Curridabat: Sweet City

A city modelling approach based pollination

Sweet City:

Curridabat's vision of development

A city modelling approach based on pollinators as prosperity agents

General Overview

The Municipality of Curridabat has been implementing many actions over the last ten years in order to enhance the well-being of our citizens, mainly through the increase of contact with nature. Our initiatives include the creation and maintenance of greener public areas and innovation in problem-solving in the face of demanding environmental issues. Even though this has always been one of our guiding principles, it was in 2015 when the Mayor´s office, through its Innovation Team, started to conceptualize a whole new vision for the city: Curridabat as a Sweet City. The keystone concept in this new vision of urban development is that a Sweet City considers pollinators as the most efficient agents of prosperity.

We believe that our Sweet City model will help redefine the role that small and medium-sized cities play in the world, because it brings us closer to sensible answers to the following disturbing question: How can a city add value to nature instead of subtracting value from it?

The Sweet City vision seeks to improve the way in which all the members of the community experience the place where they live, since all citizens are members of a territory. In this sense, the Mayor's office has been promoting an internal transformation through its main operational axes: administrative management, public services and innovative projects. This, in turn, has allowed the Municipality to pursue its goal of transforming Curridabat into a sentient city, one which is capable of "feeling" its territory, of knowing its needs. During approximately three years, a series of efforts have been undertaken to achieve effective outreach among our citizens, mainly through project prototypes to be tested and enhanced under the Mayor's office oversight. These prototypes have been developed in order to disseminate the concept of Sweet City as the Municipality's official vision of development. This approach has been trickling from the Municipality's officials down to the citizens of Curridabat.

The Sweet City framework has not only guided the Mayor's office proposals and the work of its Innovation Team, but has also re-drawn Curridabat's Municipal Operational Plan as an officially adopted public policy, and has shown its potential to become a whole new development model for small- and medium-sized cities. The great majority of the world's cities share Curridabat's profile: their smaller size, lack of urban planning throughout their history, the geopolitical role they play and other key aspects tend to limit their economic possibilities, but they usually have a wealth of natural resources, which have to be responsibly managed so they can continue to offer vital ecological services as well as livelihood opportunities. Therefore, we consider this vision of development as a blueprint that can be reproduced to generate prosperity in other cities around the world.

Geographical and natural context

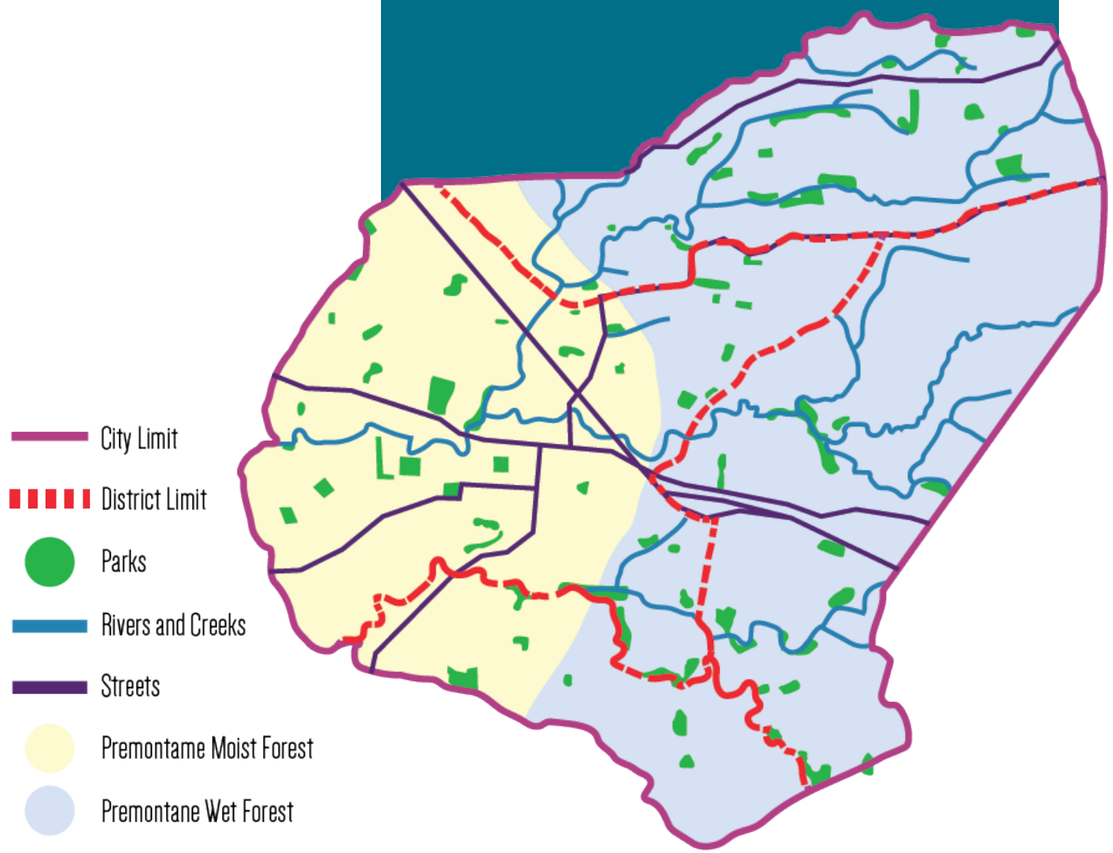
Curridabat is the 18th county in the province of San José, and is located within the Greater Metropolitan Area of the Central Valley of Costa Rica, occupying an area of 16.40 km². Its population is approximately of 65,000 resident citizens.

It is subsequently divided into four districts:
Curridabat (population: 28,813)
Granadilla (population: 14,913)
Sánchez (population: 4,694)
Tirrases (population: 16,614)

El Prado Park

Curridabat is the easternmost city in the San José province, and is located just a few kilometers away from the continental divide that defines two different climatic regimes Costa Rica. This special geographic position defines the climatic and ecological patterns of the city. The average altitude is 1,200 m.a.s.l., and temperature fluctuates between 16.5°C and 25°C. The original forests of this region belong to two different life zones, according to Holdridge's life zones system: Premontane Moist Forest (36% of the county's total area) and Premontane Wet Forest (64% of the county's total area).

The Premontane Moist Forest is the most altered life zone in Costa Rica, because a substantial part of the urban development that has taken place in the Central Valley has coincided with this particular kind of forest. The remaining fragments of this type of forest in Curridabat are located alongside riverbeds, and the remnants of this particular life zone constitute a nationwide conservation priority. The Premontane Wet Forest is located at higher altitudes, and some fragments occur along the María Aguilar river, which is one of the most important bodies of water within Curridabat.



Sweet City:
A Multidimensional Development Vision

Pollination as a new basis for city modelling

Historically, Latin America has imported urban development models that do not correspond to its reality or its needs as a region. These traditional models have lagged behind relevant global challenges such as climate change, inequality, human security, technology gaps and ecosystem connectivity, among others.

The Sweet City vision recognizes pollinators, and especially native bees, which are the largest producers of plants, trees and ultimately soil, as the center of urban design. By reframing the role of pollinators, and recognizing them as native inhabitants and as city dwellers, Sweet City overcomes the long-lived antagonism between city and nature that has characterized traditional urban development. This vision arises from the certainty that a city designed to improve the way pollinators experience an urban environment will become abundant, diverse, robust, comfortable, colorful and better organized.

This holistic approach aims to enhance the adaptability of cities to climate change by implicitly and explicitly paying attention to all members of a community, including nature, and especially the marginalized elements that have been left behind by traditional urban models. Within Sweet City's vision, pollinators such as bees, butterflies and hummingbirds, as well as the plants and trees they are intimately linked to, along with all other organisms, are effectively recognized as citizens, with roles to play and rights to be upheld.

How to adapt this vision to the Governance of a City?

