



WP3

ENTREPRENEUR ECOSYSTEM ANALYSIS

ITALY/PALERMO CASE





U-SOLVE WP3

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The 2014 2020 ENI CBC Mediterranean Sea Basin Programme is a multilateral Cross Border Cooperation initiative funded by the European Neighbourhood Instrument (ENI). The Programme objective is to foster fair, equitable and sustainable economic, social and territorial development, which may advance cross border integration and valorise participating countries' territories and values. The following 13 countries participate in the Programme: Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Malta, Palestine, Portugal, Spain, Tunisia. The Managing Authority (JMA) is the Autonomous Region of Sardinia (Italy). Official Programme languages are Arabic, English and French. For more information, please visit: www.enicbcmcd.eu

The European Union is made up of 28 Member States who have decided to gradually link together their know how, resources and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders.

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Executive Summary

This report seeks to present collected information and data relating to U-SOLVE'S Work Package 3 requirements.

Under U-SOLVE WP3 related activities, Consorzio ARCA conducted research on Palermo's business and entrepreneurial ecosystem to identify the most pressing sustainable development challenges, paving the way for the detection and application of appropriate solutions from the Cultural and Creative sector for sustainable change and progress.

The report provides a comprehensive representation of all the stakeholders who might influence urban sustainable development in Palermo (Italy) and consequently the U-SOLVE project – entrepreneurial ecosystem mapping. It is based upon a complete analysis of data collected from desk-based research, online surveys, and in-depth interviews. All of these were conducted using a significant sample of Palermo's entrepreneurial ecosystem and underlying business culture. U-SOLVE's partners in Italy – Consorzio ARCA – have classified and defined the most important urban actors and approached them with the purpose of gathering more information about their activities and their expert knowledge on the strengths and weaknesses of Palermo's ecosystem. The local U-SOLVE team has identified one hundred stakeholders, collected **fifty-one** complete **surveys** on **urban sustainable development initiatives, challenges** and **opportunities** in Palermo, and produced **twenty-two in-depth interviews**.

These interviews and surveys have been with local stakeholders who represent civil society, start-ups/SMEs, local authorities, policy makers, academic/research organisations, business support organisations as well as cultural agencies and governmental organisations. A desk-based research approach has also been employed to enable the triangulation of information and data.

City's stakeholders have suggested where the problems and obstacles lie, who has the authority to bring change, envisaged the possible strategic partnerships. Therefore, the outcome of the analysis offers insight into the current conditions under which the innovation and entrepreneurial ecosystem operates; it provides an understanding of the underlying business culture in Palermo and the relationships amongst actors and presents their knowledge or perception of the most critical urban sustainable development challenges. It offers an insight towards the identification of the most relevant bottlenecks and the resources to be leveraged.

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1.0 Introduction

1.1 Palermo at a glance

Before embarking on implementing initiatives and activities aimed towards improving an urban area, it is crucial that urban actors have a clear understanding and knowledge of the state of affairs in that area. Following are some key facts about the city of Palermo:

- Palermo is fifth largest municipality in Italy in terms of population and capital of the Sicily Regions.
- Palermo is the seat of the Sicilian regional Parliament and Government. Sicily has a special statute and enjoys a high degree of autonomy compared to the rest of the Italian regions.
- The city of Palermo is divided into eight administrative zones, which in turn are divided into 25 districts and 55 first-level units.
- As of 01/01/2021, the population of Palermo was 637.885 people (ISTAT data).
- Palermo lies within a plain of about 160 km² (the Conca d'Oro) overlooking the sea, displaying the characteristics of a typically Mediterranean climate: variable, but generally temperate.
- The city was founded by the Phoenicians between the 7th and 6th centuries BC. Previously the area had been a commercial and logistical centre for north-western Sicily.
- The city of Palermo was called Zyz (pronounced /'zi:z/) by the Phoenicians (meaning "the flower") The present name derives from the ancient Greek πᾶς, pās, "all" and ὄρμος, hórmos, "port", "wide harbour", due to the presence of the two rivers Kemonia and Papyrethus creating a huge natural harbour, and became Panormus with the Romans. The Arabs pronounced the name of the city Balarm, a diction that was partially adopted in the official form Balermus of the Norman period. Palermo was definitively acquired in modern times. In 254 BC the city was conquered by the Romans who managed to take it away from the Carthaginians.
- After the fall of the Western Roman Empire in 535 Sicily was largely devastated with the arrival of the Vandals in the west of the island. Palermo was rebuilt by the Byzantines, who held Palermo for three centuries.
- In the 9th century, Muslims from North Africa invaded Sicily. The Muslim governors moved the capital of Sicily from Syracuse to Palermo and the city was provided with all the bureaucratic structures and services necessary for a capital city. The Arabs introduced the first citrus groves, forming the Conca d'Oro and opening up a new possibility for economic development. In 948, the city had more than 200,000 inhabitants, making it one of the most populous cities in the world.
- In 1098, the Normans completed their conquest of the rest of the island: the capital, first of the Grand County of Sicily, then of the Kingdom of Sicily, remained in Palermo, but the population fell dramatically. The arrival of the Normans in Palermo led to the construction of a considerable number of Christian buildings and the city reached its peak under the rule of Ruggero II. After the Norman reign in Sicily came the Swabians (from 1194 to 1266), who made Palermo an imperial administrative centre. On the death of Federico II (1250), Palermo and Sicily lost importance in the political scene: power shifted to Naples.
- The island lost its independence in the 15th century and came under the rule of the Kingdom of Spain, with Palermo becoming the seat of the Viceroy.
- In 1734 the city became the domain of the Bourbons, who kept the Kingdom of Sicily and Naples separate. In 1816 the kingdoms were united to form the Kingdom of the Two Sicilies: Palermo lost its status as capital, becoming the second administrative centre after Naples. However, Palermo continued to hold the title of capital of the island part of the kingdom.
- In the first two decades of the 20th century Palermo went through a flourishing period, with a short but intense Art Nouveau period, mainly characterised by eclectic architecture. The protagonists of this season were the Florio, a family with an industrial tradition, who made the city an international protagonist in the so-called Belle Époque. Unaffected by the First World War, Palermo suffered considerable destruction due to bombing during the Second World War, until it was occupied in July 1943 by the Allied troops of American General George Patton.

- The second half of the 20th century was characterised by Sicily being granted the status of a region with a special statute, which once again made Palermo the centre of regional bureaucracy and politics.
- From the end of the 1950s onwards, the main Sicilian criminal organisation, Cosa Nostra, thanks to the economic boom and the process of urbanisation of the peasant population, experienced a phase of growth, managing to infiltrate public spending, post-war reconstruction and expansion of the city. This was the period of the sack of Palermo, the uncontrolled expansion of the city northwards, even at the cost of demolishing Art Nouveau villas. From the 1960s to the 1980s, there were three mafia wars with many deaths among the members of the mafia. In that period and afterwards, entrepreneurs, journalists, doctors, magistrates such as Giovanni Falcone and Paolo Borsellino, policemen and the Italian cultural heritage were also affected, which led to a strong response from the state and civil society and a consequent retreat from Mafia power.
- In March 2015, a number of jurists, human rights activists, public administrators and non-governmental organisations signed the *Carta di Palermo* to urge the world community to review legislation on residence permits and policies related to migration phenomena, supporting international human mobility as an inalienable right of the person. In November 2015, Palermo joined the Safer Cities programme launched in 1996 by the UN-Habitat Agency, assuming the global co-chairmanship.
- The Arab-Norman residences, the cathedral and other churches, together with the cathedral of Monreale and that of Cefalù, were included in the list of UNESCO World Heritage Sites on 3 July 2015 in the serial site "Arab-Norman Palermo and the cathedrals of Cefalù and Monreale".
- Apart from its legislative and administrative functions, Palermo is one of the two main island's financial and business hubs together with the city of Catania.

In addition to the aforementioned trivia information, a general overview of and state of affairs in Palermo's key urban domains is provided below.

Urban and Transport Planning

Traffic congestion in the urban area of Palermo is one of the most serious problems hindering the Sicilian capital's sustainable development and has a negative impact on the urban environment and its citizens. The problem is caused by a series of interconnected factors, namely: the inadequacy of public transport services; the citizens' intensive use of private vehicles — there are 61 cars per 100 inhabitants - the lack of adequate sustainable public transport services (e.g. electric buses, car sharing, etc.); the lack of parking areas.

In addition to these "fast mobility" related problems, Palermo also suffers from "soft mobility" related problems: "soft mobility" in Palermo is still underdeveloped compared to the size of the city and its needs, with insufficient pedestrian areas and a severe lack of bicycle lanes, bicycle parking areas and soft mobility services. A recent Legambiente report records:

- Equivalent cycle paths 1.91 sqm per 100 inhabitants
- Pedestrian islands 0.54 sqm/inhabitant
- Public transport 40 trips/inhabitant/year
- Public transport offers 16 cars/km/inhabitant/year

To counteract the problem of traffic congestion, some initiatives have been taken in the last decades in urban and strategic planning. The latest strategic planning tool for mobility that was adopted is the PUMS - Urban Plan for Sustainable Mobility (definition formulated in the Italian Ministry of Transportation - MIT Decree of 4 August 2017). In a medium-long term time horizon (10 years), this tool develops a systematic vision of the Metropolitan City's mobility, "proposing the achievement of environmental, social and economic sustainability objectives through the definition of actions oriented to improve the effectiveness and efficiency of the mobility system and its integration with the urban and territorial layout and developments." Through the Urban Sustainable Mobility Plan, the Municipal Administration defines a "concert" of coordinated actions for the planned and programmed governance of public and private

mobility in its territory. It organises planning processes and paths, aiming to fully define the complex system of interventions in traffic and soft mobility areas, and in car alternatives, parking and public transport. Urban Plan for Sustainable Mobility (PUMS)'s main strategy in the city of Palermo is to create a balance between collective and individual demand for transport. It has adopted this strategy to reduce congestion and improve accessibility to and from the city's suburbs.

