



**CONNECTING NATURE CITY REPORT**

MALAGA, JUNE 2021

*Urban garden in Lagunillas*

Draft version

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## Summary

Malaga is a Mediterranean city located in the South of Spain, with a green and blue environment typical from the Mediterranean coastal cities. During many years Malaga was mainly known as a touristic destination due to the diversity of its environment offering beaches and mountains landscapes but also because the city has a mild climate throughout the year.

For more than three decades Malaga has been relying on tourism and construction as the main engine of the local economic activity, building hotel and residential developments with little regards to the environment. In the past two decades consciousness about the environment has hit many social actors who have seen the need to evolve the productive model towards one that is more respectful of the environment. Cities are today human ecosystems with the best opportunities for social, economic, and environmental opportunities but at the same time they face important inequalities and some of the biggest sustainability challenges.

The City of Malaga is implementing measures to improve the environment and thus also improve the quality of life of its citizens. The city is exploring ways to restore an ecosystem damaged by the impact of economic activity and through the Connecting Nature project, learn more about the benefits of this framework and its methodology. The city had already developed some nature-based solution but without applying the framework of the Connecting Nature project. This innovative framework involves a series of innovations in the way of facing and implementing nature-based solution projects, introducing new elements such as co-production, co-creation, governance, financial and business models, technical solutions, impact assessment, nature based enterprises and reflective monitoring when creating, planning, executing, and maintaining those projects. The connecting nature framework seeks to optimize environmental, economic, and social resources by applying its own work methodology.

# CONNECTING NATURE: CITY REPORT

## URBAN GARDEN IN MALAGA

### CONNECTING NATURE FRAMEWORK

#### STEP 1 Identify the City context.

After a several years of relative stagnation during the 1980s and early 1990s, the city has experienced rapid development over the last two decades due to the entrance of Spain in the European Union and a certain local political stability. Today, the city has become much more attractive, prosperous, and dynamic but the city has been relying on two main activities: construction and tourism and in a smaller scale textile. At that time Malaga was building infrastructures like the new airport terminal, the highspeed train station, a coastal walk, the reconversion of the city center into a pedestrian zone and a new dock for cruise ships. Many of those projects benefited from financial support of the European Union.

The focus of recent urban development on construction and tourism gives rise to the following challenges:

**Need for balance between tourism and construction and other dimensions of developments.** In the years 2000 Malaga had a great dependence on tourism (sea and Sun segment) and construction. At the end of the 2000s the city experienced a severe financial and real estate crises that left many construction project abandoned, real estate prices crashed, and many companies related to the sector went bankrupt leaving thousands of workers without work. At the time the tourism policy developed in the city was around short city trips and sea and sun segment for tourist arriving by plane or by cruise ship with strong negative environmental impacts.

**Prioritization of quality of life as strategic asset for economic development.** The city of Malaga developed a strategy to diversify from construction and tourism by focusing on the quality of life that Málaga offers to its residents but also to attract companies looking for cosy, less congested location to establish subsidiaries or back-office facilities to relocate some of their activities. The urban development challenge for Málaga is to support this development by making place for these activities (office space, attractive housing, convenient transport, and communication infrastructure), which to some extent boils down to compete with the current model of city tourism.

**Getting a grasp on real estate speculation.** This is an important point for the city since the real estate market has always been very speculative market over the years but after the crisis of 2008 there is a need to get a grater control on real estate speculation. Besides, in Málaga, the real estate market movements are an important source of wealth for a part of the population and a powerful influence on all aspects of city making. Real estate boom result in the construction of massive housing developments resulting very damaging for the environment. Other environmental challenges exacerbate the environmental impact of this tourism.

**Mainstreaming of environmental ambitions as general policy goals.** The city of Malaga is a classical Mediterranean city where citizens rely on cars to move within the city and to the residential areas mainly because there are a lot of stiff slopes in the city. Here an effort is to be made to try to reduce private transportation in favour of other less polluting means.

**Coastal management.** Malaga's coastline has been for many years Malaga's greatest asset, event though the city has been turning his back to the sea for many years. It is not until the development od the new port (Muelle 1) that the city faces the sea. But in environmental terms, the management of the Mediterranean coast as a strategic asset

requires more attention among other issues, like the sustainable management of aquatic and coastal ecosystems and the control over sewage treatment and water pollution caused by activities in the port and the city.

Finally, there is a third set of challenges that can be identify and need to be considered:

**Management of socio-demographic change.** Like in many other European cities Malaga, event though is a young city, experiences an ageing of its population and therefore also the repercussions of this phenomenon on public finances, the provision of public services, pension schemes and other core elements of the welfare state. In Spain, many cities the impact of local population’s ageing has been somewhat curbed by the arrival of immigrants, especially from Central and South America. While many of these migrants speak Spanish, their integration remains a challenge for the city.

**Labour market integration of young generation.** The regeneration of several strategic neighbourhoods (e.g., industrial port, waterfront, historical centre) has benefitted the city, and there is still work to do to regenerate other neighborhood like Lagunillas and Cruz Verde, left aside for many years. All those changes have been of great importance for the development and image of the city but at the same time they have left some groups more vulnerable than others. This concerns not only the construction sector, whose workers were hit hardest by the last crisis, but younger people in general. Many of them have sought well-paid jobs on construction sites during boom period, but later experienced that they lacked the skills and qualifications to find jobs in alternative jobs. Many educated young people have left the city to look for opportunities in Barcelona, Madrid or abroad, leading to a certain brain drain. Youth unemployment remains high compared to the European average.

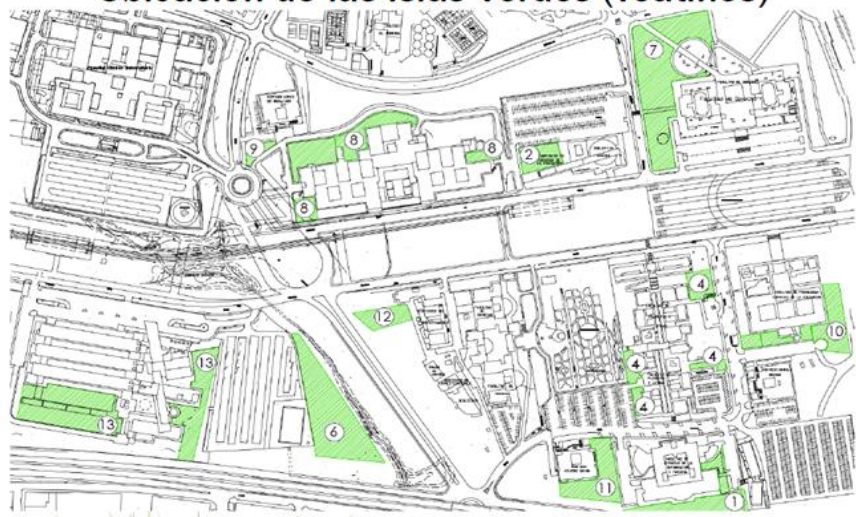
Regarding the Nature based projects the city of Málaga has been developing a few urban projects event though some of the are still in development:

### Project Path and Green Islands (Sendas e Islas verdes)

This project has been developed by the University of Málaga in its Teatinos Campus to fight heat islands in hot summer days. The project is about creating high-quality green spaces for the students to use. The innovative character of the intervention lies in participatory process that underlies each of the green islands and the green paths that link them. The objectives of the project are therefore two: the design and physical construction of green islands and paths and

the stimulation of cooperative, multidisciplinary and educational processes on the campus.

Ubicación de las Islas Verdes (Teatinos)



### Green island’s location

Related to this green islands project, there is another one that is also interesting from a nature based solutions perspective: the central Green Boulevard on the campus. The green boulevard will feature seven outdoor aulas for teaching and other university activities, again taking advantage of Málaga’s benign climate throughout much of the year. The boulevard will be developed between 2019 and 2025.

**Urban Planning Green infrastructure planning**

The Urban Planning department has developed a plan for green infrastructure in and around Málaga. These planning activities have been documented in the book “Green infrastructures of the City of Málaga” that provides a great amount of detailed diagnosis, analysis, propositions, and planning orientations for the development of different types of green interventions in Málaga, ranging from general principles (access and connectivity) to specific interventions on individual sites.



At the city-wide scale, three main green corridors have been identified and to some extent planned:

- The (mostly dry) river Guadalmedina
- The (mostly dry) river Guadalhorce
- The area of the historical San Telmo aqueduct

For the green corridor around the Guadalmedina, a general plan exists that includes, among many other features, the development of a bike path along the embankment. Its implementation depends on the cooperation of the Junta de Andalucía: the city alone cannot develop this corridor as the management of waterways falls under the competence of the regional authorities.



**The San Telmo aqueduct is another nature-based solution in development:** The city has been able to restore a part of it, but some important parts remain for restoration using Nature based solutions. This structure was built in the XIXth century to irrigate agricultural land situated around Málaga.



### **Waste water treatment and reuse systems**

Bioazul is a small engineering company who specialises among other things in innovative water management solution. The designers and engineers from Bioazul provide technology consultancy, project management and product development. The company is based in Málaga and partner of Connecting Nature.

Over the last years, Bioazul has developed technology for small-scale water treatment and reuse that allows to remove pathogens from waste water while keeping nutrients. The system combines several treatment stages in one compact technological solutions: microbiology, ultraviolet, filters. This system could be used in different contexts, including urban and peri urban settings. It can work at different scales. Bioazul has worked on the development of the system with innovative companies from different parts of Europe, such as suppliers from Germany and Switzerland. The assembly of the system takes place on the site of its application.

### **Vertical garden in Pericón square**

A vertical garden has been built during the remodelling of the square improving the beauty of the square



### **Community gardens**

The city has developed Community gardens in some available sights for the benefit of the community. The improvements introduced in the urban environment have an impact on the three aspects of sustainability: economic, social, and environmental. The gardens are owned by the municipality and are managed by different associations.





### The OMAU building

The building is constructed on a municipal plot of 2000 square meters. The building was built to optimise natural resources aiming to be self-sustainable and ecologically functional so it could be classified as Bioclimatic.



### Park Promenade (Paseo del parque)

The Parque de Malaga is located right in the center of the city very close to the port. The parc was built in the XIX century by Joaquín de Ruccoba. It has an extension of 3.3 hectares in which a great diversity of vegetation meets, all adorning the numerous fountains and monuments.



### Senda litoral

Is a pedestrian pathway that runs the entire coastline of the province of Malaga for a total of 178 km long. The path is still under construction, but several sections are already done



## “Málaga cómo te quiero!?”

This is a joint program of the City of Malaga and Limasa, the city’s public-private waste operator, that aims to influence the neighborhood responsibility in cleaning and image of public spaces in the city. The program “Málaga how I love you !?” focuses on the role of the individual as an active agent and whose knowledge and behaviour determine, ultimately, the conditions of the urban environment. This program focuses on education to help social changes of behaviour regarding g the environment.



## Other Nature based Publications

Last year the city of Málaga in collaboration with some of the Cluster companies and Institutions published a guide for the application of Nature based solutions in the province of Malaga (Guía para la aplicación de soluciones basadas en la naturaleza en la provincia de Málaga, Diputación de Málaga 2021, [https://www.malaga.es/es/turismo/publicaciones/lis\\_cd-16413/guia-para-la-aplicacion-de-soluciones-basadas-en-la-naturaleza-en-la-provincia-de-malaga](https://www.malaga.es/es/turismo/publicaciones/lis_cd-16413/guia-para-la-aplicacion-de-soluciones-basadas-en-la-naturaleza-en-la-provincia-de-malaga))

The city has also taken place in many events to disseminate Nature Bases solutions as seen in the cluster presentation used in the Urban nature seminars in Brazil and the Caucasus. In 2020, Gerardo from Bioazul and myself also presented in the International University of Andalusia, the Nature based solutions Cluster from Malaga, and the Nature based solutions concept to the students.



## **The strategic plans (see all the plans in annex)**

In the last two decades with the implementation of the first strategic plan (1992-1996), the city has positioned itself as a European Mediterranean City lined up with Europe. This first strategic plan has been the beginning of the transformation of the city. In 2002 the second strategic plan (2002- 2008) is launched with the aim of providing the city with important infrastructures for the future like the high-speed train, a new terminal for the airport and a Congress and trade fair center. But the 2002 plan was different, excepting the infrastructures the plan was conceived for the first time around key elements like people, governance, globalisation, and sustainability.

In 2015 the city adopted a new plan called Urban Agenda, formerly called Agenda 21, (agenda Urbana, 2020-2050) and a more comprehensive plan from 2020 until 2050. This new plan englobes all the other plans that the city is currently working or carrying out like the plan Alicia, also called plan for climate 2050, which includes among other measures the green ring measures to be adopted in the city and its surroundings. The city is also aligned with the United Nations Sustainable development goals, the Urban Agenda for Cities, and the compromise to reach zero emissions in 2050.

In the past years the city Hall has been improving the city by planning in advance including new and important elements regarding sustainability and nature. This changes have improved the liveability of the city and since then the city has change from a range of 0.4 square meter of green space per inhabitant in 1980 to 7 square meters per inhabitant in 2015 and that figure is still on the rise.

## **Origin and historical development of the Lagunillas neighbourhood**

The Lagunillas neighborhood is part of the Historic Center of Malaga, to the northeast of the old city, forming one of the old suburbs outside the old space inside the walls of Málaga Nazari (the current Calle Carreteras).

It is believed that the name of Lagunillas, which is a plural diminutive, comes from the lagoons that originated from the extraction of clay around the El Ejido hill, for the manufacture of bricks and tiles. The large cavities produced by the extraction, and due to the height of the phreatic level and the impervious nature of the clay soils, small lagoons were generated due to the rain.

When Lagunillas Street was finally built in the 19th century, it became the commercial and marketplace of the entire area with great activity.

In the twentieth century the neighbourhood had two high moments, and Lagunillas street registered its greatest commercial splendour before 1936 (Spanish Civil War) and another between 1955 and 1975. Lagunillas street had all the types of traditional commerce that was sold on the street: bangers, craftsmen, rags, water carriers, oil makers, etc. Special mention must be made of the market that preceded the Casa de Socorro located in what is currently the Federated Society of the Deaf of Malaga, which had up to 17 grocery stores. Later, in 1939, after the civil war, many businesses were dedicated to "black market", and coal mills abounded.

From the decade of the 1970s, the population in the neighbourhood began to decline, which was practically relegated to oblivion. Many of its inhabitants were relocated to other areas of the city due to the problems of deterioration of their homes, leaving these abandoned and in ruins and the plots began to appear.

The starting point of this process of massive abandonment and depopulation is related to the housing plan that is being developed in the Cruz Verde. In what are now Calle Altozano and Calle Cruz Verde there were settlements with a fully entrenched gypsy population, with an urban structure of low houses. But in the early 1990s an urban operation was developed, which would destroy these houses, to build large blocks in a development of 400 social housing units. Thus, came a new and numerous population from exclusion zones throughout Spain, the majority of which were gypsy ethnic groups, which became crowded into large blocks, but unlike the previous population without roots in the area. This formed a ghetto with an uprooted population, in a situation of social exclusion, and without planning or institutional resources for community building and social cohesion.

With this, the social context of Lagunillas changed, and in a neighbourhood that functioned as if it was a small town, with the arrival of the new population, problems of coexistence began to arise, which disrupted trust, freedom, and neighbourhood. Problems with the sale and consumption of drugs begin to arise, generating a lot of insecurity, and that is when the decline of the neighbourhood begins, with the closure of businesses and abandonment of the

population. The result of this process was a neighbourhood full of abandoned lots and houses that offer an image of increasing degradation and some health problems, even.

This context served for the administrations to become aware that the neighbourhood was in decline, and with the aim of revitalizing it, in 2002 the Junta de Andalucía and the Málaga City Council proposed the project of the "Tecnocasas". It was a project of officially protected housing (VPO) that would be built on the abandoned lots or replace the buildings that were in ruins, expropriating them, and that would be aimed at young people on a rental basis, linking the

residential space with rooms for place of work (mainly for workers of the Andalusian Technology Park), so that the young population was introduced, and the neighbourhood was revitalized.

In parallel, there is an urban regeneration of the historic center, with the intention of promoting it for tourism, especially with the demand for the opening of several museums.

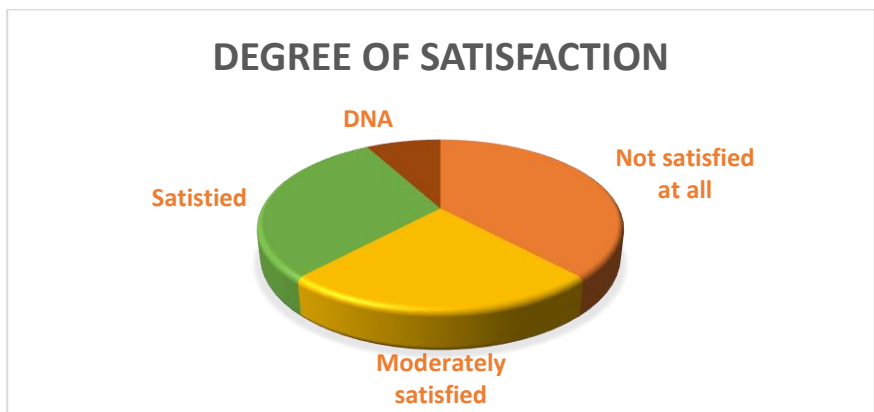
Likewise, from the year 2000, thanks to Miguel Chamorro (an artist from Madrid) the Fantasia Lagunillas Association was created to work with the boys and girls of the neighbourhood through art, giving workshops, and painting murals. The goal was to turn the neighbourhood into a place of teaching, learning and culture. This brings with it the help of other artists.

And so Lagunillas, a peripheral neighbourhoods, degraded, cheap, and with the walls that surround its lots painted with graffiti by the local artistic community, becomes a central neighbourhoods with places like the Plaza de la Merced and the Picasso Foundation just a short walk away. Less than 50 meters.

Currently Lagunillas is in a process of change, which has begun to attract many people motivated by its central position, the price of the houses and the tranquillity of its streets. As more life enters the neighbourhoods, it in turn causes problems such as the abandonment of homes, or drugs, to move and new residents to arrive with initiatives, installing small artisan workshops, cultural centers, local businesses, etc.

But after the tourist saturation of the so-called "historical almond", the neighbourhood with its privileged situation is situated in an ambivalent situation, between carrying out a necessary regeneration that continues to preserve its identity, with a quiet neighbourhood structure, permanent residents, and patterns of coexistence, or to become a leisure park for tourism, with the problems of gentrification and tourism associated with it.

Regarding the perception of residents about this change of identity suffered in the neighbourhood in recent years, it is found that in general they are not very satisfied since, after the 124 surveys carried out, 38% are not satisfied at all and 24% they are moderately satisfied compared to 30% who are satisfied.



Different times in Lagunillas





ESCALERAS DE CALLE ALTOZANO  
1970



ESCALERAS DE CALLE ALTOZANO  
2019



CALLE ALTOZANO  
1970



CALLE ALTOZANO  
2019



CALLE ALTOZANO  
1970



CALLE ALTOZANO  
2019



Calle Lagunillas



## Lagunillas location and delimitation

It is in the Centro district of Malaga, bordering on the southwest with the La Merced neighborhood, on the north and west with the Cristo de La Epidemia and El Ejido neighborhood, on the northeast with Conde de Ureña and on the east and south with La Victoria.

At the orographic level, Lagunillas forms a valley between two elevated areas, Mount Gibralfaro to the east and the neighborhood of El Ejido to the west. This arrangement historically favoured the flow of groundwater and the formation of surface lagoons, which gave rise to the name of the neighborhood.

It can be considered as a small quiet neighborhood behind the Cervantes Theatre and a few meters from the Plaza de La Merced. In fact, in many informal conversations with residents, it is characterized as a town, especially the southern areas, close to Coto de Doñana, Vital Aza and Cobertizo del Conde streets, both for its urban morphology and for the lifestyle that it has been taking shape and is still being perceived today.



Situation of Lagunillas neighborhood in Malaga.



## STEP 2 Define the goals of Project goals

### City goals

Malaga's exemplar should achieve many goals, but it is important to say that the development of the exemplar should lead to open new ways of implementing and doing things.

So far, we can aim at the following objectives:

1. Promote Nature based solutions within the city. This is an important aspect since NbS is a brand-new concept here. To do so we should work on the gated and abandoned plots by transforming them into productive plots aimed towards social use, social cohesion, and activity promotion.
2. Promote NbS Cluster. The Malaga Nature Based Solutions cluster was created in 2018 to exchange knowledge, raise opportunities and disseminate Nature based solutions. It started with 8 companies and has grown up to 30 companies all related to gardening, laws, protection of nature, topography, solutions for cities, and environmental companies.
3. New development of Lagunillas. The Lagunillas neighborhood has little green, a lot of concrete and many empty plots walled so people do not get in them. It is important in the development of Lagunillas to create more green spaces and to connect them with the nearby hills of Gibralfaro.
4. Reintroduction of autochthonous plants. This aspect has been an issue for a long time. In Malaga there are a lot of invasive species (Pampa's duster, eucalyptus, reed beds, acacia, cat's claw), brought in the past by foreigners. These species have been in certain cases very invasive, and it is now time to replace them by the autochthonous ones.
5. Develop economic activities and initiatives in the area. To do so you need to plan solutions that will attract business to the area. This is a challenge since the economic development of an area usually also generates important problems like gentrification. Economic initiatives like the incubator project can help to provide the area with new businesses.
6. Provide a space for education. It is important to promote educational activities and it is important to do so with young people, to teach them the importance of nature as itself but also to promote the importance of nature in the health and wellbeing of the people, to ensure good practices in the future.
7. Promote neighborhood activities by creating spaces for the community. In this case urban gardening can be a moderate activity for the neighbours to ensure some social contact, gain in wellbeing and fight loneliness.
8. Increase social cohesion among the community and within the neighborhood by promoting relationships among neighbours and helping develop social skills of people in situations of vulnerability and loneliness.
9. Promote models of active citizenship, increasing engagement, community self-organization and involvement in social life. Engage citizens to play an active role in the maintenance and managing of the public space.



### Connection to existing urban agendas (see chart about urban agendas in annex)

Nature-Based Solutions are a new concept that encompasses all actions that rely on ecosystems and the services they provide, to respond to various societal challenges such as climate change, floods, and other natural disasters. The term Nature based solutions goes beyond traditional principles of biodiversity conservation and management, reorienting

the debate on human beings and specifically integrating social factors such as human well-being and poverty reduction, socio-economic development, and governance principles.

NBS "are actions that are easily seen as positive for a wide range of stakeholders, as they generate benefits at the environmental, economic and social level. However, the occasions in which the implementation of NBS involves public participation are not common. Through the following actions it is intended to value the collaborative and educational urban garden "Huerto las Yucas" by displaying the Nature based solutions and promoting the values of a neighborhood project.

**What makes your nature-based solutions’ strategy legally binding, e.g., by connecting it to existing policy plans**

Strategies are designed to implement improvements and Málaga has developed many strategic plans to try to take the city to the next level. As a matter of fact the compromise of the city with the environment is growing steadily. Malaga has been developing in the past decades plans to fight against climate change like the Plan Alicia established in the urban agenda strategy for the next 30 years and in which the city should strive to reach 0 emissions by 2050. The city is also aligned with The UN sustainable goals and is also part of the European Green Deal. All these policies made to improve citizen life and taking care of the environment are subscribed by local authorities. (See all the plans in annex)

**STEP 3 Identify your target audience and other relevant actors**

For whom is this report?

How will your target audience use your report? What is needed to make this happen (e.g., translation, graphic design, turning the report into a video etc.)?

Who has been involved in developing the report?

How did you engage/plan to engage with all quintuple helix actors (see figure to the right) across all the different elements for your nature-based solutions exemplar? Please explain why you have chosen the actors and how you will engage with them.

This report has been elaborated by the Project department of Promalaga and the Promalaga steering committee will be the first to read it. Usually, the report will be redirected to decision making bodies and related stakeholders like OMAU, Urban Planning, Environmental department, NbS Cluster, and the University of Málaga.