A Sweet City aims to improve the way its inhabitants experience urban life, and does so by focusing on five fundamental dimensions that encompass the overall experience of a citizen: Biodiversity, Infrastructure, Habitat, Coexistence and Productivity. These five dimensions are described as follows:

Biodiversity:

Biodiversity is the foundation from which all aspects of development arise. The main objective of the Sweet City model is to reintroduce biodiversity into the urban space, which basically means "to bring the park back into the neighborhood, to bring the river back into the city". Cities, and the quality of life of their inhabitants, depend upon the plethora of ecosystem services that urban nature provides: food, clean water, improvement of soil conditions, prevention of erosion, removal of air pollutants, noise buffering, temperature regulation, mitigation of storm water runoff and reduction of flooding, more accessible natural and green space, improvement of the physical and mental health of residents, among many others. Including all organisms in the development vision of an urban environment, from trees to pollinators to seed dispersers to soil microorganisms, is key to the growth and betterment of a city.

Infrastructure:

This dimension aims to align urban infrastructure and landscape architecture with biodiversity, and not the other way around, as is almost always the case. Traditionally, infrastructure has been the mechanism to contain and provide structure to nature within the urban territory. With emerging challenges such as climate change, infrastructure should make cities resilient and adaptive, while reducing their ecological footprint. Within this framework, we can ask questions like "How can we accommodate infrastructure so that rivers can actually serve their natural purpose and how can we enhance their ecological value within the territory?", or "How does a raindrop move around the city?". Urban infrastructure has been designed to promote runoff, to quickly drive raindrops to the nearest river. Nowadays, it is necessary to design infrastructure that favors a Water- Sensitive City, which delays, retains, stores, reuses and then drains water only when necessary. Water is a precious resource for a city, it should not be seen as just a nuisance that has to be quickly disposed of.

Habitat:

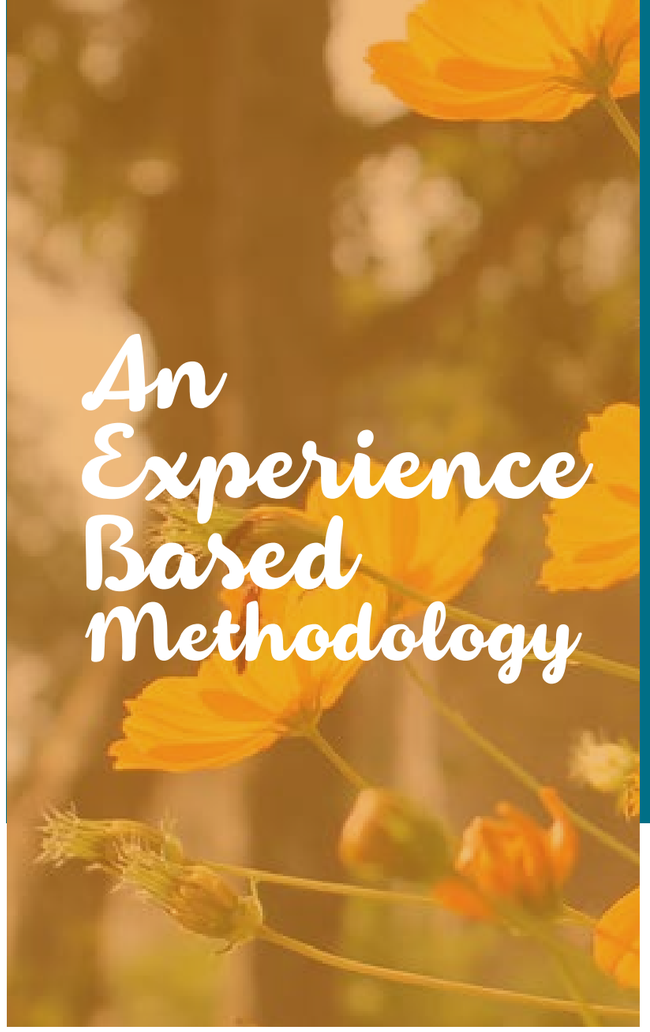
This dimension seeks to answer questions about the interaction that occurs between the previous two dimensions, Biodiversity and Infrastructure. It aims to improve the relationship of city inhabitants with all urban elements. It deals with questions such as: "How can we design an environment that promotes a less segregated society?". That Is to say, a more accessible and integrated habitat, with better access to opportunities. How can we provide access to opportunities –work, education, facilities, services, health and recreation– to everyone, equally? The Habitat dimension is focused mostly on how such opportunities are distributed within the territory, in conjunction with the way in which housing is arranged and the level of convenience of the transportation systems that connect all of these elements. A pertinent example is how a city must comply with our recently implemented Law on Equal Opportunities for People with Disabilities, which mandates the construction of access ramps and the installation of elevators in most buildings. However, from actual experience, we have documented that a person with a disability cannot even move around his or her neighborhood to reach these buildings, so a much more comprehensive implementation of this law is required to achieve actual equal accessibility.

Coexistence:

The main objective of this dimension is to empower and include vulnerable populations and to provide them with cohesive influence on policy, in order to foster a more inclusive Habitat. This dimension seeks to promote the necessary conditions that lead to true inclusiveness for all the different communities that populate a city. This ranges from the inclusion of pollinators and pets to all the citizenry's cohorts. Moreover, it includes temporary inhabitants or occupants, such as people who work but do not reside in the city. How friendly, pleasant and inclusive is our city to fauna, such as hummingbirds, and minorities, like female immigrants? If only property owners are considered as the population to serve, and this population is represented mostly by men, the design of the city would ultimately exclude women, migrants, and pollinators, as well as other citizens who actively coexist within the urban space.

Productivity:

The aim of this dimension is to revert a city's most common and destructive pattern: intensive resource consumption. A paramount objective of urban development should be to transform cities from extractive and consuming conglomerates, to productive urban ecosystems. Despite the fact that the majority of the world's citizens currently live in urban settings, we continue to rely on rural areas to produce electricity and food, underestimating the productive capabilities of cities. How do the previous four dimensions work as layers that lay the groundwork for a more productive urban scenario?



The definition of a **Minimum Common Denominators** and the fulfillment of their needs under umbrella experiences. Priority is given to the experiences of those who are more vulnerable, and to experiences which are connected to several other experiences, which stimulate more interactions among citizens.

The definition of an **Optimal Desired Consequence** for each of the experiences which we seek to improve. What would the ultimate fulfillment of a particular experience achieve? What would this ideal experience be/feel/look like? This allows the Municipality to keep its eye on the ultimate goal, and to assess what is the minimum Threshold Point we need to overcome to actually make a difference in the way a citizen experiences his/her/its urban environment.

In order to transform the city through the integration of these five dimensions, it is necessary to move towards the design of experiences, which represent results, and to overcome the traditional approach mainly focused on projects, which represent processes. Following this approach, we seek to transform the way in which our citizens experience the place where they live, and the achievement of this ultimate desired result starts with two fundamental premises:

This model also encompasses other premises. In this sense, experiences achieve the following:

- They manifest spatially and transform the environment: the setting of an experience counts.
- They can be compared to one another.
- They are evaluated based on sufficient minimum indicators corresponding to the five dimensions.
- They are not mutually exclusive and usually overlap.
- They aim to maximize resources.
- They incorporate the concept of imperfect design to provide for flexibility, change and adaptation.
- They refer to the reverse engineering process: focusing on opportunities to take advantage of rather than problems to solve, and decomposing such opportunities in reverse, in order to achieve specific actions to follow.
- They exceed territorial limits and competences.
- The sum of several umbrella experiences designed from these premises, will transform the city.

The design of experiences

The process of designing new experiences for citizens follows design thinking principles. When considering specific new experiences to design or how to improve an already existing experience, the first question to ask is: who is this particular experience going to affect? For example, if you are thinking of designing experiences for homeowners only, other members of the city may be excluded from the process. If you think about humans only, then pollinators or raindrops are excluded from the design process.

Another crucial aspect of experience design is its spatial manifestation.