The pursuit of this "modal split" re-balancing strategy implies an incisive mobility policy that favors the use of collective transport—tram lines, rail loops and metro in particular. As the new PRG - General Regulatory Plan - confirmed, urban development planning and urban mobility are closely related as instruments of urban and territorial city planning. In fact, the city's historical-settlement structure has dominated the logic used for the insertion of new fast and soft mobility services. These are positively influencing people's movements within the urban environment by making them more sustainable.

In terms of mobility in Palermo, it is possible to recognise four large partitions:

- the "central" city, formed by the historical center and the 19th century new center along the north axis of the city, where hybrid mobility, as combination of fast car mobility and the increasing presence of soft mobility, is now taking place;
- the "intermediate" city, which lies between the dense historical urban core and the arching ring road, a complex road structure which has been variously interrupted and discontinued due to the insertion of the railway systems, but which nevertheless facilitates movement thanks to the presence of the tram;
- the "discontinuous" city beyond the ring road and the "dispersed" city to the northern edge. This area is characterised by the presence of low-density and high-density settlements in the historical boroughs and the twentieth-century social housing district of the ZEN (Zona Espansione Nord), and is mainly served by traditional road and car mobility.

Built and Indoor Environment

The city has a heterogeneous urban physiognomy due to its diverse historical periods and the different dominating populations that have determined its development throughout history: it has different urban morphologies, types of buildings, construction periods and is intended for various uses. The texture and fabric of Palermo can be read as a set of different tesserae within a mosaic and different macro areas correspond to the parts of tesserae. Each of these areas has a "specific identity, which is historically and culturally identifiable both in terms of urban planning and the types of buildings which are predominantly used and their installed functions". The passage between the historical city and the modern one is marked by the northern expansion axis that connects the historical city (which mainly falls within the Historic Centre, I Circostrizione) to neighbourhoods built between the nineteenth and the twentieth century. These neighbourhoods show signs of significant development with wide, regular blocks and wide streets, and they are strongly linked to commercial activity and the beginnings of some industrial activity. During the 19th and 20th century, the city was equipped with important infrastructures: a port, roads and a railway (the first railway bypass connecting the port area with the central station). It also experienced a new urban development with the creation of new neighbourhoods to the south of the city and along the waterfront. During this period, the city was built up beyond the historical centre, especially along the new road Via della Libertà. At the end of the 19th century, the urban axis of Via Roma crossed the historical city, linking the railway station with the port area. During this time, Palermo also followed the model of the great European capitals and built two great theatres: the Politeama and the Massimo.

Despite the economic crisis, in the early decades of the 20th century expansion works took place on the port, and the Matteotti district and the new public hospital (Ospedale Civico) were built. During the Second World War, the city's historical centre was heavily bombed, and in the following decades the area was gradually abandoned due to increasing decay. Between the 1950s and 1960s, there was a construction boom known as "the sack of Palermo" and this completely changed the city's architectural features: to construct new neighbourhoods intended for public housing such as the Borgo Nuovo (1956) and the ZEN, numerous old hamlets and historical structures (especially buildings from the Liberty-Art Nouveau period) were demolished. The buildings erected during this urban are known for their low quality.

Today, the historical centre (one of the largest in Europe) is home to numerous important urban redevelopment and building renovation projects (including the URBAN programme, the PRUSST and the 'Plan for the Recovery, Redevelopment and Revitalisation of the Historical Centre'). The city's most used areas are the Historical Centre (I Circoscrizione), the Central City (VIII Circoscrizione), the Consolidated City (VI Circoscrizione - VIII Circoscrizione) and, to a lesser extent, the neighbouring urban areas: most of the collective (public and private), commercial and recreational services are concentrated in the historical centre along Via Roma, Via Maqueda and Via della Libertà. The central Waterfront, the area surrounding the waterfront, and the historical centre (Piazza Marina and the Kalsa in particular) have recently been converted into recreational and commercial neighbourhoods, which exist more for touristic and leisure purposes than for residents. Lastly, the urban centre's satellite areas are home to hospitals, University campuses, sports facilities such as the stadium and hippodrome, and the Parco della Favorita.

Currently, the city's architectural heritage is very heterogeneous, both in terms of private residential and commercial buildings, and public buildings with a strong artistic, cultural and touristic vocation. The collection of Arab-Norman architecture weaved into Palermo's urban fabric was declared a UNESCO World Heritage Site in 2015 and has been a driving force for a series of interventions that aim to restore, renovate and recast the city's architectural heritage.

In recent years, more attention has been given to themes and interventions related to urban redevelopment and regeneration which have aimed to preserve Palermo's built environment, stimulating the recovery of existing buildings instead of using untouched land for new construction. The main urban planning instrument is a combination of the PRG General Regulatory Plan and the EPP Detailed Executive Plan and their implementation rules. "The new Palermo 2025 General Regulatory Plan which was approved in recent years on the Orlando Administration's initiative has outlined what Palermo will be like in 2025 following green and blue developments, making particular reference to: sustainable mobility from the trams; the recovery of existing buildings; zero soil consumption; the improvement and enhanced care of the city's green spaces; the overhaul of the coast and the purification of sea and waterways to make Palermo the "Panormous" (all port city) of its name. The key concepts of this new planning are: respect for the environment; urban regeneration; improved quality of services; improved accessibility; and increased soft and sustainable mobility. The new plans include 29 km of trams, 145 km of cycle paths, new pedestrian precincts, the completion of Viale Regione Siciliana with a new bridge over the Oreto, and the sea bypass."

Palermo overview



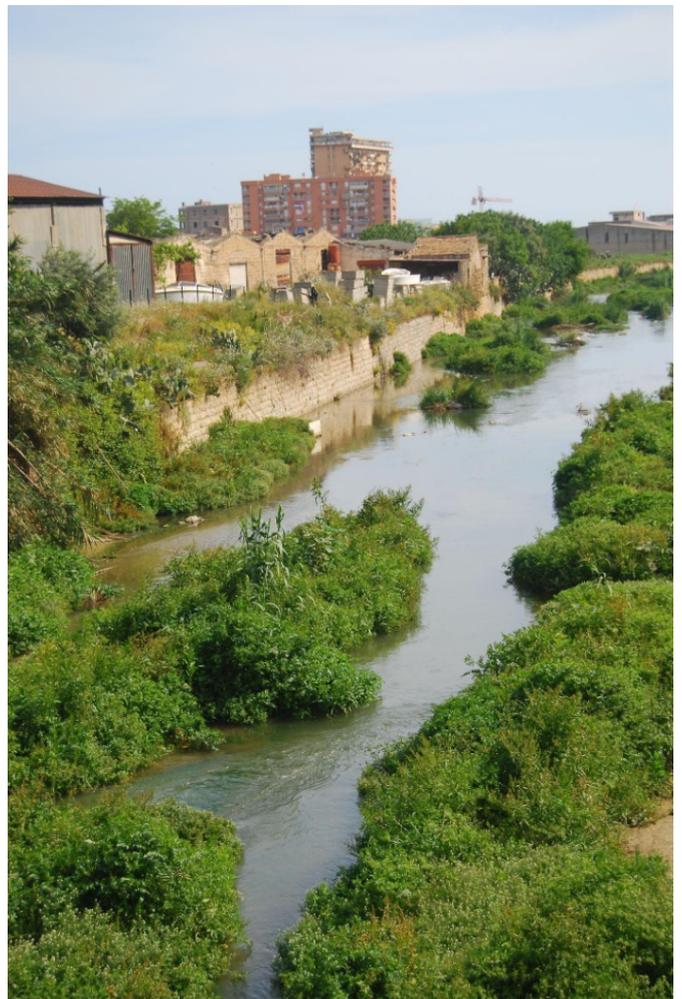
Palermo Cathedral



Palermo Tram Network



Oreto River



Harbour Sant'Erasmo



Palermo's environmental system is particularly rich and varied thanks to the city's sea location and its numerous important naturalistic emergencies. In terms of the city's green infrastructure, there are numerous urban parks and historical gardens and villas. The biggest park is the Parco del Real Tenuta della Favorita, one of the largest parks in Europe, running a total distance of 200 hectares. It is known for its natural beauty and its sport and recreational facilities. Other green spaces of naturalistic and historical-cultural interest include the Botanical Garden and Villa Giulia and the nearby Foro Italico, the English Garden, Villa Trabia, Villa Torre di Sperlinga, Uditore Park, Ninni Cassarà Park, Zisa Park, Villa Malfitano, Villa Niscemi, the agricultural park of Ciaculli and the Royal Reserve of Boccadifalco which is rich in historical artefacts. The Oreto River Valley (part of a Site of Community Interest - SIC1) is also in the urban area although it is currently in a state of environmental and social degradation. In the suburban area the

following important naturalistic sites are recognised as both regionally protected areas and Sites of Community Interest: the Marine Protected Area of Capo Gallo, Isola delle Femmine and the area of Monte Pellegrino (Natural Reserve covering 1,050 hectares, established by a 1995 Decree).