During the visit of OSMOS we were able to establish the following partners described in the project environment Canvas below chart below

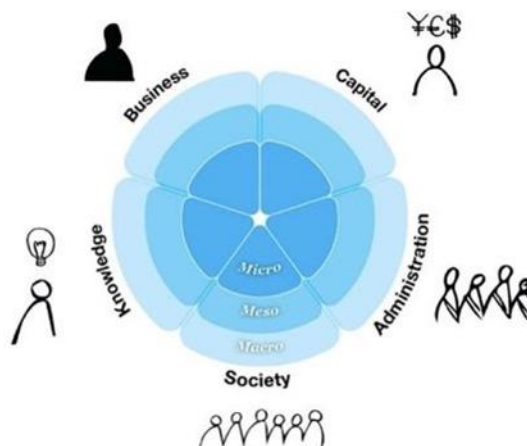
<b>INVOLVED PARTNERS</b>	<b>VALUES</b>	<b>ACTIONS</b>	<b>OUTPUTS</b>
CIEDES University of Malaga OMAU Rizoma Foundation Promalaga Gerencia urbanismo (ayuntamiento) Junta de Andalucía (Consejería medio ambiente y ordenación territorial)	Ecological integration and connectivity Quality of the urban landscape Health and well-being of inhabitants Historical value of heritage Urban sustainability	Facilitate consensus on an action plan among key stakeholders Support participation in green infrastructure projects Communication and dissemination activities around green infrastructures Capacitation on economic models (incl. sponsoring, philanthropy)	Moving from planification to implementation Boosting awareness and societal momentum around green infrastructures

		Execution and maintenance of physical projects	
<b>INTEREST GROUPS</b> Landscaping and gardening companies Land and real estate owners Horticultural producers Farmer’s cooperatives Residential population in adjacent neighborhood	<b>NEEDS</b> Urban climate comfort Easier mobility Accessibility to a wider territory	<b>RESOURCES</b> Connecting Nature network experts and knowledge) Prototipes from UMA (Islas y Sendas Verdes, aulas abiertas, huertos urbanos, etc...) Local academic community (UMA) CIEDES Working group “Coastal line sustainability”	<b>OUTCOME</b> Quality of life Green jobs for young population A new urban model Reaching Sustainable Development Goals Productive green corridors

During the Osmos visit one of the objectives of the exploratory research was to identify the relevant stakeholders, both individuals and institutions. The methodology of the exploratory research involved three elements: Desk research based on planning documents, project reports and other material, Interviews with key stakeholders representing different profiles and a workshop. The interviews and workshop were carried out by OSMOS in Spanish on November 20-21, 2018.

The Connecting Nature team from Málaga organized the interviews in advance but the interviews were conducted by Osmos. The interviews were useful not only about gathering information, but also as an occasion for the project partners to meet potential local partners in person.

Since nature-based solutions reach into different areas of city-making, it is important that the group of interviewees reflects different types of stakeholders that have to cooperate to make NBS possible and successful. Schematically, the interviewees were selected to represent the five different types of stakeholders in a “quintuple helix” shown below. This schema distinguishes between five types of stakeholders that we want to bring on board: business, capital, knowledge, society, and administration.



Penta helix diagram

The stakeholder types defined by the penta-helix diagram were too abstract to identify interviewees (and potential partners). This is why the interviewee selection guidelines finally defined 12 typical “profiles” within each of the five categories mentioned above.

The first category would be the Administration (political and institutional capital) with the three following profiles:

**The policy maker.** This person has a senior role in a public organization and is tasked by an elected official to define concrete policy. This person may be responsible for setting key performance indicators, targets, and review progress. City-scale governance is also a general topic that this person is very familiar with.

**The planner.** This is the person that is connecting policy and place by acting within a certain governance regime. The planner may be an architect focused on spatial design or it could be an urbanist that is concerned with area plans. This person may work for the city or be a private consultant that is capable of building a project. Sometimes this role will be combined with the policy maker’s role and will draft policy and then develop concrete projects.

**The maintainer.** This person is responsible for the Operating Expenditure (OPEX), long-term maintenance of public works. This person manages a team that cuts grass, fixes pavements, unblocks sewers, paints seats and so forth and therefore has a very good sense of what the long-term maintenances costs will involve. Depending on the local context, this person could belong to the “business” category rather than to the “administration”.

The second category will be the Business itself (economic and human capital) with two profiles:

**The entrepreneur.** This person is involved in creating business and has a very clear understanding of the real-world realities that come with urban projects, including their business models and economic viability, either as public services or private undertakings. The entrepreneur is connected to the business milieu of the city and understands the strengths and weaknesses in terms of future economic development.

**The builder.** This person is doing or responsible for Capital Expenditure (CAPEX) of public finances. This person understands the costs associated with construction and technical problems associated with materials or building. This person could work for a public authority or may work for a private organization that is contracted by the city. It could be the project manager of a large urban (preferably NBS) project.

The third category will be the Financial capital with three profiles

**The financial officer.** The person manages budgets for public works and has a clear overview of where money is being sourced and how it is being invested. This person generally works for the city or region. This could be the financial controller of the municipality.

**The investor.** This person has access to private or public capital that could be invested in NBS projects. The investor could work for a local (or regional) bank but also for an organization that manages public funds that are invested in urban projects (such as the unit in charge of European structural funds or urban renovation programs). The investor is aware of the criteria against which potential projects are evaluated and has an eye for selecting projects that “will work”.

**The philanthropist.** This person invests into urban improvements without requiring a financial return on the invested capital. This can take the form of foundations, non-profit companies, or individual donations.

The fourth category will be Knowledge with a single profile:

**The involved expert.** This person may be a philosopher, an academic, an independent urbanist, a sociologist or maybe a journalist. The observer has an overview of how the urban dynamics, the general quality of life, the main challenges facing the city and so forth. This person generally does not work for the city, however, is a respected voice irrespective of political views and often is involved in public talks and events. The observer is not necessarily passive: through action-research, she might acquire first-hand knowledge of how nature-based solutions work out in practice.

The fifth category will be society with three profiles

**The community builder.** This person helps to reach out to the community and better understand their needs. Sometimes the community builder is focused on a very specific topic, such as the environmental quality of a nature

reserve or in the development of cycling infrastructure. This person may work for the government or may work from an NGO or cultural organization.

**The environmentalist.** The environmentalist is concerned with the natural environment and/or the human impact on the environment. They may be concerned with ecosystems, water quality, waste management and so forth. Often this person will work for a city or region.

**The social innovators.** This person initiates new ideas or projects that enlarge the scope of what is possible. They influence the city directly through their activities or indirectly by inspiring others. Often municipal administrations take the ideas and projects of social innovators into consideration.

Based on these guidelines, the following interviewees were selected:

<u>Name</u>	<u>Organisation</u>	<u>Profiles</u>
Rocío Mora	University of Malaga	Involved expert
Patricia Mora	University of Malaga	Involved expert
Gerardo González	Bioazul	Entrepreneur/involved expert/social innovator
Fátima Salmón	Ciedes Foundation	Community builder/planner
Carlos Lanzat	Urban Planning	Planner
Francisco Salas	Promálaga	Policy maker/planner
Isabel Pascual	Promálaga	Policy maker/planner
Cristian García-Espina	Promálaga	Policy maker/planner
Ruben Mora	Rizoma Foundation	Social innovator/entrepreneur

#### STEP 4 Introduce your nature-based solution exemplar

The Connecting Nature project in Malaga is part of developing a new perspective for urban planning and in the Lagunillas neighborhood. The implementation of this new perspective can cover the three types of interventions:

The renovation of three public squares in Lagunillas

- The renovation of public squares.
- The development of a green corridor between Lagunillas and the mount Gibralfaro
- Incorporating nature-based solutions in small-scale interventions across the neighborhood (street crossing, publicly owned vacant lots, use of abandoned buildings, small public spaces into pocket parks).

Finally, the Connecting Nature project in Lagunillas aims for urban revitalization of this dense neighborhood located in the city center.

Our Nature based solution exemplar is to build a nature Based solution urban garden in a disused plot of land in the Lagunillas Neighborhood. Lagunillas has several plots of land abandoned and the idea is to do a pilot project in the area with the possibility in the future to replicate the idea in other plots or in other neighbourhoods.

The Lagunillas neighborhood has very little green spaces but has a lot of walled and abandoned plots. Most of those plots belong to private people and a few of them belong to the city. Private owners are attentive to the development movements of the city council, they are waiting for real estate opportunities that will end up creating gentrification in the area.

The urban garden La Yuca was designed in a participatory process with the partners involved ( OMAU, Cluster NBS). It was then built by some private companies from the Cluster dividing the plot in three parts, one for schools to come and learn about the autochthonous plants in Málaga, the other as a space for the neighbors to gather and relax and the third for elderly neighbors to be able to cultivate some produce doing moderate activity buy also to get together with other people and therefore aimed to fight loneliness.

In this context we also have a population in the area that is also growing older, so the idea is to generate interest among residents and neighbours and to keep them active.

## STEP 5 Position this report

Lagunillas is a degraded neighborhood that needs improvements in many aspects like a new urban design, an increase of green spaces and the rehabilitation of half demolish buildings. There are a lot of abandoned and ruined buildings that need to be rebuilt, there are also a lot of empty plots walled so people do not have access to them, and there is very little street business because the area does not have good access by car or by foot.

Like Einstein used to say if you want different outcomes try different things. Therefore, trying to implement the Connecting Framework was necessary to obtain a different outcome. The initial idea way to pilot a nature-based solution using the framework. There was already a few nature based solutions in Malaga five years ago, but they were isolated projects without a process tool like the Connecting Nature Framework, a structured tool allowing for efficiency and optimisation in a three phases process with seven elements to consider in each of the three phases. To use the tool, we selected a plot in the Lagunillas neighborhood using nature-based solutions.

If we consider, the framework, we can find three stages, planning, delivery, and stewardship. For each phase there are seven elements to consider (see framework image on page 16). What is innovative is the application of the framework itself, to create the exemplar, since usually this kind of operations are conducted in a different, traditional way: design, implementation, maintenance and then evaluation following the initial design from the first phase. The evaluation usually serves to reflect that the work has been done but does not reflect if the work has been well done and much less if there are some improvements that could have been made to improve the results. Elements like coproduction cocreation and reflexive monitoring for example are not considered in a traditional approach.

The framework is innovative in all its aspects. Using the framework has allowed to change the traditional way of working. With the Connecting Nature framework all the elements must be considered in each of the three phases of the project and at the end of each phase an evaluation process occurs to see if the phase has been fully optimised. Once the first phase is approved, the second phase can start following the same process and considering the same elements. The third phase of the framework follows the same guidelines than the previous ones to ensure that nothing is left aside. The third phase is more complex than the traditional phase where the evaluation is made to confirm that the work has been done reflecting the initial approved project. With the framework the evaluation is different since it considers indicators to measure in real time performance and then through a process of reflexive monitoring allows for changes and corrections with the aim at optimisation of all the resources.

Most all the elements of the framework are innovative in it selves and others are innovative in their approach. For example, one of the seven elements called reflexive monitoring is a new element that has never been used before in the development of an exemplar in Malaga. It contains a set of rules and follows a thinking process and methodology for evaluation. In the other hand Governance is also an innovative element in the way the Connecting Nature project focuses on this element since the term collaboration can have different approaches. For example, the connecting perspective to governance is to create a team to collaborate in the development of the exemplar. This differs from a more classical approach to governance, where the collaboration between departments exists, but without creating a team to develop the exemplar. Here the focus is different, but the collaboration exists in both ways of work.

This happens also with other elements of the framework like coproduction, technical solutions and Financing and Business models for example.

TRANSFORMATION POINTS	Reflect on the impact of this transformation point on your exemplar
<p><b>1. AGM Iannonina</b></p>	<p>June 2018  <i>First all partners AGM gave the opportunity to meet the Connecting Nature family hidden behind the cities and to see on what kind of projects cities are working.</i></p> <p><i>Linked to phase: planning</i></p>
<p><b>2. NbS Cluster</b></p>	<p>March 2018  <i>Málaga create the first NbS cluster in the city. Mission: The Cluster-NbS was created to promote NbS application and contribute to the development of more resilient, healthy, liveable, and lively cities. NbS is a brand-new concept that to promote and disseminate you need a backup with expertise to rely on.</i></p> <p><i>Linked to phase: planning, delivery &amp; stewardship</i></p>
<p><b>3. Malaga Workshop</b></p>	<p>October 2018  <i>Workshop enabled to map the city areas/administrations/ Institutions working on NbS. It also helps to understand the importance of including NbS in developing a spot or a neighbourhood. Cities need to regreen to improve citizen lives.</i></p> <p><i>Linked to phase: planning</i></p>
<p><b>4. Business Model Canvas</b></p>	<p>June 2019  <i>BMC is useful tool to explain Connecting Nature methodology and a “vertebrate” path to follow. It shows how to engage NbS thorough entrepreneurship, partnerships, governance and how to look for financing NbS projects. Financing is key in developing any kind of project</i></p> <p><i>Linked to phase: Planning</i></p>
<p><b>5. Selection of the exemplar</b></p>	<p>August 2019:  <i>Urban garden in Lagunillas and other developments related to NbS in Lagunillas. The idea is to flourish the Lagunillas neighbourhood with NbS</i></p> <p><i>Linked to phase: Planning</i></p>
<p><b>6. Malaga Public Event &amp; AGM</b></p>	<p>October 2019  <i>Opportunity to bring together de Connecting Nature Family to Malaga, and to showcase several NbS projects undergoing in Malaga and several other cities from Andalucia.</i></p> <p><i>Linked to phase: planning, delivery, and stewardship</i></p>
<p><b>7. Delivering the exemplar</b></p>	<p>December 2020  <i>Lagunillas Yuca Urban Garden. Real turning point. Difficulties to deliver something with no budget for it.</i></p> <p><i>Linked to phase: planning and delivery</i></p>
<p><b>8. Looking for business</b></p>	<p>March 2021  <i>La Bocaná de Lagunillas Project. Following Glasgow steps to try to develop a coworking and NbS program incubation. This is s stakeholders project with the collaboration of the NbS cluster</i></p>

### Most relevant elements for you during the three phases of the Framework

TRADEMARKS	Phase		
	Planning	Delivery	Stewardship
<b>Co-production</b>	<i>Stakeholder could be interested in cooperating in any point of the phases</i>	<i>Inputs, expertise, and management of the exemplar</i>	<i>Planning and delivery of the activities, maintenance of the exemplar.</i>
<b>Technical solutions</b>	<i>Aligned with the specific needs of the area and the goals they are intended for</i>	<i>Ensure that the delivery phase will reach all the benefits and co-benefits planned</i>	<i>Ensure long term run of the exemplar, reducing costs and increasing benefits by adding new elements</i>

**Degree of importance** for the seven **elements** of the CN Framework during the three phases (i.e., planning, delivery, stewardship).

ELEMENT	SCORE		
	Planning	Delivery	Stewardship
Technical solutions	<i>High</i>	<i>High</i>	<i>Medium</i>
Governance	<i>High</i>	<i>High</i>	<i>Medium</i>
Financing & business models	<i>Low</i>	<i>Medium</i>	<i>Medium</i>
Entrepreneurship	<i>Medium</i>	<i>Medium</i>	<i>High</i>
Co-production	<i>High</i>	<i>Medium</i>	<i>High</i>
Reflexive monitoring	<i>Low</i>	<i>Low</i>	<i>Low</i>
Impact assessment	<i>Medium</i>	<i>Medium</i>	<i>High</i>

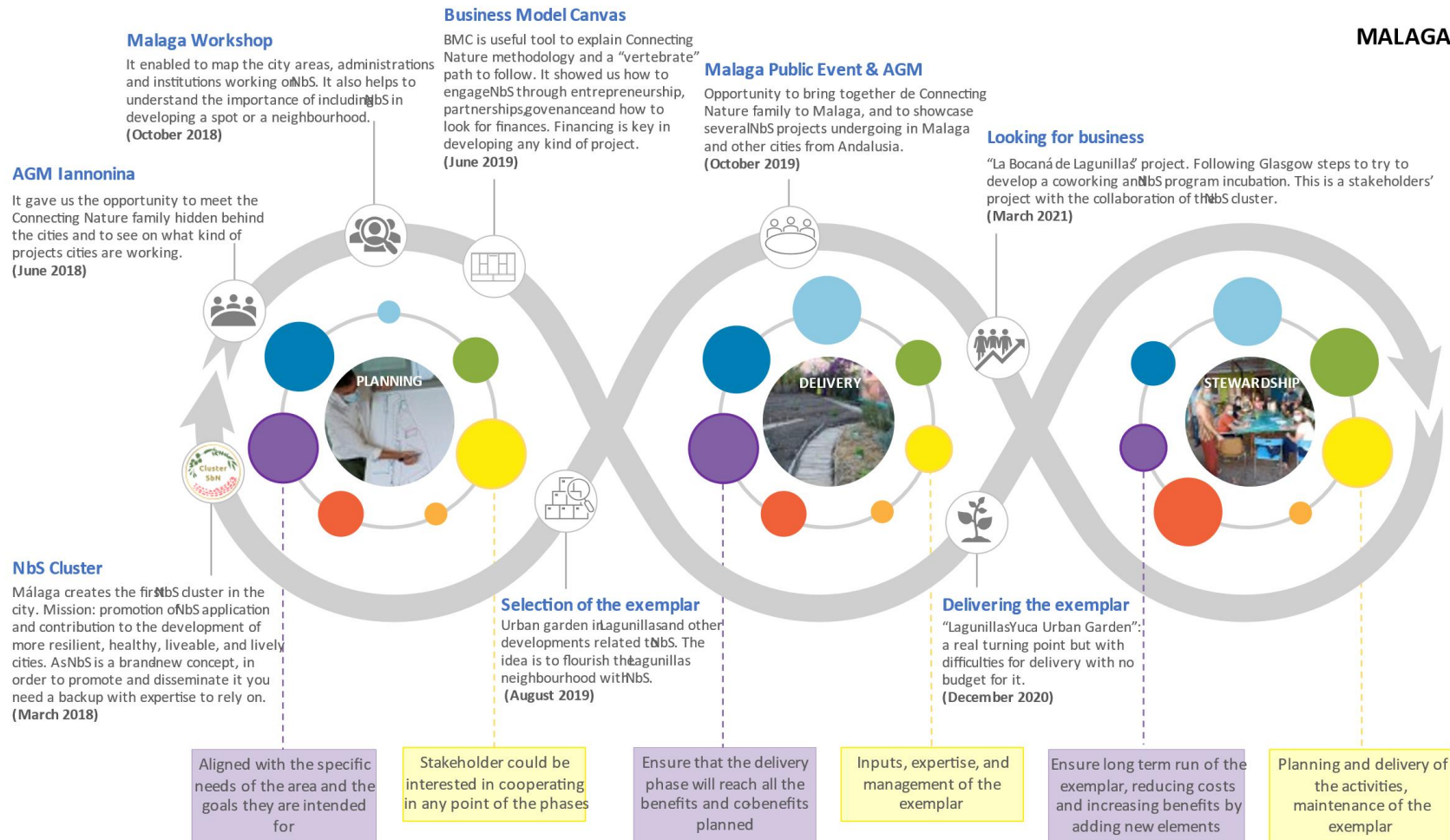
**degree of development** of each **phase** of the CN Framework

PHASE	Score
Planning	<i>Medium</i>
Delivery	<i>Medium</i>
Stewardship	<i>Medium</i>



# Malaga CN Framework

MALAGA v1



## TECHNICAL SOLUTIONS

### STEP 1 Define the nature-based solution

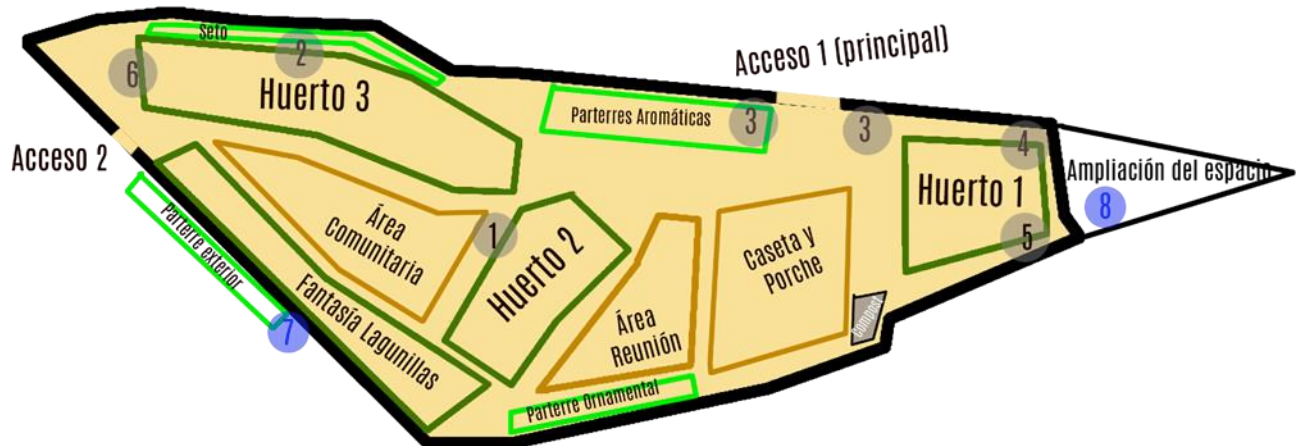
The name of the exemplar is Lagunillas **Las Yucas Urban Garden** This is a plot of land located in the Lagunillas neighborhood in an urban landscape, right in the middle of the city surrounded by housing blocks and roads. Lagunillas is an urban degraded area of the city of Malaga, with the following characteristics:

- Old and dilapidated buildings. Often homes in poor condition.
- Numerous vacant plots. Most of them gated.
- Low average family income and high unemployment rate.
- Population multicultural, with great ethnic and cultural diversity.

Remarkable is the scarce awareness that exists among part of the neighborhood community of these neighbourhoods regarding the care of the environment, the value of recycling or cleaning public roads, which is evidenced in the large amount of garbage and waste that accumulates certain public spaces located in the neighborhood.



## Plot size and distribution



The plot is around 400 square meters. The objective is to regenerate and restore a disused space for the neighbours and for the community through an ecological approach for the regeneration of public spaces through nature-based solutions and for the creation of a collaborative community management project that can be replicated in other spaces and serves as a management model for the use of future urban spaces.

To achieve those goals some actions are intended to value the collaborative space **Las Yucas Urban Garden** by displaying the NBS and promoting the values of a community project.

1. Value native plants Yucca. Emblem of the plot Algarrobo, Lemon trees, White Sapote, Acebuches, Cherimoyo and Moringa
2. Elimination of invasive species
3. Conditioning and supply of nutrients
4. Installation of an efficient drip irrigation system with a programmer
5. Construction of furniture with recycled materials
6. Adequacy of a compost bin
7. Promotion of renewable energies by installing a photovoltaic system.
8. Dissemination of NBS information.

The actions agreed during the participatory process, distribution of spaces and some milestones are indicated below:

### *Community Area:*

- Provision of benches and tables with recycled materials for participation spaces and for use in workshops.
- Perimeter the area with planters that delimit the space.
- Aromatic plantation.

### *Outdoor fence area*

- Conditioning of the existing parterre,
- Elimination of invasive species (Ailantos and Ricinos),
- Contribution of land and planting of climbing plants that cover the fence. Jasmine (2) and Winter Bignonia (Pyrostegia venusta)
- Keep existing bougainvillea at the ends.
- Installation of "Library furniture" to exchange books with the neighborhood.
- Hedge: Elimination of existing invasive species (Ailantos and Acacia) and maintenance of Raspberries, lavender, and Jasmine.
- Maintenance pruning of the Carob trees (elimination of basal suckers).

*Aromatic Parterre:*

- Improvement of the soil with the contribution of organic matter and the planting of aromatic herbs (lavenders, rosemary, mint, lemon balm...).
- In the area with paved soil, installation of a cultivation table for the use of culinary species and / or seedbeds.

*Booth and Porch:*

- Adequacy of the batteries of the photovoltaic panels for putting them into operation.

*Orchard's area:*

- Conditioning and supply of nutrients to garden areas; Topsoil and compost.
- Physical treatment of the soil with a walking tractor.
- Soil analysis
- Installation of drip irrigation system with programmer and solenoid valve for differentiated irrigation in 6 zones.

## STEP 2 Develop an understanding of the landscape context and ecosystem services needs

### Landscape scale:

Lagunillas is a central district right in the center of the city. Unfortunately, it's an ideal location for business and commerce led in the past the area to fast urbanization. The exemplar is located right in the city Center surrounded by buildings and concrete. The Lagunillas neighborhood has very little green but in the other hand, it has many walled plots that could be turned into pocket/urban gardens.