Where exactly is an experience going to occur in the territory? By geo-referencing the changes that have been implemented, we can keep track of their impact on citizens.

How do we decide which experience is improved and how? We take into consideration the following process:

1. Define and decompose the optimal desired consequence.

2. Define the current experience and identify areas for improvement.

3. Analyze the decomposition/composition process to define specific actions to implement.

4. Execute these actions.

5. Evaluate geo-referenced implementations, based on indicators corresponding to the five dimensions.

Sweet City's enhancement of the citizenry's experiences

The Sweet City model has developed seven overlapping experiences, which encompass the main elements to be enhanced in order to improve the quality of life for all of Curridabat's citizens.

These experiences are:

1 The raindrop's experience: improvement of water management.

2 The earthworm's experience: recovering soil health and promoting its self-regeneration.

3 The conscious eating experience: improving the availability of healthy foods and promoting conscious eating.

4 The access to desired destinations experience: steering public and private investment towards enhancement of urban mobility and accessibility.

5 The trust in the inhabited space experience: procuring safe and inclusive spaces for all citizens.

6 The mental health experience: promoting spaces for the enhancement of our citizens' well-being.

7 The local governance experience: guiding governance and local government management to respond to local and global demands.

These seven experiences add to the main goals that the Municipality of Curridabat will promote via its Strategic Municipal Plan from 2018 to 2022, in order to guide its main lines of action in the medium-term, and also procuring the fulfillment of the intentions and aspirations expressed by citizens in the Local Human Development Plan.

Sweet City's Sustainability Concepts

BIODIVERSITY / GREENERY

A biodiverse city immersed in a natural system is the starting point for sustainable development. We procure a safer city by stabilizing climatic effects, reducing runoff and the impact of strong winds and storms, and an acceptable degree of mitigation of the "heat effect"; an enjoyable city by promoting the existence of spaces for recreation and social interaction; a healthier city by improving air and water quality, space for physical activities and psychological well-being, which means we look for citizens to become more connected with nature; an attractive city by enhancing how people experience nature through diverse landscapes; a prosperous city by providing food, wood and other important resources such as medicines; and a sustainable city by ensuring carbon sequestration and the mitigation of climate change.

We currently have a broad base of scientific literature that points to the multiple, and sometimes intangible, ecosystemic urban services and co-benefits derived from closeness to nature, especially in the case of small- and medium-sized cities. Research shows that it is not only enjoyable to have nature included within the urban space, but that the urban landscape has become an essential habitat for life. As simple as this essential habitat for life that occurs within a city may seem, it is largely determined by the presence of effective pollination agents. Pollinators such as native bees, butterflies, hummingbirds and bats are adapting to life in the city, and share the authorship and benefits of biologically diverse local environments, as they are attributed for more than 80% of the events of pollination that happen worldwide. In this sense, conceiving the city through the experience of pollinators allows for us to rethink a series of key aspects related to the transformation of the urban scenario in favor of the well-being of all its inhabitants. For example, the analysis of urban design reveals an intended separation between public and private space, while nature continues to open up through living corridors that do not distinguish these artificial barriers. Recognizing and enabling these biological corridors is fundamental for connectivity, and therefore conservation.

The urban environment is the closest point of contact with flora and fauna for the majority of the population, and it probably is where most people will have the greatest number of interactions with other natural species throughout the course of their life, since it is expected that by 2050 more than 70% of the global population will live in cities. Recent studies refer to wildlife in the city, and how high buildings, abundant food sources and the absence of predators make modern cities a convenient habitat for many birds and wild animals such as foxes. Although we do not yet have specific data for Curridabat, the presence of wild animals in urban neighborhoods is becoming more and more evident.

With this in mind, it can be conceived that a city which strives to improve the experience of its pollinators will become more sustainable, which is to say, will offer better conditions for them to carry out their ecosystemic functions, and thus set the stage for a more attractive, enjoyable, healthy, secure and prosperous urban environment.

WATER / RIVER-ORIENTED URBAN DEVELOPMENT / WATER-SENSITIVE CITY / SPONGE CITY

Water, and more precisely rivers, should guide sustainable urban development. In response to accelerated migratory movements from rural to urban environments, cities like Curridabat have been immersed in an urgent urbanization process mainly aimed at finding single-family dwellings, and these tend to be connected to rudimentary drainage systems. Due to this, local efforts have focused on the evacuation of rain water away from the city, and have been completely disconnected from a sensibility to the hydrological and ecological processes inherent to a natural system. Our present challenge is to integrate urban planning in the management, protection and conservation of the local water cycle. It is by effectively managing its hydric resource that a city will be able to promote a sustainable urban environment, ensuring the availability of a vital resource and paving the way for the re-introduction of lost biodiversity.

Appropriate management will also promote safety, by means of enhancing adaptability to climate change and shifting natural conditions; prosperity, by supporting all productive processes inherent to water, specially food production; health, by ensuring water quality; and enjoyment, promoting scenic value, recreation and social interaction.

To restore the relationship between the city and its creeks and rivers, it is urgent to understand the local hydrological system and explore possibilities to recover the urban water balance, that is to say, the balance between human needs and the natural ecosystems they inhabit. This involves adaptive multifunctional infrastructure and urban design that reinforces water-sensitive behavior. Water-sensitive urban design is more than incorporating water into public space, it is to design public space based on the dynamics of water: its sudden abundance and necessary flows, seasonal water deficits and the behavior of storm systems.

Solutions that go beyond traditional technical measures are required to allow a city to increase its capacity to be a sponge city, which can delay, retain, store, reuse and then drain rainwater only when necessary. By doing

so, a city is able to replenish its water sources, preserve this precious resource for its greening, and ultimately contribute to the cooling of the urban environment through the occurrence of the natural phenomenon of evapotranspiration.

SOIL REGENERATION / ORGANIC WASTE RECUPERATION

Soils are the main agent of water purification, and sustain life on terrestrial ecosystems, from which more than 90% of food, fibers, fuels, materials and medicines come from. Soils account for more than 30% of biodiversity, and regarding climate change are the largest terrestrial carbon sinks (they hold more than twice the total vegetation of the planet together). Soil carbon plays a vital role in climate regulation, water supply and maintenance of biodiversity, and its role is essential in the continuity of ecological services that are critical to humanity's well-being. Soil is the most undervalued resource in a city, and is probably the largest silent ally it has. Without any awareness of this, urban soils have been degraded, lost, and with it, its multiple functions within natural systems. According to the United Nations, each year 3.4 tons of fertile soil are lost per planet inhabitant, and at this rate by 2050 we will reduce the fertile soil by half.

The key to the regeneration of soils is life: microorganisms, fungi, plants and animals. Where there is diversity, there is regeneration. If there is regeneration, there are nutrients, which are the main source of matter for the constitution of the human body and energy for the sustenance of all its processes. Fertile soils mean healthy humans, in physical, mental and emotional ways.

Regarding waste, local governments have focused efforts on recyclables, which account for approximately 35% of all waste. Under this approach, we have become dependent on an extractive economy, based on external and finite resources such as hydrocarbons, and this model is increasingly demanding due to factors such as programmed obsolescence and new consumption habits. We are also promoting informal economies which are usually associated with subordination and uncertainty, due to inappropriate management, as well as a high environmental costs related to the reincorporation of recyclable waste into new production cycles.

Cities like Curridabat produce approximately 11 tons of organic waste per year, which represents more than 50% of all waste. This is caused by inefficient waste separation, which prevents us from tapping into the full potential of its life cycle, as a continuous source of biological nutrients for the urban natural system. Instead, these valuable resources end up in open pit dumps that generate serious pollution problems. Recovering these resources not only improves the quantity and quality of urban soil, but also enables new opportunities for the local economy: both by the recovery activity in itself and by the production of healthy food and greenery for the urban environment. In addition, it enables governance autonomy and increases the environmental awareness of cities under a whole new circular economy approach, which is restorative and regenerative. Following nature's cyclical model, this type of economy consists of a continuous cycle of positive development that conserves and enhances natural capital, optimizes the use of resources and minimizes system risks by managing a finite quantity of supplies and renewable flows.

