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Towards a Human Smart Sustainable City: The case of Barcelona

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Abstract

The world's urban population has grown exponentially since 1950, making urbanisation the trend of the 21st century. By 2050, more than two-thirds of all people will call cities home. This rapid urbanisation brings with it enormous challenges. As urbanisation increases and the climate crisis worsens, cities and new smart cities will play a critical role in addressing global challenges such as climate change. Cities cover only 2% of the Earth's surface, but house over 54% of the world's population, consume three-quarters of global resources, and are responsible for 75% of greenhouse gas emissions (World Urbanisation Prospects).

The goal of this research is to observe how cities, and therefore the smart cities of the future, represent the new centres of economic and political power as well as proximity actors that can play a fundamental role in solving the problems of our time. The need for bottom-up approaches and synergies with European multi-level instruments will also be analysed. In addition, the importance of re-establishing a human-nature relationship in the city and a human rights-based approach to climate change will be explored. Indeed, creating this link allows for greater social awareness and could lead to the use of existing structures and frameworks to simultaneously address human rights and climate change.

To validate the research questions, Barcelona was used as a case study; a smart city that has managed to combine technological innovation with sustainability and human rights. Barcelona, through the projects described, also demonstrates the ability to create a smart city that is at the same time innovative, sustainable, inclusive, respectful of citizens' human rights, and integrates real engagement through participatory democracy and co-production processes in the city.

Key words: Climate Change, Smart city, Human Rights, Sustainability, Innovation, Digital Democracy, Inclusion, Barcelona.

1. Introduction

1.1 Climate change is a crucial problem

"Our home - planet Earth - is on fire". And despite all scientific warnings, we are letting it burn. (Greta Thunberg, World Economic Forum Davos, January 25, 2019)

According to reports (AR6 IPCC 2022) by the Intergovernmental Panel on Climate Change (IPCC), climate change is now underway, and scientific evidence in the latest report identifies humans as the proponent and cause of global warming and related climate change, which is progressively becoming more extreme and frequent. Scientists underline that if action is not taken quickly to drastically reduce global emissions, the business-as-usual scenario risks making it impossible to limit the increase to 1.5°C compared to pre-industrial times, resulting in irreversible damage to us and the planet. In particular, the IPCC's Sixth Assessment Report estimates a greater than 50% probability that the 1.5° C warming threshold will be exceeded after 2030, ahead of the previous report. Indeed, we live in an era of profound transition and crucial transformations within a capitalist economic system that, despite its many economic and developmental advantages, has retained many contradictions and distortions within it.

Andrew Kolin in his book "Irrationality of Capitalism and Climate Change" analyse the alteration in the relationship between man and nature with the beginning of the pre-industrial era and the birth of capitalism. In this regard, the author in his book also quotes the IPCC that recommends the necessity of a complete re-emphasis of social priorities, if mankind wants to avoid a climate catastrophe. The global effects of climate change represent the visible evidence of an irrational disharmony between humanity and the environment. Besides the capitalist scenario, we also live in an era that is still unofficially referred to as the Anthropocene. The Anthropocene is informally identified as the current geological epoch in which the earth's environment is modified by the effects of human activity. In the wake of globalisation and the new age of the Anthropocene, it has become increasingly clear that prosperous social and economic development relies on the ability of the biosphere to sustain it. Incremental changes and adaptations to current development pathways may be insufficient for achieving sustainability (Olsson et al., 2017; Westley et al., 2011). In the Anthropocene, the human being is privileged; is an individual separate and autonomous from the non-human, who lives according to his enjoyment or interest. Human beings are therefore superior and not reliant on the ecological consequences of their actions. Paul Crutzen and Eugene Stoermer first introduced the concept of the Anthropocene or 'age of man' in the publication of the International Geosphere-Biosphere Programme (IGBP) in 2000 (Crutzen & Stoermer 2000). In this age, humans evolved rapidly, concentrating progressively in super-technological urban areas, often leaving the human factor and the human-nature relationship behind.

Because of these great transformations and evolutions, our society is facing enormous challenges. One of the most important of the 21st century is the massive and unstoppable urbanisation, which together with Climate Change, interconnected with the rest, will amplify every crisis and inequality in a self-feeding way. Climate Change, Sustainability, and Green economy are just some of the words that are beginning to enter the common vocabulary. This is because Climate Change is no longer just an academic issue, but a catastrophe taking place on a global scale that cannot be ignored. Indeed, it must be tackled immediately, with all available tools, integrating local approaches that, being closer to the problems, suffer its direct effects and can more easily propose and find effective and innovative solutions.

1.2 Cities and smart cities have a role to play

In the near future cities will play a crucial role. According to many studies, urbanisation is increasing rapidly and it is expected that by 2050 more than two-thirds of all people will call cities home. As a result, we will see a weakening of the right to the city and an exacerbation of all issues related to the so-called Tragedy of the Commons (Hardin, 1968). The tragedy of the Commons is "commonly defined as a situation in which the selfish actions of individuals lead to the complete collapse of the resource over which they are competing" (Rankin et al., 2007). Therefore, increasing urbanisation combined with Climate Change could lead to the disruption of cities as we know them today with a worrying increase in inequalities.