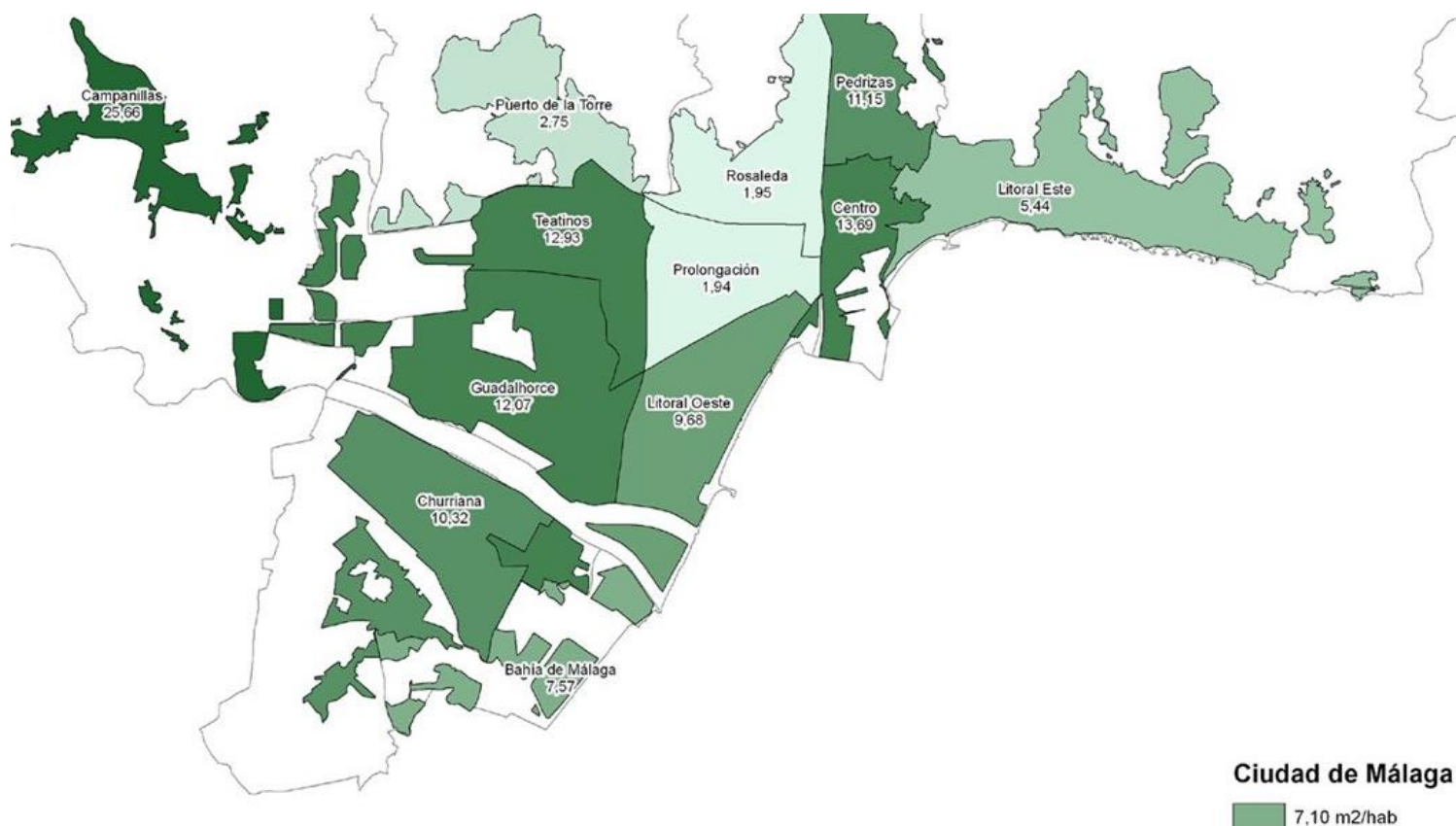
At the environmental level Málaga is suffering from frequent flood within the city center due to heavy storms, increase in the city temperatures becoming very hot in the summertime and producing heat island effect. The city is looking for solution for both problems. The first solution relies in **Green Ring Project** a project in development to reforest and plant autochthonous plants in the mountains surrounding the city to avoid storm waters to rush into the city. The second one through the University which is developing Nature based solutions to fight the heat in the summer time through the creation of green islands.

At the social level we have almost the same problems everywhere in Spain and I think in Europe also. Our population is aging even though there are a lot of younger professionals coming to our attractive city to work since we have an interesting IT ecosystem with the Málaga Tech Park among other things. The other problem is endemic, and its unemployment. Unemployment is higher than in Europe and young people unemployment is even higher. There are little opportunities for qualified jobs outside the tourism sector so many young professionals leave the country to find opportunities elsewhere.

Finally at the economical level, these years have been difficult for the local economy since Malaga relies on tourism and foreign residents. The pandemic has somehow frozen things for almost two years and destroyed a lot of

employment in the service sectors and in tourism since a lot of hotels and resorts have been shut down for most of the year triggering the closure of other entertainment venues.

At the city scale the city landscape context, the city can be divided in two parts. Green and blue context. The old town has very little green area, little shades and suffers heat islands effect in summertime. At the time of those constructions there was very little planning by the local authorities. To start to see some parks and green areas you need to go to the new developments of the city. Those new development have been made following new urban planning standards including green areas and other services. The city counts also with a high number of small and medium size parks with



a lot of trees that need maintenance and other green elements like roundabouts. The image below shows the green area density per area and per inhabitant. This figure has been increasing since 1980.

**Green density per area and per person in the city of Malaga.**

The blue context is the shore of the city where a path is being built, as mentioned above from the east part of the province all the way to the end of the west part. In total 178 Km of a pathway for pedestrians and bicycles.

Malaga has numerous beaches for the summer period. Climate change provokes heavy storm, and the beaches need to be fixed for the season. The cost of maintenance is becoming higher and higher to meet the EU standards of quality. The city faces many challenges as climate becomes more challenging every year. Under an environmental perspective the main challenges for the city are related to water management issues, which are central to keeping the city cool in the summer and urban parks and gardens attractive. More generally, the management of the coastal line brings a host of environmental challenges, the most important one being the protection of the coast as a resource for the future development of the city and its inhabitants. Other issues like the heavy rains and storms cause flooding in the city, making great damages in streets and parks.

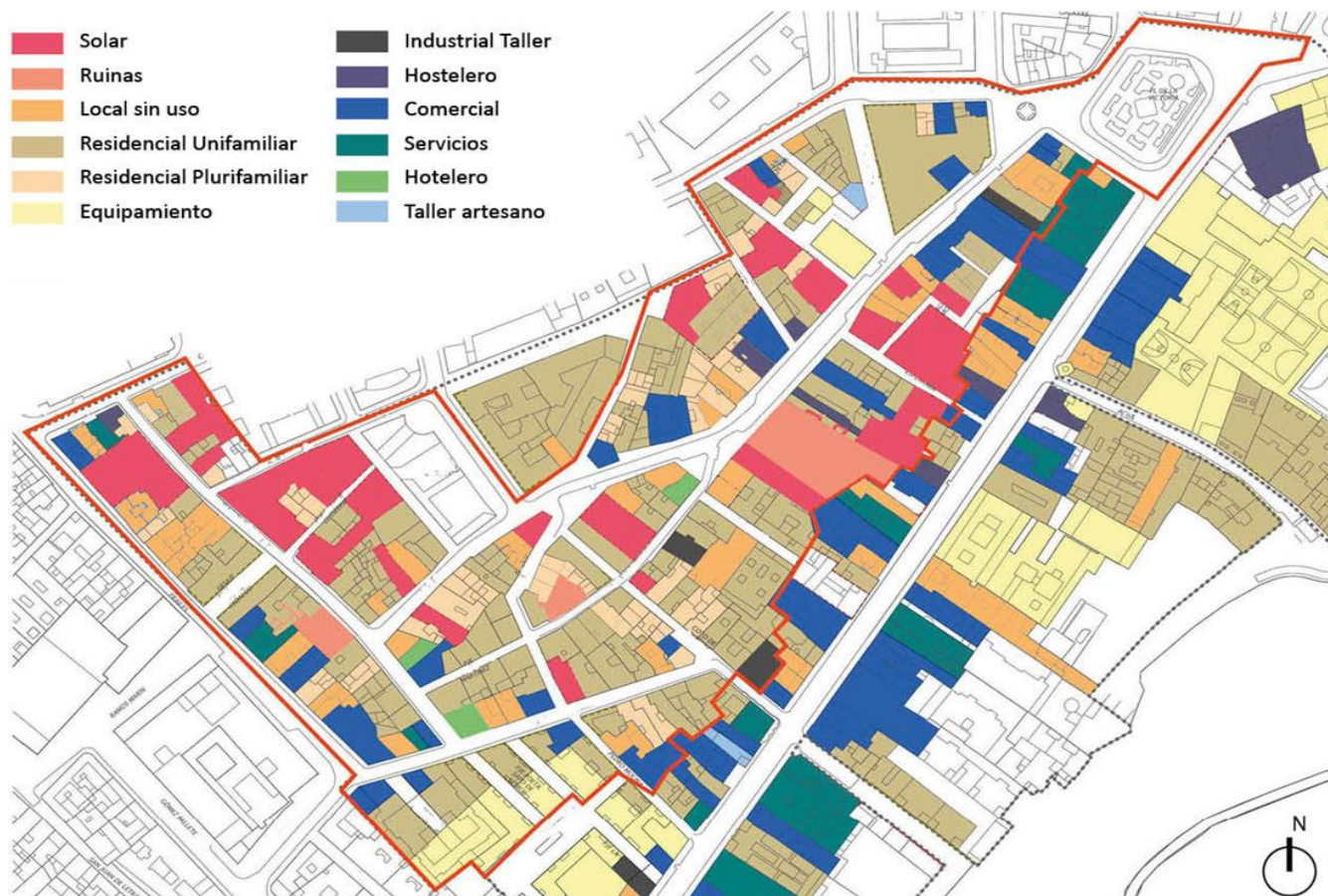
Social challenges are also for great concern. The population of the city as in many other European cities is aging the city there are several concerns about the aging population, youth unemployment and lately the rise of poverty in certain sectors.

In the economic area the city has been able to diversify activities from tourism and construction and implement a hub for the technological companies, the Málaga Tech Park. This park provides services to tech companies from abroad that are eager to relocate some of their services in smaller size city less congested.

The Las Yucas Urban Garden is in the Lagunillas Neighborhood with a particular landscaper context. The neighborhood is made up of 272 plots, of which 219 are built and 53 are empty plots, representing 80% and 20% respectively of the total. That is, 20% of the plots lack a building, so they cannot host any activity. In addition, there are many abandoned or unused commercial premises.

Of the 219 built-up plots, 868 dwellings are quantified, of which it has been found that 582 (67%) are inhabited, 107 (12%) are uninhabited, and of 179 (21%) no information has been obtained. Therefore, residential use constitutes the majority use of the neighborhood and a large part, 32% of the total of these homes, have been dedicated to tourism purposes.

### Residential use in Lagunillas



Lagunillas is a very central neighborhood in the heart of the city, but somehow the access is quite difficult because it lays behind long housing blocks. This neighborhood was built centuries ago without proper planning resulting in very narrow streets and small edifications, many of whom are closed or abandoned making an area of social exclusion.

The areas of social exclusion, defined by the regional government, are those territories with a high concentration of excluded households. Many of those household are in the Downtown district and are basically made up of five neighbourhoods: Capuchinos Sur, Cruz Verde-Lagunillas, Ollerías, Perchel Norte and South Trinidad are the urban areas that border the so-called “almond” of historic city center.

**From the 70s**, the neighborhood began to reduce its population. Many of its inhabitants were relocated in other areas of the city due to the problems of ruins in their homes. Most were abandoned. It entered the vicious circle that is repeated and again in degraded neighborhood: less population, less attention, less resources, more problems.

**In the years 70-80**, the historic center, on either side of the river, is in full stage of deterioration and urban abandonment, resulting in an escape from good part of the population towards the periphery, where they find better urban conditions to live.

In the center it is mostly what was called "population trapped" characterized by a low level of income that prevented them from buying or rent homes in another neighborhood.

Following the floods of **the years 87 and 89**, the eradication of traditional housing begins and a policy of construction of transitional neighborhood in the outskirts of the city begins, being from 1995 when the suburbs begin to consolidate its urban and housing renovation, with new and modern buildings but supporting a high construction and population density.

From this whole process, the consolidation of three large segregated urban areas results, bordering and enclosing the noble zone of the historic center, constituting today a threat to social cohesion and the integral development of the city.

The group that predominates in most of the exclusion zones would be framed as a lower working class, which resides mostly in the field of social housing. A large percentage of this social aggregate falls within the parameters that define the groups at risk of social exclusion and the “subculture of marginalization”.

In the defined exclusion areas, 19,209 people reside, which represents 23% of the population of the Central District, distributed in 7,681 families and living units. 27.5% of families and living units live in social housing (2,109 families of 7,681).

Truancy affects 10% of the school-age population mandatory, a situation that poses a worrying threat to the future of a significant number of minors from social exclusion zones.

The environmental needs are also high. Over the last 20 years the useful urban green areas per inhabitant have improved markedly since 1.35 m<sup>2</sup>/hab. of 1995 (or earlier in 1980, when the first General Planning of democracy begins, 0.4 m<sup>2</sup> /hab.). In the data included in the 2015 Urban Agenda, the useful green surface / inhabitant in the city is 7.10 m<sup>2</sup> / room, establishing a 10 m<sup>2</sup> target (the O.M.S. recommends between 10 and 15 m<sup>2</sup> per inhabitant). Without However, although the area of parks and gardens is important, it is more important its situation of proximity to the population.

About the whole scope of action, the zone indicator Greens exceeds the municipal average with 12.90 m<sup>2</sup> / hab. mainly due to Park of Malaga and Mount Gibralfaro. In the case of Mount Gibralfaro, an ecosystem with high natural value, the sector requires interventions of reconditioning and enhancement. The Gibralfaro Special Plan has received provisional approval and stands in the final approval phase. The Plan contains specific management objectives and guidelines for the protection, conservation, and maintenance of the mountain environment, as well as to enhance its territorial and environmental uniqueness.



If we descend to certain areas, the situation is quite differentiated between the Old City, the Ensanche Heredia and the Port, and the rest of the areas, Arrabales, the Ejido and Trinidad-Perchel. As in other issues these three areas are clearly in an environmental situation, just like the socioeconomic, much inferior.

Thus, in Arrabales, as in Trinidad Perchel, the Ensanche Heredia and the Ejido, the provision of green areas per inhabitant is below the optimum settled down. Therefore, it is necessary to propose actions that allow recover existing spaces, and as far as possible, study the possibility of creating new green areas within the limitations of the sector due to its historical urban configuration.

Another factor to consider is the proximity of the population to at least one useful green area or space, understood as those spaces of stay for citizen use, such as squares, gardens and large green areas like parks or walks. It is desirable that natural spaces be close to the citizen and therefore are integrated in the area urban consolidation of the city, so that the population can access to them covering short distances, since this distance clearly influences in which citizens can enjoy daily or with some regularity of these areas.

In Lagunillas, there are several places that have a high degree of physical and functional impairment and therefore, require actions of remodelling and reconditioning. The places that require intervention are Plaza Miguel de los Reyes and Plaza de la Victoria, known as the Plaza de los Monos (Monkey Square).

The economic activities in Lagunillas are not very abundant (12%) and are concentrated in the upper part of Lagunillas street, and in Frailes street with the southern part of Huerto del Conde Street, next to the Merced market, as a complementary trade of this market. There is also a small concentration on the corner of Cruz Verde and Frailes, being here the only local business in the Green Cross, apart from another small business in Altozano street.

The high percentage of unused premises stands out (18%), which together with the large number of lots (20%), means that 38% of the neighbourhood's ground floors are without any activity. The premises without activity are related in most cases to abandoned buildings.

### **STEP 3 Embedding multiple functions into the planning, delivery, and stewardship of the nature-based solution**

The planning phase is crucial in the development of the exemplar and must follow a cocreation and coproduction process with all the actors involved. In this coproduction process the area where the nature-based solution needed first to be defined and designed. The plot that was implemented was subdivided in three plots, each plot to be used by a group of persons generating benefits for three different groups (schools, neighbours, and seniors). The landscape context was of an abandoned plot in a neighborhood, so the possibilities of improvement were important. From there on, the design was made, the elements to plants and the compost to use were all decided in this phase and the use of the plots were also determinate in this phase. The urban garden is then designed to provide educational and social benefits and minimising trade-off, since the subdivision and the timing will entitle all the groups from benefiting of it use equally. Another cobenefits from this nature-based solution is that nice and beautiful garden has been created from an abandoned plot.

The transition from technical planning to technical delivery was well managed since the Nature based solution cluster was among the coproduction process in the planning phase. Even though some adjustments had to be made with the delimitation of the plots and the plants. Those adjustments were considered during the coproduction meeting.



## STEP 4 Monitoring and evaluation

Stewardship phase must make good use of the information related to the use of the natural based solution. The main tool here is to monitor and evaluate the correct use of the green spaces distribution, the water management, the plants turnover, and educational value through the selected indicators and focusing on the primary benefits of the urban garden. Benefits must be steady and align with what was initially planned. In the stewardship phase, management was assigned to the environmental department to set initial evaluation of the plot, but the idea was to shift it slowly towards the associations and the local participants from the senior projects. This shift needs also to be monitored to measure the overall success of this measure.

Benefits may vary over time, but the technical solution aims at reducing costs and maintenance costs over time since monitoring the nature-based solution should end up maximising its benefits and reducing its cost in the long run.

## STEP 5 Build an evidence base to promote nature-based solutions to a wider catchment

Technical barriers may arise when the stewardship management does not have the skills to evaluate properly technical solutions and then cannot apply proper changes to avoid trade-offs. This can incur in a raise of the costs of maintenance or in a loss of interest for the activities managed in the plot.

The participatory process is key to get in the right tracks for the planning delivery and stewardship of the nature-based solution since all the experts are involved in the process from the beginning. In the planning phase is extremely important in the selection and planning of the exemplar since all the work is going to be related to the right selection of the right elements to have a soft transition from planning to implementing and then monitoring the results.

## GOVERNANCE

### ***STEP 1 Make the case: aligning nature-based solutions with the wider goals of a city or a community***

The urban department owns all plots and parcels belonging to the City Hall. And within the city hall several departments can call for responsibility. Here the land belonging to the city Hall is managed by the Urban Planning department, but sometimes like in the cases of gardens and parks, management of the land relies on the environmental department. What happens is that Urban planning department is responsible for the classification of the land in several categories depending upon its use. In this case the land has been classified as green land, meaning the purpose of the land must be for green spaces like gardens and parks. Once this is established, the ownership is shared with the environmental department since the purpose of the land is to be an environmental asset but also because the garden and the park need to be built and maintain and that is a task performed by the Environmental department. In some other case figures maintenance of the gardens and parks are subcontracted to private companies though public procurements. It is also important to ensure collaboration from other departments or other institutions to secure the right activities and to be able to carry out those activities.

In the case of Urban Garden La Yuca, the plot was already formally integrating in the PGOU which is the General Urban Planning Plan, a general planning instrument defined in the urban planning regulations of Spain as a basic instrument for the comprehensive planning of one's territory. Since the adoption of the strategic plan the city of Malaga has developed many comprehensive plans to tackle the development of the city in all the aspects (see all the plans in annex)

Since the strategic plans the city of Malaga has acquire compromise with sustainability. In March of 2015 the city approved in the city council plenary the revision of Urban Agenda for the city. Revising and updating the Malaga Urban Agenda also had the assumption of a strategic framework for the city, as indicated in the Association Agreement between Spain and the European Commission. Since then, numerous plans have been developed by the city to fight climate change and therefore to improve the life of its citizen. The Urban Agenda is a strategic plan that seeks to promote integrated sustainability strategies until 2050 where it should reach the zero-emission goal. (<https://www.omau-malaga.com/agendaurbana/>)



The 2050 Forum is a working group made up of citizens, public and private entities, and the local administration, through which a participatory process is established that allows collaboration in the development of the sustainability strategy of the city of Malaga with the objective to provide a participatory and transversal perspective. This 2050 Forum is structured into four working groups that coincide with the thematic blocks of the Malaga Urban Agenda:

1. Territory and city configuration
2. Natural resources management
3. Social cohesion and economic development
4. City government
5. Indicators

The Malaga Urban agenda will substitute the Malaga agenda 21 which was the previous agenda for urban planning and sustainability. The new agenda contains 5 blocs, the first two have issues related to the environment.



**2050 Forum working group**

The government of the Community of Andalusia has committed itself to the progress of the objectives of the agenda 2030 of the United Nations through the elaboration of two specific strategic plans: the Andalusian Strategy for Sustainable Development 2030 (EADS 2030) and the Andalusian Strategic Plan for the fulfilment of the Objectives of Sustainable Development (Agenda 2030 Andalusia). The Andalusian Strategy for Sustainable Development 2030 (EADS

2030) has been conceived as an indicative instrument of public and private policies by defining lines of action and measures based upon two axis, the promotion of green economy and the strength of social cohesion.

At the National level the Spanish government approved in 2018 the Action plan for the Implementation of the 2030 Agenda for sustainable development. This Agenda represents a plan for the people, the planet and prosperity. This inclusive plan has been carried out with the participation of all the ministries of the National government, the regions and the autonomous regions, the Unions, local entities, public administrations, academics, and civil society as it was aiming to reach maximum consensus. A year later the Spanish Urban agenda (AUE) was approved in the Minister council of Spain. This Urban Agenda is drawn up to fulfil several commitments made by Spain in various international agreements: the Agenda for Sustainable Development 2030; the New Urban Agenda of the United Nations and the Urban Agenda for the European Union. The Spanish Urban Agenda is a national urban policy, a strategic and non-regulatory framework, which seeks to guide the decisions and policies that affect the territorial and the urban planning with a global, integrated, and continuous vision in time. Besides the Spanish Agenda tries to focus on a new vision of Urban planning. The main contents of the documents are: A diagnosis of urban and rural reality; A strategic framework structured around 30 specific objectives and 291 lines of action; A system of indicators that will allow the evaluation and monitoring of compliance with the objectives; Some fact sheets that illustrate how action plans can be drawn up for the implementation of the Spanish Urban Agenda and An Action Plan for the General State Administration with specific proposals from the sphere of state powers. One of the proposals approved has been the creation of a ministry of ecological transition to fight against old and conservative policies develop sustainable policies and align new environmental policies to the SDG's. It is true that this agenda will certainly require improved versions as the different actors incorporate new implementation processes and mechanisms.

The urban Garden La Yuca itself is a small part of the big picture but it represents a new way of doing thing. In this case the urban garden align itself with several United nations sustainable goals



**Goal 2: Zero Hunger:** The Yuca garden produces vegetables that can be eaten o sold out by the Lagunillas neighbours with low income.

**Goal 3: Good Health and wellbeing:** One of the main objectives of the Yuca Garden. Gardening is good as a moderate and healthy activity that bring wellbeing. Besides gardening in a community Garden also helps to fight loneliness

**Goal 4: Quality education:** The garden will host classes to teach children about the autochthonous plants and insects from the city.

**Goal 10: Reduced inequalities:** Like goal 3 in the sense that community garden like the Yuca garden help increase social cohesion and fight loneliness mainly among elderly people.

**Goal 11: Sustainable cities and communities:** Urban gardens can contribute to the community as spaces to meet people and improving neighborhood and sustainable cities by increasing green spaces. Malaga has increased his green spaces from 0,4 square meters per inhabitant in 1980 up to 7 square meters per inhabitant in 2018.

**Goal 12: Responsible consumption and production:** Urban Garden enables for small scale production and natural consumption with low carbon print since small production are made to be consumed by the locals

**Goal 13 Climate action:** Urban Garden helps mitigate heat islands in hot summer days and provides shades to people.

**Goal 15: life on land:** Organic agriculture and autochthonous insect increase biodiversity of the area. The Yuca Garden not only has been set to have autochthonous plants, but it is also home for insects from the area.