It is imperative to assign a strategic role to soil within city development efforts, and more specifically, to incorporate rational soil use as a climate change mitigation strategy. The challenge is to recover riverbeds, avoid soil waterproofing by promoting biodiverse vegetation, recovering organic waste, retaining existing soil, re-incorporating eroded soil as a vital local resource, promoting organic farming practices and rethinking land uses within urban planning.

FOOD / CONSCIOUS LIVING / LIFESTYLE MEDICINE

The most recent research not only points to the most well-known health problems related to malnutrition (obesity, hypertension, cardiovascular diseases) but it also shows a direct and revealing relation with mental health, which further establishes this condition as a determinant aspect of people´s well-being. Mental health depends directly on digestive system health, mainly intestinal flora. Food has a determining effect on the conformation and functioning of cells, which according to studies are in a state of inflammation in most humans, especially those with the poorest and most limited lifestyles. Cellular inflammation caused by malnutrition, stress and chemical intoxication is currently the main factor behind depression symptoms. According to FAO, "hidden hunger", meaning nutrient deficiencies, will be a greater cause of death than "visible hunger" in low-income communities.

Our body makes great efforts and invests a lot of energy trying to adapt to current lifestyles, which are both the cause and the effect of the range of opportunities offered by the urban environment. While poverty levels have declined, surveys show that poor nutrition has increased in all segments and is now a problem for all, especially citizens affected by adverse environments and lack of information. Even people who have access to fresh healthy food do not have well-intentioned information that empowers them to change their lifestyles. Proposals such as "conscious food" or "lifestyle medicine" stem from the fact that human beings "are what we eat", and today this is supported by a critical mass of scientific evidence.

Cities must naturalize their environment, which is paramount to ensure the continuity of the natural systems that support the production of fresh, healthy and nutritious food in sufficient amounts, and should also guarantee that citizens have access to quality sources of food through local production. Local governments should take the lead in educating and informing their population, and should also participate actively in the current market economy, which is biased towards private economic interests. For example, in many places food that has a greater nutritional value, or nutrient-dense food, such as fruits and vegetables, is more expensive and less available than energy-dense foods which are produced at an industrial scale. Local governments must take responsibility for procuring well-nurtured human beings and therefore mentally and emotionally healthy citizens.

CURRIDABAT'S BIODIVERSITY-ORIENTED EFFORTS AND SHORT-TERM GOALS

Curridabat's achievements regarding the implementation of the Sweet City urban development model has. It includes information derived from studies and inventories, as well as project descriptions. These projects represent initiatives that have already been implemented or are in their prototype phase, being tested in the field. A successful project is meant to be adopted as a regular service to be provided by the municipality, so as to benefit the entire population of the Curridabat county.

City parks in
THE CURRIDABAT LANDSCAPE

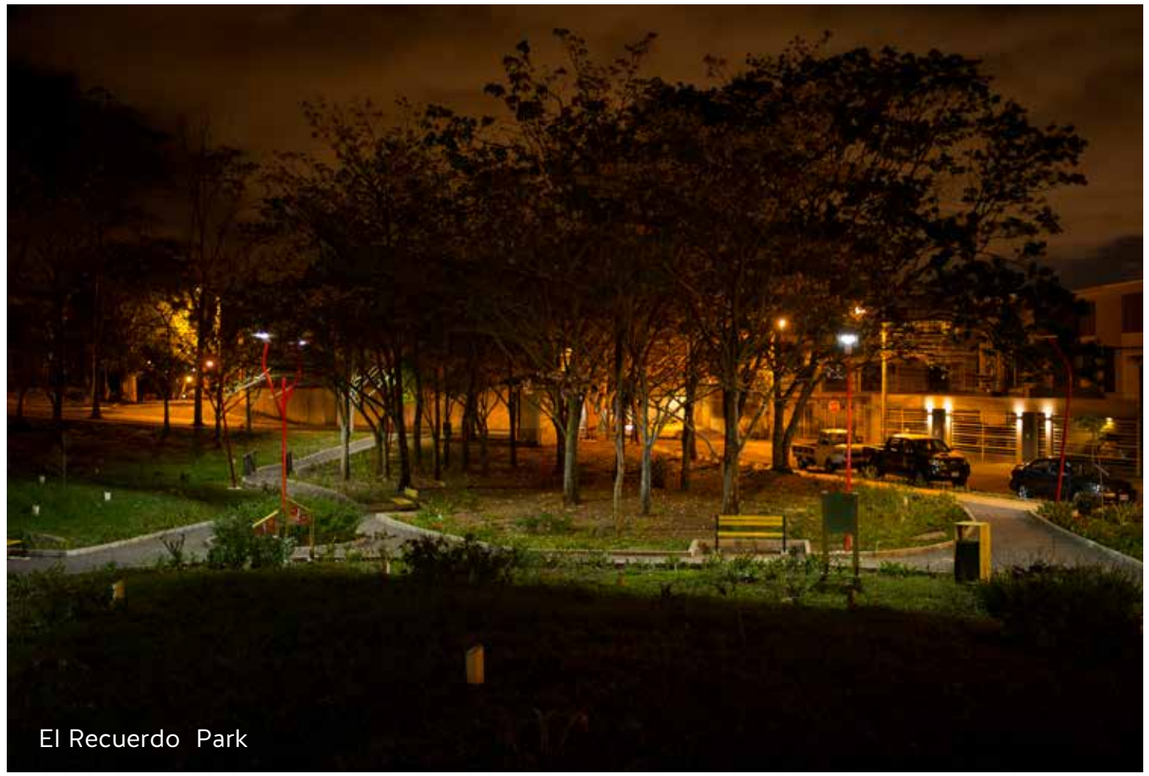
Curridabat expands over a total area 16.04 km2. A total of 1.42 km_2 is dedicated to its 90 city parks and other communal areas. This represents 8.8% of the total county area. The distribution of park area by district is as follows:

	Total Area	Percentage of Total County Area	Number of Parks	Total Area Dedicated to Parks	Percentage of District Area Dedicated to Parks
District #1: Curridabat	6.57k m^2	40.9%	29	0.22 km^2	3.3%
District #2: Granadilla	3.41 km^2	21.3%	18	0.16 km^2	4.6%
District #3: Sánchez	4.17k m^2	26.0%	17	0.13 km^2	3.0%
District #4: Tirrases	1.89 km^2	11.8%	11	0.91 km^2	4.8%
Curridabat County	16.04 km^2	100%	75	1.42 km^2	8.9%

The Park Maintenance Office is currently working towards improving lighting infrastructure in all city parks. A main objective of this undertaking is to improve citizen security by providing adequate lighting systems. To achieve this goal, the new city policy is to use solar-powered LED lampposts, and the first batch was installed throughout the first semester of 2018. By the end 0f 2018, this office intends to install solar lampposts in six to eight city parks. Another major goal is to improve general park infrastructure, which

includes universal accessibility options. The city has been putting together a catalogue of official park furniture to ensure accessibility and to procure a more uniform and visually pleasing city landscape.

To tend to the Biodiversity dimension, pollinator-friendly plants are now a part of standard park design. To better tend to the Infrastructure and Coexistence dimensions, dog park use is being studied to gauge the geographical distribution of the population that visits each of these parks, as well as their habits in terms of hours and frequency of visitation. Park services used to be limited to lawn mowing, and now include gardening, irrigation and planting, among others. Park soil quality is also being studied, and the resulting data will help guide local garden implementation, will inform the municipal water management master plan and will be used as a baseline to assess soil health and carbon storage potential.