In this context, Smart Cities as a new form of city that is more efficient both technologically and socially could play a decisive role. Specifically, the smart city is defined as:

A smart city is an advanced, technology-intensive city that connects people, information, and city elements using new technologies to create a sustainable and greener city, competitive and innovative commerce, and a higher quality of life (Bakıcı et al. 2013).

The application of information and communication technologies (ICTs) and their effects on human/educational capital, social and relational capital, and environmental issues are often referred to with the notion of a smart city (Lombardi et al. 2012).

Again, Smart Cities have been defined by the British Standards Institute as "the effective integration of physical, digital and human systems in the built environment to deliver a sustainable, prosperous and inclusive future for its citizens" (BSI 2014).

Therefore, the smart city combines an infrastructural component with a set of desired outcomes, which are often sustainability and improved quality of life for its residents (Ramaprasad et al. 2017).

To date, the concept of a smart city has not had a convergence of definitions and is very often elusive and contradictory. Smart cities represent the evolution of the current urban space that with technology and data can help the development of the city and improve the quality of life of its citizens. Despite the progress these cities are making, opinions are still divided. In the research fields of human rights, urban planning, politics, and sociology, smart cities are often criticised. The main issues raised are the excessive presence of private

actors, technocentrism, and prioritising the needs of the wealthiest citizens while neglecting the less privileged (Reuter, 2019). In particular, this concerns fundamental human rights, not only from a technological point of view but also those related to climate change and sustainable development. Indeed, “citizens, unlike consumers, have only one urban service provider” (Ranchordás, 2018) and may particularly suffer from the privatisation of services in the city. Despite the many criticisms that have been raised against surveillance capitalism, digital exclusion, data privacy, the overwhelming power of private individuals, and the lack of the human factor, to date it represents a valid evolution of the urban space. With various adjustments, it can really improve the lives of citizens and facilitate problem-solving through the use of technology.

Today, the smart city as a concept has become a reality - at least in developed countries - that, while it succeeds in addressing sustainability issues, still fails to fully integrate with the human side. The smart city will disrupt our relationship with the city, consequently affecting our fundamental rights and the management of common goods. In this case, the Tragedy of the Commons will occur in a super-populated and super-intelligent environment that will still have to adapt to humanity and its rights. As already mentioned, estimates indicate that in 2020, 56% of the world's population will live in urban areas and the percentage will reach 68% by 2050 (World Cities Report 2022). It will therefore be necessary to rethink the city model of the future by integrating social, environmental, and economic sustainability issues with the technological efficiency model of the smart city. Therefore, integrating it with a human-centric model that considers the changes and the human rights that will be damaged.

In a circumstance where half of the world's population will be concentrated in an urban context, their role in addressing the enormous ecological and socio-economic challenges of our society will be crucial. The city will therefore have to reorganise itself to accommodate the many climate refugees, and people of different nationalities and cultures, by developing spaces, services, infrastructure, and urban and environmental design in line with the new needs. Moreover, in recent decades, decentralisation policies around the world - whether as a result of neoliberal austerity measures, because of a reliance on the power of local authorities, or both - have brought unprecedented responsibilities and challenges to cities in formulating and implementing social policies (Glaeser 2011; Graham et al. in Global Urban Justice). Considering the data and the important role that cities, civil society, and the synergies between local and global are assuming, the strategic importance of cities in the development of climate and social policies becomes increasingly evident.

"Cities [can] do what nation-states have failed to do" (Oomen 2016, 2).

It is estimated that cities are increasing in both number and size, sometimes resembling full-fledged nations. Of course, the continued expansion of cities is linked to their power and the role they can assume in various spheres, from policy generation, as engines of the economy, and as laboratories of social innovation and

cultural integration.

Cities have already shown that they are able to create important networks and alliances, such as the Conference of Mayors, Cities for Human Rights, and the Green Cities Network. They often succeed, even better than at the national level, in addressing the most complicated challenges of our time, such as rampant inequality, mass migration, human rights, and climate change that amplify any existing tragedy or inequality.

1.3 Linking Human Rights and Climate Change

The idea of the studies behind this thesis is that human rights and related climate change have enormous potential to be addressed in a decentralised bottom-up approach through political struggles, social relations, and the redefinition of social justice, equity, sustainability, access, and inclusion of all (Dikec and Gilbert 2002; Reuter 2019). Human rights are necessary to rethink the cities of the future from a human-centric perspective that goes beyond technocentrism and overcomes the current criticism of smart cities. During the interview with Eva Garcia Chueca, conducted on 08/23/2022 it emerged that:

“Although the conversation on human rights has not historically been connected to the conversation on sustainability, now the challenge is to be able to bridge these two different worlds. I think it is now evident that more synergies need to be created between human rights activists and defenders or even human rights cities with those cities or agents or stakeholders working more in the field of sustainability. Now, this bridge has to be created”.