According to a report issued the 1st of March 2022 by the #Conibambini Observatory on Educational Poverty and carried out by Openpolis with the social enterprise Con i Bambini in the field of the Fund for the fight against juvenile educational poverty, on "The presence of equipped neighbourhood green spaces in Italian cities", Palermo is among the Italian cities with less surface area of equipped green spaces for children (0.15 square metres per child) compared to the national average of 25 square metres per child and it has 11 trees per 100 inhabitants in publicly owned areas, placing it in the lowest bracket compared to 116-190 trees per inhabitant in the case of the greenest cities (Ecosistema urbano 2021 report - Legambiente). This data clearly highlights the urgent need for specific planning to improve equipped and accessible green spaces. In the last two decades or so, several initiatives have been launched to improve the equipped green areas, among them: the opening of "La città dei ragazzi", an area dedicated to the recreation and culture of children and young people, located within the Parco della Favorita and bordering the Palazzina Cinese: the area, born in the 1950s, after several years of closure was reopened in 1997; the creation of the Parco Uditore was requested by a civic committee in 2010 which then became, in 2014, Cooperativa Sociale Parco Uditore: today the area of Fondo Uditore, saved from the sack of Palermo in the 1960s, is used as an urban park; the area equipped with children's games in Piazza Magione, created with the support of the AddioPizzo Association and of the Municipality of Palermo (2015); the creation of the Parco della Salute at the Foro Italico, created on the initiative of the non-profit organisation Vivi Sano Onlus as a solidarity economy project to redevelop a public space intended as a park through services promoting the health and wellbeing of the person, especially children; the landscaping; the redevelopment project of the Parco della Favorita (2018).

In terms of environment and eco-sustainability, in its entirety the green system represents one of the essential aspects for future urban and territorial development in Palermo. The various green areas are also important for the development of the city's tourism sector. The new urban development plan places the protection of green areas at the centre of the city's growth: it identifies and protects parks such as the Oreto or Ciaculli river and the cultural parks of Maredolce and Uscibene, as well as natural and agricultural areas with landscape and historical value. New parks and urban gardens are included in the planning. A substantial section of green infrastructure is planned along the south coast, which is divided into five zones: Sant'Erasmus-foce Oreto, Brancaccio-Maredolce, Sperone, Bandita and Acqua dei Corsari.

Blue Infrastructure

Palermo, whose name is derived from the ancient greek "Panormus" ("all-port city"), arose from two—now buried—rivers: the Kemonia and the Papireto. The city has had a special relationship with the water and the sea ever since it came into being. The Oreto River occupies an important place within Palermo's blue infrastructure, the marine and coastal system and the urban waterfront. Together these blue spaces are of high environmental value and quality but at present they are poorly equipped and either inaccessible or difficult to access. Redevelopment plans have been approved for these areas: in particular, the Ministry of the Interior has granted municipality funding (EUR 12 Million) from the PNRR resources for a redevelopment project in the Oreto River Valley.

This project includes measures for the safe and sustainable use of the mouth and adjacent coastline of Via Messina Marine and will affect the south-eastern part of Palermo's coastline. Meanwhile a new port master plan has been approved for Palermo's urban waterfront and a major redevelopment project is underway.

These above-mentioned interventions aim to improve accessibility to the city's blue spaces and enhance people's enjoyment of them by de-polluting the coast and the sea. By doing this they hope to develop the tourism sector and strengthen the relationship between the city and the sea. The waterfront project presented in 2021 will be carried out with an EUR 35 million investment aimed at redeveloping the

interface areas which separate the port from the city centre. It will do this by using a tourist-cultural model that envisages the creation of new multifunctional spaces and buildings, all of which have services which improve reception for passengers and port operators, new parking areas for heavy vehicles and cars waiting to embark, and green areas to enhance the liveability and usability of urban and port spaces. The project, which follows the port's master plan, will instigate development longitudinally for about 400 metres along an area of about 52 thousand square metres.

Urban Food Systems

In ancient times, Palermo was known as the Conca d'Oro. This name was used to indicate the flat region with gentle slopes which extends irregularly around Palermo for a radius of between 3 and 8 km. When the Arabs ruled Palermo this area was cultivated with citrus fruits and vegetables. Until the middle of the last century, the Conca d'Oro surrounding the city was a large garden which, at its peak, covered about 15,000 hectares of intensely cultivated land. Today, very little of this land remains: in the last fifty years cultivated land has shrunk by almost 80% and food production is low. However, in the last two decades, a number of initiatives which aim to create new urban gardens have been launched. These include the Consortium "Il Tardivo di Ciaculli" initiative which was set up in January 1999 with the aim of promoting all initiatives that protect, enhance and develop the agricultural areas located in Palermo's Conca d'Oro. In this way, "Il Tardivo di Ciaculli" has been enriching the territory with sustainable and quality agriculture. The agricultural park now covers an area of 850 hectares in the Ciaculli and Croce Verde districts which are located to the east of Palermo's plain and thus represents a true "green lung" for the city, combining landscape, production and environmental functions. The main crop is the Mandarino Tardivo di Ciaculli, which occupies about 80% of the current farmed surface, followed by the Avana mandarin, the giant red medlars of Ciaculli, lemons and small quantities of apricots and oranges.

Another initiative is the Urban Gardens project, promoted by CODIFAS, the Consortium for the Defence of Sicilian Agriculture. This initiative aims to recover a direct and active relationship with land and nature, giving citizens the opportunity to cultivate the land so that they can autonomously produce their own food. Launched in 2014 with the association Gli Orti della Fate, over the years it has given life to four plots of land which are used as fields: vegetable gardens have been established at Fondo Badia, Via Galletti and Baglio Culluzia where expert agronomists and gardeners, citizens, associations and schools are involved in environmental education projects.

Among the most recent experiences here are: the association 'Oasi degli orti' that promotes educational vegetable gardens and a social garden, which citizens can cultivate by themselves; the 'Orti Urbani Palermo' project promoted by the association of the same name, which has been implemented on land located to the north of the city and aims to provide citizens with various plots of land which can be used as shared urban gardens for organic farming.

Sustainable Energy

In 2011 Palermo joined the Covenant of Mayors and this has led the city to commit to reducing its CO2 emissions by more than 20% by 2020 (20% reduction in comparison to 1900 levels). The Covenant of Mayors is an initiative whereby countries, cities and regions voluntarily commit to reducing their CO2 emissions beyond the 20% target. The city of Palermo will maintain this formal commitment by implementing Sustainable Energy Action Plans (SEAPs) and to do this the municipality has decided to create an internal cross-sectoral structure with the technical coordination of the Environment sector called the "Covenant of Mayors Project Unit". With SEAP's approval, an investment of about EUR 107 million is planned. With this sum and that of the foreseen amounts for the three major mobility infrastructural works (Railway Ring, Tramway and Railway Link) the city is investing more than EUR 1 billion in initiatives which intend to reduce by 21% polluting gas emissions in the city. This will improve energy efficiency and offer new services to citizens. It has emerged from analyses carried out for the drafting of the SEAP that the largest energy consumption in the city of Palermo is attributable to private and commercial transport and to the residential and tertiary sector. During the transition from final energy consumption to CO2

emissions, the percentage weight of tertiary and residential buildings increases and the percentage weight of transport slightly decreases, although it is still the most polluting sector (59,99% of consumption and 50,86% of CO₂ emissions for public and private transport and municipal car fleet; 23,36% of final consumption related to residential buildings, with 28,02% of CO₂ emissions). The Municipality of Palermo has identified key areas which are a priority for action and initiatives so that the CO₂ reduction targets described in the Action Sheets attached to the SEAP can be met.

The actions foreseen by the SEAP will intervene in the following areas:

- Building sector, by implementing energy saving actions in buildings and public lighting installations. In order to plan these actions, the Administration will equip itself with an Energy Cadastre, i.e. a detailed database on the thermophysical characteristics of buildings and their associated installations and a Public Lighting Plan.
- Transport sector, with the aim of developing "sustainable mobility" through a gradual renewal of the vehicle fleet circulating on the territory and the implementation of sustainable mobility systems.
- Renewable energy sector, promoting the installation of photovoltaic systems in private buildings and renewable hot water systems. To do this and to reduce the supply costs related to the purchase of this technology, the Municipality wants to facilitate the diffusion of photovoltaic systems in the territory through "green public procurement" (GPP) initiatives.

In terms of renewable energy sources, one of the most relevant initiatives in recent years is that of the Palazzo dei Normanni in Palermo. Built by the Sicilian Region within the Interregional Operational Programme Renewable Energy and Energy Saving (POI 2007-2013), for a value of EUR 621 k, it is a low-enthalpy geothermal plant with 315 kWf and 305 kWt power and serves Presidency's rooms the reception rooms. The Sicilian Region was one of the first administrations to equip itself with a geothermal plant, thanks to the use of 36 probes installed in 130 metre deep wells. Consequently, in Sicily, the use of geothermal energy, especially low-enthalpy energy, is a potentially complementary resource to RES: it is a natural 'renewable' source and depending on its characteristics it allows for heat to be obtained for heating and other direct uses. It is also advantageous in that it generates thermal and touristic development. In 2015, several public lighting systems with thermal and photovoltaic panels were presented and tested. In 2019, a project was also presented for the production of renewable energy through the latest generation of photovoltaic greenhouses that were integrated with storage systems in the Danisinni neighbourhood. For years, together with the parish and support from the municipality, Danisinni's resident community and cultural and social operators have created a series of initiatives aimed at regenerating the neighbourhood.

