The main objective, to create Land Reservations, was subordinated to enlarge the Xochimilco Urban Development Plan. This permitted an increase in urban uses of the land, instead of safeguarding the old agricultural system.

The principal problems causing harm to the authenticity and integrity values of the chinampa area of Xochimilco are: the dramatic decrease of agricultural-lacustrine production; the uncontrollable urban spread of Mexico city and the purchase of communal land for house building; disappearance of channels to build bridges and vehicular accesses to cultivation areas; the construction of an urban instead of agricultural infrastructure; the 240 irregular housing settlements situated on land for ecological use; the drainage from many houses and green houses is discharged into the channels; use of fertilizers and chemical pesticides; water levels decreasing dramatically year after year (these are decreasing by almost to ½ foot each year due the uncontrolled exploitation of the water resources from the subsoil); invasion of exotic and ornamental plants from other regions of the country and even China, contributing to the decrease of the chinampas production; 80% of the Ahuejotes tree (the "ahuejote xochimilca" which, in mythical times, multiplied in the marshland of the area. Tezcatlipoca, in turn, chose to become a mirror-tree, the tree whose image is reflected in the transparent waters of the channels and lagoons: the "tezcáhuitl" or "ahuejote" which, by means of an optical illusion, seems to sink into the depths of the water and hold up the sky reflected on its surface) have a mistletoe, these trees are a fundamental part of the cultural landscape in Xochimilco due to their presence around the chinampas, the control of the mistletoe is through the colossal work of technical pruning; agricultural policies are resulting in people (chinamperos) giving up cultivating the earth for established jobs in Mexico city. Hence they are abandoning the landscape.

2 Convención para la protección del Patrimonio Mundial, cultural y natural, UNESCO, Art. 11.4.

3 Idem.

3. The chinampa lands in the valley of Mexico

The need for chinampas was the result of the geography and hydrology of the valley of Mexico and the history of the Aztecs. One of the terms by which they called their home was Anahuac, a name that was, at first, only given to the Valley of Mexico. The word Anáhuac means “by the water”, and it seems from this name the words Anahuatlaca or Nahuatlaca were formed and used to refer to the cultivated nations settled along the margins of the lagoon of Mexico.

This was due to the fact its main cities were founded in the small isles along the margin of two lagoons. Over the years, the name was used to refer to the land, which during the viceroyship was known as New Spain.

*The Valley of Mexico is surrounded by beautiful green mountains, whose circumference measured from the lower mounts is greater than 120 miles.*⁴ The larger lagoon within this Basin contained fresh water while the minor one held brackish water. The two lagoons were connected through a large channel. The water that flowed from the mountains into the brackish water lagoon was located in the lowest part of the Valley. Because of this the Great Tenochtitlan was constantly flooded, not only under native rule but also during the Spanish domination. It was in this lagoon where the Great Tenochtitlan was founded in the year II Calli, or A.D. 1325.



Illustration 2: Valley of Mexico

One of the main problems faced by the Mexicans was the lack of land on which to build their houses, because the Tenochtitlán island didn't have enough room for all the inhabitants. They rectified this situation by extending those parts of the island where the water was shallow by reclaiming land with alternate beds of reeds and mud taken from the bottom of the lagoon. This, of course, was the same technique used to create the chinampas. As they enlarged the inhabited islands, other lands were created to sustain wildlife for hunting and gathering, while other chinampas served as extensive gardens.

4. The chinampas during the prehispanic period

The ancient people from Great-Tenochtitlan and the villages around the valley of Mexico performed the agriculture in chinampas. All the vegetables and flowers were cultivated in the lacustrine or 'floating chinampas' and inland or dried chinampas. For example, the agriculture of the corn and red tomato “xitomate” remained after the conquest. At present, the “xitomate” is no longer cultivated in the chinampas, and chilies and pumpkins can only be found in a few small plots. Pumpkins systematically appear in the historical registers of every century from the 16th century onwards. However, the first detailed description of their production process was made in 1791 by the Ozumba wise man, José Antonio de Alzate. The

⁴ Clavijero, Francisco Javier, *Historia Antigua de México*, (México: Editorial del Valle de México, S. A; 1853), 2.

data indicates that these were the most important commercial products for the chinampa economy, at least since the end of the 18th century until they were completely replaced by Old World vegetables introduced between 1930 and 1950. The chinamperos combined them with native plants.