In this context, cities have assumed an exceptional power and role in researching, defining, implementing, and ultimately monitoring policies on human rights, sustainability, and global social justice. Indeed, to quote Barbara Oomen, human rights serve as a 'moral lingua franca' [for] addressing social injustices around the world' (Oomen et al., 2016). Despite the crucial importance of cities as economic and development engines and centres of power, scholars have only recently begun to take an interest in this field. The New Urban Agenda, aims to ensure "that all inhabitants, of present and future generations, without discrimination of any kind, are able to inhabit and produce just, safe, healthy, accessible, affordable, resilient and sustainable cities" (Habitat III 2016b: 10), further broadened the dialogue on these issues. This discourse takes on even more value when considering the words of Maimunah Mohd Sharif, Under-Secretary-General and Executive Director of the United Nations Human Settlements Programme (UN-Habitat) when he states that the vision of a sustainable and equitable urban future will not be secured unless cities and subnational governments take bold and decisive action to address both chronic and emerging urban challenges. Without urgent and transformative political action at all levels, the current situation will only get worse. The urgency of new approaches for transformative change in cities cannot be over-emphasized. In the context of this Decade of Action, there is an urgent need for cities and sub-national governments to adopt innovative approaches that support the optimistic scenario of the urban future (World Cities Report 2022).

The urban context will certainly be a determining factor in our near future and it will be important to take all those actions aimed at mitigating and counteracting the negative effects of dangerous urbanisation that risks emphasising the current deviations of our time, especially in light of the strong impact that Climate Change will have in this context. It will be important to address the challenges of urbanisation by maintaining a collaborative, multi-governmental, and multi-level approach, taking the New Urban Agenda and the SDGs as a reference and maintaining a strong focus on human rights.

Specifically, the thesis aims to demonstrate the crucial importance that cities and bottom-up approaches will have in promoting and advancing the New Urban Agenda for Sustainability and the implementation of the SDGs. Research has focused more on the technological aspect of cities of the future, but has not yet addressed in depth the human-nature relationship that will be created in a super-technological and super-populated urban space.

Bottom-up, multilevel and human rights-based approaches can make a difference in creating good practices that can truly have an impact from the local to the global, from the bottom up in a globalised landscape.

1.4 Literature review

The thesis was written using official reports, municipal documents and extensive literature.

The current context is presented using the latest available scientific reports (AR6 IPCC 2022; World Cities Report 2022; United Nations, 2016; World Cities Report 2020; WUF11, 2022), climate change literature (Andrew Kolin, 2022), the Anthropocene (Crutzen & Stoermer 2000) and the tragedy of the commons (Garret Hardin, 1968).

The definition and literature of smart cities are then described noting a lack of convergence between the different definitions (Lombardi et al. 2012; Bakıcı et al. 2013; BSI 2014; Ramaprasad et al. 2017; Moura, F., & de Abreu e Silva, J. 2019; Shelton, T. 2014, February; Bibri, S. E. 2019; M., Brynskov, M., Timo Ojala, & Springerlink 2015; Huovila, A., Bosch, P., & Airaksinen, M. 2019; Shelton, T. 2014; Smith, N., Bardzell, S., & Bardzell, J. 2017), highlighting criticisms of private power (Ranchordás 2018; Cardullo, P., & Kitchin, R. 2018) and technocentrism (Hare, S. 2022; Marcus Foth 2015; Gabrys J.2014; Mullins P.D 2017; Houston et al 2017), and the necessity of a human approach (Reuter T.K, 2019; Amnesty 2019; Ana Qarri, Lex Gill 2022; Flak, L., & Hofmann, 2020).

Cities and related literature are then analysed, highlighting their potential as new global actors, given their growing role as proximate actors to problems as well as solutions. Specifically, human rights cities are used as an example of localisation (Oomen, B., Davis, M. F., & Grigolo, M. 2016; Algaze, G. 2018; David Harvey. 1973; F Swiney, C. 2020; Glaeser, E. L. 2012; Glasius, M. 2017; Porras, I. 2009; Shaw, J., & Štiks, I. 2021; Smith, M. E., & Lobo, J. 2019; Acuto 2013; Shelton et al. 2015; Buck and While 2017; Huovila et al. 2019; Barber 2013).

The link between human rights and climate change is then demonstrated by highlighting existing relationships and the necessity of making this link (Dikec and Gilbert 2002; Darling 2016; GreenReport

2022; Rocque, R. J., Beaudoin, C., Ndjaboue, R., Cameron, L., Poirier-Bergeron, L., Poulin-Rheault, R.-A., Fallon, C., Tricco, A. C., & Witteman, H. O. 2021; Habitat III 2016). Next, the right to the city and its implications given increasing urbanisation and the climate crisis (Marcuse, 2012; Lefebvre 1960; Harvey 1973; cf. Kitchin, 2018) and the right to the sustainable city are analysed (Aitlinger S. 2019). Subsequently, bottom-up and local tools useful for the implementation of sustainable practices that mitigate climate change and human rights are analysed (Cheng 2021; Utrilla Fernández-Bermejo 2021; Perrels and Nijkamp 1994). The role of civil society (UN Habitat 2016; Gear 1995; Glasius 2006; Gready 2004), NGOs (Wexler 2009; Keck, M. E., & Sikkink, K. 1998) and European multilevel instruments (Hooghe, 1996) is then described. Finally, with the aim of demonstrating the localisation of rights, Human Rights Cities (Donnelly 2006; Steiner & Alston 2000; Hunt 2007; Neier 2012; Marks, Modrowski, & Lichem 2008; PDHRE 2007) and their ability to act on a multilevel level (Soohee & Stolz 2008; Judith Resnik; Barber 2013; Oomen 2016; De Feyter et al. 2011) are presented. Some criticisms of human rights that are often considered too Western or used for marketing or instrumental purposes are then highlighted (Donnelly 2003; Helfer 2002; Hopgood 2013; An Na'im 1995; Ishay 2004; Uitermark, Nicholls and Loopmans 2012) and potentialities (Goodale and Merry 2007; Berends et al. 2013; Davis 2007; Oomen and Baumgartel 2014; Kamuf Ward in Global Urban Justice 2016; Grigolo 2010; Papisca 2011).