Finally, in recent years, thanks to state subsidies and the increase in building bonuses for energy efficiency (SUPERBONUS 110%), numerous interventions which aim to improve the energy performance of buildings have been carried out on residential constructions.

Waste Management

According to ISPRA data (Report on Urban Waste 2021), the production of Urban Waste (UW) over the last few years (2013-2018) has increased: on a national level, it went from 29.6 to 30.2 Mt (+2%). On the other hand, in Sicily the total production of waste between 2013 and 2018 fell slightly from 2.4 to 2.3 Mt (-4%), thus bucking the trend both nationally and in the rest of Southern Italy, which remains constant. Considering the national average per capita of urban waste production and an interval of $\pm 20\%$ variation with respect to the average value, it is possible to group the 9 Sicilian Provinces according to their performance: low, if the production of waste is 20% higher than the national average; medium, if the production is within the interval of $\pm 20\%$ variation with respect to the average; high if the production is below 20% with respect to the average value. According to this classification, Palermo presents an average performance and also records a high increase in waste production in 2018.

The most important actions to be taken by waste management regulations are measures which aim to prevent the creation of waste and waste as a hazard. Palermo's performance in waste sorting is still very poor. The overall trends of growth in urban waste sorting for 2018 show that the whole of Sicily lags behind the national average data: it is still far from the urban waste recycling targets set for 2025, 2030 and 2035 at European level. The first data available for 2019 mark a further growth of 30% compared to the previous year, showing that Sicily is well on its way to aligning with the Italian average. Palermo, together with the cities of Syracuse, Messina and Catania, is lagging furthest behind in differentiated waste collection and, consequently, in the recycling of urban waste. Therefore, it is necessary for the city to take steps to improve its waste sorting performance in order to align with national and European trends. Recently, the areas that perform door-to-door sorted waste collection have increased and so has the use of the mobile ecological island system. Nevertheless, waste management is one of the Sicilian capital's biggest and most unresolved environmental and social problems— it is so severe that it is regarded as one of the city's emergencies.

Palermo is the least sustainable city in Italy, as confirmed by the 28th edition of the *Ecosistema urbano 2021* report, produced by Legambiente in collaboration with Ambiente Italia and Il Sole 24 Ore, which photographs the green performance of 105 provincial capitals in 2020, when the Covid beat faster and the lockdown had frozen travel. The overall ranking, determined by a set of 18 indicators, sees Palermo in last place.

In terms of waste management, it appears that not only is sorting of waste proceeding apace, but that the annual quantity of waste to be recycled has increased by 25 kg per inhabitant compared to 2020. The percentage of waste sorted as a proportion of the total produced will fall from 19.2% in 2019 to 14.51% in 2020! The collection of the wet fraction per capita is > 50 kg /year.

Urban Health Equity

Palermo's health service depends on the regional service and consists of nine provincial health agencies and nine hospital agencies which depend on the regional health department. Each of the nine provincial health agencies is in turn divided into hospital and territorial districts. The hospital districts (20 in all) are made up of a collection of one or more hospital wards. Meanwhile the health districts are the territorial division of the company: within these districts, prevention, diagnosis, treatment, rehabilitation and health education services are provided.

The provincial health agency of Palermo consists of administrative and health departments, structures with technical-professional and managerial autonomy within the limits of the assigned objectives and resources, that operate in relation to the annual plan of activities and resources negotiated with the General Management, within the framework of the company planning. The departments group together operational units which are both complex and simple and are responsible for producing and providing homogeneous services and organising and managing the resources allocated to such services. The Department is the ordinary operational management model for the Company's activities, and should be considered as a coordination and management structure for the performance of complex functions, with guidance, consultancy and supervision tasks for the functions that it is in charge of.

Health Districts constitute the territorial structure of the Provincial Health Agency, within which services are provided for individual or collective prevention, diagnosis, treatment, rehabilitation and health education for the population. Due to the many characteristics of the population, these services must be guaranteed in a widespread and homogeneous manner throughout the territory. The Health Districts directly manage the PTAs (Presidi Territoriali di Assistenza - Territorial Assistance Garrisons) and have assigned the relative activities to the Single Point of Access (PUA), the Multidimensional Assessment Units (UVM), the Disability Services and the Chronicity Services. The Single Point of Access (PUA) is the gateway to territorial services that involve taking responsibility for citizens with health and social problems, and accepting requests and directing them to the appropriate care settings.

Main outpatient clinics and hospital companies are: A.R.N.A.S. "Civico Di Cristina Benfratelli", Azienda Ospedaliera Universitaria "Paolo Giaccone", Azienda Ospedaliera "Ospedali Riuniti Villa Sofia - Cervello".

Over the years, Palermo has developed an assistance model which is dedicated to the most vulnerable. This model meets many of the city's needs thanks to the creation in 2006 of EMERGENCY's first outpatient clinic in Italy, Ambulatorio Palermo, which was set up with the aim of offering free basic and specialist medical services to people who were excluded from existing services for income or legal status related reasons. The clinic also offered health education and socio-healthcare guidance. The project was set up in collaboration with the general management of the Health Provincial Agency 6 of Palermo, which renovated the outpatient clinic and made it available for use. Following the beginning of the first outpatient clinic in March 2019, the Outpatient Clinic was converted into a Social and Health Orientation Desk until it was eventually handed over to the 6th Health Provincial Agency.

As well as the hospital units that have already been mentioned, in recent years ISMETT (Istituto Mediterraneo per i Trapianti e Terapie ad Alta Specializzazione: Mediterranean Institute for Organ Transplantation and Highly Specialised Therapies) and the RiMED Foundation have occupied an important space in Palermo's healthcare service. ISMETT is an Istituto di Ricovero e Cura a Carattere Scientifico (IRCCS): in Italy these institutions are research hospitals which take on clinical research and manage hospital services. ISMETT was born out of an international partnership between the Regione Siciliana (Sicilian Regional Council), the ARNAS Civico (Azienda Ospedaliera di Rilievo Nazionale e di Alta Specializzazione "Civico di Cristina e Benfratelli": Tertiary Healthcare Facility "Civico di Cristina e Benfratelli") and the UPMC (University of Pittsburgh Medical Centre) and is specifically concerned with care and research for end-stage organ disease. It is a centre of excellence for organ transplantation and a key reference point throughout the Mediterranean region. In June 2017, the Ri.MED foundation became an associate of ISMETT. The foundation was established by the Presidenza del Consiglio dei Ministri (the Presidency's Council of Ministers) and aims to promote, support and lead research projects and programmes in biotechnology.

ISMETT is the first hospital in Southern Italy to be accredited by the Joint Commission International (JCI). The JCI is one of the most advanced accreditation systems for the quality evaluation of healthcare facilities. The Ri.MED foundation was established by a decree from the Presidente del Consiglio dei Ministri and was born out of the international partnership between the Italian government, Regione Siciliana, the Consiglio Nazionale delle Ricerche (CNR, National Research Council), the University of Pittsburgh and the University of Pittsburgh Medical Centre. The foundation promotes, supports and leads research projects in biomedicine and biotechnology and enables innovative findings to be rapidly applied to clinical practice. Currently the foundation is engaged in establishing the Centro per le Biotecnologie e la Ricerca Biomedica (Centre for Biotechnologies and Biomedical Research). The Commissione Regionale dei Lavori Pubblici (The Regional Public Works Commission) has already shown support for the Centre's project. The Centre will be a reference point for researchers from all over the world and will thus place Sicily at the forefront of research in biomedicine and biotechnology, a research sector which is always growing.

ASVIS Report - Palermo

In 2016, the Alliance for Sustainable Development - ASVIS was established in Italy to raise awareness of the importance of the 2030 Agenda for Sustainable Development and to mobilise for the achievement of the Sustainable Development Goals.

The ASVIS Report "Territories and sustainable development" intends to measure and analyse the positioning of regions, provinces, metropolitan cities and urban areas with respect to the 17 Sustainable Development Goals of the 2030 Agenda, verifying the progress of the various territories towards economic, social and environmental sustainability.

In 2021 Sicily improves on Goal 3 (Health), 5 (Gender equality), 9 (Infrastructure and innovation), and 12 (Responsible production and consumption).

- Goal 3: life expectancy increases (+1.2 years between 2010 and 2020) and there is an increase in the number of doctors (+0.8 per thousand inhabitants), while hospital beds decrease (-0.3 beds per thousand inhabitants between 2010 and 2019).
- Goal 5: both the ratio of women with pre-school children to women without children and the share of women in regional councils improve, but the share of involuntary part-time work by women increases (+7.6% between 2010 and 2020).
- Goal 9: Households with broadband connection (+35.3%) and knowledge workers increase between 2010 and 2020, but the number of regular users of public transport decreases (-3.6% between 2010 and 2020).
- Goal 12: between 2010 and 2019, the share of separate collection increases (+29.1%) and per capita waste production decreases (-13.1%).

Negative trends are instead found in Goals 1 (Poverty), 4 (Education), 10 (Inequalities), 11 (Sustainable Cities) and 15 (Terrestrial Biodiversity).