Since the conquest, Mexicans have known how to take profit from the lakes. This is in contrast to the Spaniards who, in times of floods, were primarily concerned with saving their temples, convents and houses. On the other hand, the Mexicans were only worried for the damages floods could cause to their cultivations and particularly to their chinampas, as was the case in the floods of 1446 and 1496.

The pre-Hispanic dikes protected the chinampas areas. Moctezuma, under advice of Nezahualcoyotl, built the dikes.

The draining of the lakes, a project which lasted nearly 400 years, started at the beginning of the 17th century with the construction of the Huehuetoca tunnel, otherwise known as the Nochistongo channel. To prevent the growing viceregal city from flooding, the Cuautitlán river which flowed into the Zumpango river was deviated through a cut measuring eight kilometers and a channel of seven kilometers with a depth of 50 meters.

The lacustrine environment became a “valley” connected to the Gulf of Mexico by the Tula, Moctezuma, and Panuco rivers. By the end of the 18th century another channel was constructed, the Guadalupe or Castera channel which connected to the lakes of Xaltocan and San Cristóbal.

At the end of the 16th century Clavijero mentions *with the commerce from hunting on the areas settled on the margin of the lagoon, they could acquire all they needed. But where their efforts went further, was in the construction of floating orchards, or chinampas, which they made from an embankment of rocks and mud from the lagoon. The chinampas were used to cultivate corn, capsicum, beans and squashes.*⁵

Fernando de Alva Ixtlixochitl provides a detailed description of the districts that were devoted to the chinampa agriculture in the Basin of Mexico: *The king Izcohuatzin and other important people, asked Nezahualcoyotzin for the grace of their lives, which he granted. And he ordered that from then on they would offer him some recognition or tribute which was known as the royal census of Tezcuco, “chinampanacatla callacuilli” which means the tribute of the chinampanecas, which includes the following cities, towns and places: Mexico-Tenuchtitlan, Xolteco, Tlacopan who were the heads of their respective kingdoms; Azcaputzalco, Tenayocan, Tepetzotan, Quauhtitlan, Toltitlan, Ecatepec, Axocitlan, Coyohuacan, Xochimilco, Iquexomatitlan each of whom gave tributes of jewelry and pieces of gold and all the vegetables, flowers, fish, and birds growing in these parts of the lagoon.....*⁶

So the tlatoani or emperor Moctezuma came back to his city and *ordered the cities and villages of the Chinampa, which used to pay tribute to the kings of Tezcuco, were not to pay further tribute...*⁷ In fact Nezahualcōyotl exacted infamous tributes from the Aztecs.

*In 1521, the chinampanecas villages of Xochimilco, Cuitlahuac, Mizquic, Ixtapalapan, Mexicatzinco, etc;*⁸ helped the Mexicans and “tlatelolcas” to fight against the Spaniards. All of these cultures were witnessing the transformation from a water civilization, into one that sees the ideal city without floods and the position of religious ideals over the pagan indigenous temples.

⁵ Clavijero, Francisco Javier, *Historia Antigua de México*, (México: Editorial del Valle de México, S. A; 1853), 60.

⁶ De Alva Ixtlixochitl, Fernando, *Obras Históricas*, (México: Biblioteca Nezahualcōyotl, I y II, 1997), 187.

⁷ *Ibid.*, 187.

⁸ De Sahagún, Fray Bernardino, *Historia General de las Cosas de Nueva España*, (México: Editorial Porrúa, Tomo IV, 1981), 63.

5. The chinampas during the viceroyalty period

The period after the conquest saw much continuity, and also many changes. For instance, as Javier Clavijero described, the ancient type of chinampa could now be moved around the lagoon. The mobile islands were the nurseries where the plants were grown in “chapín” or earth cube to be later transplanted to the inland chinampas. The variety of corn grown was also modified. At present, the cultivated variety in the chinampas and wetlands of the ancient lacustrine zones is the “chalqueño”, named after the Chalco district.

According to Teresa Rojas among other specialists, in the beginning the type of corn was conical races or “corn of the hill”, as it is known in the area of Xochimilco and the tuxpeño.

Some plant cultivation, like chile for instance, withered away with the years. In their legendary migration to Tenochtitlan, the Mexica-Aztecs had sowed the “chilchotl”, probably the green chili, in the chinampas of Xaltocan. It could also have been the tornachile, which Molina translates as the chile of irrigable lands, which has a green lemon color, was still cultivated in the chinampas of Iztacalco in 1826.

European culture introduced a new economy, new issues of political control and new religious perspectives. All of these contributed to large changes. Two major series of events should be highlighted to understand the history of the chinampas: the drying up of the lakes, and the introduction of European plants.