Regarding the analysis of the case study, the research began with a study of the literature related to the evolution of the smart city of Barcelona from an innovation perspective (Balibrea, 2001; García Ramón and Albet, 2000; Marshall, 2004; De Jong and Edelenbos 2007; Pique Huerta et al. 2019) analysing the different stages and criticisms of the excessive focus on the private at the expense of residents (Batalla and Ribera-Fumaz 2012; Zarlenga et al, 2013; Cruz i Gallach and Martí Costa, 2010; Pradel, 2011). Barcelona's climate change efforts are then analysed by delving into various municipal documents, green gentrification issues (Anguelovski et al., 2017), Barcelona's evolution on the issue of human rights (Grigolo 2019, Grigolo 2011), open governance and open innovation tools (Chesbrough and Appleyard, 2007) and democratic participation as opposed to opposing critiques of surveillance capitalism (Shoshana Zuboff, 2019).

1.5 Structure

The thesis will thus be structured as follows. Following the introduction of the topic and the description of the current climate change context, the links between climate change and human rights will be discussed, also showing a specific correlation between the Sustainable Development Goals and the progressive increase in urbanisation. In this context will be addressed the importance of the right to the city and the right to a sustainable city. Subsequently, local instruments and the importance of bottom-up approaches, the role of cities, civil society and the role of mayors are outlined to show the importance and increase in recent years to implement bottom-up approaches to address global issues. This is followed by a description of European multilevel and bottom-up instruments such as the Human Rights Cities as an example of localisation of rights and bottom-up experience.

Finally, the case study is presented to represent the state of the art of the city of Barcelona by outlining it in 3 main aspects: smart city and innovation, Climate change and sustainability, Human rights and participatory democracy by delving into some specific projects.

2. Methodology

Introduction

The purpose of this chapter is to illustrate the methodology behind the study in order to answer the research questions:

- How cities, as centres of power, and new smart cities have a significant impact on climate change and the implementation of the SDGs?
- How bottom-up approaches be the new decentralised paradigm for implementing the SDGs and combating climate change?
- How can a human rights-based approach help combat Climate Change?

Specifically, within this chapter, the methodology is described, and structured as follows: the research philosophy, the research data collection and case study methods, the research ethics, and, finally, its limitations.

Research Philosophy

This research lies within the critical theory paradigm. The methodology combines existing thematic literature and new data obtained through qualitative research and interviews. The two sources are mixed to develop confirmatory or negative results. The research philosophy is therefore interpretivist and deductive. The research questions and methodology were outlined with the aim of conducting exploratory, confirmatory but also descriptive research. This makes it possible to address issues that are apparently unconnected, but which turn out, after careful study, to be profoundly interrelated. Indeed, the importance of cities, as a new central actor in addressing the challenges of the 21st century, ties in perfectly with the emergence of bottom-up practices and approaches that are beginning to change the classic top-down relationship of solving global challenges. Human rights fit into this discourse as a necessary approach in the realisation of an environmentally but also socially sustainable smart city of the future. Furthermore, the link between SDGs, human rights and climate change is evident and could be a new push to create awareness and help in the resolution of emerging global challenges.

The research strategy is the Case Study (Yin, 1984) focused on the Barcelona smart city model. The approach is based on qualitative research in which, through document analysis and several semi-structured interviews with experts, academics, citizens' organisations and institutions, the facets present in the research questions are explored. This model aims to investigate the importance of human rights and bottom-up

approaches in the realisation of a smart city of the future that is fundamental in combating climate change. The case study on the city of Barcelona, through the analysis of documents and semi-structured interviews, allows the initial hypotheses to be confirmed or refuted. The results will reflect the fundamental importance of cities taking the lead in combating the fundamental challenges of this century and the necessity of a human-centered, bottom-up and human rights approach.