## STEP 2 Current status of the location: identify the current use, ownership, and management of where you want to implement your nature-based solution

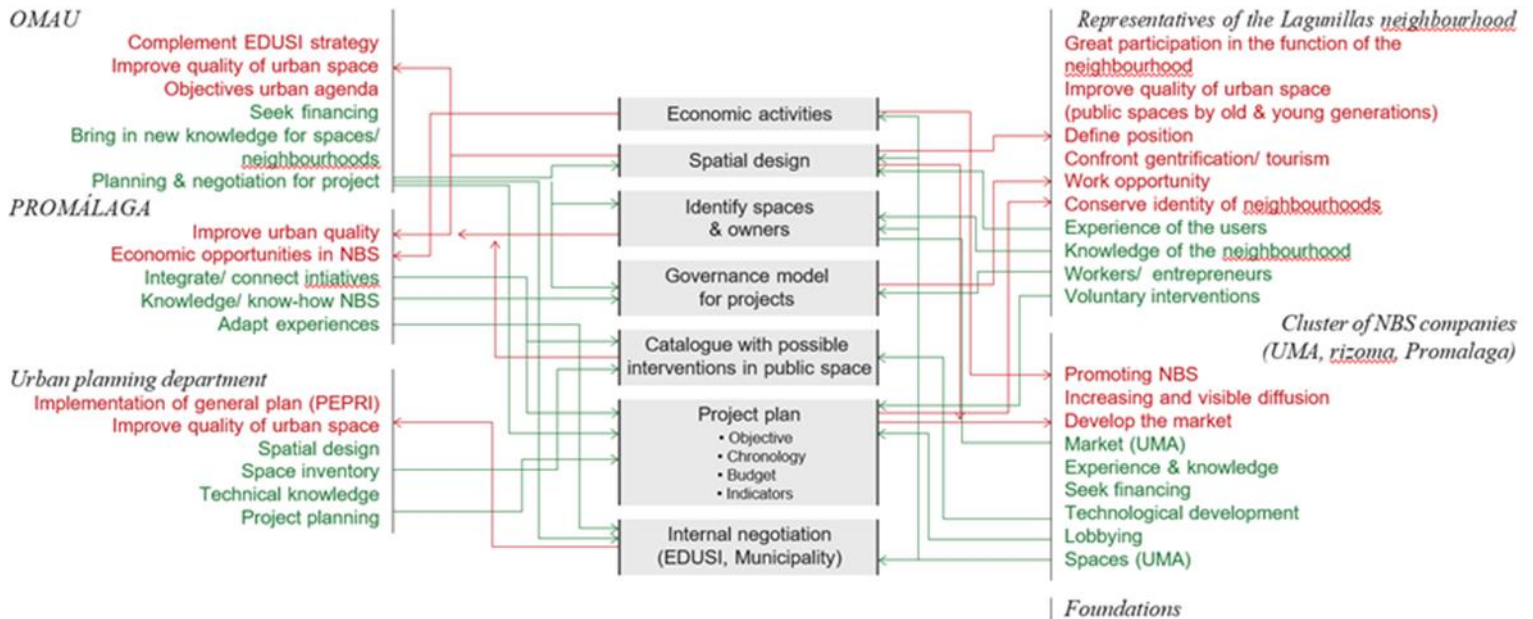
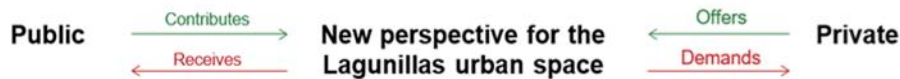
The Yucca Garden was a space in transition. The Garden has been used in the past as a recreational space for the neighbours to meet. Then the garden became an orchard garden where people could go there to plant some vegetables for proper consumption or to sell on street markets.

Now the garden has been transformed in an educational and recreational area for the residents of Lagunillas. The Yucca Urban Garden has been divided in three distinct areas to host different activities. There are many activities happening in the **Las Yucas Urban Garden**, from educational classes for children, workshops for neighbours, meetings to realize some physical activity through gardening makes that the space is used by the following actors:

- Environmental Area from the City Hall.
- Seniors' citizen from the Lagunillas Neighborhood.
- Urban Land (ASPA) Main energizers of the Yucca Urban Garden.
- Fantasy Lagunillas (they carry out workshops with children, they work with 4 schools in the area)
- Cluster NbS. Execute the project (Advice, participation, and training)
- Lagunillas Neighbours Association.
- Children from schools nearby.

The space is owned by the City of Málaga, who lets it for a period to private companies or to Institution to run it. The space is currently managed by the Environmental Area from the city Hall along with Urban Land (ASPA). The plot belongs to the city, but it can be transferred to a private organization for its exploitation, within a framework of very common public-private collaboration.

## STEP 3 Who are the required partners: identify all relevant partners and bring everyone together to co-create a vision and goals for the nature-based solution



There are several central actors and partners that are key in the development of a nature-based solution. It is important to consider the process design principles of inclusivity, openness, and legitimacy to ensure the credibility of the project. In the planning phase the OMAU is of great importance to plan in a coproduction way with all the other actors. Usually, OMAU sets the bases of the project in accordance with the other partners involved like Promalaga, NBS cluster, Environmental department, Promálaga and Urban Planning for the public stakeholders and Rizoma Foundation, UMA, NBS Cluster and associations for the private side since public-private collaboration model is a mixed model often used by the city. In this stage the plot is planned, the activities selected and the budget and resources are allocated depending upon a previous study from an NBE to estimate the cost of planning, delivery, and stewardship.

The execution phase carried away by the Nature based enterprises from the cluster. In this phase the Natured based companies followed the guidelines that have been established during the planning phase and report all the coproduction process.

problems they may encounter to the other partners to be later discussed. At the end of this phase an evaluation is done by the partners in a coproduction way to see if the initial planning was would still work. Here it is important to review the output design principles resulting from



coproduction like actionable knowledge for policy making and planning, usable knowledge and empowerment for valuable outputs and Institutions to connect and strengthen agendas within the city.

In the stewardship phase some different actors are involved for the maintenance and the monitoring of the results. This is completely different from the way it is normally done. A traditional evaluation will look upon the initial planning to see if the execution coincides with the planning phase and will allocate the resources initially planned instead of the ones resulted from the stewardship monitoring.

In this case the stewardship phase demand to start with the maintenance of the Garden and monitor the objectives through the set of indicators previously establish but not set in stone since this process always changes. The analysis of the results may vary and demand a reflexivity process to adjust.

#### **STEP 4 How will you work together? Develop and agree a collaborative governance framework so that the different partners work together effectively, sharing roles and responsibilities**

This is a process and an exercise where all partners will share responsibility in the development of the exemplar. It is also to say that collaboration is frequent in the city, but the usual collaborative type is different, it is more vertical with a top to bottom line of command and with less interaction among the people who collaborate. Those people also must report always to the same person in the line of command.

Here the idea is to make a group where actors are involved throughout the process and will play a role in the development of the exemplar. OMAU will do the planning along with the other partners and will assume the leading role. The cluster will do the delivery of the exemplar. Urban planning will let the plot and collaborate with Environmental department in the stewardship phase for the maintenance. Promalaga will check upon the process and the right procedures to follow and ensure the coproduction and governance process and the different associations will design the schools' programs and the activities for the elderly.

#### **STEP 5 What will you need to succeed? Identify conditions, skills, and reflexive learning capacities to ensure ongoing success**

The city has already gone through different Nature based solutions project. Maybe here in the south there is a different line of command that usually works with a responsible figure that will be accountable for the work. This figures usually has a team and can look for collaboration in another department to develop a product.

With Nature based solution the focus is different. Here a team with different specialists will be crated to develop the same product.

To ensure success it is important to follow h guidelines stated in the coproduction guidebook which are the following: "Inclusivity to bring together different actor of equal knowledge, openness to adopt integrate and share knowledge throughout the process and legitimacy to ensure that the process is credible.

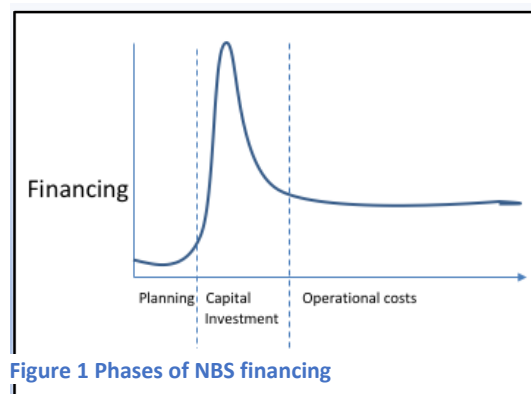
In this changing world, process and procedures are changing frequently and collaboration has gone from being occasional to be almost compulsory. It is evident than in a collaboration several people will come out with better ideas, and they will be able to collaborate to polish the plan or ideas in a much more efficient way. Collaboration also empowers people and helps them work in a more relax and effective manner since success is shared but failure is also shared.

Neutral organisations are important to build trust. We have in Malaga the case of Ciedes foundation, a private non-profit organisation composed of the main institutions and entities of the city. Created in 1994, Ciedes is seen as an example of all institutions and the main economic and social agents of a city joining forces to work together on strategic planning and urban development.

## FINANCE AND BUSINESS MODELS

### Objectives of this section:

Connecting Nature identifies three distinct phases in the planning and implementation of NBS from a financing perspective. Specific financing is required for the planning phase, the capital investment phase, and the operational phase of NBS. This section of the framework document focuses on identifying sources of financing required for the up-front NBS capital investment costs and the development of a sustainable business model to identify how the ongoing operational costs of NBS will be covered. The costs of financing the planning phase are not covered in this document.



The objectives of this section for cities are to:

- Build an understanding of how NBS have been financed to date in cities and current NBS business models.
- Encourage cities to identify opportunities for innovation in the financing and business models of future NBS.
- Provide cities with tools to support the planning of new approaches to financing, business, and governance models of NBS.
- Capture learning throughout the implementation process and through reflexive monitoring to identify appropriate adaptation and change strategies.

### Format:

The format for this section encourages cities to follow a series of four steps in the planning and implementation of financing, business, and governance models for NBS.



Figure 2 Steps in Planning & Implementation of NBS Financing, Business & Governance Model

## Step 1: Lessons learned from how NBS has been financed in each city to date

### How the capital expenditure costs of NBS have been financed to date in your city?

Up to date capital expenditure costs are financed by the city hall areas. The city Hall is currently divided into 8 areas. Each one of these areas prepares a Budget with an expense forecast for the following year. There are several different types of expenses depending upon the characteristics of the expense. In the case of connecting nature:

- Infrastructure costs for new investments and developing new activities.
- Public procurement costs to develop new activities or to support existing ones.
- Personal and material costs will be used within other costs to quantify general costs of developing new projects.

- Expertise and evaluating costs as part of the technical costs of developing and maintaining projects.
- Community campaign costs are needed to sensibilise the population area and to inform on the projects and developments that are going to take place in the area.
- Community works will be at a second stage to see if the project can be run and maintain by the community
- Educational and training costs are needed to carry on the projects with good practices and knowledge on what needs to be done.

OMAU is the overall coordinating body for this process; other partners include CIEDES (indicators), other partners such as Promalaga, OMAU submits projects to city hall for funding. City Hall can ask OMAU to develop projects and OMAU can submit suggestions for funding independent projects funded by city from own funds (City fiscal budget, taxes etc) comes through city planning (feasibility) environment, tourism etc depending on purpose of project.

It is important to say that within the country there are several layers of financing available depending on the type of project, the site of the project and the relevance of the project. In case of capital expenditure local City Hall get support from regional and national government, European funds and sometimes in the case of a public and private cooperation mixed funds.

**Local funds** usually are given to the municipality departments to develop projects but in the case of NbS o green and blue infrastructures like parks and beaches the amount can be divides in expenses in materials, maintenance, and investments.

**Regional funds:** are usually reserved to develop bigger projects in the cities like the Green Ring or the Climate Plan. Several actions can be mixed budget between regional and local governments.

**National Funds:** Usually used for bigger infrastructures and for building o renovate public spaces.

**Private funds:** in Spain, this modality is very rare unless it is made through a public and private partnership

#### • How ongoing operational costs of NBS have been financed to date in your city?

The Operating costs for European projects are usually financed by Promalaga. One of the steps in evaluating a Project is to quantify all the costs and prepare a Budget for the Project where it considers all the different costs that emanate from it. Operating costs will cover daily expenses of creating and maintaining the project going. The goal is to have steady operating costs through creation and maintenance of the project.

For the projects that are not financed by European funds, the city uses to cover operational costs unless is stated otherwise. Like in some housing projects where private companies can cover those costs for grounds maintenance. Another way to cover those costs is through public procurement. Public procurement is used frequently in Spain to subcontract services to the private sector. It is usually done to subcontract full projects or maintenance costs from a project. The are limited in time to four years per contract, then another public procurement process must be made. As far as community management there is no precedent for community managed public spaces.

#### What is the governance structure of NBS in your city - how are NBS managed?

NBS projects get to the city through the OMAU, which is the environmental urban observatory of the city of Malaga. The OMAU looks for the projects that can be developed in the city in function of the needs of the city and the different neighbourhoods. Then the OMAU distributes the projects depending on the nature of it. Projects can go to the environmental area for development and application; they can also go to Promalaga if they must be executed in a certain time frame or if they need an investment in infrastructure or other type of expenses.

The governance usually follows the collaborative model. In the first stage, the local authorities usually set the basis for developing projects and take care of the financing of the projects given the solvency and experience of the public administration.

In a second stage public administration will set the base to collaborate with businesses to involve them in several steps of the project, to get training, expertise, and experience in implementing and running projects. The final stage appears when private businesses can carry on projects with the help and implication of the community.



The City Hall, OMAU, Promalaga confer and collaborate with private entities as well. This is the case of the development of the Yuca Garden in Lagunillas where a private company from the cluster has been commissioned to select and plant the autochthonous plants and to run the maintenance of the garden. In practice City Hall covers and manages Nature based solutions. Looking to move to this collaborative model described above.

**•Who are the key stakeholders involved in financing and governance – internally in your organisation and externally?**

There are many parts that can be involved in financing and governance. Usually, OMAU, Promálaga, the City Hall and the concerned areas are the most implicated in financing and governance within the city at the early stages of project creation or development. OMAU looks for European projects that will fit the needs of the city. The OMAU gets the information from different areas and from the City Hall. With the information the OMAU looks for projects or looks for the best way to develop the existing projects. Usually there is a prior study made by the area or by Promalaga to quantify the feasibility of the project in terms of time and costs. OMAU and Promalaga have internal partners usually city Hall departments to develop and execute projects.

In this same early stage but for strategic development of the city we can have the following organisations involved at the earliest stages of developing projects:

- Ciedes foundation, OMAU
- City development Agency, Promalaga
- Planning Department
- Environmental department
- Politicians, policy maker's
- Monitoring University up front studies

At this stage of the project all the above-mentioned partners must contribute to put together the project and study the feasibility of it.

In a second stage where the local authorities are looking for private partners new entities can be incorporated such as:

- Innovative incubators companies
- Local companies, local business, and shops.
- Clusters
- Cooperatives
- NGO's
- Associations like UICN
- Foundations like the Rizoma Foundation
- Private land owners willing to collaborate.

**•What have been the main challenges and enablers to financing, business models and governance to date?**

In Spain there are three layers of governance, local regional and national. If we consider, the European Union we can reach four levels. In each level there is a financing enabler depending upon the characteristics of the projects. Usually for big projects involving creation and maintaining of infrastructure financing can come from the national or regional level, like the Malaga subway project.

The complexity of governance with its multiple layers and different political ideologies is a challenge – a source of friction and can slow down the approval, planning and delivery of projects.

Some other project can get local sources of financing by the city hall for example. In the case of NBS this financing aims at developing NBS solutions to be applied in the city, by developing new green areas like the aqueduct of San Telmo or the improvement of certain neighbourhoods like the Lagunillas one.

The OMAU in accordance with the city Hall and the concerned areas and Promalaga set the bases in NBS.

Financing in general is quite difficult nowadays and it will depend upon the nature of the project. If the governance model follows a collaborative model that starts with traditional public administration financing projects, the model the stages a network collaboration between local government and businesses to look for capital investment. In Spain this capital can be found in form of:

- Grants or green loans given by the banks
- Funding by Associations like UICN
- Budgetary items by City Hall Areas
- Private funding, local Businesses, shops, etc...

Some other financial sources like crowdfunding can work for other types of financing but it is extremely difficult to crowdfund NBS projects or any kind of projects because the nature of them but also because crowd funding and fundraising are not usual way of financing here, financing is more rigid and means like crowdfunding or fundraising are not that much in use in this country.

**•What is the level of knowledge and skills of the Connecting Nature team in your city from a financing, business model and governance perspective? If skills gaps have been identified, how do you plan to address them?**

This is a difficult question to answer. More that the ability of the Connecting team the characteristics of the project and its benefits are key in all mentioned perspectives. The team should always rely on experts for the development and execution of projects approved by the city. Besides the team can rely on the Málaga Nature based solution cluster to overcome difficulties.

## Step 2: Explore opportunities for innovation in financing, governance, and business models

We can talk about three different sources of financing:

The first source of financing may proceed from European funds like EDUSI or FEDER funds allocated to project proposals with a budget broken down by items as it has been done in the past with several proposals in the city.

Another source of financing is though participatory budgets. This is a novelty and a pilot project in Málaga where the city Council has approved participatory budgets for the people to be able to present projects like parcs, kinder gardens, plants, or other kind of proposal to improve life of residents.

But usually, the city covers upfront capital costs. Those costs occur often at an early stage of the project and generally budgets are planned that way. In other stages usually when we reach maintenance stages the city Hall can pull out from financing and through public procurement designate private companies to take over those costs.

In a second stage capital expenditure costs will need to drift from the public administration to some other organisations like associations, Banks, and businesses. The city will have to somehow develop plans:

To incentivise companies with low interest loans or grants, to develop some volunteering plans in the neighbourhoods, to provide starting budgets to communities and to engaging NGO's and associations.

Recurrent costs are usually periodical, like payroll maintenance, material costs. In the case of NBS once the city reaches level 2 or 3 in governance some actions could be taken to reduce those costs like for example:

Choice of plants and trees to reduce costs but also to boost production that could later be sold out to private parties.

Finding free volunteers will help reducing the cost of maintenance as well as improving lives of those volunteers.

Cooperatives could bring expertise in means of production.

Implementing new technologies will also optimise production at a lower cost.

Charging a fee to users like a lease.

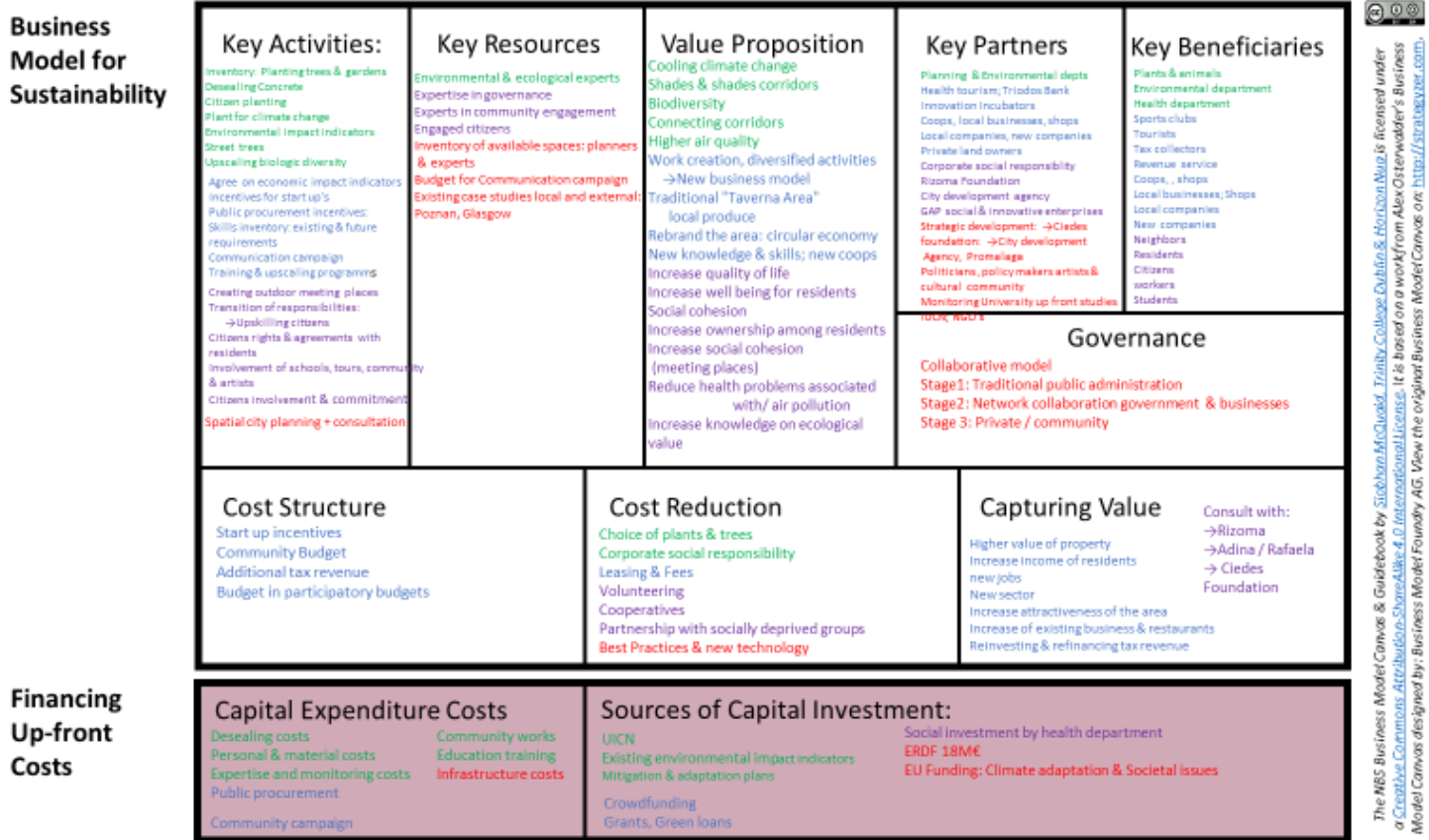
Selling products of the urban gardens could also help

Have you identified and changes in governance models which you would like to explore in future NBS e.g., new organizational structures/stakeholders who could be involved in the management of future Nature based solutions? It will be difficult to change governance models for governance management since the city planning belongs to the local authorities. In the field of Nature based solutions the city could involve environmental organisations or environmental companies to take over projects. These organisations have a know-how on developing these projects because they have the skills to do so. They can also work on budgets reduction through expertise and new tools like the circular economy.

Step 3: Planning the financing and business model of Connecting Nature NBS exemplars

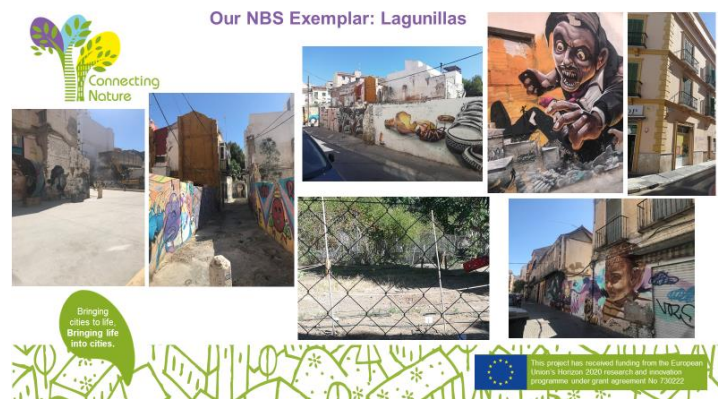
Version 1: Promalaga BMC for Lagunillas exemplar (following workshop but prior to analysis of poll results)

Figure 3 Business Model Canvas and Financing Plan for NBS exemplar(s)



The NBS Business Model Canvas & Guidebook by Sinead McGlade, Trinity College Dublin & Horizon NBS is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. It is based on a work from Alex Osterwalder's Business Model Canvas designed by: Business Model Foundry AG. View the original Business Model Canvas on: <http://strategyzer.com>.

## Brief Description of exemplar



Lagunillas is a neighbourhood of Malaga which is very close to both the historic (and touristic centre) and the university. However, to date the Lagunillas has been overlooked in terms of development and has many derelict and vacant spaces often walled up and covered in (amazing) graffiti. There is a strong community spirit which was galvanised through a local artist who inspired a lot of the graffiti. There is a strong resistance to real-estate developers coming in to the neighbourhood as gentrification has already started to occur with rents going up in the area and short-term accommodation being offered.

The city of Malaga has identified this region for development in their current development plan and an NGO - Rizoma has completed a survey of approx. 1000 residents in the area to find out what they would like in terms of development. One idea of the city is to engage citizens in NBS e.g., reopening the derelict spaces to create a network of pocket parks (NBS) and encouraging citizens to use the characteristic balconies of the area to create green corridors connecting the pocket parks with the larger green areas around the University and the city centre area. Promalaga is interested in exploring how Nature based solutions in this area can be used to reskill construction and unskilled workers, to address high youth unemployment and to expand from NBE into other activities supporting a green circular economy. The area already has a lot of shops which 'fix stuff' so repair, recycle & reuse services could be encouraged to develop in this area as a complement to Nature based solutions. In one of the photos, you see a shop selling organic produce – the idea would be to explore how this could be perhaps connected with local community gardens which may also be developed in some of the vacant spaces. Finally, just to mention that Lagunillas also borders with another area called Cruz Verde where several social housing projects have been built to accommodate migrants and other lower income communities. There have been some lovely community projects in this area encouraging residents to improve this area through planting internal gardens.