Some major transformations were due to the introduction of plants from Europe after the 16th century. The great majority of vegetables, flowers and spices introduced by Spaniards, immediately after the conquest and during the viceroyalty, were incorporated into the chinampas and cultivated according to this technique.



Illustration 3: Cultivation plan

With the arrival of the European culture and their techniques and botanical knowledge, the floating gardens were enriched by the cultivation of the new imported flowers from distant lands. Flowers or “xóchitls” grew together with their relatives from Asia and Europe, dahlias, various types of roses, irises, gladiolas, poppies and water-lilies the current symbol of Xochimilco; white lily, jasmines, carnations and many more, which compete with the American flowers in the gardens of Mexico.

The poppy was a key cultivation in the chinampas areas. These beautiful flowers were sought after for many years to help communicate with the spiritual world, until its consumption was prohibited for its high content of noxious alkaloids. On the other hand, at the present time the cultivation of the traditional wallflower flowers, cloud, “cempoalxóchitl”, flower of the death, and paintbrush continues today.



Illustration 4: The poppy cultivation

The European plants, which were adopted by the chinamperos, presented the incorporation of species that had different values: botanical, religious, social and commercial. These plants

offered producers more possible combinations and options because of the capacity for adaptation of these plants to prevailing environmental conditions, means of production, and regional demands, especially for Mexico city market places.

Some popular European vegetables in the 16th century, in particular the cucumber, the lettuce and cabbage were fully incorporated into the chinampas production. The “commercial” native plants and the species that came from Europe (fast-growing plants and ornamental plants) were also gradually integrated into the agricultural system from the 16th century.

The draining process, which started after the conquest, continues to the present day with extraction of water through clandestine wells. This systematic drainage and drying of the lacustrine zone has resulted in the modification of the traditional chinampa techniques, as well as the uses of the cultural landscape. Ancient corn is still cultivated in the areas of Chalco, Xochimilco or in small agricultural, which can be found in Mexicaltzingo, Iztapalapa and Tláhuac. However, it is no longer cultivated in chinampas but in the fields with a plow and tractor. These are alien techniques that were introduced as a consequence of the evolution of the chinampa-based agriculture in Mexico in a drying environment. The consequence of this has been the development of salty and impoverished soils, as well as the necessity to use fertilizers, mainly cow manure, but also chemicals, and the proliferation of plagues unknown or not infrequent until present.

In the first years of the 20th century, corn was grown together with beans and chilies. The chinamperos from San Luis and Mizquic remember growing corn with beans or with the “uauhzontle” in the same chinampa(Figura 5). Today chili is cultivated on a small scale in the chinampas and in the hills, and transplanted during the appropriate season from the mud nurseries in the chinampas to the fields(Figura 6).



Illustration 5: Chinamperos from San Luis and Mizquic



Illustration 6: Cultivation today

6. The chinampa techniques

Torquemada wrote on the fragility of the chinampa-based agriculture. Although floods destroyed these cultivations, droughts rarely affected them. Numerous authors have written on the chinampa technique, such as Sahagún, Durán, Bernal Díaz del Castillo, West and Armillas to the last publications by Teresa Rojas Rabiela. However, Javier Clavijero’s descriptions are the most comprehensive on the construction of the chinampas.

Torquemada mentions that the natives...*with little effort, cultivate and collect their corn, because all these are “camellones”, otherwise known as chinampas, which are furrows built on the water surrounded by ditches, thereby eliminating any risk...9*

9 De Torquemada, Fray Juan, Monarquía Indiana, (Madrid, España, Libro 13, Cáp.32, 1723).

The zone regarded as the core of the chinampa horticulture was the Xochimilco-Chalco district. Additionally, in the bay of the Texcoco lake, there were other chinampa zones, around island settlements, and on dry land, in Huizilopochco, which nowadays is Churubusco, and Iztapalapa.

The methods and procedures used to construct the chinampas have been described as follows...*they do their farming...fetching grass in canoes from dry land, throwing them into the water until they are about four to five feet thick, and rise about one and a half foot above the water, being between eight and twelve feet wide. The natives make a farm out of several of them, travel in their canoes, grow herbs and profit in a way that has not been seen before.*¹⁰

Additionally, Father Alonso described the chinampas, stating that they are built in the water, stacking many alternated layers of reed and mud from the same lagoon, and making them at times very narrow.....*leaving a channel between two chinampas rising two feet or less above the water and carrying ears of corn that grow very large because they get water directly from the lagoon without the need for rain water. They also make seedbeds of corn in their chinampas producing young plants to be later transplanted according to a common practice on the land.*¹¹

The plant nurseries Father Alonso describes were made in movable sections which measured between twenty and thirty feet in length, with the width desired, founded on the water over aquatic-grass, rush and reed, *in where they made the nursery of their vegetables... to be transplanted later elsewhere; they tie them with ropes to take them from one place to another in the lagoon.*¹² Father Alonso Ponce saw for himself the corn growing in the chinampas of Xochimilco in 1585.