El Recuerdo Park

Planting in Central Park

Water-Sensitive Territory Master Plan

In collaboration with Deltares, an independent and world-recognized Dutch institute for applied research in the field of water management (https://www.deltares.nl), the Mayor's Office hosted an interdisciplinary collaborative research workshop that produced the first inputs towards the design of a master city plan for water management in Curridabat. This initiative has been included in a cooperation framework with the University of Costa Rica, and an agreement has been signed allowing us to work in coordination with specialized water research laboratories. This will provide technical advice and will help assure the continuity of this process. This plan will involve a water-sensitive approach, in line with the Sweet City vision as already defined. This concept includes elements of water circulation, retention and storage that also are part of the "Sponge City" concept, notably applied in China.

This master plan is intended to be a comprehensive but high-level, long-term strategy. Some of the particularly important elements in Curridabat are the rivers and creeks that connect our city with other cities in the same river basin, the associated biodiversity, a sustainable water infrastructure, and social cohesion. The master plan should contain the guidance and tools to enable Curridabat to transform into a water-sensitive city. It should also inspire neighboring cities to join Curridabat in an integrated approach that extends to the scale of the entire river basin.

The master plan will also include aspects of risk management and attention of emergency situations. Costa Rica is a multi-risk country, due to tectonic and volcanic activity as well as seasonal weather-related situations. Emergencies due to flooding, landslides and storms are common in the territory. As a Sweet City, we aim to be able to safely inhabit a resilient territory that accommodates its rivers and creeks as well as a rainy season and its inherent risks. Curridabat's approach has been to work closely with communities and organized local groups to promote awareness. With Deltares, the Risk Management Department expects to be able to model different risk scenarios for the county.

Atlas of Curridabat's Urban Landscape

In 2017, the Municipality developed a summer research program which pursued the systematization of Sweet City's approach of bringing nature to the urban space. This was done in coordination with the Harvard Graduate School of Design, and included students from fields such as landscape architecture, urban planning and design programs. The material obtained through this program served as a guiding document for the development of a seminar and the production of base material to advance graduate student research. The seminar participants studied how biodiversity, pollinator habitats, landscape and water management can contribute to the preservation and enhancement of native nature within the urban landscape. This experience allowed the development of an atlas with a wealth of information and analysis of the main dynamics that occur in Curridabat.

This atlas includes both individual layers of information, such as rivers, life zones and forest fragments, as well as dynamic layers, like access points to waterways, soil purpose and land use conflicts, tourism and mobility, etc. This immensely useful tool has led to the proposal of different scenarios for future urban development, and will continue to inform the Municipality's decisions and the Sweet City vision as it evolves to continually improve and respond to new challenges.

The authors conclude that as an autonomous municipality with a clearly legible ecological structure, Curridabat is in the unique position to be able to contribute to the environmental integrity of the larger metropolitan region, the central valley to which it belongs. To reach this conclusion, it was necessary to inventory at different scales the shared territorial structures, such as hydrology and topography, which connect the municipality with the sub-region and with the central valley. At the same time, it was necessary to investigate the discontinuities in the environment and their causes. In so doing, the complex web of interconnected political, social, and ecological phenomena that defines the present condition was uncovered.

According to this study, Curridabat presents many of the challenges that are common to municipalities that developed in the peripheries of capital cities, in what were previously agricultural lands. As the economy shifted from agriculture to suburban developments around the historic center, the old plantations were transformed into housing developments in mostly a haphazard and uncoordinated way. Thus the main challenge in Curridabat, from the point of view of its ecological structure, is fragmentation. Fragmentation is the result of the barriers imposed by political boundaries (which are arbitrary in terms of geographical or territorial logic) between counties and districts, uncoordinated infrastructure building, the predominance of single-family housing, and limited public transportation. The main challenges faced by Curridabat that can be tackled by the Sweet City model are:

- Fragmentation due to infrastructure
- Fragmentation of its ecological and landscape systems
- River pollution
- Air pollution
- Inadequate storm management
- Informal settlements on river banks and river buffer zones
- Lack of information on the current use and protection of wells.

SWEET CITY'S GREENERY GUIDE

Sweet City's Greenery Guide is an informative document exclusively conceptualized to make our pollinator-based vision a reality. Its purpose is to promote the use of Sweet Plants all over Curridabat, be that in a citizen's home, a work space or an infrastructure project built by a development company. In this first version, we have considered that many of the native species that we aim to re-introduce in the city are not yet available in the local market. In this sense we have decided to incorporate a 70% of locally available species and just a 30% of less common ones in order to start boosting their demand, and hopefully impact local market dynamics. We plan to constantly upgrade this guide and increase the number of native and less common species as we are able to establish a community nursery that can grow and sell these Sweet Plants.

THE SWEET CLASS PROGRAM: TRAINING THE TRAINERS

This program proposal aims to train local citizens to be Sweet City trainers. The participants will be in charge of developing educational projects that promote positive and transformative experiences on a Sweet City-based approach. By training trainers, we hope to reach a number of secondary audiences that include families, the local workforce, primary school pupils, youngsters and elderly citizens. Participants will be exposed to a varied curriculum, including aspects such as urban planning, urban economy, mobility, productive landscapes (including urban gardens, waste management, water sensitive management), ecology and conservation, environmental health and risk prevention, conscious living (quality relationships, self-knowledge, mindful eating) and others, always taking into account local ecological, socio-political, psychological and cultural factors. Program graduates will be able to propose their own training programs based on their particular interests and skills. The program seeks to find proactive people and community leaders who can become agents of development in their social circles.

Achiote

Bixa orellana

Familia Bixaceae

Descripción

Arbusto o árbol pequeño, perennifolio o caducifolio. De rápido crecimiento, con flores grandes, vistosas, de color rosado, rojizo o blanco. Común en Bosque Tropical Húmedo. Naturalizada.

Fotografías
1, 2 y 3: Mundo Forestal

13

Función Dulce

Especie con potencial para reforestación, asociada a sistemas agroforestales. Polinizada por insectos.

Parámetros Climáticos — Luz — Agua

Polinizadores

Servicios Ecosistémicos

Dispersores

Urbanidad

Reproducción

15-30 m — 20-60 cm

14

Spaces of Sweetness
Master Plans

The majority of the 65,000 inhabitants of Curridabat live in areas with paved or sealed surfaces, which hinder the appearance of flora and fauna, and hence, of pollinators. This barren ground for natural interactions and pollinating activities also affects the visual quality of the urban landscape, dominated by asphalt and buildings. This rivalry between nature and city negatively affects stress levels in the population, and hence its productivity and its capacity for resilience.

Spaces of Sweetness aims to redesign Curridabat´s neighborhoods under the premise of making infrastructure that fits biodiversity, and not the other way around. This means to prioritize investment in green infrastructure (sustainable drainage systems, riverfront parks, spring water recovery), as ecosystem-based disaster risk reduction measures and climate change adaptation actions. This United Nations Habitat Award-winning urban model was possible due to public, private and civil society partnerships. The Municipality, its Innovation Team and three consulting firms created a series of master plans for highly vulnerable areas throughout the territory, in terms of income, level of risk due to natural disasters and access to services. The guiding principle of this initiative is to provide access to nature for economically-marginalized communities.

The participatory design of these master plans resulted in a proposal of collaborative work spaces, land use change (from industrial to mixed-use), and the steering of real estate investment through Public-Private Partnerships between the Municipality, private landowners and developers. Approximately 1,100 citizens attended 400+ hours of participatory design workshops in 21 communities, and 28% of the total population of Curridabat are direct beneficiaries. Some of the features included in these master plans are: inclusive streets (aiming to improve people's mobility), new green corridors, new parks and urban viewpoints, river-oriented development, new community meeting areas, accessibility improvement, regeneration of industrial areas into new mixed use areas with cultural and residential uses, flood risk mitigation through new wetlands, improvement of 30 existing parks, neighborhood network intervention through participatory design, as well as coordination between the community, the local government and multidisciplinary technical teams.