Brief explanation of major elements/assumptions:

### 1. Value proposition: how will your exemplar create environmental, social, economic or any other type of value?

The NBS will address **social issues** by providing access to connected missing green spaces through Lagunillas with a core focus being to improve health and Quality of Life of the community living in the area. It is expected that the pocket parks created will provide a space for people to connect, interact and for some, participate in urban gardening projects together. Feelings of isolation should be reduced, and intergenerational relations will be improved through providing a combination of seating and play areas. The **Environmental Value Proposition** should address issues such as the heat island effect – providing much needed shade and vegetation to cool the heavily concreted exposed surfaces currently in place, the green corridors envisaged will support biodiversity and provide safe pathways for residents to traverse during high temperatures and the increase in vegetation should also have an impact on the air quality in the area absorbing emissions and dust particles from the heavily trafficked streets bordering Lagunillas. From an economic perspective the planned NBS will provide opportunities to address regeneration in a way that is sensitive to the

communities that already live there. The area has a strong tradition associated with recycling and upcycling – fixing. The circular economy will feature strongly in the development plans for the area and jobs in these areas and in nature – based enterprises will be the focus of our economic strategy.

There is a real fear among residents that the area will become gentrified – that rents will rise pushing families out and the area will be sucked into the tourism offering of Malaga – Air BnB offerings instead of apartments to rent for families is an example. Any redesign and implementation of a Nature based solutions exemplar will consider and mitigate in so far as possible against this type of gentrification activity.

## 2. Value creation:

- a. *Key activities and resources*: what are the most important services or activities which need to happen to deliver the environmental, social, economic value?

From an **environmental perspective** key activities that must be undertaken is to map out the areas in Lagunillas that are vacant – identify whether they are publicly or privately owned and enter negotiations with the land owners to create community services such as pocket parks on these sites. From there a design plan for the area is needed with special consideration being given to the type of planting that will be required to provide sufficient shade, increase biodiversity and ensuring that appropriate native species suitable for growing in this part of the city are planted. Environmental indicators to measure the impact of the planned activity need to be identified.

From a **social perspective** the key activities identified include the development of relationships with local communities - identifying the different residents associations, community and cultural groups, schools and other groups who will stand to gain directly from the redevelopment of the Lagunillas area. It is vital that their buy in and support for the plan is harnessed at the outset and that they are equipped with the necessary capacity building skills to ensure their voice is heard through this process and beyond. Agreements between the city and citizen groups may need to be entered.

From an **economic perspective**, an inventory of existing skills and a plan for future skills required in the area needs to be developed. If the plan to develop Lagunillas a champion of the Circular Economy, opportunities for new businesses and start up's need to be identified that come under this remit. The feasibility for supports for new business (tax incentives, start-up grants etc) need to be examined and if necessary, enterprise support programmes and actions like fairs to sell products need to be put in place to stimulate the local economy in the area. The economic indicators to capture the intended outcomes from the economic value proposition will have to be identified and measured

- b. *Key partners and beneficiaries*. Who needs to be involved to deliver the different value propositions? What is your city's 'ideal' governance model for the long-term management of the NBS e.g., city-managed, or citizen-managed?

- *City of Malaga* – Environmental and Urban Planning departments – Environmental department will have a central role in the design and possible implementation of the Nature based solution. Urban planning is important for land use and land management.
- *IUCN Mediterranean* (headquarters for the Mediterranean area are in Malaga) instrumental in establishing a NBS cluster in Malaga – can provide expertise and guidance on optimum Nature based solutions for the area. The person in charge is Andrés Alcantara
- *University of Malaga* – Also a founding partner of the NBS Cluster. Experience in implementing NBS and can provide expertise in environmental monitoring. The Uma through its area of Smart-Campus (directed by Raquel Barco Moreno) has developed the green island project aiming at giving extra green spaces and shades to students on Campus.
- *Nature Base Solution Cluster*. With a mix of private and public companies from different activity sectors it could provide expertise and resources to the development of Lagunillas.
- *BioAzul* is a company with experience in Nature based solutions and could provide expertise

From a social perspective the following partners have been identified:

- Rizoma – NGO active in Malaga currently conducting a needs analysis of the community in Lagunillas. Expertise in community development, skills facilitation, and capacity building.
- Any other NGO's, community groups, residents, and neighbours (Association Fantasia, association neighbours of Lagunillas, Association Lagunillas Cruz Verde, Association Lagunillas Por Venir
- Local health centre to measure the impact on health.
- Local and elected politicians from the districts that usually are aware of the problems first hand from the neighbours.

From an economic perspective the following partners have been identified:

- Local businesses – repair shops, local tavernas, craft shops etc (Association of businessman of Lagunillas)
- Chamber of commerce
- Local Co-ops
- Social enterprises active in the area
- Enterprise support agency
- Corporate and social responsibility departments of Banks like Triodos Bank or La Caixa.

Other partner who needs to be invited include:

- OMAU – projects broker, collaborate with City and Promalaga to identify, source funding and implement projects
- CIEDES Foundation – strategic development role.
- Promalaga which is the Malaga local development agency.

### 3. Value capture

*a. Cost structure – what are the major ongoing costs associated with delivering key activities?*

We identified the following cost structure and opportunities to reduce costs for the Lagunillas district. Ongoing costs such as personnel and materials, monitoring for impact measurement and continually working to increase the capacity of residents in the area to enhance their sense of pride, and encourage them to take ownership of this NBS and manage it for the community good. We also looked at ways of funding these costs by identifying funding through participative budget programmes, introducing tax incentives into the area or encourage start ups and using the tax revenue generated for these start-ups to finance part of these ongoing costs.

*b. Are there opportunities to reduce costs e.g., through volunteers?*

Cost reduction measures can be utilised through the careful selection of appropriate planting and vegetation; working with corporates to implement CSR programmes in the area that will help maintain the NBS and perhaps introducing opportunities to adopt a tree, or a park and take responsibility for the ongoing maintenance and care.

*c. Capturing value- what does success look like? How will you know if you have succeeded in delivering your value proposition e.g. economically – is direct revenue generated or new business supported? What are the indicators for capturing social or environmental value?*

The indicators have yet to be identified using the Connecting Nature Indicator as a basis. Impact measurements required by EU funding programmes if used for this exemplar will also be used to measure success. (Check chapter 7 on impact assessment to see chosen indicators)

## Version 2: BMC following analysis of poll results

NbS Model Canvas City of Malaga				
Key activities	Key resources	Value proposition	Key Partners	Key beneficiaries
Inventory: Planting trees & gardens Decealing Concrete Citizen planting Plant for climate change Environmental impact indicators Street trees Upscaling biologic diversity Agree on economic impact indicators Incentives for startup's Public procurement incentives: → Carrot + stick skills inventory: existing & future requirements communication campaign Training & upscaling programms Creating outdoor meeting places Transition of responsibilities: → Upscaling citizens Citizens rights & agreements with residents Involvement of schools, tours, community & artists Citizens involvment & commitment Spacial city planning + consultation	Environmental & ecological experts Expertise in governance Experts in community engagement Engaged citizens Inventory of available spaces: planners & experts Budget Communication campaign Existing case studies local and external: Poznan, Glasgow	Cooling climate change: covenant of mayors Shades & shades corridors Biodiversity Connecting corridors Higher air quality Work creation, diversified activities → New business model Traditional "Taverna Area" local produce Rebrand the area: circular economy New knowledge & skills; new coops Increase quality of life Increase well being for residents Social cohesion Increase ownership among residents Increase social cohesion (meeting places) Reduce health problems associated with/ air pollution Increase knowledge on ecological value	Planning department Environmental department Health tourism Triodos Bank Innovation Incubators Coops, local businesses, shops Local companies, new companies Private land owners Corporate social responsibility Rizoma Foundation City development agency GAP social & innovative enterprises <b>Strategic development:</b> → Ciedes foundation → City development → Agency, Promalaga Politicians, policy makers artists & cultural community Monitoring University up front studies IUCN NGO's	Plants & animals Environmental department Health department Sports clubs Tourists Tax collectors Revenue service Coops, , shops Local businesses Shops Local companies New companies Neighbors Residents Citizens workers Students
<b>Cost Structure</b>	<b>Cost reduction</b>		<b>Governance</b>	
Start up incentives Community Budget Additional tax revenue Budget in participatory bases	Choice of plants & trees Corporate social responsibility Leasing & Fees Volunteering Cooperatives Partnership with socially deprived groups Best Practices & new technology		Collaborative model Stage1: Traditional public administration Stage2: Network collaboration government & businesses Stage 3: Private / community	
<b>Capital expenditure Costs</b>			<b>Capturing Value</b>	
Decealing costs Personal & material costs Expertise and monitoring costs Public procurement Community campaign	Community works Education training Infraestructure costs		Higher value of property Increase income of new residents new jobs New sector Increase attractiveness of the area Increase of existing business & restaurants Reinvesting & refinancing tax revenue	Consult with: → Rizoma → Adina / Rafaela → Ciedes Foundation
			<b>Sources of capital investment</b>	
			UICN Existing environmental impact indicators Mitigation & adaptation plans Crowdfunding Grants, Green loans	Social investment by health department ERDF 18M€ EU Funding Climate adaptation Societal issues

The initial exemplar and the final exemplar are very similar, but some changes appeared in key activities, key resources, key partners, and key beneficiaries. Some changes also affect the cost structure, the cost reduction, capturing value and sources of capital investment

The value proposition is still the same as in the first business model canvas, the changes are in other blocks with no effect in the prioritization of environmental, social, economic propositions. Some of the changes are due also to the pandemic that has been disastrous in all the aspects of the development of the exemplar. The development of the exemplar did not get a communication campaign to disseminate the activities of the Yuca Garden nor we were able to establish and disseminate information about the training programs and educational courses that were initially planned. Same happened in the key resources with the communication campaign and dissemination as a resource. Due to covid, most activities have been cancelled then it was a nonsense to disseminate information.

Key partners has change substantially from the first BMC. For the planning development and stewardship the partners involved in the the urban garden la Yucca were, Urban planning department, environmental department,

OMAU, NbS cluster and Promalaga. The governance model remains a collaborative model between Institutions, public administration, associations and private companies. This collaborative model is based on a public- private collaboration much to the liking of the local administration.

Key beneficiaries ended up also having some slight changes since sport clubs, tourists, tax collectors do not benefit from the urban garden la Yuca.

The key activities remain the same as planned as well as the financing aspect of the Garden financed integrally by the municipality. In order to deliver the exemplar, securing financing with the public administration is key and a guarantee for success, besides financing sources like crowdfunding or fundraising are not used very much in Spain. These sources usually are a good opportunity to raise finance for the initial stage of the project but they fade as the project enters the maintenance phase.

The urban garden La Yuca delivers an environmental improvement by creating a green space for people to learn and to meet through

The social value is at the core of the development of the Garden, created to attend societal challenges in a neighborhood that is growing older. Out of the three subdivided plot two of them are for the seniors and for the neighbours for them to cultivate, meet or just spend some time in a pleasant place

Brief explanation of major elements/assumptions: (*Reflection on consistencies or conflicts*)

1. Value proposition: has there been a change in the prioritization of environmental, social, economic or any other type of value proposition?
2. Value creation:
  - a. Key activities and resources: what are the most important services or activities which need to happen to deliver the environmental, social, economic value? Have these changed?
  - b. Key partners and beneficiaries. Who needs to be involved to deliver the different value propositions. What is your city's 'ideal' governance model for the long-term management of the NBS e.g. city-managed or citizen-managed? Has this changed?
3. Value capture
  - a. Cost structure – what are the major ongoing costs associated with delivering key activities? Has this changed?
  - b. Are there opportunities to reduce costs e.g. through volunteers? Has this changed?
  - c. Capturing value- what does success look like? How will you know if you have succeeded in delivering your value proposition e.g. economically – is direct revenue generated or new business supported? What are the indicators for capturing social or environmental value? Has this changed?

#### Step 4: Implementation of financing and business model plans for specific NBS exemplar

In this section, cities are asked to translate the BMC and financing plan into an actionable implementation plan by identifying from a resource perspective, **who** will be following up specifically on the plans for implementation of the financing and business models of NBS exemplars identified in Step 3 and to set out a timeframe and actions for implementation.

Implementation actions may involve follow up on:

- Preparation of applications/bids for funding/financing (where relevant).
- Engagement with investors and other stakeholders for alternative sources of financing.



- Continued engagement of all stakeholders in preparation for implementation of business model.

Specific quarterly calls will be organized by TCD with the responsible person(s) on each team to follow up on progress on implementation of this planning.

Please complete the following Financing & Business Model Implementation Plan:

<b>Name of NBS exemplar</b>	<b>Action to be undertaken (arising from BMC &amp; financing plan)</b>	<b>Responsible person</b>	<b>Timeframe for implementation</b>
Lagunillas	First version of BMC and explanation completed (Step 3)	Cristian	21 November
	Results from community poll analysed and compared with BMC to see consistencies or conflicts - updated BMC taking into account poll results	Cristian	End November
	Step 3 updated and shared with Stephan to prepare December 3-4 workshop focusing on engaging Key partners, beneficiaries and identifying potential governance model	Cristian	21 November
	Section 5 overall completed (brief paragraph Step 1 and Step 2)	Cristian	21 November
	Follow up on up-front costs and sources of financing from BMC (more specific actions to be identified once BMC is updated)	Cristian	December....
Lagunillas	Check possibility for development of other plots into pocket gardens	Cristian	January june 2021
Lagunillas	Other actions to be realised in Lagunillas	Cristian	End of project

Cities are asked to reflect from a longer term perspective on how they will measure success in terms of financial, business and governance planning. Please identify potential indicators for measuring success here.

### **Reflexive Monitoring and Adaptation**

Throughout the process of NBS implementation, the existing monthly reflexive monitoring process in place with all FRCs will be used to identify critical turning points, key learning questions and follow up actions. Reflexive monitoring supports learning by doing, helps in the early identification of roadblocks and challenges and stimulates the development of adaptive solutions. The current reflexive monitoring process facilitates a 6 monthly reflection on key lessons learned.

Please identify here the learning outcomes on financing, business and governance models which have emerged through the reflexive monitoring process to date.

## NATURE BASED ENTERPRISES

### STEP 1 Awareness and strategic alignment

- What are the priorities for economic development in your city? E.g., priority sectors for development, priority geographical areas for economic development, other economic priorities?

Malaga is a well-known city for its touristic characteristics. Every year the city receives more than four million tourists or even more. Through the past two decades the city has been working on planning and developing hotels, resorts, activities to get the blessing from tourist. At that time tourism was the main activity for the city. In the past two decades also, many people came to Malaga to visit and to stay. By doing so those people created awareness for the city abroad and the city was able to develop other touristic products like museums and cruises. The city has always been an attractive destination for tourism but once tourism has taken off, the city was in need to develop other activities in other sectors. Business and entrepreneurship came next, with the Malaga Tech Park, which is a parc with a lot of IT companies from Spain and from abroad. The city also built a Trade fair center for exhibitions and a network of incubators to stimulate and develop entrepreneurship.

At the same time the city became aware that all the progress that was made in the development of the city will somehow raise some important environmental issues, that would have to be addressed and solved in the close and near future. To organise itself the city of Malaga prepared with the contribution of all the political and social agents in the city reaching maximum agreement, the strategic plan (Written by Fundación Ciedes and published in 1994 <https://ciedes.es/el-plan/i-plan-estrategico.html>) based in the following 5 lines of work:

Line I: "Metropolitan city of Mediterranean scope". It encompasses, among others, the issues of the role and context of Malaga in the territory, the large transport and communications infrastructure, the government of the city and the urban system, resulting in a set of 5 programs.

Line II: "Metropolis of high quality of life and respect for the environment". It deals with aspects related to the "sustainability of the city". In addition to environmental issues, these lines refer to the population, social structure and articulation, the health system and housing, as basic needs.

Line III: "Economic and technological capital of Andalusia". This line analyses matters relating to the labour market, infrastructures, economic competitiveness, and the industrial sectors - financial, construction, etc...

Line IV: "European tourist and leisure capital". Its objective is to project the city abroad and make it more attractive. It is concerned with cultural, tourist and commercial issues.

Line V: "Educating and formative city". It encompasses the topics of education and training developed in three programs. It is considered to have a horizontal or transversal nature (as well as quality of life) insofar as it invades and/or interferes with the other lines.

Since the strategic plan the city has developed the following actions to deal with environmental changes and to increase the quality of life of its citizen: (detailed information annexed)

- Sustainable Urban Mobility Special Plan (Pemus) (2015-2035)
- Territory Plan for The Urban Agglomeration of Málaga (Potaum) (2009)
- Urban Agenda in The Integrated Sustainability Strategy (2020-2050) (Former Agenda 21)
- Alicia - Climate Plan 2050
- Municipal Health Plan Málaga City Healthy (2016-2020)

- Plan For Disadvantaged Areas of The City of Málaga 2019-22
- Goal: Málaga Advanced Territorial Strategy
- Málaga Strategic Plan for Technological Innovation (2018-2022)
- Action Plan SDG Málaga
- Evaluation of the II Strategic Plan of Malaga (2007-2014) and framework proposal for an Integrated Strategy for Sustainable Development Málaga 2020

## STEP 2 Building alliances

Traditional economy or market economy is reaching a point where new ideas must be developed towards a sustainable environmental economic and social model. New proposal like SDG's, the Green Deal, circular economy is becoming a reality and the traditional economic model is shifting towards other more resilient and sustainable models. This change of scenarios will facilitate the growth of Natural based solutions and natural based enterprises. In this sense Promalaga created in 2018 a cluster for companies aware of nature-based solutions to join forces and create a panel of experts for advice and development. The cluster started with 8 companies and now has more than 30. Currently, the main activities of the cluster are: (see web page: <https://clustersbn.org/>)

- Advise on sustainable development and develop some Nature based solutions projects (i.e., Senda Litoral)
- Disseminate Nature based solutions in different spaces, events, and conferences.
- Create a Nature based solutions good practices catalogue to be a reference guide for Nature bases solutions
- Write and participate in European Projects related to environment and nature-based solutions
- Develop and advise on Cluster own projects and publications

Also, the planning and development of the Yuca garden as describe above has been done by NBE companies from the cluster, setting a pilot project for Nature based solutions. This first step should be the beginning, but Nature base solutions encompasses concepts that are yet to be known and its development will increase proportionally as efforts are made to improve climate change adaptation and mitigation, but also as local authorities pronate policies to promote greener and cleaner cities as described above.

Nature based solutions are part of the future environmental, economic, and social development of cities. Traditional model is shifting towards more resilient model like the circular economy model and other models that consider environmental issues and well being of citizens. At the city level, Nature based solution is a brand-new concept involving many actions that make it complex and difficult to grasp. The main barriers to the development of NBE are:

- New and complex concept
- Lack of projects/market
- Not enough dissemination of the projects and the benefits (environmental, economic, and social)
- Public sector is key for its development to include in new legislations
- NBE's need further integration in Municipality.

On the other side enablers of Nature based enterprises are strong

- Cost efficient companies and efficient management.
- Nature Based enterprises have a cluster since 2018 to join forces and disseminate projects and activities. One of the Cluster mission is to support the growth of NBE's, promote and support the implementation of NbS by NBE's.
- City is developing new plans and projects around the environment that will generate green jobs.

- How can the planned NBS contribute to these economic development priorities?

- For each NBS exemplar please consider, how could NBEs contribute to the planning, delivery, maintenance and sustainability of these solutions?
- What are the challenges and enablers from a city perspective in involving NBEs in the implementation of NbS

### STEP 3 Planning, implementing, and monitoring a customised support programme

Cities today are facing many challenges in the environmental economic and social aspects shifting from a traditional model to new models that will increase quality of life of its citizen by making their cities more liveable. Malaga is one of those cities pushing to increase liveability in the city following a process of continuous improvement. In that sense the city is looking to improve some of the older neighborhood located in the center of the city. With new methods of doing things arising, Promalaga through Fundación Rizoma started a participative action through a survey and several activities among the population of Lagunillas to see what residents, business owners and citizen wanted for their neighborhood.

Most of the NBE in Malaga are in the cluster as the cluster itself is composed by all the city main actor in a public and private collaboration. In order for NBE to emerge there is a need to disseminate the Nature based solutions to the Institutions and to the public (see Conama Foundation web page with all the info available in Spain on Nature based Solutions and Nature Based enterprises, <http://sbn.conama.org/web/>) but it is important also to try to educate students of the importance of Nature based solutions and the possibilities they offer for future implementations. Within the Connecting Nature project and after several talks with Glasgow, one of the front runner cities in the project, about the accelerator they created for natural based solutions, the cluster tried to set up a program to create an Incubator for NBE and a program for future entrepreneurs. This is a comprehensive, online incubation program for social entrepreneurs, based on IUCN Global Standard for Nature-based Solutions, and the principles of economic localization, as defined by the non-profit organisation Local Futures. The main characteristics of this incubation program were:

- 4 months (January - April 2022), early-stage projects, with potential to become “Nature-based Enterprise” (H2020 Connecting Nature)
- Preincubation (1 month, January - February): Training on NbS (2 weeks): IUCN Global Standard for NbS and its recent applications, adaptation to entrepreneurship, sector specificities (water, forests, rivers, coastline, urban & rural contexts...), scale-up (Connecting Nature Framework)
- Training on economic localization (2 weeks): principles and good practices (Local Futures), local economy ecosystems around NbS, opportunities and inspiring examples of NbS local entrepreneurship (LF, Connecting Nature Entrepreneurship Platform)
- Incubation (3 months, February - April):
  - (3 weeks) Project design with NbS Canvas (merged with H2020 Connecting Nature’s NbS Business Model Canvas)
  - (2 weeks) Identification of hypotheses, validation, and enhancement of the value proposition via consultation of stakeholders
  - (2 weeks) Business model design: cost structure and market study
  - (4 weeks) Market test: MVP (Minimum Viable Product), price, test
  - (1 week) Feedback, conclusions, improvements, and preparation of final presentations
  - Online monthly exchanges with Glasgow’s NbS Accelerator (H2020 Connecting Nature): best practices, mentors, B2B synergies
- Pitch & Launch Day (1 day): final presentation of projects to potential clients, investors, and partners

Other aspects of the program were already introducing items from the **Connecting Nature** project as the Nature based solution canvas and the Nbs Business model canvas shown below this figure

<p><b>Challenges (global)</b> <i>Inequalities, poverty, climate impacts, loss of biodiversity ...</i></p>	<p><b>Nature-based solutions</b> (NbS, IUCN Global Standard) <i>Societal challenges, design at scale, biodiversity net-gain, economic feasibility, inclusive governance, balance tradeoffs, adaptive management, mainstreaming and sustainability</i></p>	<p><b>Economic localization</b> <i>(M. Shuman, Local Futures, Utopies) Place, regeneration, connectivity, diversification, property, culture, innovation, reinvestment, equity, and democracy</i></p>	<p><b>Opportunities (global)</b> <i>Multiple crises, social &amp; cultural changes, replicating innovations, finance, science &amp; tech ...</i></p>
<p><b>Challenges (local)</b> <i>Detailed info and context of challenges on the local level</i></p>	<p><b>Value proposition, beneficiaries, and partners</b> <i>Shared value created for beneficiaries, together with partners, in terms of services and products offered, to meet the challenges identified, and seizing the opportunities emerging, by leveraging the tools of NbS and economic localization through social innovation</i></p>		<p><b>Opportunities (local)</b> <i>Detailed info and context of opportunities on the local level</i></p>
<p><b>Engagement strategy</b> <i>Target audiences, goals, key messages, channels...</i></p>	<p><b>Objectives, mission, vision and expected impact</b> <i>From challenges to objectives to sustainable impact indicators</i></p>		<p><b>Business model</b> <i>Customers, revenue sources and costs</i></p>

The incubation project had also a budget included to have a precise estimation of costs of the program:

1. Learning platform (IUCN Academy): hosting of the course and its materials (4 months, 2 editions)
2. Preparation: content design and translation (Spanish edition): 70h + 25h → 95h
3. Communication, marketing & project selection: 50h
4. Preincubation (1 month):
  - a. Training on NbS (2 weeks): two 2h sessions x 2 weeks x 2 editions → 16h
  - b. Training on economic localization (2 weeks): two 2h sessions x 2 weeks x 2 ed. → 16h
5. Incubation (3 months):
  - Incubation with merged NbS Canvas: two 2h sessions + 2h follow-up x 12 weeks x 2 ed. → 144h
  - Mentoring by partners: one 2h session x 12 weeks x 2 ed. → 48h
  - Exchanges with Glasgow's NbS Accelerator: four 2h online sessions x 2 ed. → 16h
  - Pitch & Launch Day: presentation of projects (1 day): 6h execution + 6h preparation + 6h communication x 2 ed. → 36h

This budget was estimated for the incubation classes to pay teachers, materials, and dissemination. The proposal had some extra interesting activities to be executed outside in nature to be realised over the four months that the incubation lasts:

1. Pitching of ideas, training & mentoring on NbS with IUCN-Med, PROMALAGA and NbS Cluster, at PROMALAGA's facilities (Month 0)
2. Day of Sustainable Mediterranean Entrepreneurship (marine projects), at Regional Government's Blue Economy Innovation Hub (Month 1)
3. Day of Youth-led Eco-entrepreneurship at University of Malaga's Green Ray business incubator (Month 2)
4. Day of Sustainable Rural Entrepreneurship and Art at Regional Government's Rural Social Innovation Hub & Rancho Limon (Month 3)
5. Launch day and NbS Impact Investment Forum, at PROMALAGA's facilities (Month 4)

Finally, the program had important key partners from the cluster involved as always in a public private collaboration:

- **IUCN & IUCN-Med:** learning platform, knowledge, and compliance with Global Standard for NbS
- **H2020 Connecting Nature:** seed funding, experience via Glasgow's NbS accelerator
- **NbS Cluster** (IUCN-Med, Bioazul, PROMALAGA, UMA ...): training, mentors
- **Spanish NbS Observatory:** mentors, promotion
- **Promalaga:** mentors, events, promotion
- **University of Malaga (UMA):** training, applied research
- **Local Futures:** knowledge on economic localization, mentors, promotion

It is very difficult to launch a new product specially one that is not yet well known so many difficulties arose to try to disseminate this program and to have students willing to do it. One of the best dissemination action was to create a climathon and to disseminate the idea during this event that consisted in creating and developing a Natural based solution in and for the Lagunillas neighborhood.