- Goal 1: absolute poverty increases in southern Italy (+6.6% between 2010 and 2020, of which 3.3 in the last year). Between 2010 and 2020, the number of people with low work intensity also increases (+8.8%), but those living in dwellings with structural problems decrease (-13.6%).
- Goal 4: both preschool participation rates (-3.9% between 2013 and 2019) and cultural participation (-8.5 percentage points, of which 4.2 in 2020) decrease. The share of university graduates increases over the last ten years, although the region has the lowest level in 2020 (18.6%).
- Goal 10: Differences in disposable income increase (+1% between 2010 and 2018) and the youth employment rate worsens (-5.0% between 2010 and 2020, of which -1% in the last year), which measures the lowest level in Italy in 2020 (17.6%).
- Goal 11: between 2010 and 2020, both the number of people living in overcrowded housing (+5.3%) and unauthorised building (+19%) increase.

HOW FAR AWAY IS SICILY FROM MEETING SOME OF THE 2030 AGENDA TARGETS?

The Region is showing promising trends for five targets, relating to the share of organic crops, overcrowding in penal institutions, use of fertilisers, early exit from the education and training system and air pollution due to PM10.

On the other hand, fifteen indicators, such as the share of university graduates, the gender employment gap, the efficiency of water distribution networks, the employment rate, the share of NEETs, the share of GDP devoted to research and development, inequalities in disposable income, and the number of kilometres per inhabitant in local public transport, have deviated from the targets.

THE METROPOLITAN CITY OF PALERMO AND SUSTAINABLE DEVELOPMENT

In 2020, the Metropolitan City of Palermo reached the Target on the overcrowding of penal institutions. There is a positive trend, which would allow the Target to be reached, also for air quality. In the last five years, the maximum exceedances of the air pollutant PM10 have been reduced from 64 to 18 days.

Metropolitan City of Palermo

SDG	INDICATORS AND TARGETS	VALUE LAST YEAR AVAILABLE	SHORT PERIOD	LONG PERIOD
Goal 3	Target 3.6 - By 2030, halve road traffic injuries compared with 2019	21.4 for every 10,000 habitants (2020)		
Goal 4	Target 4.1 - Entro il 2030 ridurre al di sotto della quota del 15% gli studenti che non raggiungono il livello sufficiente di competenza numerica (14-15 anni)	60.9 % (2019)	● ●	● ●
Goal 4	Target 4.1 - By 2030, reduce the number of students below the 15% level of literacy reach a sufficient level of literacy (14-15 years old)	47.6 % (2019)	● ●	● ●
Goal 4	Target 4.3 - Reach 50% of graduates (25-39 years old) by 2030	20.7 % (2020)		
Goal 5	Target 5.5 - Halve the gender employment gap by 2030 compared to 2020	57.9 females/males * 100 (2020)		
Goal 6	Target 6.4 - By 2030, achieve 90% efficiency in drinking water distribution networks.	54.3 % (2018)		● ●
Goal 7	Target 7.2 - By 2030 to achieve a 55% share of energy from renewable sources in gross inland electricity consumption	28.7 % (2019)		● ●
Goal 7	Target 7.3 - By 2030 to reduce electricity consumption by 14.4% compared to 2019	24.6 ktoe per 10,000 inhabitants (2020)		● ●
Goal 8	Target 8.5 - By 2030 to reach 78% of the employment rate (20-64 years)	43.1 % (2020)		
Goal 8	Target 8.6 - By 2030 to reduce the share of NEETs below 9% (15-29 years old)	36.8 % (2020)		
Goal 9	Target 9.c - By 2026, ensure that all households have Gigabit network coverage	54.2 % (2020)	● ●	● ●
Goal 11	Target 11.2 - By 2030, increase the number of seat-km per inhabitant offered by public transport by 26% compared to 2004	1823 place-km per inhabitant (2019)		
Goal 11	Target 11.6 - By 2030, reduce PM10 exceedances to less than 3 days per year	18 days (2019)		
Goal 12	Target 12.4 - By 2030, reduce the amount of urban waste produced per capita by 27% compared to 2003	485 kg/inhabitant* per year (2019)		
Goal 15	Target 15.3 - By 2050, zero annual increase in land use	4.0 ha per 100,000 inhabitants (2020)		● ●
Goal 16	Target 16.3 - By 2030, reduce to zero the overcrowding in penal institutions	95.3 % (2020)	ACHIEVED	ACHIEVED

Nine targets show a negative situation, six of which show too little improvement, which does not allow the target to be approached. In particular: the rate of injuries in road accidents (Target 3.6) improves by 12.4% in the short term and by 26.8% in the long term; the share of NEETs (8.6) improves by 3.7 percentage points in the short term and by 0.5 percentage points in the long term. A similar situation in the short term is shown by the trends of the targets on water efficiency (6.4), renewable energy (7.2), energy consumption (7.3) and land consumption (15.3).

Two targets, however, show a negative trend, which goes against the direction needed to reach the target: the employment rate (8.5) and the production of urban waste per capita (12.4). Finally, the greatest criticism is to be found in the supply of local public transport (11.2), which deteriorates in the short term by 10.2% and in the long term by 36.0%.

There is a discordant trend between the short and the long term for the targets related to the share of graduates (4.3) and to the occupational gender gap (5.5). Both indicators have improved moderately in the last five years, by 5.3 and 5.4 percentage points respectively; while in the last 15 years they have made insufficient progress towards the target.

2.0 Methodology – Data Collection and Analysis

In this section, more information will be provided on using desk-based research, surveys, and in-depth interviews for analysing Palermo’s entrepreneurial/business ecosystem and the relevant actors and their functions.

2.1 Quantitative Data: Desk-Based Research

Using secondary data collection (desk research), a complete documentation and evaluation of approximately **one-hundred urban actors**, active in the city of Palermo, was achieved. With the help of published studies, articles, reports, and actors’ websites an initial picture of Palermo’s current urban ecosystem environment and actors was formed. In section 9.0 – References, we list a sample of key studies and reports utilised for gathering information and data concerning sustainable development, entrepreneurship, innovation, and the urban (business/entrepreneurial) ecosystem in Sicily and the city of Palermo.

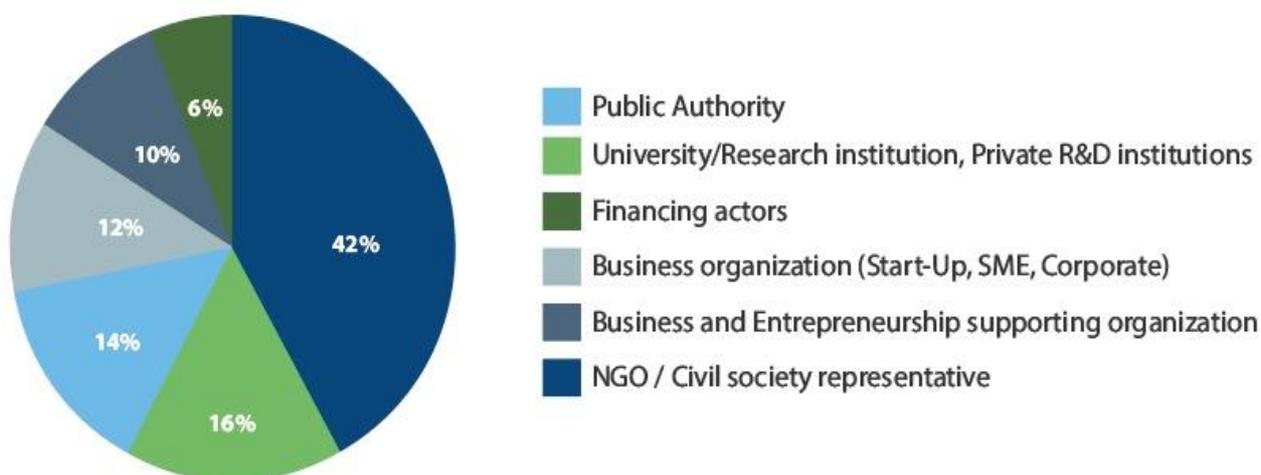
Following a high-level review of the initial contact list and after forming a better idea on who were the most important urban actors, the local U-SOLVE team selected **seventy out of** the initially identified **one-hundred** actors in order to approach them for the arrangement of in-depth interviews and ask for their input in the U-SOLVE survey.

2.2 Quantitative Data: Survey

The U-SOLVE survey has been employed in order to capture Palermo’s ecosystem experts/actors’ opinions on the ecosystem’s functions. This survey was designed using indicators from the ANDE (ANDE, 2013) and OCED/Eurostat framework (OECD, 2008), besides some other indicators extracted from the geographic mode of Leendertse et al. (2021).

Between the months of **December 2021** and **March 2022**, **fifty-one surveys** have been **completed**. Figure 1 shows the percentage of each stakeholder category that completed our survey. It can be argued that there is a satisfactory actor sample from each ecosystem domain who completed the survey.

Figure 1: Categorisation of Stakeholders who Completed U-SOLVE Survey.



The majority of these surveys have been filled in and submitted during our in-depth interviews with the stakeholders. This ensured that the survey respondents understood what each question was asking and did not rush to complete it. Consequently, the results of the surveys can be considered more trustworthy.

Some other general facts about the completed surveys:

- The U-SOLVE survey has been widely promoted and advertised through ARCA's network of contacts. This helped reach and inform a wide audience in addition to the promotion of the survey through email communications to and our in-depth interviews with targeted audience.
- A statistically significant number of local stakeholders representing civil society, start-ups/SMEs, local authorities, policy makers, academia/research organizations, business support organizations as well as cultural agencies and governmental organizations has been targeted.
- The completion time of the survey was ranging from **30 to 60 minutes**.
- The majority of survey respondents hold **managerial/executive positions** and the 82% with **more than 10 years** of experience
- **72%** of respondents are **men** and **28% women**.
- Around **34%** of respondents hold a **Postgraduate Degree**.