Data Collection

The methodology was based on two different methods to collect data. The first is the documentary analysis of literature and reports published by the municipality and associated departments. The second was based on a collection of semi-structured interviews. The two methods were equally important. On the one hand, the literature and document analysis were useful for the descriptive part of the research, providing a snapshot of the state of the art and clarifying the actions that have already been taken in terms of Climate Change and human rights. On the other hand, the interview method was extremely helpful in understanding the views of experts from various fields as well as citizens experiencing these transformations. Furthermore, the instrument of semi-structured interviews is optimal for understanding the experts' opinions from different perspectives (Silverman, 2015) and at the same time leaving the freedom to argue openly without constraints. This was done through non-probabilistic sampling, i.e., by selecting participants non-randomly and choosing them for their expertise on the relevant topics. The questions were asked in relation to the research questions and the specific expertise of the experts or the specific projects. It was also crucial for the purposes of the research to have one respondent from the municipality, specifically from the Sustainability section of the Urban Ecology Department, and one respondent from the citizens' associations to have a double overview and answer some questions from a double perspective.

The results were then grouped to answer the research questions that drive this thesis.

Research Ethics

When conducting the interviews, an ethical protocol was followed. During the interviews and before their publication, the interviewer asked for consent to use the information and concepts discussed for academic purposes. Some interviewees emphasised that the recording should not be shared with third parties and outside academic use. Therefore, to develop ethical research, the wishes of the interviewees were respected.

Limitations

Some limitations emerged during the development of the research. Regarding methodological limitations, the opportunity to organise interviews with experts in the field and municipal workers came up against a time constraint due to the summer period in which the research was developed. In fact, a smaller sample of interviewees than expected was collected, a total of 10 interviewees against more than 200 requests.

The low rate of respondents compared to requests was justified by those contacted as being due to the summer holiday period or in relation to the excessive workload upon return.

However, the information obtained from the interviews was still sufficiently useful in analysing the different aspects of the research.

Another limitation concerns the argumentation concerning the link between human rights and climate change, as it was difficult to demonstrate its practical applicability. A hypothesis was formulated regarding the possibility of responsibility of the Barcelona Ombudsman on environmental issues related to human rights. However, the fundamental usefulness of a human rights-based approach for creating smart cities and addressing climate change and related social transition remains.

3. Climate Change and Human rights

3.1 Introduction

This section aims to investigate the necessity of a human rights-based approach in fighting Climate Change and the consequential correlation between the two.

The Intergovernmental Panel on Climate Change (IPCC), in its six reports, has repeatedly emphasised that climate change is real, is happening, and above all, is a consequence of greenhouse gas (GHG) emissions caused by human activity. Moreover, already in 2009, the Office of the UN High Commissioner for Human Rights (OHCHR) recognised an interference and dangerous link between human rights and climate change. "It is clear that climate change is already having an impact on human rights and that this impact will intensify in the coming years". (Kumi Naidoo, Secretary General of Amnesty International, Amnesty Climate Change and Human Rights).

Given this situation and considering irrefutable scientific evidence, the inability and inaction of governments to act against climate change represents the greatest intergenerational violation of human rights in history. Notwithstanding that only scientists and governments, but also ordinary people struggle to understand the enormous impact Climate Change is having. One clear example is that today most people struggle to change their habits, even though the consumption of meat is proven to have a huge impact on the planet.

"You say you love your children above all else, yet you are stealing their future right in front of their eyes" (Greta Thunberg, climate activist and founder of Climate School Strike).

Through this statement, the Swedish activist wanted to emphasise that future generations and young people will be the most disadvantaged, as they will not have the possibility to defend themselves against the violation of their rights. Similarly, the most vulnerable, discriminated countries and communities will suffer the most from the effects of climate change, as they will not have the means to adapt, eventually exacerbating inequalities and disparities.

3.2 Countries experiencing Climate Change

Climate Change affects and disrupts the lives of millions of people, who are victims of catastrophic events: storms, hurricanes, floods, tsunamis, heat waves, fires, rising sea levels, migration of populations, and changing habitats are only the visible tip of a huge iceberg. The impact on the population and on the marginalised will be devastating, amplifying existing inequalities and severely damaging human rights. The effects will be intercorrelated, intersectional and self-feeding, creating a spiral that is likely to worsen over time and irreversibly damage current and future generations.

More in depth, there are mainly two categories of states that will be most severely affected. The first is determined by geographical location, i.e., island or near-coastal states, while the second group is characterised by economic and social conditions that do not enable the necessary adaptation and mitigation measures to counter climate change to be put in place. These countries are mostly located in the global South and paradoxically represent those that bear the least responsibility for the climate crisis, despite suffering its most catastrophic effects.

Recently, indices have been developed such as the Global Climate Risk Index, which in 2019 identified the countries most affected and at risk from Climate Change.

To give some examples, in March 2019 Mozambique, Zimbabwe and Malawi were hit by Tropical Cyclone Idai which caused catastrophic damage and unprecedented humanitarian crises.

Moreover Bangladesh is ranked 7th in the Global Climate Risk Index 2020 and in this regard, Foreign Minister Shahriar Alam stated that Climate Change costs the country 1% of GDP every year and that by 2050, sea level rise will submerge about 17% of Bangladesh's coastal lands displacing about 20 million people. It is also significant that Atiq Raham, envoy of the Bangladesh Centre for Advanced Studies, warned the Berlin conference audience, already in 1995, about the risks of Climate Change and the fate of his country. "If climate change makes our country uninhabitable, we will march with wet feet into your living rooms." (Pellegrino, 2014)

Recently, Pakistan also fell victim to 'a climate disaster of biblical proportions' (Bilawal Bhutto Zardari, Pakistan Foreign Minister). One-third of the country was flooded, 33 million people were affected and 1,200 were killed, causing more than USD 10 million in damage to the country. Like other poor countries, Pakistan is responsible for less than one percent of global emissions; yet it is among the top ten countries most vulnerable to climate change.