An external Project Management Office is already working on implementation and oversees all stages of the process, from the master plan design to the financing and constructing stage. In 2016, the Municipality arranged an innovative agreement with FODESAF (the Costa Rican Fund for Social Development and Family Allowances) which is the main instrument of selective social policy within the national government. It finances programs and services for State institutions that tend to needs such as housing, education, health and social protection of both native Costa Ricans and legal resident immigrants. Funds were approved for approximately $868.000 and will be designated for two low-income neighborhoods: Miravalles and Valle del Sol (both located in the district of Tirrases). At the moment, three different firms are being considered as the developers for the different spaces to be intervened. Construction of infrastructure is projected to start during the second semester of 2018 in these two communities, and before 2019 is over, in the rest of the participating neighborhoods.

In 2018, the Municipality of Curridabat and Fundación Arquitectura Solidaria (Foundation for Social Architecture) received $50.000 from the CR-USA Foundation to implement part of the master plan for the community of La Colina, which is also located in the district of Tirrases. This plan includes the improvement of more than 23,000 m2 of public spaces and the consolidation of a 21,840 m2 park to benefit a local population of 2,154 people. The short-term improvement goals include the public space which provides access to the emblematic park that gives the community its name. This intervention area covers more than 250 m2 and includes the construction of sidewalks and a plaza, as well as the installation of adequate vegetation, lighting and urban furniture.

Transitions

This project represents a second stage for Spaces of Sweetness, and looks to create linear articulations between areas of Curridabat that are currently separated by physical, cultural and socioeconomic barriers. These linear articulations include contextual analysis, civic engagement and master plan formulation, which are based around the enhancement of biodiversity, landscape design, and public space and mobility infrastructure design. The process was developed for the six top linear articulations that occur within the city, with the collaboration of three consulting firms and a Sweet City-oriented biologist. Each applied their own participatory design methodology, and the final master plans for the twelve locations that will serve as transitions have already been presented and are awaiting financing; eight of these have been prioritized. For the implementation of these projects we want to be able to access alternative financing sources like SPVs (Special Purpose Vehicles).

To ensure that these transitions will also serve as effective corridors for pollinators, an inventory of ornamental plants used along the proposed transition locations was completed in 2017. This study has shown that locally, the existence of domestic gardens and community parks significantly increases the biodiversity of a neighborhood. It also highlights the importance of the Sweet Sidewalks project in order to promote the introduction of plants into the urban space, so as to take advantage of ecosystem services like sustenance for pollinators, carbon capture and buffering of urban heat islands. The majority of plants in use at the moment are exotic species, so the implementation and widespread use of the Sweet City Greenery Guide is important to bring native biodiversity into the city and promote the best possible environment for pollinators.

Sweet Sidewalks

The Municipality has already constructed 1,560 linear meters and 2,810 square meters of sidewalks following a new construction typology, which includes plants from the Sweet City Greenery Guide. The departments responsible for sidewalk building and park maintenance work together to ensure that every pedestrian space includes a designated space for plants. These pedestrian spaces include 1,50 meters of walking space (enough to accommodate special needs to ensure these are universally accessible spaces) and 0.50 m of greenery space. This is an effort to make pedestrian spaces more comfortable, and to prevent or mitigate heat islands within the city. The Municipality also offers instructive manuals for developers so they can align their projects to this new directive. Old sidewalks are also being gradually modified to comply with this new typology.

The Blue Ecological Flag Award

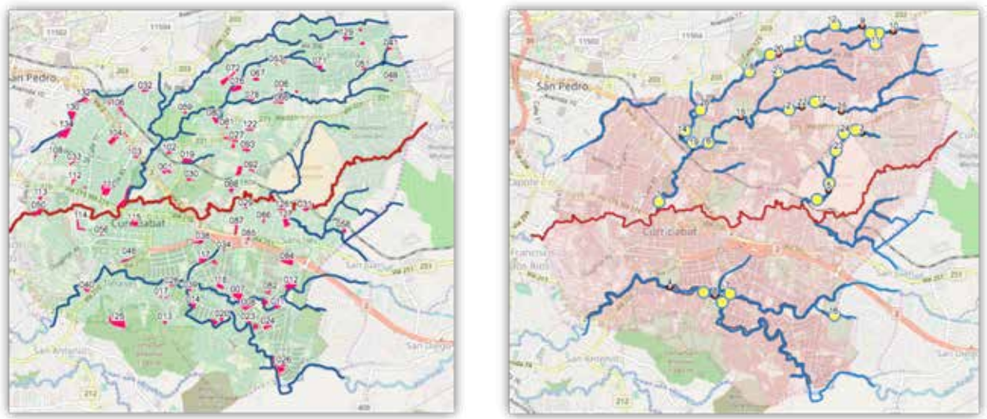
The Municipality has been honored with a “Blue Ecological Flag”, which is an award promoted jointly by the Ministry of Health, the Ministry of Education and the Ministry of Environment and Energy. The Blue Flag Program is a nation-wide initiative that seeks to recognize and encourage local efforts that promote sustainability. In Curridabat’s case, a joint work group that included Municipality members, citizens and private sector representatives was in charge of making sure the city met the award’s standards. The report submitted to apply for the award included information regarding urban cleanup campaigns, reforestation efforts, rehabilitation of communal green spaces, installation of adequate street and park furniture, implementation of inventories to provide baselines of

the local flora and fauna, an inventory of county-wide carbon storage, studies of the water quality of rivers and creeks as well as of the current state of riparian protection zones, phytosanitary protection measures and forestry cover within local parks. The Blue Flag Program awarded Curridabat in the “Sustainable River Basin Management” category.

Carbon Capture Inventory

A baseline study for Curridabat’s Carbon Capture Inventory was completed during 2017. The study used a sample of city parks and riverside forests to establish a first approximation of the county’s carbon stock. Riverside forests are protected by law, and since the María Aguilar river is one of the two main bodies of water in the county, the remaining forest patches along its margins were analyzed. An area equivalent to 2% of the total surface of riverside forests in the county was used as a sample, in which all trees with a diameter larger than 15 cm at breast height were included in the inventory and measured. The methodology for city parks was based on establishing a complete census of all trees present in a sample of 134 city parks and other forested properties. All of these trees were tagged and included in the Municipality’s GIS database. In total, 2,364 individual trees were inventoried, and Curridabat’s current carbon stock was calculated at approximately 295,602.17 tons.

All of this information will be used not only to monitor the growth and health of these trees, but also to bring people closer to them, following the Sweet City vision, which recognizes trees as citizens. With information available for every tree in several of the city parks, our aim is to implement an online app which will allow visitors to scan an QR code tag on any particular tree and receive information such as its common name, scientific name, relevant facts and a statement of its singular value for the city and its inhabitants, including a calculation of how much carbon it stores. Ultimately, we want our citizens to recognize trees as fellow neighbors and key members of our city. The study also included strategies on park management and reforestation, in order to improve the carbon sequestration potential across Curridabat.



Riverside forest quadrats (left) and city parks (right) included in the baseline Carbon Storage Inventory study

Inventories of Local Flora and Fauna

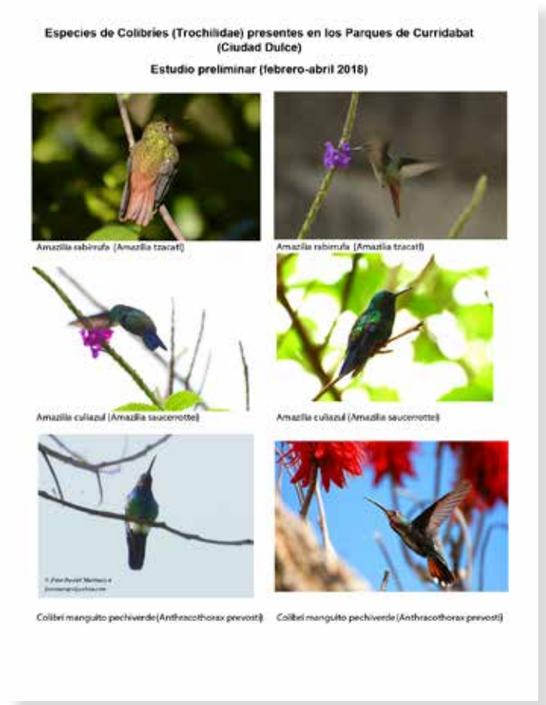
The Municipality has invested resources on the establishment of baselines of flowering plants and pollinators, in order to be able to monitor the impact of Sweet City policies on their target species. A team of biologists has already provided a list of more than 300 flowering plants present in selected parks across Curridabat, of which 188 (63%) are native to Costa Rica and 112 (37%) are exotic and used due to their ornamental value. These plants represent 82 different genera and 235 different species.