2.3 Qualitative Data: In-Depth Interviews

Using information gathered from the desk-based research on the identified one-hundred key urban actors, the Italian U-SOLVE team attempted to narrow this list even further, at a first stage. **Seventy** actors have been chosen; these actors can be relatively easily approached and can possibly have the biggest role and influence in the U-SOLVE project. Out of these seventy actors and **between** the months of **December 2021** to **March 2022**, **twenty-two** in-depth interviews have been **scheduled and fulfilled**. Results from these in-depth interviews have been extremely useful for understanding the state of affairs in urban sustainable development challenges and initiatives in Palermo. Additionally, these results complement desk research activities and have been used to complete the main actors mapping as well as validate the classification of each actor under a specific functional domain.

Because of covid19 related restrictions, around **70%** of these interviews have been **online** and **30% face-to-face**. Table 1, Appendix A provides the name and type of organisation approached for an interview as well as the names of the organisation's representative(s) at the interview. It can be noted here that the in-depth interviews will continue beyond the time of the writing of this report – this will not affect collected information/data up to this point, but rather help arguments and conclusions become more robust. The team has been aiming for quality interview respondents and reaching out to such influential urban actors can be a difficult task. Many of these organisations and their people have busy schedules and a lot of times are worried to engage in additional activities that might compromise in one way or the other their own projects and responsibilities.

Flow of Interview Meetings

Some other general facts about the completed in-depth interviews:

- All interviews started with the U-SOLVE team providing a thorough description of the project and its objectives so that interviewees can better understand the topic of discussion and what we are asking from them.

- Interviewees then provided more information about themselves and the organisation they represent.
- Following the above step, the conversation shifted to more open-ended and specific/fitting to each interviewee Q&A approach.
- We tried to find synergies with interviewees' own projects and activities and ways that we can join forces.
- We received expert advice and suggestions from individuals and organisations' representatives on how to better prepare for and plan upcoming U-SOLVE activities (e.g., design of focus groups, call for ideas and solutions, discover opportunities for available and suitable urban hubs).
- Using thematic analysis, we managed to identify certain commonalities between interviewees' responses, especially when they were debating about Palermo's urban ecosystem and the obstacles that need to be overcome for sustainable development.
- Approximately **80%** of interviewees and survey respondents expressed ***interest in helping us*** with future U-SOLVE related activities and initiatives.

3.0 Identified Urban Sustainable Development Challenges in Palermo

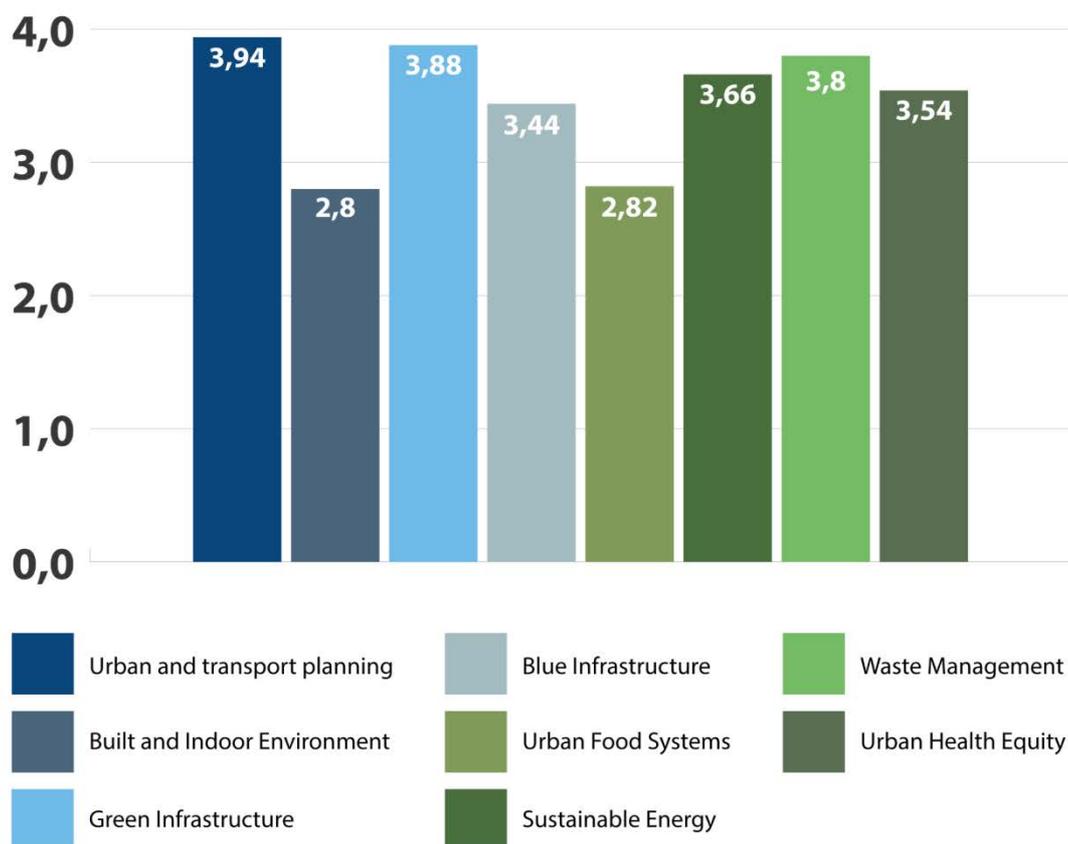
Section 3.0 will present and analyse information/data on Palermo's most critical urban sustainable development challenges gathered mainly from the fifty-one completed U-SOLVE surveys. The U-SOLVE survey identifies eight principal urban domains that cities and their actors are focusing on when trying to solve challenges for sustainable development. The survey asks respondents to rate the level of importance of sustainable development challenges in each domain from 1 to 5, where 1 is not important and 5 very important/critical.

3.1 Survey Results on Palermo's Urban Domains and Sustainable Development Challenges

Adding all survey responses together, urban actors who completed the survey have given:

- **Urban and transport planning** challenges in Palermo **3.94/4** in terms of level of importance.
- **Built and indoor environment** challenges in Palermo **2.8/4** in terms of level of importance.
- **Green infrastructure** challenges in Palermo **3.88/4** in terms of level of importance.
- **Blue infrastructure** challenges in Palermo **3.44/4** in terms of level of importance.
- **Urban food systems** challenges in Palermo **2.82/4** in terms of level of importance.
- **Sustainable energy** challenges in Palermo **3.66/4** in terms of level of importance.
- **Waste management** challenges in Palermo **3.8/4** in terms of level of importance.
- **Urban health equity** challenges in Palermo **3.54/4** in terms of level of importance.

Figure 2: Importance Level of Sustainable Development Challenges in 8 Urban Domains.



As it can be concluded from these results, **urban and transport planning** are considered to be the **most important** when it comes to sustainable development in the city of Palermo, followed by **green infrastructure** and **waste management** and related challenges (**including circular economy**). Of course, reflecting on the survey results, almost all eight identified urban domains are facing important challenges.

What is more, the survey allowed respondents to add additional issues that, from their experience, are important in terms of sustainable development. Respondents mentioned:

- ***education and misinformation;***
- ***Sicilian culture, attitude and mindset;***
- ***social inclusion or lack of;***
- ***democratic governance and community participation;***
- ***social justice and social equity.***

It can be argued that the additional issues that the respondents mentioned are not challenges as such, but rather overarching characteristics and peculiarities of the business ecosystem and society in Sicily that contribute to the creation of challenges in the eight urban domains evaluated in Figure 2. Since U-SOLVE focusses on inviting ideas/solutions to sustainable development challenges from the Creative Sector, it foresees that such ideas and solutions will be very suitable for influencing behaviors and culture as well as the promotion of structural changes leading to a more sustainable socio-technical regime.

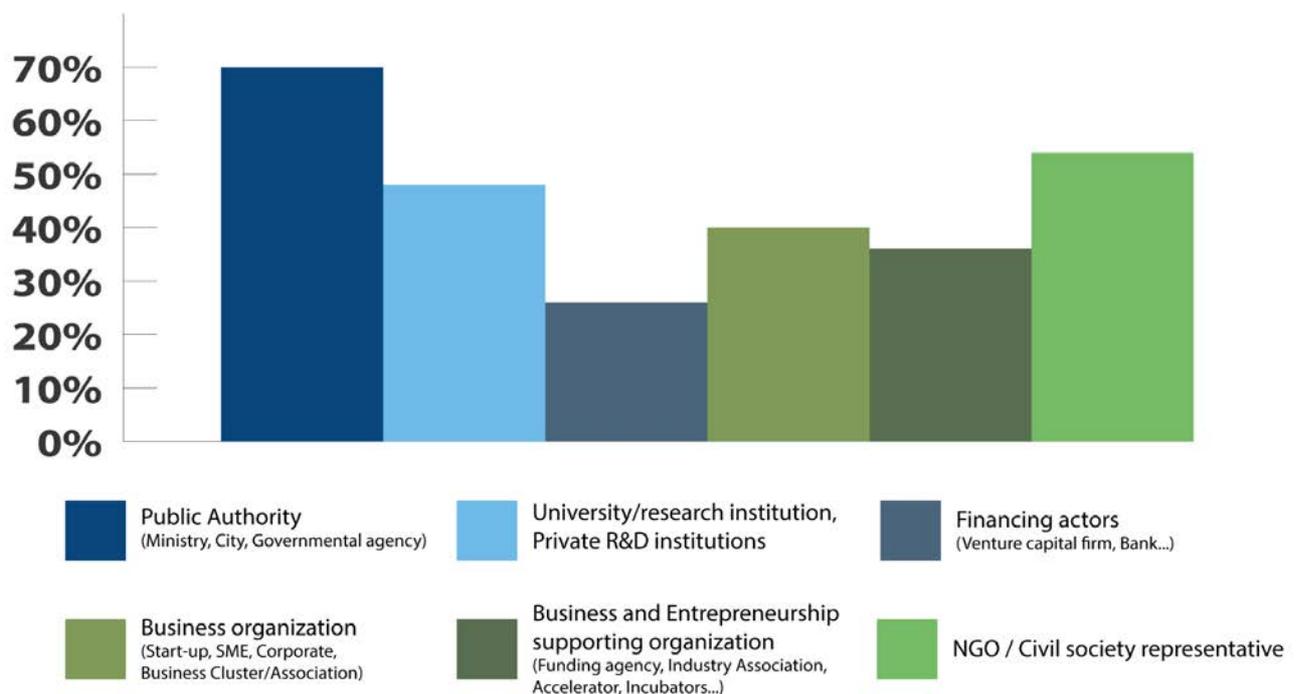
4.0 Entrepreneurial Ecosystem Actors Important for Urban Sustainable Development