3.3 Human Rights violated

Climate Change damages the right to housing, destroying homes and irreversibly altering the environment in which we live. The right to live in a safe environment and, more generally, the right to life is thus damaged.

The World Health Organisation predicts that Climate Change will cause 250,000 deaths per year between

2030 and 2050, due to malaria, malnutrition, diarrhea, and heat stress. (Amnesty International report on Human Rights and Climate Change).

Consequently, the right to health will also be affected. According to the IPCC, frequent heat waves and increased fires will cause more injuries, illnesses, and deaths. Due to the change in the natural environment, there will be a reduction in the food supply and consequently an increase in malnutrition and an increase in food- and water-related diseases. Furthermore, it should not be underestimated that exposure to these catastrophic events could lead to eco-anxiety and post-traumatic stress disorder.

In addition, several factors such as reduced precipitation, extreme temperatures, ice melting, and the consequent rise in sea level and its acidification will negatively affect water resources, harming the right to water and sanitation.

Specifically, human rights will be harmed in two ways, both in terms of direct physical impacts and political impacts due to the consequences of adaptation policies that will be implemented to counter climate change.

In terms of physical impacts, as already mentioned, these are due to extreme weather conditions that cause the rise and acidification of the seas, the increase of the earth's temperature, and the disruption of precipitation cycles. As a result of these environmental disruptions, we will see the destruction of livelihoods through loss of land and erosion of coastal properties, contamination of water supplies, an increase in disease, the displacement of entire populations, and the disruption of educational systems and normal life expectancy. Climate change, therefore, damages the following human rights: life, health, water, self-determination, food, property, culture and education.

Numerous studies have been conducted on the impacts of climate change on health, which confirm a correlation between Climate Change and health deterioration.

Health damage will increase in direct proportion over the years due to worsening weather conditions, rising temperatures, increased air and water quality, and an increase in catastrophic Climate Change-related events (Rocque et al., 2021). Another factor not to be underestimated is the enormous impact these events will have on the psyche. Already today, especially among young people, there are signs of eco-anxiety, and these pathologies are bound to increase as the climate crisis worsens.

Regarding the impacts of policies, according to an OHCHR report, adaptation measures that aim to improve the resilience of society and the environment to Climate Change may also violate human rights. Indeed, by failing to take full account of socially disadvantaged groups, they risk further exacerbating already existing social inequalities.

For example, a mandatory switch to electric cars, which are still expensive, for part of the population could lead to a mobility disadvantage for those who cannot afford it. Similarly, a rapid switch to alternative energy sources could impose more onerous minimum consumption standards that could disadvantage poorer social groups that are unable to pay them. It is therefore important to be aware that adaptation policies may have

highly negative impacts on the right to non-discrimination, equality, culture, housing, and property, despite good faith.

3.4 Clean and healthy environment as a universal human right

It is crucial to fully recognise the link between climate change and human rights, as it enables the use of existing international standards and frameworks to address possible human rights violations.

Moreover, given the transnational nature of Climate Change and the inequalities in terms of how it can be addressed, this link to human rights can often be important for international cooperation and to support affected countries. This link could be extremely useful in helping states that do not have the resources to fulfil their international obligations under the UNFCCC and the UN Charter, assisting them in the adaptation and mitigation strategies needed to reduce greenhouse gas emissions and protect the basic human rights of the weakest and most vulnerable populations. It will therefore be necessary to implement more policies at the local level that link human rights to Climate Change, to facilitate the rapid and effective implementation of sustainable and inclusive policies.

On the 28th of July 2022, the UN General Assembly adopted a historic resolution formalising access to a clean, healthy and sustainable environment as a universal human right. This right to a healthy environment is linked to existing international law and its implementation will require the cooperation of states to fulfil their international commitments and intensify efforts to realise it.

According to the UN High Commissioner for Human Rights, Michelle Bachelet, "this decision reflects the fact that all rights are linked to the health of our environment".

In light of this pronouncement, the link between Human Rights Urbanisation and Climate Change takes on historical importance. "This historic development shows that Member States can unite in the collective fight against the triple planetary crisis of climate change, biodiversity loss and pollution. The resolution will help reduce environmental injustice, close protection gaps and empower people, particularly those in vulnerable situations, including environmental human rights defenders, children, youth, women and indigenous peoples. The decision will also help States to accelerate the implementation of their human and environmental rights obligations and commitments" (António Guterres, UN Secretary-General).

The human right to a clean, healthy, and sustainable environment, now universally recognised, encompasses all these substantive elements. This historical moment, full of upheavals, transformations, and uncertainties, can be a huge opportunity to rethink our relationship with nature, especially in the urban environment, and take significant steps towards environmental justice.