The Aztecs, during their quest for a final place in which to settle in the Basin of Mexico, cultivated vegetables in the chinampas of Xaltocan, and once settled in Tenochtitlan, they kept on doing so in the numerous chinampas they built. The same thing happened with the inhabitants of the near by kingdoms during the biggest stage of expansion in their efforts to claim these plots in the Basin swamps.¹³

Javier Clavijero described the chinampas as mobile isles or floating gardens where plants grew, and were later transplanted to the fixed chinampas. However, under early Spanish domination, natives could not be easily controlled and it wasn't possible to develop a tax registration of mobile lands. Authorities imposed planting "Ahuejotes" or "Huejotes" Salix trees, around all the chinampas, which would grow roots into the bottom of the lake, thereby giving permanence to all the mobile chinampas or lacustrine orchards.

According to the laws published by the famous *tlatoani* or emperor Nezahualcōyotl,... They also condemned to death thieves of the "sementeras" or chinampas, declaring that it was enough to steal seven ears of corn for this rule to be applied. Also the owner of the field had the right to enslave whosoever stole a certain number of ears of corn or took away from another's field a certain number of useful plants.

The importance of chinampas is further evidenced by the great care taken in developing shelters for garden workers: *On the fields of corn in the chinampas they used to build a kind of stick turret, where a man, protected from the sun and the rain, watched and hunted with the sling the birds that went there to damage the "sementeras" or "chinampas". Even now there are similar turrets in the*

10 De Vargas Machuca, B. Milicia y Descripción de las Indias, (España, Madrid, 1599).

11 Ponce, Padre Alonso, Relación breve y verdadera de algunas cosas de las muchas que sucedieron al Padre Alonso Ponce en las provincias de la Nueva España, (España, Madrid, Libro 13, Cáp.32, 1723)

12 Ojea, Fray Fernando; Libro tercero de la historia religiosa de la provincia de México de la orden de Santo Domingo, (México, 1897), 3.

13 Armillas locate this from the 14th century to the 16th century; 1971:658.

*Spanish fields, due to the abundance of birds.*¹⁴ They also built barns, some of them were so big they could contain five to six thousand or more “fanegas” or big sacks of corn.

7. Conclusions

We may conclude that the chinampa tradition continues to survive, in spite of the Spaniards draining the valley of Mexico. Yet its significance has changed completely.

Originally it had been the source of all cereal, fruit, vegetables and flowers for the Mexica-Aztecs, permitting the expansion of their cities around the lakes of the Basin.

Mesoamerican vegetables were still important after corn, dominating the chinampa-agrarian landscape during the viceroyship in the 19th century and the beginning of the 20th century. The species uauhtli and chía, which were mainly used to process flour and “masa”, were widely used in the prehispanic world and for a period during the viceroyship. The native vegetables did not lose their importance until the 20th century.

Yet some chinampas, in Xochimilco and Chalco, were especially devoted to flowers, and the introduction of foreign flowers may have contributed to obscuring cultural memories linked to native flowers. The recent period of growth of Mexico city has brought a new phase of development, with the abandonment of all but a few scattered plots of traditional vegetables, and a further specialization in floriculture of Xochimilco and Chalco.

However, this may have contributed to the survival of the chinampas as a native agricultural system. It is remarkable that lately Xochimilco stands out for two kinds of cultivation: the production of bedding plants to be later transplanted on the mainland fulfilling a significant economic role, and production of flowers important both for economic and symbolic reasons.

All levels of government, society, and expertise must make it their highest priority to attend to the previously mentioned problems. If not we will witness the disappearance of the last beating of pre-Hispanic Mexico.

The chinampas are disappearing from the valley of Mexico and with their disappearance, our conception of the lacustrine city, which evokes the last living memory of the prehispanic landscape. In the 16th century there existed 1,200 square kilometers of water, right now there are 1,500 square kilometers of asphalt and concrete. Mexico City is the most clear failure in the urban planning traditional.

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¹⁴ Ibid., 168.

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