Based on survey responses, section 4.0 presents weighted results on how important a number of predefined urban actors are for supporting organisations operating in Palermo's urban ecosystem respond to urban sustainability challenges.

4.1 Survey Results on Level of Importance of Urban Actors in Supporting Sustainable Development Initiatives

Adding all responses together, survey results (70% of survey respondents) show that **Public Authorities (Ministries, Cities, Governmental Agencies)** are the **most important** urban actors when it comes to supporting other organisations and their initiatives for sustainable development. Figure 3 below shows all six predefined urban actors mentioned in the survey and ranks them based on their level of importance.

Figure 3: Urban Actors and Their Importance in Palermo for Sustainable Development.



As mentioned previously, **70%** of the survey respondents stated that **Public Authorities** followed by **NGO/Civil society representative (with 54%)** and **University/Research/Private R&D institutions (48%)** have **high level of importance** and are crucial for influencing sustainable development initiatives and projects. Almost all actors want to connect and have some type of relationship with the previous-mentioned ecosystem actors.

5.0 Evaluation of Ecosystem Functions

Continuing with the analysis of data, survey participants were asked to give their opinion on how well they believe the ecosystem is set up to support entrepreneurial innovation in Palermo and provide indicators covering eight innovation ecosystem functions.

The eight innovation ecosystem functions monitored are:

1. Access to capital/finance
2. Knowledge Creation through university and research institutions
3. Entrepreneurship and sustainability supporting regulations and policies
4. Entrepreneurship and environmental sustainability culture and awareness
5. Accessibility to physical and digital infrastructure
6. Availability of qualified human resources to solve urban challenges
7. Existence of sustainability-oriented entrepreneurship business supporting organizations
8. The market of innovative products (purchasing power of the community)

The next subsections take each one of the eight innovation ecosystem functions and break them down into more specific indicators for a more detailed assessment of Palermo's ecosystem. Survey respondents are asked to rate each indicator based on how big of an obstacle they considered it to be for the growth of entrepreneurial activities and start-up companies.

5.1 Capital/Finance

For **Capital/Finance**, the survey measures **three** different **indicators**: Access to Debt Finance; Access to Equity Finance; and Access to Grants. Table 3 presents the results.

Table 1: Capital/Finance Related Indicators for Assessing Palermo's Ecosystem.

	No Obstacle	Minor Obstacle	Moderate Obstacle	Major Obstacle
Access to Debt Finance	2%	24%	44%	30%
Access to Equity Finance	10%	28%	32%	30%
Access to Grants	2%	42%	46%	10%

Looking at these results it can be argued that **Access to Debt and Equity Finance** related **challenges** present **moderate to major obstacle** for entrepreneurs and start-up companies trying to operate in the city of Palermo. **Access to Grants** represent a **minor to moderate obstacle**.

5.2 Knowledge Creation

For **Knowledge Creation**, the survey measures **four** different **indicators**: Existence of enough Universities and Research Institutes; Expenditure on Research & Development; Availability of Urban Sustainable Development Scientific Studies; and Brain Drains of Researchers and Scientists. Table 4 presents the results.

Table 2: Knowledge Creation Related Indicators for Assessing Palermo's Ecosystem.

	No Obstacle	Minor Obstacle	Moderate Obstacle	Major Obstacle
Existence of enough Universities and Research Institutes	20%	50%	24%	6%
Expenditure on Research & Development	12%	20%	26%	42%
Availability of Urban Sustainable Development Scientific Studies	16%	34%	34%	16%

When it comes to Knowledge Creation related challenges, availability of **Urban Sustainable Development Scientific Studies** is considered to be a **significant obstacle** for entrepreneurs and start-up companies. Whereas, the majority of survey respondents (**50%**) believe that the **number of and accessibility to Universities and Research Institutes** is **NOT** really **an obstacle**.

5.3 Policy and Business Environment Elements

For **Policy and Business Environment Elements**, the survey measures **three** different **indicators**: Existence of Sustainability and Environmental Challenges-Oriented Policies and Regulations; Incentives for entrepreneurs and creative ideas to solve environmental or urban challenges; and Availability of Information or Data on the National Level. Table 5 presents the results.

Table 3: Policy and Business Environment Elements Related Indicators.

	No Obstacle	Minor Obstacle	Moderate Obstacle	Major Obstacle
Existence of Sustainability and Environmental Challenges-Oriented Policies and Regulations	22%	24%	30%	24%
Incentives for entrepreneurs and creative ideas to solve environmental or urban challenges	24%	28%	26%	22%
Availability of Information or Data on the National Level	30%	24%	30%	16%

Looking at Table 5 shows a substantial lack of homogeneity in the opinions expressed by the participants concerning **Policy and Business Environment** Elements in Palermo, which are considered a significant obstacle by about 50% while the remaining 50% consider them a minor obstacle or no obstacle at all.

5.4 Entrepreneurial Culture in Italy/Sicily (and Palermo)

When it comes to assessing the **Entrepreneurial Culture** in Italy/Sicily, the survey identifies and measures **five** indicators: Entrepreneurial Motivation in Society; Inclination for Risk; Entrepreneurial Cultural and Social Norms; Positive Media Narratives of Entrepreneurship; Awareness of the Importance of Being Innovative. Table 6 below shows the results. For this function, the survey is assessing the indicators based on if they are present or not in the Cypriot society and ecosystem.

Table 4: Entrepreneurial Culture Related Indicators.

	Not Present	Relatively Present	Strongly Present
Entrepreneurial Motivation in Society	16%	78%	6%
Inclination for Risk	40%	58%	2%
Entrepreneurial Cultural and Social Norms	32%	66%	2%
Positive Media Narratives of Entrepreneurship	14%	62%	24%
Awareness of the Importance of Being Innovative	14%	68%	18%

Survey answers reveal that the **Entrepreneurial Culture and Motivation** in Palermo is **present**, but there is a strong **belief** from a significant percentage of respondents that this culture should **be promoted and encouraged further**.

5.5 Physical and Digital Infrastructure

Moving to **Physical and Digital Infrastructure**, the survey assesses **three** indicators: Availability and Quality of Utilities; Accessible Telecom/Internet/ Mobile Networks; Accessible Transportation Services. Table 7 presents the results. For this function, the survey measures the indicators based on how adequate they are.

Table 5: Physical and Digital Infrastructure Related Indicators.

	Inadequate	Adequate	Excellent
Availability and Quality of Utilities	40%	56%	4%
Accessible Telecom/Internet/ Mobile Networks	32%	60%	8%
Accessible Transportation Services	92%	8%	0%

Immediately, one can notice from the survey results that **Transportation Services** in Palermo **represent an absolute priority**. Equally notable is the **satisfaction** of the survey respondents **with the Telecommunications Networks** in the country and city of focus.

5.6 Human Capital Elements

Referring to **Human Capital Elements**, the survey provides **four** indicators: Availability of Entrepreneurship and Business Education; Quality of Entrepreneurship and Business Education; Availability of STEM Graduates with Good Qualifications; Availability of Educated/ Trained General Technical Workforce. The survey returns back to measuring the indicators based on how big of an obstacle they are.

Table 8 below presents the results.

Table 6: Human Capital Elements Related Indicators.

	No Obstacle	Minor Obstacle	Moderate Obstacle	Major Obstacle
Availability of Entrepreneurship and Business Education	12%	24%	46%	18%
Quality of Entrepreneurship and Business Education	6%	20%	46%	28%
Availability of STEM Graduates with Good Qualifications	8%	28%	30%	34%
Availability of Educated/ Trained General Technical Workforce	4%	32%	34%	30%

The **availability** and **quality** of **Human Capital Elements** in Palermo seems to be somewhat weak and a considerable obstacle for entrepreneurship and start-ups based on survey results.

5.7 Business Support Services

Talking about **Business Support Services**, the survey looks into how easy it is to access **four** different services: Legal Services; Tax and Accounting Services; Incubators/ Accelerators; Technical Consultants/ Mentors / Advisors. Table 9 provides the results.

Table 7: Business Support Services Related Indicators.