The relationship between Climate Change and human rights will be developed in a particularly overpopulated urban environment, where it will be imperative to ensure sustainable development in the face of galloping urbanisation.

3.5 Urbanisation and Human Rights and the Role of the SDGs

The world's urban population has grown exponentially since 1950, making urbanisation the trend of the 21st century. This rapid urbanisation brings with it enormous challenges.

Cities cover only 2% of the earth's surface but are home to over 54% of the global population and consume three-quarters of global resources being responsible for 75% of greenhouse gas emissions. (World Urbanization Prospects). To address these challenges, the United Nations has developed the Sustainable Development Goals (SDGs), which represent the world's shared plan to end extreme poverty, reduce inequality and protect the planet by 2030. Specifically, Sustainable Development Goal 11 aims to make cities and human settlements inclusive, safe, resilient and sustainable by 2030.

More in-depth, it aims to reduce pollution in the city by improving waste management and air quality (11.6). It wants to ensure sustainable and inclusive urbanisation through a co-governance and co-planning model (11.3). Ensuring affordable and inclusive housing (11.1), services and public transport (11.2). In order to protect cultural and natural heritage (11.4), disaster deaths will be limited (11.5). In the light of increasing urbanisation, it will be important to ensure access to accessible and safe green spaces while maintaining a strong connection between urban and rural areas, and between national and regional to avoid further inequalities (11a).

The human rights framework and the SDGs framework are fundamental in setting the standards needed to develop virtuous and innovative urbanisation processes that are socially and environmentally sustainable.

These concepts and the importance of human rights are part of the goals of the 2030 Agenda for Sustainable Development and also of the Urban Agenda adopted in 2016. Each Sustainable Development Goal (SDGs) can, in fact, be associated with one or more human rights. For example, in an urban space characterised by rampant inequality, the commitment to leave no one behind is linked to the human principles of equality and non-discrimination and to SDGs 5 and 10 on inequality. Today, in fact, 24% of wealth is found in 90% of the population, while 76% of wealth is found in only 10% of the population (World Inequality Report). The Sustainable Development Goals also address health risks caused by urbanisation, including air pollution, noise, high population density, inadequate housing, inadequate water supply and sewage disposal. Urbanisation represents a great opportunity globally, but only if human rights-based and sustainability approaches are promoted and respected. Human rights frameworks and approaches are needed to also address environmental issues and to implement equitable, resilient, green and sustainable urbanisation. Sustainable urbanisation based on human rights would transform cities into an accessible, inclusive, and equitable place for all.

4. Right to city

Given the growing importance of cities and smart cities, a rights-based urban discourse becomes even more relevant. In the 1960s, the debate on the right to the city first developed in connection with social protests against capitalism and through the writings of Henry Lefebvre. In his work, Lefebvre emphasised the importance and necessity of the participation of all city dwellers in urban design and planning, i.e., a right to urban life understood as a collective right, of all those who live in the city beyond the legalistic criteria of citizenship. Lefebvre's concept of the right to the city represents the imaginary of cities as a more just, democratic and sustainable social organisation and has therefore inspired movements for the right to the city in Europe and especially in Latin America in contrast to neoliberal development and the capitalist development model.

The critique also extended to postmodern cities, standardised and governed by financial centres and technology that have ended up annihilating fundamental human relations in a city.

In order to counter this technological and 'inhuman' drift, the concept was taken up in the European Charter for the Protection of Human Rights in the City, drafted by the Human Rights Cities movement, which in its first article defines the right to the city as 'the right to conditions that enable (city dwellers) their political, social and ecological development' (Art. 1).

Through this approach, an attempt is made to localise human rights through the role of local government, civil society and the synergies and alliances between the local and the global.

This role is usually attributed to central government with a top-down approach to rights, in which authorities grant rights to citizens; with this paradigm shift and a bottom-up approach, many benefits can be achieved. Given the proximity of local government to citizenship issues, this approach can lead to a better implementation of social, economic and cultural rights, as well as the provision of municipal public services. This approach also improves the realisation of political rights through co-governance and participatory democracy. Moreover, in this urban context, the issues of public transport, sustainable urbanisation, local governance, citizen participation and local accountability, i.e., so-called neighbourhood rights, are added. In a bottom-up approach, citizens assume a crucial role in the implementation and monitoring of local policies, even if these examples often result in a symbolic and short-lived aspect.

The social function and democratic management included in the right to the city contrast with the current model of urban development, which often takes the form of the privatisation of spaces and services, the commodification of land, and urban planning processes that favour only economic interests.

The right to the city, through an urban approach to human rights, favours municipal services of proximity (e.g. the 15-minute city), emphasising the importance of public spaces that stimulate sociability, culture, and the valorisation and inclusion of the multiple identities that live the urban environment daily.

The right to the city represents the right of the last, the marginalised and excluded who, thanks to it, shape

the urban space and become protagonists in the creation and enjoyment of the city and not just mere recipients of rights imposed from above.

In other words, the right to the city is "a moral claim, based on fundamental principles of justice" (Marcuse, 2012), which opposes the injustices of a capitalist and neo-liberal system, and thus represents a right to social justice. According to Harvey, this is the only way to create an authentically humanising urbanism (Harvey 1973, p. 314; cf. Kitchin, 2018).