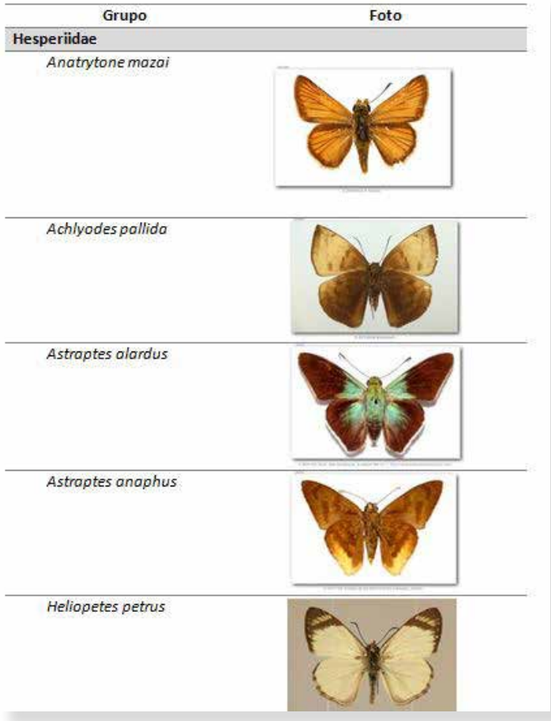
Inventories of pollinators have documented 51 species of butterflies belonging to 6 families, 41 subfamilies and 41 genera; 13 morphospecies of bees in 8 different taxa which are under further revision to achieve a definitive identification; and 3 species of hummingbirds. In 2018, the inventories will be extended to other parks, and will also include groups such as bats and beetles.

The locality known as La Colina, which is one of the biggest and most important green spaces in the city, has its own inventories of bird and tree species. This area adjoins a Protected Natural Area called La Carpintera, which constitutes an important local biodiversity reservoir (it is home to 663 flowering plant species, 31 mammal species, 187 bird species and 178 butterfly species), as well as a vital groundwater recharge zone. La Colina’s geographical position makes it an important buffer zone between this protected natural area and urban development, and part of a strategic biological corridor.

As a complement to the Transitions master plans, the occurrence of flowering plant species was studied in urban settings like gardens, sidewalks, gates, walls, abandoned fields and sports facilities. Exotic ornamental species represent a 67% of local plant diversity, whereas native species represent a 33%, and 232 different species were identified, including trees, shrubs and herbaceous plants.

The diversity of freshwater macroinvertebrates was studied in two of the main rivers that flow through Curridabat. So far, analyses have shown that water quality is poor and aquatic biodiversity is dominated by groups which have a high tolerance level to pollution, such as some genera of flies, mosquitoes, midges, caddisflies, damselflies, leeches and snails. This shows that water quality is an important challenge to be faced, and has to be dealt with in conjunction with other municipalities who share responsibility in the management of the bodies of water of our local river basins.





Grupo	Foto
Hesperiidae	
Anatrytone mazai	
Achlyodes pallida	
Astraptes alardus	
Astraptes anaphus	
Heliopetes petrus	

Bee Inventories and Bee Hotels

Too better understand the needs of bees, our signature Sweet City species, we partnered with the Tropical Apiculture Research Center (CINAT), a central government research center, to carry out bee inventories in two of our city parks.

One of our findings indicates that most bees nest in the ground, trees and unexpected spaces that comply with specific habitat requirements. The availability of such spaces has tended to decrease as a consequence of current urban development models. As a solution to this problem, the Municipality is directing efforts to install "bee hotels", also known as nest boxes or trap nests, which artificially aggregate nest sites of above ground- and tree-nesting bees. There are two functioning bee hotels already, and we plan to generate data to assess the effect of this initiative.

Memorial Trees Project

This project aimed to establish a memorial site for citizens who have passed away and who brought joy to their fellow neighbors or served as an example to the community during their lives. One of our city parks was dedicated to this purpose and went through a renovation that removed exotic gum and pine trees that were substituted with saplings of native species. Each of these trees was planted next to a commemorative plaque bearing the name of a beloved citizen. In this first phase, the park was remodeled, providing universal access, new walking trails, drainage systems, bridges and general park furniture. Approximately 12,490 plants were added to the park, including 118 trees belonging to 30 different species, and 12,375 pollinator-friendly plants and herbs belonging to 15 different species. We expect to be able to replicate this prototype project in strategic areas within the city, in which important pedestrian traffic has been reported.

Urban Gardens

In recent years, we have had some successful initiatives involving urban gardens, either carried out by volunteer groups or by the Municipality itself, through the Sweet City project agenda. At least one organic vegetable garden has been established for self-consumption and as a restaurant provider, innovating through commercialization within Curridabat. Our goal for 2018 is to carry out field reconnaissance visits to locate possible locations for community gardens, and to complete a first assessment in order to set specific requirements and identify improvement opportunities to achieve best possible agricultural land use within Curridabat.

Presently, we are in the process of implementing the first Municipal Urban Agriculture Program. This has been the result of the growing demand for the promotion of this type of activity by various groups in the community, ranging from children to organized community groups to the elderly. At this moment, Curridabat has six community gardens, three demonstration and training centers, four projects in public educational centers, two projects focused on small- and medium-scale productivity, a new farmer's market specialized on natural and artisanal products, and a growing demand for fresh, organic and accessible produce. This initiative will complement projects dealing with the recovery of public and private urban spaces in disuse, and the possibility of diversifying local productivity.

This program will be implemented through three main work axes, which respond to the first three developmental stages of this prototype: education, productivity and diversification. All derivative projects, activities and events aim to validate the program's strategy, as a way to assess its applicability as a future model to apply to the whole city.

Waste Management

The Sweet City: Zero Waste program is part of our efforts to achieve a circular economy, appropriately managing our waste, and which will help us in becoming a resilient community. Within the framework of this program, specific projects have been implemented, including: training on adequate waste management for both educational centers and communities; collection of non-traditional waste on demand; pilot experiences for the composting of organic waste in parks and homes; a Behavioral Economics study on attitudes towards recycling; mobile app for waste management; establishment of a self-financing system for the Recycling Program through the sale of collected materials; study of the local rate of waste generation; characterization and design of collection routes; and study of the tariff system to define incentives for citizens to adequately manage waste.

Animal Welfare

The Municipality established the first Municipal Animal Welfare Program in the country, which includes educational projects, awareness of the role of pets in mental health, subsidized castrations, pet-inclusive emergency management, among others. We have also created and implemented an Interinstitutional Framework Agreement between the National Animal Health Service and the Municipality of Curridabat, to strengthen and support animal welfare programs, as well as to prevent and mitigate situations of animal abuse.

Awards Received by Curridabat

Congress for the New Urbanism

2014, Charter Award for Best City Plan

Members of the Congress for the New Urbanism (CNU) help create vibrant and walkable cities, towns, and neighborhoods where people have diverse choices for how they live, work, shop, and get around. People want to live in well-designed places that are unique and authentic. CNU's mission is to help people build those places. With eighteen local and state chapters and offices in Chicago, IL and Washington, DC, CNU works to unite the New Urbanist movement, acting as a connector, convener, alliance builder, and teaching platform. Its staff, members, partners, and allies are the international leading minds in the field of building better places; CNU helps bring them together.