	Not Accessible/ Hard to Access	Moderate Accessibility	Easy to Access
Legal Services	30%	58%	12%
Tax and Accounting Services	18%	58%	24%
Incubators/ Accelerators	22%	72%	6%
Technical Consultants/ Mentors / Advisors	22%	66%	12%

Importantly, it can be argued that **Business Support Services** in Palermo are **accessible**. Accessibility seems to not be considered an important obstacle, based on survey results, for entrepreneurial and business activity in the city of Palermo.

5.8 Market Demand Elements

Looking at the **Regional Market Elements** and how big of an obstacle it is, the survey identifies and measures **five** indicators: Availability of Market Information/ Studies; Potential Market Size Expressed in the Population; Potential Purchasing Power (income per capita); Access to Local Markets; Access International Markets.

Table 10 below presents the results.

Table 8: Market Demand Elements Related Indicators.

	No Obstacle	Minor Obstacle	Moderate Obstacle	Major Obstacle
Availability of Market Information/ Studies	14%	36%	42%	8%
Potential Market Size Expressed in the Population	8%	6%	48%	38%
Potential Purchasing Power (income per capita)	6%	6%	42%	46%
Access to Local Markets	15%	47%	23%	15%
Access International Markets	8%	29%	46%	17%

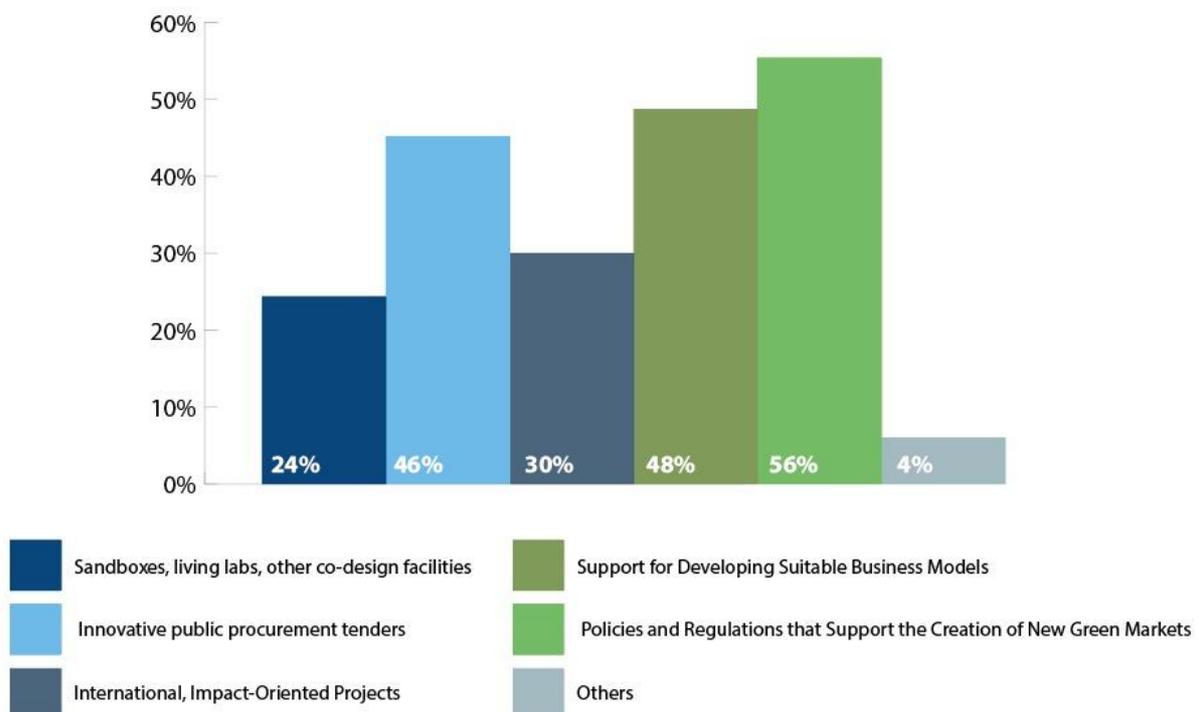
It seems that survey respondents believe that the **Local Market** and related subfunctions are an major **obstacle for business and entrepreneurial activity**. Importantly, **Access to the Local Market** is considered to be a **minor/moderate obstacle** from the large majority of survey respondents while **Access to the International Market** is considered a moderate/major obstacle.

6.0 Impact of Ecosystem on Achieving Sustainable Development Goals

The opportunities and support that the ecosystem of an urban area creates and provides to people and urban actors has the power to make or break efforts for sustainable development. Section 6.0 presents collected information/data regarding survey respondents' beliefs on what type of support can be beneficial for their operations and for addressing sustainable development challenges.

The survey identifies **five** different **types of support** that urban entrepreneurial actors can take advantage of when working towards **solving sustainability challenges**: Access to Sandboxes, Living Labs, Other Co-Design Facilities; Through Innovative Public Procurement Tenders; Joining International, Impact-Oriented Projects; Support for Developing Suitable Business Models; Introduction of Policies and Regulations that Support the Creation of New Green Markets. Survey respondents are asked to choose which types of support they believe is important. Figure 4 presents the results.

Figure 4: Types of Support Valuable for Sustainable Development Initiatives and Activities.



The results of the survey presented in Figure 4 confirm the importance of these five different types of support when it comes to stimulating impact and helping sustainable development initiatives flourish. **All types of support** mentioned in the survey **received the endorsement** of urban actors out of the fifty-one who completed the survey thus far. The support with the **biggest endorsement** is the introduction of **Policies and Regulations** beneficial for sustainable development (**56%**). This type of support can have the biggest impact when it comes to creating the right environment for sustainable initiatives in Palermo to succeed.

The survey allowed respondents to add other support options that they considered important and that were not included in the survey. There were only two additional comments that stress the need to improve communitarian dynamics and to implement a leaner collaboration between companies and professionals.

7.0 Improving the Performance of the Ecosystem and its Actors & Next Steps

After trying to gather general information about the state of Palermo's business and entrepreneurial ecosystem and sustainable development challenges, the survey concludes by asking respondents to evaluate how significant twenty-one very specific types of challenges are for improving the current performance of the ecosystem and its actors. Results from this are offered below.

Figure 5 presents these twenty-one proposed challenges and how the survey respondents felt about each one.



Figure 5: Challenges for Improving the Performance of the Ecosystem and its Actors.

Reflecting on the results from Figure 5, we could conclude that all the challenges were considered highly valuable by survey respondents. However, it can be realized that the most voted ones as highly significant are aligned with U-SOLVE key priorities. The respondents clearly converged in highlighting the challenge of improving the job market, with better wages and quality, reduction of unemployment and more jobs for youth. Supporting female entrepreneurs, and increasing access to education and culture have all received a high level of attention from survey respondents. Clean energy, waste management and access to water are also top ranking, together with health and quality of cities.

Next Step – Focus Groups & Participatory Event

Information and data collected and analysed from desk research, surveys and in-depth interviews has been critical for the design and realisation of focus groups. Currently, these focus groups are being planned and scheduled to run in the months of April and May 2022.

Accordingly with the key challenges emerged during the survey, the Italian U-SOLVE team is designing three focus groups to be held in Palermo, each with a focus on a particular urban sustainable development challenge. The design of the focus groups will be such that the discussion is clearly set around a challenge by a number of short and inspiring talks, and it flows through a number of steps to explore the actual and potential role of the entrepreneurial creative sector in tackling that specific urban sustainability challenge, by triggering behavioural and cultural transformations and enabling the adoption of good practices and solutions.

Through this process, experts and key actors of the urban entrepreneurial ecosystem will co-develop a shared vision of the selected urban sustainable challenges and debate about culture and creativity as part of the solution. The second phase of the meetings will explore a number of possible options through an interactive brainstorming process with agents from the creative industry. The participants of the focus groups will be considered as ‘active agents’ rather than ‘beneficiaries’ and the aim is to create shared value.

In the focus groups we will bring together an heterogeneous variety of stakeholders, including marginalized groups and minorities. Different levels of experience in the field of discussion should be represented, in order to ensure quality, but also openness to new viewpoints and suggestions.

Following the completion of the three thematic focus groups, a large public co-creation event will be organized, offering a true open forum where all the engaged stakeholders and agents of change will meet, interact and develop upon the results of the survey, towards a more mature vision about the role of culture and creativity in enabling the adoption of sustainable practices and solutions to SDG challenges.

8.0 Conclusion

The dialogue we have so far conducted with relevant stakeholders is pointing out substantial point of weakness in the local business and entrepreneurial ecosystems. In particular, the city of Palermo is showing critical needs in terms of physical and immaterial infrastructures, as their lack seems preventing the development of a mature business and entrepreneurial environment. There is a potential in terms of human resources and generation of knowledge, which is not translated into sustainable development, yet. Public authorities are asked to implement combined policies to promote the development of new sustainable businesses by public procurement, new regulations and specific support. In a relatively poor entrepreneurial environment, the civil society has been identified as a key player together with the knowledge and education providers (University/Research/Private R&D institutions). Any attempt to mobilize energies towards the sustainable development goals should connect actors from these three environments

Waste management, mobility and green infrastructures have been identified as the key playgrounds for the sustainable development of the city and it is commonly accepted that cultural and behavioural transition is needed to accelerate the adoption of innovative solutions. Along the dialogue, U-SOLVE has confirmed its potential to unlock the current status quo, because of the combined action on sustainability, culture and entrepreneurship.

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