The project did not have the expected success and not enough inscriptions were made so finally it was cancelled/postponed. Financing is an important issue but other factors like the academic one is important as well. With a different approach and with the collaboration of the university or other consolidated educational centers implementing this program will certainly gain in importance. It is to say that Nature based solutions remain relatively new and complex in essence and some new projects are needed as well as new developments to demonstrate the efficiency of Nature based solutions.

#### STEP 4 Planning a programme to support nature-based enterprises

<i>NBS</i>	<i>NBS Phase</i>	<i>Type of NBE Involved</i>	<i>Challenge</i>	<i>Goal of NBE Program</i>	<i>How will this be achieved?</i>	<i>Partner</i>	<i>What does success look like and how will you measure it?</i>
La Yuca Garden	Delivery	Urban Garden in the city center as a pilot project	NbS urban garden for educational purposes, neighbor's meetings and activities for elderly for moderate activity and fight loneliness	Educational for the children and social for the elderly. Part of a strategy for the future.	The Yuca Garden has been set up and financed by the City	NBE companies, NBS Cluster, Environmental department, OMAU, Promalaga.	In this case success is measured by the use of the Garden for whom is it intended. In the future need to apply the selected indicators to see evolution
Climathon	Planning	Any NBS project that will fit in the Lagunillas context	Development of ideas to implement in the Lagunillas Neighborhood	Idea generation and NBE startup creation	Winner will get a free of charge place in the incubation program	Bioazul, UICN, Social Climate, Promalaga, University of Malaga,	To be able to implement the winner's idea in Lagunillas
Incubaeco Incubation Programe	Planning	All types	to be able to set the program and to carry it all the way to the end	To create NBE startups	Through a four months incubation program	Bioazul, UICN, NBS Cluster, Promalaga, University of Malaga, Local Future Organization, Spanish NbS Observatory	Success will be to carry out the program and to find projects to execute afterwards

## CO-PRODUCTION

### STEP 1 Define the goals of the co-production process

Co-production is a governance method which can be used by cities and other stakeholders when developing nature-based solutions. This method intends to improve the process and the quality of the proposals by engaging several agents in the planning development and delivery of the proposal. It is important to secure participation of all the agents engaged in this process.

During the development of the Yuca Garden all the actor participating in the project were involved from the beginning. OMAU, Promálaga, Environmental department, Urban planning, Cluster, Neighbours group called Lagunillas Porvenir, Urban land (ASPA), Lagunillas Neighborhood Association, and a School called Nuestra Señora de Gracia.

The goals were to create an urban garden to fit three objectives, the first one was educational and for the kids from the schools nearby to be able to learn about plants and trees, the second was a leisure one encouraging neighbours to use the garden as a meeting point outside the concrete from Lagunillas and the third objective was intended to fight loneliness and have a moderate activity for the elderly people from Lagunillas.

The design of the garden was made after a brainstorming session of ideas generated by the people involved during the planning phase. In this phase the garden was designed and divided into several plots following the idea of the people involved. At this stage there was already a bond between the people involved in the project and it certainly improved the quality of the design, a better and more fluid communication among all the parties a better understanding of the whole picture with the barriers and the enablers leading to a new perspective to frame the project. This stage also improves a better understanding of the materials and resources, that will lead to lower costs of maintenance and finally will lead to a better execution in time and costs

It is important that all the actors are involved in the process all the way throughout the process even though the roles are not the same for every involved party. In the case of the Yuca Garden we had a participatory process with several meetings, to talk and exchange ideas on the project, the process, and the expected results. The participatory process permits also to assign tasks to the people involved.



## STEP 2 Use the design principles to flesh out the coproduction goals and structure

Principles	What for?	How?	Challenges
<b>Inclusivity</b>	<ul style="list-style-type: none"> <li>• Depends on specific NBS: e.g. urban garden need to get political will, urban planning on board, experts (cluster)neighbours &amp; associations</li> <li>• Bring in diverse knowledge, needs and expertise, e.g. gardening companies (interested in NbS development), private stakeholder/bank (for financing), experts (how long does it need)</li> </ul>	<ul style="list-style-type: none"> <li>• Political will – politicians need to recognise and support it (co-creation/solution)</li> <li>• First bilateral communication to let them know/get to know them, then joint meeting</li> <li>• Important is at every step to define who is in charge of what part, one party needs to coordinate</li> <li>• Engage actors by going door-to-door</li> </ul>	<ul style="list-style-type: none"> <li>• Can be chaos to involve too many actors; especially regional power has different political colour than local one</li> <li>• People who live in an area can also be afraid of gentrification, difficult to work in some areas on revitalisation with neighbourhood associations</li> </ul>
<b>Openness</b>	<ul style="list-style-type: none"> <li>• Critical because of long-term process from design to implementation: new needs come up, technologies and budget change</li> </ul>	<ul style="list-style-type: none"> <li>• Communication: when a public project is approved, there is communication in press, important to get buy-in, to give them details - important not to be vague so there are no assumptions/new questions raised</li> </ul>	<ul style="list-style-type: none"> <li>• Every time new discussions are needed the process is delayed</li> <li>• Difficulties to carry out the project</li> </ul>
<b>Legitimacy</b>	<ul style="list-style-type: none"> <li>• Ensure legitimacy of different opinions and equal representation</li> </ul>	<ul style="list-style-type: none"> <li>• To find balance: who is involved, who is not</li> </ul>	<ul style="list-style-type: none"> <li>• Involving too many actors can create chaos</li> </ul>
<b>Actionable knowledge</b>	<ul style="list-style-type: none"> <li>• There are always opportunities to learn from project implementation</li> <li>• Sense of belonging and empowerment of the actor involved.</li> </ul>	<ul style="list-style-type: none"> <li>• Learning: learning about process and solutions</li> <li>• Cooperation between public and private institutions</li> </ul>	<ul style="list-style-type: none"> <li>• Break silos, traditional (from top to bottom) implementation is very strong.</li> </ul>
<b>Usable knowledge</b>	<ul style="list-style-type: none"> <li>• Important to disseminate project and the results of it. Good results will result in possibilities to replicate in the area</li> </ul>	<ul style="list-style-type: none"> <li>• Organisation of educational activities for children</li> <li>• Moderate physical activity for neighbours</li> </ul>	<ul style="list-style-type: none"> <li>• Promote coproduction projects</li> </ul>
<b>Extending institutions</b>	<ul style="list-style-type: none"> <li>• Collaboration across departments in municipality and financing.</li> <li>• Collaboration between local and regional institutions</li> </ul>	<ul style="list-style-type: none"> <li>• Need to frame the project and equally level competencies among institutions.</li> <li>• Split leadership and financial participation</li> </ul>	<ul style="list-style-type: none"> <li>• Working with other departments because they don't support the project or don't have a leading role</li> <li>• Get local and regional Institutions to collaborate.</li> </ul>

### STEP 3 Plan the co-production steps and activities

Four participation sessions have been held to specify, coordinate the actions and co-design the space that will be carried out in the Yucas urban garden. These collaborative meetings have been held at the Observatory of environment of Malaga (OMAU) and in the Yucas urban garden, participating in each meeting representatives of the different groups involved and with participation of more than 6 people in each meeting.

- OMAU
- Urban department
- Urban land (ASPA) Main energizers of the yucca garden with the current “ownership” of the cession of space.
- Fantasy Lagunillas Association which carries out environmental educational workshops, working with four schools in the area
- NbS Cluster, to advise and execute the project.
- Neighbours group called Lagunillas Porvenir
- Lagunillas neighbours Association
- Schools Nuestra Señora de Gracia has shown interest to teach some classes in the Yuca Garden.



All participants except the school were involved in the planning phase to bring ideas for the execution and the latter use of the urban garden. In this case we can outline the collaboration between public and private sector which is very important in the city.

In the execution phase the Nature based solutions cluster had a leading role to implement the ideas from the planning phase and choose the autochthonous plants that will be planted in the garden as well as the timing to do so and the nature based enterprises that will do the execution.

The stewardship phase was set up for the different association to take over the exploitation of the garden by setting different time frames in which to use the garden depending on the availability. Schools were supposed to visit in the morning, neighbours, and elderly to do so in the afternoons.



## STEP 4 Select the co-production tools

Several tools are used in the Yuca Garden depending upon its use. To attend schools some paper and some colour pens are used for them to draw a tree or a plant as part of an educational process.

For the neighbours and the elderly some gardening tools if they wish to cultivate some plants. The space is also used to exchange used books. A first selection of books was set up in the little barn with a mailbox big enough at the entrance of the plot to return it in case the plot was closed. Some chairs are available for the people who desire to read their book in the garden

## STEP 5 Reflect on the co-production process and results

It is difficult to measure success in a coproduction way since many variables from different actors must be considered. The planning phase and the execution phase are simple to set and to execute in the way that the ideas generated in the meetings will provide the design of the garden. At this stage all the groups involved are in a collaborative and positive mode. But inclusivity is not a very common practice here so involving too many people can create confusion in the process in the way that everyone is eager to collaborate and not all the ideas generated are applicable, but still there is a sense of empowerment among the people integrating the project.

The execution phase of the garden went well, since the species were already previously selected, and the budget was set up in advance. This phase has had less actors involved at the beginning but while executing the phase many new questions arose and the group had to bring some solutions. This had a negative effect on the established schedule by delaying the timing. Since new questions arose the group had to be informed of the Private companies from the nature-based solution cluster did the work following the guidelines established in the planning phase.

The stewardship phase is more difficult since there are several groups using the plot. In the morning with the schools attending the Yuca Garden runs smoothly but in the afternoon it is different. Day to day operation sometimes show deficit in the budgets to buy new seeds or other materials that were underbudgeted or were not considered.

Coproduction process is a new way of doing things that is not yet well implemented in Malaga. Here the structure of command is usually vertical and from top to bottom and this process is difficult to change. Here collaborations are frequent but in other aspects, everyone has a role to execute but each person's role is predetermined and there is not such a space as inclusivity. Another lesson learned is related to the participatory processes in the co-production. It is difficult to bring the right people but also difficult to get the right number of people. Co-production could work a small-scale intervention like this one if the number of people is small. If the group is too big anytime decision last longer to come out since quorum is difficult to obtain delaying the process over time.

Finally, the coproduction method helps throughout the process. At the planning stage it brings more and better ideas to set the idea and the idea becomes similar and familiar to all the actors. This phase is also tricky in the empowerment of the people who participate in it that are sometimes eager to collaborate. The implementing phase is easier to manage since almost all the aspects have been decided in the planning phase.

Finally, the stewardship phase allows for a broader use of the space by different groups. This stage needs constant adjustments to fit all the necessities. Besides as far as budget is concerned, it is difficult to find private actors to take over public spaces for exploitation and make them profitable without charging fees.

## REFLEXIVE MONITORING

### STEP 1 Rethink what learning process you need to achieve the goals of the nature-based solution

The reflexive monitoring is a method developed to monitor and evaluate transformative solutions. In the case of Malaga, it should monitor and evaluate the transformation of a classic approach from top to bottom to a more co-productive approach where actors and decision makers are at the same level. The development of the Yuca Garden has several goals like the regeneration of a disused space for the neighbours and the community, to increase environmental awareness starting by education. Finally, this pilot project will give insight information for further replications in the neighborhood.

Reflexive monitoring is a novel approach. The first time we set bases with this concept was in the Nicosia Meeting where Genk presented a dynamic learning agenda. The presentation was educational but the concept difficult to grasp. Reading the guidebook helped also to understand the concept.

As stated, before Malaga works on a more vertical way and cooperation exist between department but usually the tasks are set separately.

### STEP 2 Define the roles within the project team

At the beginning the idea was to try to set a stage with all the partners and to try to follow this concept with all the people involved in the process of the Yuca Garden. It is not until a one-on-one conversation with Glasgow that we realised that Reflexive monitoring was a method to use internally. These meetings with Glasgow have been very productive because the examples were concrete on the way to focus this method. Our reflexive monitoring team was composed of Cristian (reflexive monitor), Mariano and Virginia. and we have tried to involve the participants from other department or other institutions and companies. It is difficult to ensure fluidity because each person involved sees things from its own perspective but at the same time involving more partners in this real time evaluation gives a wider perspective and a wider range of ideas and solutions.

### STEP 3 Recording important events and analysing critical turning points

- How do you track the important events in time? When do you discuss what happened with your team and formulate to critical turning points? Is it connected to 'regular' project meetings? Do you organise an additional meeting for this step and if yes, who is involved in this 'timeline meeting'?
- Who is involved in updating the dynamic learning agenda? How often are the updates made? With whom is this agenda shared?
- How do you keep track on the follow-up actions, especially when they are executed by colleagues who are not (closely) involved in the reflexive monitoring process?
- Can you give 2-3 example(s) of follow-up actions and describe who was responsible for them and how they relate to the critical turning points and learning questions?

Reflexive monitoring is connected to regular meetings since many actors are involved. When we started with the Lagunillas idea with Fundación Rizoma we had several meetings to within a month to try to focus on the best approach to prepare a comprehensive questionnaire for the residents of Lagunillas, but we also had to think on how to conduct the questionnaire and set a time frame. In other meetings we were trying to see the best way to use the information we would collect from those surveys and set procedures to do so. You keep track of things from meeting to meeting since notes are taken during the meetings

We also had meeting with the OMAU and the cluster to see the different ways to develop a nature based solution in Lagunillas that were inclusive and cost effective, the follow up action was to combine efforts and resources to

develop the Yucca Garden. Usually, the best way to track performance is to step back and see how things are progressing, at the same time is difficult to do this exercise daily.

#### STEP 4 Use learning sessions to identify learning outcomes

Reflexive monitoring is very useful in a coproduction context when problems arise, and the solution is not clear. This method allows to step back and visualise several solutions that could fit and resolve the problem or give a better solution, in this sense Reflexive monitoring is a proactive tool.

During the planning session it is important to visualise what the outcome must be, then you share ideas, and the best ones will fit together with no effort. Then you monitor the meeting and in the next session you need to go to the place to take context into account visualise again and make the changes.

#### STEP 5 Share your findings with others

We learned from Glasgow that Reflexive monitoring was used as an internal process within the Glasgow team meanwhile we shared with them that it was an open process to evaluate coproduction and to monitor the efficiency in the changes that could be made in the project. The concept of daily evaluation is not generally in use in the city because the approach is more traditional, here evaluation usually happens at the end of the project.

One on one conversations are very helpful, for us Glasgow has been an inspiration to help in the process of creating an incubator for companies. We had already tackled that idea, but Glasgow has been very helpful in guiding and supporting us with ideas. The Zoom sessions with Marleen have been very helpful also in trying to understand the concept and the way it works. Still is it very difficult to visualise the learning questions and therefore to come out the right follow up action.

#### STEP 6 Reflecting on the method and peer-to-peer sharing

Reflexive monitoring is very different from the way we work. Projects in the city are planned executed and once they are implemented then they are evaluated. If the evaluation lacks some of the initial objectives or do not reach expected results, then an evaluation is made, and the corrections are implemented. Reflexive monitoring focus on evaluation daily or on real time allowing for more flexibility and perhaps more creativity in the development of a project. At the same time is a very technical issue which requires a process of analysis, communication, records and thinking and rethinking and experimentation. The learning procedure is difficult, but it is a method that works well with coproduction processes, to ensure optimal stewardship.

#### Dynamic Learning Agenda

City: **City of Málaga**

Reflexive Monitor: *Cristian García-Espina (team Mariano Morán, Virginia Walsh)*

Critical turning point/Event <i>(optional)</i>	Learning question	Connecting Nature Framework element	Follow-up action
Meeting with key partners to study BMC framework and find ideas to implement in Lagunillas. The Key	Lagunillas Area analysis. What do the people from Lagunillas would like to change in their neighborhood. Develop	Governance Key Partners: Strategic development, Rizoma foundation,	Study from the area, survey to the residents, business neighbours and associations.

partners are: OMAU, Environmental department, Promalaga, Rizoma Foundation, NbS Cluster.	methodology and questionnaire for Lagunillas people. <i>Learning question:</i> <b>How can we use the data from the survey to prepare a meeting with the residents?</b>	Promálaga, Environmental area with OMAU, NbS Cluster Key beneficiaries: environmental department, residents neighbours Value proposition: increase Knowledge on ecological value from the bottom up (kids to elderly or retired people)	Gather information for analysis
Meeting with OMAU, which is the environmental observatory in Málaga.	<b>How to develop an NbS solution in Lagunillas?</b>	Expertise in governance	Combine efforts and resources to create an NbS solution within Lagunillas
What would be the most appropriate action to develop the land since it is located in a traditional neighborhood.	Involve neighbour's and residents to contribute to the rediscover autochthonous plants and trees. <b>How to involve the community, by linking them to the associations who will develop the educational plans for the kids and activities for the elderly?</b>	Technical solution & co-production Key activities: Citizen and resident's involvement Planting trees and gardens	Create an association to inform and to educate neighbours. Create a series of master classes for kids' young people and adults.
New CTP (Evolving from previous FUA). Realised the need to attract new businesses to the area, incubator - not just 'street' businesses, including services. Give projection to NBS. To create an incubator for nature but need to educate peoples.	<b>How to attract other types of businesses to the area?</b>	Technical solutions Co-production	How can we answer the learning question we formulated = Educational activities, setting up incubator to educate potential businesses.
Meeting OMAU, Promalaga, Cluster	<b>How to create a project that will imply the community in the short and long run?</b>	Co-production Key activities will go towards	Develop activities to be realized in the space in co creation manner

NbS, to develop a strategy for Lagunillas		community involvement and commitment.	(with associations, neighbours, and local establishments)
Meeting Promalaga, OMAU, Cluster NbS and Lagunillas associations: -Colectivo Lagunillas porvenir -Asociación de vecinos Lagunillas -Colegios Nuestra Señora de Gracia	Give an overview of the project to develop in the Lagunillas plot. The idea is for the different associations to create activities for the neighborhood and to maintain the plot as an educational tool for youngster but also to keep active elderly or retired people who are quite numerous in the neighborhood. <b><i>How to create an attractive project and at the same time create awareness on NbS?</i></b>	Value proposition is going towards social cohesion, and increase well-being for residents, through the classes and the associations. Key beneficiaries are the community, the residents, and the neighbors	Associations and NBE to develop activities to create value around ecological awareness
Call with Stewart and one to one sessions with Glasgow, gave opportunity to talk about NbS incubator	.	Reflexive monitoring and entrepreneurship.	Meeting with Cluster companies to share idea
Meeting with Cluster company, Climate Alliance	Need for economic activity in Lagunillas, need to see business for the cluster, need for economic development of the area. <b><i>How to find stakeholders and financing to develop incubator?</i></b>	Entrepreneurship	Look for emplacement, create program

## IMPACT ASSESSMENT

### STEP 1 Engage in structured reflection on NBS impacts, pathways and trade-offs

The city of Malaga is firmly committed to the United Nations and sustainable development since 1992, when it began a process of participative strategic planning, which is still going strong. This plan, promoted by the Foundation CIEDES, has produced many other plans and policies, such as the Agenda 21, today Urban Agenda, which specifically contains the sustainability criteria to be followed for Malaga's development.

On September 25, 2015, the United Nations General Assembly unanimously approved the 2030 Agenda for Sustainable Development. This is a universal, comprehensive, and transformative action plan aimed at promoting sustainable human development. The main objective is to face social, economic, environmental, and good governance challenges, putting people, the planet, prosperity, peace, and alliances at the center, under the motto of "leaving no one behind".

The 2030 Agenda is broken down into 17 Sustainable Development Goals (SDGs) and 169 targets.



The plenary session of the Malaga City Council at the beginning of 2018 approved that Malaga join the global process of localizing the 2030 Sustainable Development Goals (SDGs). The Board of Trustees of the CIEDES Foundation is actively involved in aligning the city's strategic plan with the SDGs and designing an SDG Malaga 2030 Action Plan.

Thus, a collaboration process is established between the Malaga City Council (Participation Area), the CIEDES Foundation and the CIFAL Center of the United Nations UNITAR Agency in Malaga to localize the 2030 Agenda in Malaga. This process has always sought the involvement of the largest possible number of local agents and citizens, especially the main leaders and those responsible for the city's projects, most of whom are in the CIEDES Foundation. The main areas of work are:

1. Awareness, training, and involvement of agents
2. Creation of image and communication plan
3. Municipal planning alignment of all agents
4. Definition of goals and system of indicators
5. Identification of good practices and actions by SDG
6. Alignment of municipal budgets
7. Annual progress and accountability reports

In addition to the above-mentioned good practises, the city has developed a continuous and solid system to measure the progress made, with over 170 indicators and synthetic indicators of development. In 2020, with the construction of a digital tool that not only gives a clearer view of the degree of implementation of the agenda, but also provides a bigger and better rendering of accounts of these achievements. A report is filed every year with





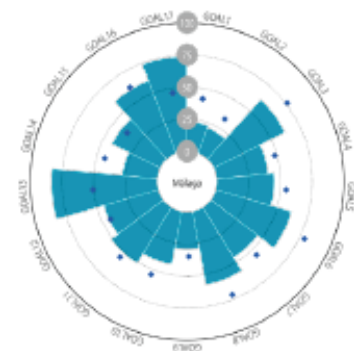
Finally, Malaga is pioneer in Spain in submitting voluntary reports ([https://ciedes.es/images/stories/Laura/ODS/180\\_memoria\\_CIEDES\\_P.pdf](https://ciedes.es/images/stories/Laura/ODS/180_memoria_CIEDES_P.pdf)) on compliance with the United Nations SDGs.

Malaga is the first Spanish city to have a follow-up and monitoring system for compliance with the SDGs and its 169 goals, compared to other territorial areas such as the province, Andalusia, and Spain. This computer tool, incorporated this year, makes it possible to measure how the city is progressing annually in the implementation of the SDGs.