The modifications implemented in the Municipal Regulatory Plan in 2013 include the following goals:

- Densify historically used urban areas for low density residences
- Reactivate the use of land towards more modern, sustainable and optimal uses
- Discourage the horizontal expansion of the city and encourage vertical construction
- Avoid greater stress on limited natural resources and promote local economic development
- Promote the pacification and improvement of the pedestrian experience and the "embellishment" of a small city which was built without a vision regarding landscaping

For more information visit: https://www.cnu.org/sites/default/files/2014%20Charter%20Awards.pdf

Innovative Practices for the New Urban Agenda

2016, Awarded by UN-HABITAT, MercoCiudades, FLACMA

The Government of Spain and the Ibero-American Forum of Best Practices launched the "Public Call for Innovative Practices of the New Urban Agenda", with the aim of recognizing projects that are examples of urban sustainable development in accordance with the methodologies and principles framed in the New Urban Agenda, promoted by the United Nations. A total of 146 applications were submitted from 16 countries and the winners included the "Spaces of Sweetness" project. This recognition not only places Curridabat on the world map of innovative cities, but in addition to recognition, information will be generated for strategies such as Spaces of Sweetness, so that they can be systematized and studied. This will allow Curridabat and other cities around the world to evaluate their potential for transferability, and for these projects to be replicated in other latitudes or taken to larger scales.

More information can be found on the following links:

What´s the New Urban Agenda?: http://citiscope.org/habitatIII/explainer/2015/06/que-es-la-nueva-agendaurbana

Abouttheaward:http://es.unhabitat.org/comite-de-evaluacion-de-la-convocatoria-publicade-practicas-innovadoras-de-la-nueva-agenda-urbana-anuncia-ganadores/

The Guangzhou International Award for Urban Innovation

2016, Certificate of Recognition

In October of 2016, the third Technical Committee meeting of the Guangzhou Award was held in Bogotá, Colombia. This was the first time that the Technical Committee meeting was conducted overseas. The members of the Committee, who come from international organizations and scientific research institutions, chose 15 cities, among which Curridabat has been included, to be awarded a Certificate of Recognition for their contribution to urban innovation. The Guangzhou International Award for Urban Innovation is co-sponsored by the United Cities and Local Governments (UCLG), the World Association of the Major Metropolises (Metropolis) and the City of Guangzhou. It aims to recognize innovation for improving social, economic and environmental sustainability in cities and regions and, in so doing, to advance the prosperity and quality of life of their citizens.

For more information visit: www.guangzhouaward.org/625/content_2881.html

Le Monde Smart Cities Global Innovation Awards

2017, Citizen Participation Prize

Le Monde awards seven world prizes for Smart Cities and urban innovation. An international jury of 17 experts, city planners, sociologists, journalists, and specialists in city innovation rewards the best projects from over 200 nominations from five continents. These prizes were handed in Singapore, at an international event organized by Le Monde at the Lee Kuan Yew School of Public Policy. Curridabat was awarded the Citizen Participation Prize for our Sweet Sidewalks project. Using the iMayor app (Yo Alcalde, in Spanish), we designed a mobility experiment to give us geo-data of the effort needed by a wheelchair-user to travel 100 feet on Curridabat's sidewalks. The findings showed a whopping 70% extra effort is needed by the wheelchair user than the walking pedestrian. Not to mention the degraded quality of air a wheelchair user endures and the associated cost of time delays. This experiment in itself, influenced the City Council to designate an additional $1,000,000 (5% of the annual budget) towards walkability development for the city. The approach has already made the city more walkable for all, and it gave and it integrated and gave visibility to a marginalized population.

For more information visit: *http://www.lemonde.fr/smart-cities/article/2017/05/31/the-winners-of-the-le-mondesmart-cities-2017-global-innovation-awards_5136605_4811534.html*

Biophilic Cities Project

2017, Incorporation

he Biophilic Cities Project is an umbrella term that refers to research and policy work on biophilic cities, both domestically and internationally, by Professor Tim Beatley and his team at the University of Virginia's School of Architecture. Its principal aim is to advance the theory and practice of planning for biophilic cities, through a combination of collaborative research, dialogue and exchange, and teaching. Researchers at UVA partner with city collaborators, to assess and monitor biophilic urban qualities and conditions, to identify obstacles and impediments to achieving more biophilic cities, and to identify and document best practices in biophilic urban design and planning. This project helps to foster discussion and dialogue between and among researchers, planners and policymakers in case study cities, and periodically convenes researchers and practitioners, and publishes working papers, reports and other publications that disseminate the project's findings.

For more information visit: *www. http://biophiliccities.org/*

BiophilicCities

International LafargeHolcim Awards

2017, Acknowledgement Prize for "Socio-Spatial Governmentality in Costa Rica"

A flagship of the LafargeHolcim Foundation are the Awards for Sustainable Construction, the world's most significant competition for sustainable design. It rewards projects and visionary concepts that go beyond balancing environmental performance, social responsibility, and economic growth, thereby exemplifying architectural excellence and a high degree of transferability. Projects and visionary concepts in the fields of architecture, engineering, urban planning, material and construction technology and related fields are eligible for entry. Each competition cycle spans three years, from announcement to completion and a total of USD $2 million in prize money is awarded.

In the regional LafargeHolcim Awards, four projects in each region receive an Acknowledgement prize. Irene García Brenes, Edgar Mora Altamirano, Erick Calderón Acuña, Alvin Soto Bolaños and Antonio Salas from Costa Rica were awarded for Curridabat's convincing proposal for a development strategy that works in harmony with nature and the environment.

A project-as-process, the Sweet City vision and the Spaces of Sweetness and Transitions projects set the stage for an eastern suburb of San José which envisions the city in coexistence with its flora and fauna. These projects overlay several networks of interventions. Together, the discrete layers reconfigure the habitat of flora, fauna, and human beings as "citizens" of Curridabat.

The image shows one of the twenty-one neighborhoods with intervention proposals built through participatory processes. Sweet City aims to consolidate natural conservation as an urban activity through the increase in the number and variety of pollinizers and through the reintegration of flora to stimulate pollinizing, and the creation of new bio diverse corridors. This will not only bring beauty and amenity for the people of Curridabat, but will also bring better performing conditions pollinizing activates.

For more information visit: *https://www.lafargeholcim-foundation.org/projects/socio-spatial-governmentality*

Congress for the New Urbanism

2018, Charter Award for "Sweet City: defeating the city-nature antagonism, Curridabat, Costa Rica. A plan to recover urban nature for a healthier city."

The Congress for New Urbanism honored the Municipality of Curridabat and Tandem Arquitectos for Sweet City, a citywide plan, based on form-based coding, to connect urban neighborhoods to nature. The project is among the eleven professional and three student winners of the 17th annual Charter Awards, which recognize exemplary projects by local government, developers, architects, urban designers and others engaged in revitalizing and creating coherent cities, neighborhoods, and metropolitan regions. Winners are chosen because they not only embody and advance the principles of the Charter of the New Urbanism, but also because they make a difference in people's lives.

Sweet City is the next phase of a project that was recognized for a CNU Charter Award in 2014. This $65 million project will transform an asphalt-dominated area of the city of Curridabat (population 72,500) in Costa Rica, with green infrastructure and a system of 63 new or revitalized parks in 21 neighborhoods. The plan will create shared streets, encourage mixed land uses, develop more sidewalks and public space, and restore wetlands in order to improve biodiversity.

For more information visit: *https://www.cnu.org/cnu18*

Sweet City is an urban development vision brought to life by Edgar Mora and Irene García, with the support of Alicia Borja and the Mayor's Office Innovation Team at the Municipality of Curridabat. The projects included in this document are those that are more closely related to the Biodiversity dimension of the Sweet City model. We want to thank Jose Retana, head of the Human Environment Protection Department, for his involvement in the execution of these projects.