# MÁLAGA

Andalucía

## ▼ EVALUACIÓN POR OBJETIVO DE DESARROLLO SOSTENIBLE



## ▼ INDICADORES

ODS	Nombre del Objetivo	Valor	Rango	ODS	Nombre del Objetivo	Valor	Rango
ODS1 - Fin de la pobreza	2020 ratio	3,72	●	ODS9 - Industria, Innovación e Infraestructura	Índice de penetración 3G y 4G	23,22	●
	Gasto en servicios de promoción social	95,29	●		Índice de penetración de banda ancha	19,90	●
	Tasa de población en pobreza alta	15,30	●		Empleados en industria	4,79	●
	Tasa pobreza infantil	36,50	●		Gasto en I+D+i por habitante	6,27	●
	Tasa de población en riesgo pobreza	27,90	●		Patentes solicitadas	3,50	●
ODS2 - Hambre cero	Agricultura ecológica	6,14	●	Superficie de suelo prevista para actividades económicas	11,38	●	
	Precios de consumo de alimentos	105,90	●	ODS10 - Reducción de las desigualdades			
	Tasa de empleados en agricultura	0,94	●	Población por debajo de la línea de pobreza	21,10	●	
	Explotaciones agrarias y forestales	1,44	●	Integración de personas con discapacidad en el trabajo	1,49	●	
	Superficie de cultivos por municipio	22,46	●	Estranjeros empleados	28,00	●	
ODS3 - Salud y bienestar	Fertilidad adolescente	4,31	●	Índice Gini	0,47	●	
	Muertes por abuso de alcohol y drogas	0,70	●	Índice de dependencia	48,74	●	
	Muertes por enfermedad infecciosa del sistema respiratorio	28,71	●	Riqueza en el 1% de la población	7,38	●	
	Muertes por hepatitis vírica	2,78	●	ODS11 - Ciudades y comunidades sostenibles			
	Mortalidad infantil	3,56	●	NO2	24,00	●	
	Muertes por enfermedades no transmisibles	715,21	●	O3	70,00	●	
	Muertes prematuras (<65 años)	223,24	●	PM10	9,00	●	
	Muertes por suicidios	7,31	●	Días en los que la peor estación supera los límites de PM10	12,00	●	
	Muertes por accidente de tráfico	2,44	●	Media anual de PM10	23,00	●	
	Muertes por tuberculosis	0,70	●	Índice de acceso a la vivienda	5,23	●	
ODS4 - Educación de calidad	Muertes por tumores del sistema respiratorio	71,87	●	Plazas en residencias	39,18	●	
	Esperanza de vida	81,27	●	Resiliencia urbana	9,00	●	
	Muertes por SIDA y VIH	2,09	●	Infraestructura de transporte	5,29	●	
	Población matriculada en un título superior	86,00	●	Vivienda protegida	3,61	●	
	Gasto en educación	36,70	●	Vulnerabilidad urbana	8,25	●	
ODS5 - Igualdad de género	Acceso a servicios en la educación preescolar	69,13	●	ODS12 - Producción y consumo responsables			
	Población con nivel de educación máxima secundaria	45,10	●	Reciclaje de plástico y envases	11,55	●	
	Población con educación máxima de 2º ciclo de secundaria	19,46	●	Residuos impropios	20,16	●	
	Población con nivel de educación terciaria o superior	35,43	●	Reciclaje de papel	13,86	●	
	Brecha salarial en pensiones	27,35	●	Turismo sostenible	1,33	●	
ODS6 - Agua limpia y saneamiento	Brecha salarial en asalariados	21,81	●	Reciclaje de vidrio	15,52	●	
	Violencia y explotación sexual	36,37	●	ODS13 - Acción por el clima			
	Violencia de género	133,20	●	Emisiones de CO2 por cápita de edificios e industria	--	●	
	Paridad en cargos electos	45,16	●	Emisiones de CO2 por cápita	3,38	●	
	Balancede ingresos y gastos en la gestión de agua	--	●	Emisiones de CO2 por cápita de transporte	--	●	
ODS7 - Energía asequible y no contaminante	Precio de canon para abastecimiento y saneamiento de agua	3,20	●	Pacto de Alcaldes	100,00	●	
	Índice de esfuerzo para el pago de abastecimiento de agua	127,60	●	ODS14 - Vida submarina			
	Litros de agua distribuidos por día por habitante	279,71	●	Banderas azules	0,00	●	
	Precio de abastecimiento de agua	17,44	●	Calidad de las aguas de baño	100,00	●	
	Precio de saneamiento de agua	8,58	●	Suelo construido en la franja costera de los primeros 500 m	57,89	●	
ODS8 - Trabajo decente y crecimiento económico	Reducción del gasto en alumbrado público respecto a 2014	4,13	●	Dominio público marítimo terrestre protegido	0,67	●	
	Impacto del gasto en electricidad sobre la renta media por hogar	2,85	●	Costa y hábitats naturales marinos protegidos	4,87	●	
	Energía renovable	33,65	●	ODS15 - Vida de ecosistemas terrestres			
	Índice de calidad de suministro	0,81	●	Territorio y diversidad de hábitats. Cobertura artificial	17,28	●	
	Accidentes en el trabajo	4653,20	●	Protección territorial de espacios naturales protegidos	12,41	●	
ODS9 - Industria, Innovación e Infraestructura	Tasa de desempleo	18,73	●	Territorio y diversidad de hábitats. Zona forestal	51,05	●	
	Impacto del covid19 en el desempleo	25,54	●	Zonas verdes	1,48	●	
	Tasa de jóvenes en paro	7,68	●	ODS16 - Paz, justicia e instituciones sólidas			
	Parados de larga duración	7,90	●	Tráfico de drogas	60,04	●	
	Índice de dependencia por sector de empleo	1,98	●	Tasa de criminalidad	47,76	●	
	Tasa de crecimiento anual del PIB real per cápita	3,83	●	Tasa de homicidios y asesinatos	1,04	●	
	Tasa de crecimiento anual de la productividad	2,08	●	Participación electoral	61,41	●	
				Índice de participación y colaboración ciudadana	90,91	●	
				Solidez y autonomía de la institución municipal	53,75	●	
				Índice de transparencia	76,92	●	
			Índice de transparencia económico-financiera	92,59	●		
			Violencia a menores (0-13 años)	21,13	●		
			ODS17 - Alianzas para lograr los objetivos				
			Proyectos de cooperación y desarrollo	9,18	●		
			Índice de Open data	100,00	●		
			Redes nacionales para lograr objetivos	57,79	●		
			Zonas blancas	0,05	●		

the United Nations Sustainable Development Goals (SDGs)

City's strategic goals	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Employment rate			•	•	•													•
Meeting point			•		•						•							•
Gender equality				•							•							•
Reduce loneliness			•							•								•
Co-production in urban settings			•								•							•
CO2 reduction							•						•					

**NBS DESCRIPTION**

Type: Scale

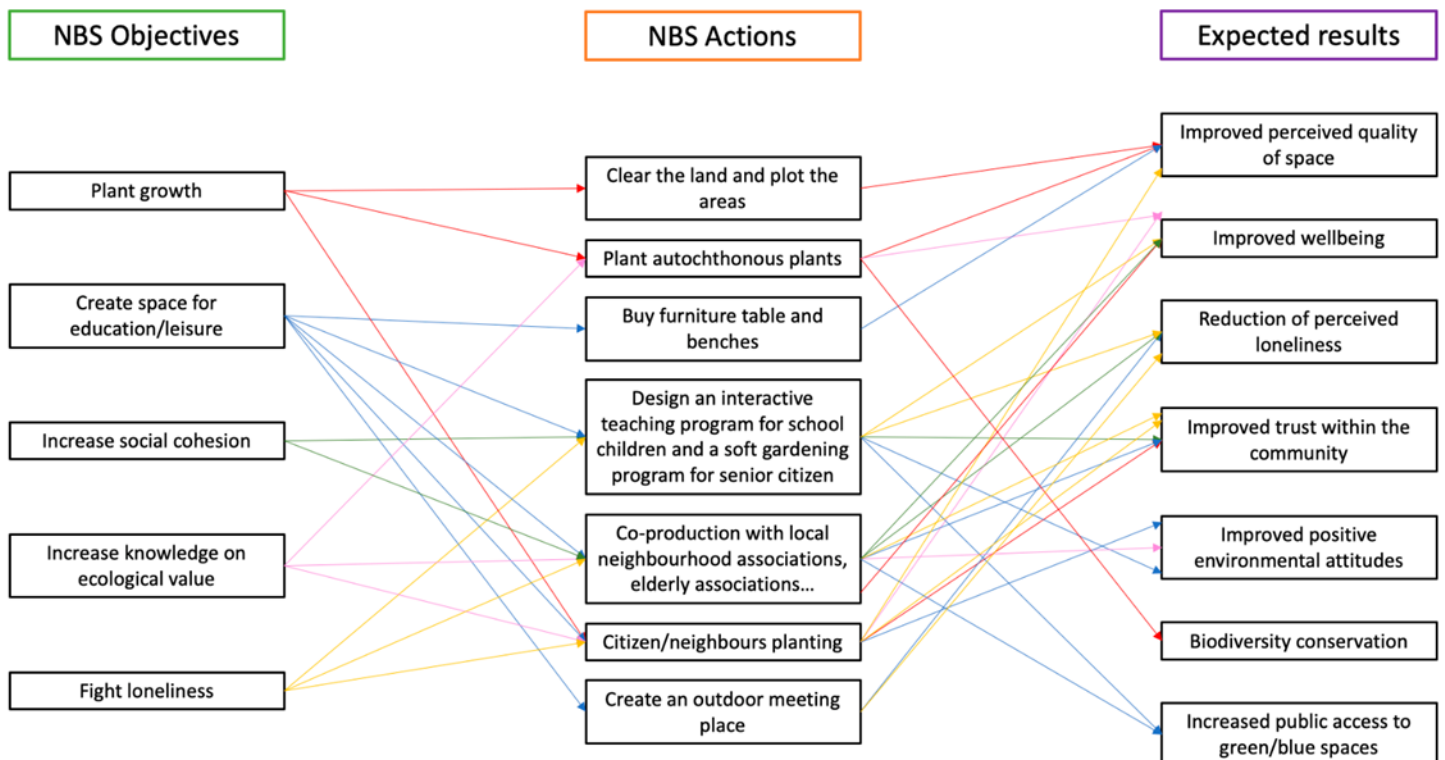
Urban garden 400m2

Context description : in the city center

Process of design and implementation

It's a public plot in a poor neighbourhood where little green is found. The idea was to create a plot to plant and cultivate autochthonous plants and insects from the area as well as having a meeting point for the neighbours. Several meetings have been taken place between local authorities and neighbourhood associations. The idea was to build urban garden for the neighbourhoods and for the children to learn in an interactive and interesting way. This plot was also pursuing other objectives, like training and upscaling educational programs, dissemination of NbS among neighbours, neighbour's involvement and commitment, citizen planting and maintaining.

**Málaga's Theory of Change**



## Assumptions, synergies and trade-offs

NBS Actions	Expected results	Assumptions	Synergies	Trade-offs
<b>Clear the land and plot the areas</b>	Improved local participation and perceived quality of space	Regular activity will fight loneliness	Neighbours will have a periodic activity to look for → could generate wellbeing and happiness	None
<b>Plant autochthonous plants</b>	Improved perceived quality of space	neighbours will have the sense of belonging	they will care and take care of the space → trust and access in the community	Rivalry among neighbours may arise.
<b>Plant autochthonous plants</b>	Environmental education opportunities	Will help to assess the importance of green and its usefulness.	generate positive environmental attitudes motivated by contact with NbS.	None
<b>Buy furniture table and benches</b>	Improved social cohesion	Neighbours will have a place to talk and interact	Will improve interaction and fight loneliness	None
<b>Buy furniture table and benches</b>	Improved perceived quality of space	Neighbours will have a nice meeting point	Will improve state of mind of neighbours as well as facilitate easier access to the community	May cause new disputes among neighbours.
<b>Design an interactive teaching program for school children and a soft gardening program for senior citizen</b>	Improved education and knowledge	Will help to assess the importance of green and its usefulness.	Will improve level of knowledge and interaction and generate positive environmental attitudes motivated by contact with NbS	None.
<b>Co-production with local neighbourhood associations, elderly associations....</b>	Improved confidence and sense of belonging	Build up neighbours' expectations.	Neighbours will show more interest in the project. and generate positive environmental attitudes motivated by contact with NbS.	None
<b>Co-production with local neighbourhood associations, elderly associations....</b>	Improved integration of neighbours and facilitate social interaction	Fight loneliness	improve social cohesion and facilitates relationship among neighbours as well as trust in the community	With time could lose interest
<b>Citizen/neighbours planting</b>	Fight loneliness	Users will interact with each other	Will improve social cohesion and trust in the community	Could create disputes among users.
<b>Create an outdoor meeting place</b>	Improved perceived quality of space	Will fight loneliness and improve	Will generate wellbeing and happiness	None
<b>Create an outdoor meeting place</b>	Recreational value of green spaces	Will improved perceived quality of green spaces	Will create positive environmental attitudes motivated by contacts with NbS	None

<b>Create an outdoor meeting place</b>	Facilitate community accessibility	Will facilitate interaction among users	Will fight loneliness and improve social cohesion	Could create conflicts or group divisions as relationships grow
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## STEP 2 Choose appropriate indicators

### CHOOSING APPROPRIATE INDICATORS

CODE	NAME	NBS expected result	Selection reasoning
PI4	Perceived quality of space	Improved perceived quality of green space	Know the perceived quality of the new park
ENV2 4	Recreational value of blue-green spaces	Improved perceived quality of green space	Measure decrease loneliness among users
ENV2 5	Cultural value of blue-green spaces	Improved perceived quality of green space	Measure the level of engagement of neighbours
ENV2 9	Supporting/increasing biodiversity conservation	Positive environmental attitudes motivated by contact with NBS	Plant autochthonous plants and disseminate for support
ENV3 5	Species diversity	Improved perceived quality of green space	Will improve positive environmental attitudes towards NbS
ENV4 2	Land use change and greenspace configuration	Improved perceived quality of green space	Try to measure the perceived quality of green spaces
ENV2 6	Community accessibility	Trust in community	Will this improve relationship between community members? Between users?
ENV3 8	Mapping ecosystem services and spatial-temporal biodiversity legacies	Improved perceived quality of green space	Questionnaire to the neighbors
ENV4 1	Accessibility of greenspaces	Community accessibility	Questionnaire to the neighbors
ENV5 5	Green space area	Improved perceived quality of green space	Since the establishment of the plot what has improved?
ENV6 6	Air quality change	Improved perceived quality of green space	Since the establishment of the plot what has improved?
HW3	General wellbeing and happiness	Improved perceived quality of green space	Try to find out neighbors perception
HW12	Enhanced physical activity	Community accessibility	Questionnaire to the neighbours
HW13	Perceived chronic loneliness	Decrease loneliness	Benefits of community planting
HW15	Exploratory behaviour in children	Improved perceived quality of green space	Can we establish a new way to teach children?
SC4.1	Trust in community	Community accessibility	Measure wellbeing and happiness
SC4.2	Solidarity between neighbours	Trust in community	Try to find out how relationship between neighbors has improved. Factors
SC4.3	Tolerance and respect	Trust in community	Direct link between trust in community and general wellbeing and happiness
SC6	Place attachment	Decrease loneliness	How does place attachment decrease loneliness
SC9	Empowerment	Trust in community	Show link between empowerment and trust in community
SC11. 1	Positive environmental attitudes motivated by contact with NBS	General wellbeing and happiness	Measure the degree of happiness related to NbS activity
SC11. 2	Environmental identity	Positive environmental attitudes motivated by contact with NBS	Measure the degree of happiness related to NbS activity
SC10	Environmental education opportunities	Positive environmental attitudes motivated by contact with NBS	How to manage educational opportunities for all age layers.
ECO1	New Businesses 'attracted' or started and additional rates received	Positive environmental attitudes motivated by contact with NBS	Positive effect on neighbourhood future employment?

ECO6	Innovation impact	Positive environmental attitudes motivated by contact with NBS	How will this motivate/generate positive attitude in a typical neighbourhood?
ECO11	Overall economic, social and health wellbeing	General wellbeing and happiness	Show how to improve all those factors
PPG5	Activation of public-private collaboration	Trust in community	Evaluate cooperation
PPG6	Trust in decision-making and decision-makers	Trust in community	Is this a participatory process, who is involved?
PPG15	Governance innovations for participatory governance	Community accessibility	What can be done to improve the participatory governance
PPG16	Community involvement in NBS implementation	Trust in community	How to improve effectiveness of this process
PPG23	Team cohesion	Trust in community	What measures do we need to implement to reach team cohesion
PPG25	Engagement	Trust in community	Try to integrate all stakeholders in project development

### STEP 3 Develop a data plan for impact evaluation

## DEVELOPING A DATA PLAN FOR IMPACT EVALUATION

Available baseline in the city of Málaga

Code	Indicator	Baseline data	Source (year)	Granularity	Periodicity
ENV24	Recreational value of blue-green spaces	●	Datos abiertos - Málaga (2021)	City	Specific study
ENV25	Cultural value of blue-green spaces	●	SIG - Málaga (2021)	City	Specific study
ENV29	Supporting/increasing biodiversity conservation	●	OMAU - Málaga (2009)	City	Specific study
ENV35	Species diversity	●	OMAU - Málaga (2009)	City	Specific study
ENV42	Land use change and greenspace configuration	●	OMAU - Málaga (2019)	District	Every year
ENV26	Community accessibility	●	OMAU - Málaga (2019)	District	Every year
ENV38	Mapping ecosystem services and spatial-temporal biodiversity legacies	●	OMAU - Málaga (2019)	District	Every year
ENV41	Accessibility of greenspaces	●	OMAU - Málaga (2019)	District	Every year
ENV55	Green space area	●	OMAU - Málaga (2019)	District	Every year
ENV66	Air quality change	●	OMAU - Málaga (2019)	District	Every year
HW12	Enhanced physical activity	●	OMAU - Málaga (2019)	City	Every year
HW13	Perceived chronic loneliness	●	OMAU - Málaga (2019)	City	Every year
PPG5	Activation of public-private collaboration	●	Datos abiertos - Málaga (2021)	City	Specific study

Note. By clicking on the information in the "Source" column, you can access the original data.



## STEP 4 Implement the data plan

### IMPLEMENTING THE DATA PLAN

New data collection on the exemplar scale from the methods proposed in the Connecting Nature Indicator

#### Reviews

CODE	NAME	Baseline method	Connecting Nature method
PI4	Perceived quality of space		Questionnaire (ad hoc)
ENV24	Recreational value of blue-green spaces	●	
ENV25	Cultural value of blue-green spaces	●	
ENV29	Supporting/increasing biodiversity conservation		Biodiversity monitoring programme Pocock et al. (2015)
ENV35	Species diversity		Urban Biodiversity Inventory Framework (UBIF 2017)
ENV42	Land use change and greenspace configuration	●	
ENV26	Community accessibility	●	
ENV38	Mapping ecosystem services and spatial-temporal biodiversity legacies	●	
ENV41	Accessibility of greenspaces	●	
ENV55	Green space area	●	
ENV66	Air quality change	●	
HW3	General wellbeing and happiness		Satisfaction with Life Scale (Diener et al., 1985)
HW12	Enhanced physical activity		International Physical Activity Questionnaire (IPAQ)
HW13	Perceived chronic loneliness	●	
HW15	Exploratory behaviour in children		Ethnographic case study (e.g., Stanley, 2011)
SC4.1	Trust in community		"Trust and Solidarity" scale (SC-IQ) (Grootaert et al., 2004)
SC4.2	Solidarity between neighbours		Items measuring perception of solidarity from "Trust and Solidarity" scale (SC-IQ) (Grootaert et al., 2004)
SC4.3	Tolerance and respect		Neighbourhood Social Cohesion – 'Tolerance or Respect' Scale (Stafford et al., 2003)
SC6	Place attachment		Place Identity Scale (Williams & Vaske, 2003)
SC9	Empowerment		"Empowerment and Political Action" (SC-IQ) (Grootaert et al., 2004)

SC11.1	Positive environmental attitudes motivated by contact with NBS	Environmental Attitudes Inventory (EAI – Milfont & Duckitt, 2010)
SC11.2	Environmental identity	Environmental Identity Scale (Clayton, 2003)
SC10	Environmental education opportunities	Ethnographic case study
ECO1	New Businesses 'attracted' or started and additional rates received	No. of new start-ups in 'close proximity' to NBS
ECO6	Innovation impact	Annual revenue arising for sales of new products / services;
ECO11	Overall economic, social and health wellbeing	Human Development Index
PPG5	Activation of public-private collaboration	Measurement or count data for number of collaborations activated
PPG6	Trust in decision-making and decision-makers	Questionnaire (ad hoc)
PPG15	Governance innovations for participatory governance	Questionnaire (ad hoc)
PPG16	Community involvement in NBS implementation	Questionnaire based on Arnstein's (1969) ladder of citizen participation
PPG23	Team cohesion	Social support scale from The Job Demands-Resources Questionnaire (Bakker, & Demerouti, 2014)
PPG25	Engagement	Utrecht Work Engagement Scale Short version (Schaufeli, Shimazu, Hakanen, Salanova, & De Witte, 2019)

## STEP 5 Integrate evidence into the policy process

### INTEGRATING EVIDENCE INTO THE POLICY PROCESS

CODE	NAME	Documentary report	Visual chart	Spatial dashboard	Scientific partners	Higher political levels	Media
PI4	Perceived quality of space	●		●		●	
ENV24	Recreational value of blue-green spaces	●	●			●	
ENV25	Cultural value of blue-green spaces	●	●			●	
ENV29	Supporting/increasing biodiversity conservation	●		●	●	●	●
ENV35	Species diversity	●		●	●	●	●
ENV42	Land use change and greenspace configuration			●		●	
ENV26	Community accessibility			●		●	
ENV38	Mapping ecosystem services and spatial-temporal biodiversity legacies			●		●	
ENV41	Accessibility of greenspaces			●		●	
ENV55	Green space area			●		●	
ENV66	Air quality change			●		●	
HW3	General wellbeing and happiness	●	●		●	●	
HW12	Enhanced physical activity	●	●		●	●	
HW13	Perceived chronic loneliness	●	●		●	●	
HW15	Exploratory behaviour in children	●	●		●	●	
SC4.1	Trust in community	●	●		●	●	
SC4.2	Solidarity between neighbours	●	●		●	●	
SC4.3	Tolerance and respect	●	●		●	●	



SC6	Place attachment	●	●	●	●
SC9	Empowerment	●	●	●	●
SC11.1	Positive environmental attitudes motivated by contact with NBS	●	●	●	●
SC11.2	Environmental identity	●	●	●	●
SC10	Environmental education opportunities	●	●	●	●
ECO1	New Businesses 'attracted' or started and additional rates received		●	●	●
ECO6	Innovation impact		●	●	●
ECO11	Overall economic, social and health wellbeing		●	●	●
PPG5	Activation of public-private collaboration	●			●
PPG6	Trust in decision-making and decision-makers	●			●
PPG15	Governance innovations for participatory governance	●			●
PPG16	Community involvement in NBS implementation	●			●
PPG23	Team cohesion	●			●
PPG25	Engagement	●			●

Note. Columns 3, 4 and 5 show how the city wants to disseminate the results obtained. The last 3 columns indicate to whom the city will communicate the impact of its NBS assessment.



## ANNEX: CHAPTER 4 NATURE BASED ENTREPRISES

### Process chart for a transferrable key performance indicators approach to nature-based solutions

#### Overarching city goal or challenge taken from key City strategic document/s

##### **SUSTAINABLE URBAN MOBILITY SPECIAL PLAN (PEMUS) (2015-2035).**

City Special Plan

<https://movilidad.malaga.eu/opencms/export/sites/movilidad/.content/galerias/Documentos-del-site/PEMUS.pdf>

- Create comfortable, safe, functional, and accessible itineraries and spaces for mobility on foot.
- Achieve quality public transport, integrated and competitive compared to the private vehicle.
- Encourage the use of bicycles as a regular mode of transport.
- Promote the rational use of private vehicles.
- Manage the parking supply as a tool to achieve a sustainable mobility model
- Promote intermodality to achieve efficient use of the different modes of transport and their tariff policy
- Achieve an agile and orderly urban distribution of goods and products.
- Achieve safe mobility
- Inform, train, and educate in the principles and strategic lines that are formulated in this Plan
- Establish in future actions a configuration of the urban public territory that guarantees the needs of the plan's mobility model.
- Develop the necessary regulations to meet the new mobility criteria

##### **TERRITORY PLAN FOR THE URBAN AGGLOMERATION OF MÁLAGA (POTAUM) (2009)**

City Territorial Plan

[http://www.juntadeandalucia.es/medioambiente/web/Bloques\\_Tematicos/Calidad\\_Ambiental/Prevencion\\_Ambiental/evaluacion\\_ambiental\\_planes\\_y\\_programas/planordenaciondelterritorioaglomeracionurbanamalaga/informesostenibilidadambiental.pdf](http://www.juntadeandalucia.es/medioambiente/web/Bloques_Tematicos/Calidad_Ambiental/Prevencion_Ambiental/evaluacion_ambiental_planes_y_programas/planordenaciondelterritorioaglomeracionurbanamalaga/informesostenibilidadambiental.pdf)

- The definition of a territorial framework that serves as a reference to ensure progress and balanced economic and social development of the urban agglomeration of Malaga, adapting urban growth to its environmental, social, and economic load capacity.
- Consolidate the agglomeration as a Regional Center corresponding to the first level of the Andalusian City System and configured as an urban area of a metropolitan nature.
- Strengthen the territorial articulation, economic integration, and social cohesion of the urban agglomeration within the framework of the Andalusian, Spanish and European community
- Encourage an increase in the quality of life, social welfare, and the rational use of natural and cultural resources.
- The conservation of natural resources and soils of agricultural, coastal and landscape value, considering them as strategic resources for economic development, social cohesion, and the well-being of the population.
- The conservation and protection of the areas and relevant elements of the historical and cultural heritage.
- The generation of new facilities of interest and supramunicipal scope in a strategic position, together with the creation of new centrality areas aimed at structuring and uniting the territory of the agglomeration.
- The strengthening of the relations and links of the cities of the agglomeration with the nearby urban areas and especially with those of the Western and Eastern Costa del Sol.
- The improvement of accessibility of the agglomeration with the outside, especially with the rest of the main regional centers.
- Maintaining tourist activity as the economic engine of the agglomeration, through its renewal, diversification, and qualification, while making it possible to take advantage of its drive for the empowerment and improvement of the remaining economic sectors.
- The prevention of catastrophic natural risks in the municipalities of the agglomeration.
- The protection of the productive space of agriculture
- Ensure proper management and integration of the water cycle, energy, and telecommunications infrastructures, establishing the measures that ensure foreseeable demand.

## **URBAN AGENDA IN THE INTEGRATED SUSTAINABILITY STRATEGY (2020-2050) ( Former Agenda 21)**

City Urban Agenda

<http://static.oma-malaga.com/oma/subidas/archivos/7/9/6997/00-introduccion..pdf>

<http://www.oma-malaga.com/18/agenda-malaga-2015>

### The territory and configuration of the city - TERRITORIAL AND URBAN DEVELOPMENT

- Commit —compared to dispersed urban models— to the compact city, reasonably dense and endowed with complexity and articulated urban variety.
- Develop urban configurations that, beyond geographical particularities, consider the main characteristics common to sustainable Mediterranean cities, such as a certain population density, sufficient levels of urban compactness and a high complexity in the mix of uses and functions
- Minimize land consumption, protecting cultural spaces and the fundamental elements of the urban image and historical memory, as well as the most valuable natural resources from an environmental point of view, and respecting the singularities and complementarities between the urban and the rural .
- Systematically integrate the landscape dimension in policies for protection, management and planning and urban planning following the Florence European Landscape Convention
- Promote greater spatial integration and social cohesion.
- Promote the enhancement and improvement of the built heritage and the integrated urban regeneration of the consolidated fabrics against the indiscriminate consumption of rural land and the construction of new works.
- Apply sustainable design and construction and promote high-quality architecture by favoring new construction technologies.
- Regenerate and reuse degraded and abandoned areas.
- Promote the diversity, quality, and versatility of urban public spaces
- Favor access to nature (green areas)
- Improve accessibility to facilities and equipments.
- From the instrumental point of view, the aim is to overcome the deficiencies and recover the credibility, potential, agility and social transparency of the planning instruments, also promoting coordination at the vertical and horizontal levels.
- Incorporate urban metabolism into urban planning.

### The territory and the configuration of the city - MOBILITY AND ACCESSIBILITY

- Promote Sustainable Mobility such as that which responds to the basic needs of access and development of individuals, companies, and societies, safely and in a manner compatible with human health and the environment
- Integration of mobility policies in which territorial and urban planning and management are taken into consideration together with transport management
- Promote economic development and improve competitiveness based on sustainable mobility.
- Improve road safety and in all modes of transport
- Promote the modal shift towards more sustainable modes such as walking, cycling, public transport and car sharing in the urban environment.
- Promote a rational use of private vehicles, promoting a modal shift towards more sustainable modes of transport, promoting pedestrian networks, and cycling routes, as well as the use of electric or hybrid vehicles in urban centers and promoting acquisition support systems or rental of this type of vehicle
- Rationalize the number of motorized journeys: dissuasive measures (tolls, reserved accesses ...), labor flexibility and teleworking and generalization of new technologies for administrative processing, telecare,
- Develop new developable land, carried out from previously planned communication and mobility nodes, prioritizing the main, secondary, or resident road levels
- Increase the autonomy of social groups without access to the car: boys and girls, young people, people with disabilities, people with low income, the elderly and people who simply do not want to depend on the car or motorized vehicles
- Improve the efficiency and competitiveness of the global transport system by promoting functional integration as a whole through an intermodal approach
- Promote sustainable mobility and territorial cohesion, making their economic and social effects compatible with respect for the environment
- Ensure the effective contribution of infrastructure actions to the sustainability objectives established by environmental and territorial planning.
- Promote greater integration of modal networks and improve connections between airports, ports, railways, metro and bus stations, configuring multimodal connection platforms for passengers

- Design a comprehensive parking policy and involve residents

The management of natural resources - URBAN METABOLISM

- Respect for natural resources including water and soil, along with reducing the generation of greenhouse gas emissions, through the application of tools and incentives to promote the construction and rehabilitation of efficient buildings in consumption and treatment of water and energy

- Reduce emissions from diffuse sectors: Transport sector; residential, commercial, and institutional sectors, waste management, agriculture and fluorinated gases

- Protect the most valuable natural resources from the environmental point of view, respecting the singularities and complementarities between the urban and the rural

- Consider natural and technological risks, being mandatory to prepare a Map of Natural Risks of the area under management.

- Integrate the concept of energy efficiency in the organization of cities, urban design, construction, mobility and accessibility systems and urban management

- Promote a system of energy infrastructures that guarantee the energy supply to citizens in an efficient, stable, and quality way, and that facilitate the integration of renewable energies in the generation and consumption structure in an increasingly distributed energy system

- Incorporate an offer of competitive energy services aimed at an efficient final use of energy rather than pure energy supply

- Raise public awareness about reasonable consumption patterns that slow down the growth of energy demand

- Adaptation of Spanish cities to the effects of climate change. Double challenge: adaptation and mitigation.

- Achieve the "20/20/20" objective in terms of climate and energy (including an increase to 30% in the reduction of emissions if the conditions are met).

- Focus the R + D + i policy on the challenges our society faces such as climate change, energy, and efficient use of resources.

- Help to decouple economic growth and the use of resources, reducing the carbon emissions of our economy, increasing the use of renewable energies, modernizing our transport sector, and promoting an efficient use of energy.

- Encourage energy saving instruments that could increase efficiency in sectors with high energy consumption, such as those based on the use of ICT.

- Develop good waste management that favors the hierarchy of management by producers, distributors, and citizens in general (prevention, selective collection, and recovery)

- Reduce the production of waste, in weight but also in volume, diversity and dangerousness, decoupling waste generation from economic development

- Promote selective collection at source, as a strategy to obtain quality materials that have an outlet in the recycling market

- Promote the selective collection at source of the organic fraction of municipal waste to generate quality organic fertilizers (compost)

- Accommodate the waste management system to the urban management system, as one more element, interrelated with others such as the management of public space, mobility, or noise

- Promote the market for recycled products with measures such as the promotion of public green purchasing, as well as compost with environmental quality certification.

- Develop the necessary infrastructures for the treatment of the waste generated, promoting the territorial organization and the training of technicians, under the criteria of self-sufficiency and proximity

- Involve and train people (citizens and personnel involved in management organizations) in waste management.

- Bear in mind at all times that water is a finite natural resource, although regenerable, whose use must be based on principles of rationality, measure, equity, and solidarity.

- Develop comprehensive management plans that consider, among others, climatic cycles, spatial planning, supply, sanitation, and measures to avoid the effects of droughts

- Carry out a sustainable integral management of the urban water cycle (collection, transport, storage, purification, distribution, consumption, sanitation, purification, reuse, and discharge).

- Promote savings and efficiency in the use of water through mechanisms such as joint management between large users (agriculture, industry, and city), the reuse of treated water and the use, where appropriate, of rainwater.

- Recover the social scenarios of water as an essential part of cultural heritage and collective memory

### The management of natural resources - BIODIVERSITY AND FREE SPACES IN URBAN SYSTEMS

- Consider open space as an essential element in the functioning of territorial systems, beyond its usual significance as green spaces for recreation. The free space must begin to be a term expressed in the singular and not in the plural. The free space system must be considered a resource for territorial and urban planning, at the same level as the equipment or infrastructure system, as a resource for making a city
- Develop free space networks that go beyond the usual concept of connection between spaces. Free space, as such, and according to this new definition, ceases to have a nature card if the spaces are isolated
- Include land and territories in free space networks that, without direct use value, do incorporate and offer essential environmental services. The effect on the conservation of urban biodiversity must be substantial, insofar as the urban areas themselves also become, through specific measures and techniques, places of connection and a green territorial matrix. In this way, not only "things" but also processes must be protected.
- Include this new approach in the definition of territorial and urban planning instruments in order to increase the land area capable of supporting vegetation and reduce the barrier effect of urbanizations and infrastructures.
- Guarantee the access of citizens to the enjoyment of nature, minimizing the impacts on biodiversity
- Control actions harmful to biodiversity that take place in the urban environment, also including research and education activities for the preservation of biodiversity
- Restore aquatic ecosystems to an optimal ecological state, avoiding any further deterioration
- Respect the conservation of the landscape, ecosystems, and biodiversity
- Introduce measures to improve the natural environment: recovery of riverbanks, water courses, environmental restoration (quarries, etc.), landscape rehabilitation, revegetation, and reforestation
- Value the landscape as a resource, taking care not only of its fragility and diversity, but also its vitality, taking special care of the key elements and components that make it up

### SOCIAL COHESION AND ECONOMIC DEVELOPMENT

- Promote "flexicurity" as agreed by the European Council, with the aim of reducing labor market segmentation and facilitating transitions, as well as facilitating the reconciliation between work and family life.
- Regularly review and monitor the efficiency of the tax and benefit systems so that work is attractive, paying particular attention to low-skilled workers and removing obstacles to self-employment
- Promote new forms of balance between work and family life and active aging policies and increase equality between the sexes
- Promote shared collective and individual responsibility in the fight against poverty and social exclusion.
- Guarantee the full exercise, under conditions of equality, of civil, social, economic, cultural, and political rights.
- Generate social, economic and employment opportunities that guarantee quality of life
- Improve the levels of access and use of public services and benefits, especially education, health, employment, social services, and dependency, by all citizens and under conditions of equity
- Adapt sectoral public policies and structures of public services to the challenges and demands of a society
- Reinforce equity in all stages of the Educational System, including university, permanence, and academic success.
- Adapt the reception systems for people in vulnerable situations and specialized reception throughout the national territory to the current needs derived from the evolution of migratory flows, ensuring that they provide them with a sufficient degree of autonomy to access goods and services, exercise of rights and fulfillment of obligations
- Promote comprehensive policies for equal treatment and opportunities and non-discrimination that contemplate the prevention and report of all forms of racism and xenophobia as well as the protection and assistance to victims in all fields of social life, both in the field public and private
- Reduce the levels of social exclusion, marginalization, and poverty, with special emphasis on the child and youth population.
- Contribute to the development of a democratic and participatory culture as well as institutional legitimacy
- Promote construction and socio-community development processes that promote intercultural coexistence, the improvement of social, neighborhood and labor relations, respect for difference and the management of diversity in a shared project of Society
- The integration of social housing and that which receives public aid, together with free rental housing, avoiding social, generational and ethnic segregations, and exclusions

### CITY GOVERNMENT

- Promote a new governance, based on cooperation and coordination both vertical and horizontal inter-administrative and between rural and urban territories
- Promote a greater openness and approach of the management to the citizenship that favors their direct participation
- Promote a cultural change towards sustainability
- Establish mechanisms for monitoring and evaluating urban and rural policies and systems
- Promote new information and communication technologies
- Execute collaboration, closely associating parliaments, social partners, and representatives of social organizations, to contribute to the development of national reform programs and their implementation
- Promote administrative transparency
- Strengthen cooperation between the various departments of the administration to articulate diversity and fragmentation with coordination or integration mechanisms, counting on the support that information and communication technologies provide to an integrated and systemic urban management and to achieve a new governance
- Promote the development of urban management instruments at the social, economic, and environmental level through a management system that identifies the environmental impacts produced.

#### **ALICIA - CLIMATE PLAN 2050**

City Plan for Climate

<http://www.omau-malaga.com/agendaurbana/pagina.asp?cod=65>

[http://www.omau-malaga.com/agendaurbana/subidas/archivos/arc\\_277.pdf](http://www.omau-malaga.com/agendaurbana/subidas/archivos/arc_277.pdf)

Urban model

- Strategic line 1 - Adapt planning to the Urban Agenda and the Climate Plan, The compact, complex and proximity city
- Strategic line 2 - Sustainable Building
- Strategic Line 3 - Public Space
- Strategic line 4 - Comfort

Mobility

- Strategic line 5 - Transformation of the urban mobility model
- Strategic line 6 - Low emission urban areas
- Strategic line 7 - Improvement of the public transport service
- Strategic Line 8 - Electrification of Mobility
- Strategic line 9 - Promote external reduction plans for mobility emissions
- Strategic line 10 - Ensuring climate-ready mobility
- Strategic line 11 - Promote pleasant pedestrian routes

Urban metabolism

- Strategic line 12 - Energy rehabilitation of public residential buildings
- Strategic line 13 - Energy rehabilitation of residential, tertiary, private and public buildings
- Strategic line 14 - Promotion of renewable energies
- Strategic line 15 - Optimization of public lighting
- Strategic line 16 - Reduction of emissions of large structures
- Strategic line 17 - Promotion of mechanical CO2 sinks
- Strategic Line 18 - Zero Waste
- Strategic Line 19 - Green Purchase
- Strategic line 20 - Circular and local economy
- Strategic Line 21 - Responsible Consumption and Healthy Eating
- Strategic line 22 - Tourism
- Strategic line 23 - Management and efficient use of water
- Strategic line 25 – Health

Biodiversity

- Strategic Line 24 - Adaptation of the Coast to Climate Change
- Strategic line 26 - Evaluation of the capacity of carbon sinks in green and blue areas
- Strategic line 27 - Conservation and restoration of coastal, marine, coastal dune and river biodiversity

- Strategic Line 28 - Biodiversity Conservation (R&D)
- Strategic line 29 - Conservation of terrestrial biodiversity
- Strategic line 30 - Interconnection of natural systems

#### Social Cohesion and Economic Development

- Strategic line 31 - Urban policies for social cohesion and Climate Change
- Strategic line 32 - Local economic development and climate change policies

#### Governance: Transparency and Good Governance

- Strategic line 33 - Institutional Coordination
- Strategic Line 34 - Budget Capacity for Climate
- Strategic line 35 - Awareness and Awareness Plan for Climate Change
- Strategic line 36 - Participation Plan
- Strategic line 37 - Training Plan
- Strategic line 38 - Regulatory measures: Integration of the perspective / criteria of Climate Change / Climate in the PPP

### **MUNICIPAL HEALTH PLAN MÁLAGA CITY HEALTHY 2016-2020**

#### City Special Plan

<http://derechossociales.malaga.eu/opencms/export/sites/dsociales/.content/galerias/documentos/Plan-Municipal-Malaga-Ciudad-Saludable.pdf>

1. Program for the prevention of psychosocial situations that affect the health of the population of Malaga.
  - Facilitate access to resources that promote healthy living conditions in those groups with particular difficulties.
  - Promote institutional coordination mechanisms that facilitate access to education at all ages and enhance school performance, as well as promote permanent training and job placement.
  - Develop active policies for the prevention of consumption and addictive behaviors, as well as for the reduction of harm.
  - Promote physical, mental, and sexual health by providing strategies and tools for personal development, focusing on the prevention of sexually transmitted diseases and unwanted pregnancies.
  - Reduce violence and discrimination by developing educational strategies with special attention to the most vulnerable groups.
2. Program for the promotion of actions aimed at increasing the quality of life of citizens through the improvement, surveillance, and environmental protection.
  - Guarantee municipal cleanliness, pollution control, and prevention of noise and light pollution.
  - Guarantee the quality of the water
  - Promote energy efficiency and renewable energies
  - Promote responsible consumption.
  - Guarantee the protection and improvement of the municipal flora and fauna with special protection of animal dignity.
3. Program for the promotion of active health habits that contribute to increase the quality of life
  - Contribute to the promotion of healthy habits in people with physical, mental, or sensory disabilities.
  - Promote multidisciplinary activities that allow the development of satisfactory aging.
  - Encourage physical activity in the Malaga population.
  - Promote healthy eating patterns in the entire Malaga population.
  - Promote accessibility to information, advice, and information on the healthy use of free time, as well as the promotion of activities to achieve leisure and healthy rest
4. Program to reduce the risk of domestic, work and road accidents
  - Contribute to the reduction of traffic accidents through road safety education.
  - Contribute to the decrease in occupational accidents.
  - Promote the reduction of accidents in the domestic, urban, and school environment
  - Prevention of food poisoning.
5. Citizen participation program in the field of health, as well as the promotion of research and training.
  - Encourage and promote the training and updating of social and health professionals.

- Mobilize and support the participation of citizens in the defense of their health rights.
- Collaborate with educational institutions and scientific research of the municipality.
  - Promote the study of healthy habits in the population of Malaga.

#### **PLAN FOR DISADVANTAGED AREAS OF THE CITY OF MÁLAGA 2019-22**

City Special Plan

<http://derechossociales.malaga.eu/es/servicios-sociales/plan-local-de-zonas-desfavorecidas-de-la-ciudad-de-malaga/>  
<http://derechossociales.malaga.eu/opencms/export/sites/dsociales/.content/galerias/1-ssociales/PLZD-MALAGA.pdf>

Axis 1. Sustainable economic and community development

Axis 2. Public policies for welfare and social cohesion.

Axis 3. Habitat improvement and Coexistence

Axis 4. Networking and innovation in social intervention

#### **GOAL: MÁLAGA ADVANCED TERRITORIAL STRATEGY**

City Strategic Document

[https://static.malaga.es/malaga/subidas/archivos/4/4/arc\\_258944.pdf](https://static.malaga.es/malaga/subidas/archivos/4/4/arc_258944.pdf)

##### **1. SUSTAINABILITY**

- Investment in the waste sector to meet the requirements of the Union acquis on the environment
- The promotion of the production and distribution of energy derived from renewable sources
- Support for energy efficiency, smart energy management and the use of renewable energies
- The promotion of carbon reduction strategies for all types of territory, including the promotion of sustainable multimodal urban mobility and adaptation measures with mitigation effect
- The promotion of energy efficiency and the use of renewable energies by companies
- Actions to improve the urban environment, revitalize cities, rehabilitate, and decontaminate old industrial areas (including reconversion areas), reduce air pollution, and promote noise reduction measures
- Support for investment aimed at adapting to climate change
- The promotion of innovative technologies for the improvement of environmental protection and resource efficiency in the waste sector and the water sector, and with respect to the soil or the reduction of atmospheric pollution

##### **2. EMPLOYMENT, ENTREPRENEURSHIP, AND INNOVATION**

- Access to employment for jobseekers and inactive people, including the long-term unemployed and people removed from the labor market
- Improving the adaptation to the labor market of education and training systems, facilitating the transition from education to work and reinforcing education and vocational training systems and their quality
- Expanding the deployment of broadband and the spread of high-speed networks and supporting the adoption of emerging technologies and networks for the digital economy
- The development of ICT products and services, and greater demand for these technologies
- Improvement of research and innovation (R&I) infrastructures and the ability to develop excellence in R&I
- The promotion of business investment in R&I, the development of links and synergies between companies, research and development centers and the higher education sector
- The promotion of entrepreneurship, in particular, facilitating the economic use of new ideas and promoting the creation of new companies
- Supporting the ability of SMEs to grow in regional, national, and international markets, and to get involved in innovation processes
- Provision of support for the development of business incubators and investment aid in favor of self-employment, micro-enterprises, and business creation

##### **3. ECONOMIC AND PRODUCTIVE GROWTH**

- Increase the quality and diversity of the province's tourist offer from a comprehensive sustainable planning and management, increasing excellence and promoting innovation.
- Conservation, protection, promotion, and development of natural and cultural heritage.
- Support for employment-generating growth through the development of endogenous possibilities, including the conversion of industrial regions in decline and the improvement of accessibility and development of specific natural and cultural resources.



- Promotion of the entrepreneurial spirit and values in SMEs in the commerce sector that improve their image and social recognition.
- Development of electronic commerce products and services, and greater demand for these technologies.

#### 4. PEOPLE AND EQUALITY

- Reduction and prevention of early school leaving and promotion of equal access to quality early childhood, primary and secondary education
- Invest in education, training, and vocational training for the acquisition of skills and lifelong learning, through the development of education and training infrastructures
- Improve the quality and efficiency of higher education and equivalent cycles, and facilitate their equal access for all
- Improved equal access to lifelong learning for all age groups in a formal, non-formal and informal activity
- Strengthening of ICT applications for e-learning and e-culture
- Protection, development and promotion of assets and services of public culture and heritage
- Promotion of active and healthy aging and social inclusion by improving access to cultural and recreational services

#### 5. EDUCATION, CULTURE, LEISURE AND SPORTS

- Promotion of social inclusion through improved access to social services and the transition from institutional services to local services.
- Providing support for the physical, economic, and social regeneration of communities in disadvantaged urban and rural areas.
- - Active inclusion, in particular to promote equal opportunities and active participation and improve employability

#### MÁLAGA 2020 STRATEGY

##### City Strategy

[https://ciedes.es/images/stories/Libros\\_PEM/2020.pdf](https://ciedes.es/images/stories/Libros_PEM/2020.pdf)

#### MALAGA OF CULTURE

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#### MALAGA OF KNOWLEDGE AND INNOVATION

...

#### COASTAL AND SUSTAINABLE MÁLAGA

##### 8. Sustainable mobility

- Promote intermodality to achieve efficient use of the different modes of transport and their rate policy.
- Promote the use of any non-polluting means of transport as an alternative to private motorized vehicles, both in the city and in the metropolitan area.
- Increase by at least 10% the demand for bicycles for trips of less than 10 km to encourage the use of bicycles as a normal mode of transport.
- Create comfortable, safe, functional, and accessible itineraries and spaces for mobility on foot.
- Reach the goal of zero deaths, zero injuries, zero congestion and zero emissions pollutants.
- Facilitate the incorporation of the electric vehicle as an alternative to the vehicle for private use with conventional technology (thermal engines).
- Encourage the development of a support infrastructure for electric mobility, together with the increase in the demand for the use of electric vehicles.
- Define a series of actions that can favor industrialization activities related to the production of the components and infrastructures necessary for the development of electric mobility.
- Achieve an agile and orderly urban distribution of goods and products

##### 9. Energy Efficiency and Climate Change

- Promote the use of renewable energies and energy accumulation.
- Promote energy efficiency and sustainable construction.
- Generate continuous programs of reforestation and growth of green areas.
- Innovate and optimize urban solid waste management.

- Innovate and optimize comprehensive water management.

#### 12. Guadalmedina Integration

- Maintain the safety of the city and citizens against floods or avenues.
- Regenerate the space for coexistence.
- Promote accessibility and communications and improve mobility in the area.
- Regenerate, improve and enhance the neighborhoods adjacent to the riverbed.
- Encourage activities in the river in the short, medium, and long term.
- Articulate the formulas of management, execution, and maintenance of the project.

INTEGRATING AND INTEGRATED MALAGA

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#### **MÁLAGA STRATEGIC PLAN FOR TECHNOLOGICAL INNOVATION (2018-2022)**

City Strategic Plan

[http://malagasmart.malaga.eu/opencms/export/sites/msmart/.content/galerias/documentos/Plan\\_Estrategico\\_de\\_Innovacion\\_bajares.pdf](http://malagasmart.malaga.eu/opencms/export/sites/msmart/.content/galerias/documentos/Plan_Estrategico_de_Innovacion_bajares.pdf)

1. Sustainable and Safe Habitat
2. Smart Mobility
3. Innovative Economy
4. Digital Transformation
5. ICT infrastructures
6. Citizen Services

#### **ACTION PLAN SDG MÁLAGA**

City Action Plan

[https://ciedes.es/images/stories/2019/Innformeprogreso%20planaccion\\_v4.pdf](https://ciedes.es/images/stories/2019/Innformeprogreso%20planaccion_v4.pdf)

1. End of poverty
4. Quality education
5. Gender equality
8. Decent work and economic growth
9. Industry, innovation and infrastructure

#### **Evaluation of the II Strategic Plan of Malaga (2007-2014) and framework proposal for an INTEGRATED STRATEGY FOR SUSTAINABLE DEVELOPMENT MÁLAGA 2020**

City Integrated Strategy

[https://ciedes.es/images/stories/Libros\\_PEM/EvaluacionIIPEM.pdf](https://ciedes.es/images/stories/Libros_PEM/EvaluacionIIPEM.pdf)

1. Malaga of knowledge and innovation (smart and inclusive growth)
2. Malaga of culture (smart, sustainable, and inclusive growth)
3. Coastal and sustainable Malaga (sustainable and smart growth)
4. Integrative and integrated Malaga (inclusive and sustainable growth)