4.1 The Right to a Sustainable smart city

Considering the presented context, development is extremely linked to the environment in which we live. For this reason, the right to the city must evolve to include issues of environmental sustainability. Every city dweller has the right to live in a city that is sustainable and implements preventive and adaptive measures to ensure adequate living standards.

The Right to the City took on new life with the Human Rights Agenda and the creation of the Global Platform for the Right to the City, a civil initiative held in São Paulo in 2014. Here, the Right to the City is defined as 'the right of all inhabitants, present and future, permanent and temporary, to use, occupy and produce just, inclusive and sustainable cities, defined as a common good essential for a full and dignified life'. According to the initiative's supporters, current urban development patterns, especially with increasing urbanisation and the massive use of technology, exacerbate social exclusion and environmental degradation.

The right to a sustainable city also includes the need to increase democratic participation and to rethink governance towards a co-creative and collaborative model, which also thanks to new technologies manages to avoid marginalisation.

Some Smart Cities, with the help of new technologies, aim to make the city inclusive in participation, implementing co-governance practices and making cities more efficient and thus also sustainable.

Some examples of these efficiency-oriented technological solutions are the use of sensors, optimisation of energy and water infrastructures and automated waste collection systems.

These technologies can be used to pursue sustainability through applications such as renewable energy sources, smart grids, positive energy neighbourhoods, recycling and waste management techniques, and sustainable and shared mobility. This creates a link between smart cities and sustainability that has led to the promotion of Sustainable Smart Cities.

The efficiency solutions described, however, are increasingly criticised by many authors (M. Foth 2015; J. Gabrys 2014; Mullins P. 2017; Stephanie Hare 2022; Paolo Cardullo, Rob Kitchin 2019; Ana Qarri, Lex Gill 2022; T. K. Reuter 2020; Leif Skiftenes Flak, S. Hofmann 2020) and by human rights associations such as Amnesty International. The criticisms are many, from the impact of technology and the lack of the human side to criticism of technocracy and privatisation and policies imposed from above and focused on efficiency and commercialisation. According to Paul Mullins, smart cities fail to address the complexity of

real, chaotic cities. (Mullins P. 2017). Indeed, sustainability practices are often implemented without leaving room for democratic processes or citizen unity. These practices, which often focus more on the economic than the sustainable aspect, could be the antechamber of greenwashing, or urban marketing operations given the economic and private interest.

In the interview dated 08/23/2022 with Sara Heitlinger, it emerged that:

“In community garden experiences, people reappropriate space and cultivate it for the benefit of the community not for property rights but to assert their right to the city. The idea of a sustainable smart city is to use technology to increase the efficiency of urban processes and optimise this process, but the question is to understand who benefits. The criticism is that it is the companies and the state that benefit, but not the citizens. With the right to the city, we begin to understand what a sustainable smart city could be in a different way, beyond efficiency and profit. The other criticism against the sustainable smart city is about efficiency and optimisation, where citizens have limited power if data is extracted from above, whereas if you empower citizens to act, you have a different picture of what a sustainable smart city can be”.

It will therefore be necessary to build co-participative cities with a strong focus on human rights, in which the idea of the smart city overcomes its efficiency-oriented technocratic nature and the legalistic criteria of citizenship towards a green, sustainable and inclusive city.

Indeed, in keeping with our anthropocentric age and a neoliberal vision, the smart city from its inception has been constructed as separate from nature, "elevated to a place of progressive human and technological mastery" (Houston et al 2017). Nature is seen as a resource to be exploited for human needs and not instead as a resource. As Nancy Smith et al. state, “urban dwellers are deeply intertwined with natural elements, including plant life, animals, dirt, water” (Smith,2017).

The right to a sustainable city in the anthropocentric and neo-liberal capitalist context assumes particular importance regarding the design of an inclusive, co-participative, green, sustainable, and humane city, moving beyond technocratic and efficiency principles.

5. Local instruments

Cities in the implementation of local and urban policies use soft law instruments to address urgent global problems at the local level (e.g., climate change) while consolidating their global ranking.

Some authors during the Covid-19 pandemic highlighted the usefulness that combinations of hard and soft law measures at both national and local levels can have in addressing situations of urgency and uncertainty. (Cheng 2021; Utrilla Fernández-Bermejo 2021).

Cities during the pandemic proved to be real centres of power and urban agglomeration capable of deploying soft law measures through local government to deal with the emergency. Soft law instruments have proven effective in addressing a wide range of global and local probematics such as increasing urbanisation, and climate change (Schaffer and Pollack, 2010). and sustainability (Perrels and Nijkamp, 2016) or the

promotion of human rights (Oomen, 2016).

Due to its flexibility, soft law has been particularly used in recent years in urban spaces and in emergency situations such as during Covid-19 or in connection with rapid technological or environmental changes. An example of this growing use of soft law can be found in the development of Transnational City Networks (TCNs) such as the Human Right Cities that develop and apply soft law instruments in the local area.

5.1 The role of cities

From ancient Athens (POLIS), the birthplace of democracy, to the medieval city-states, cities defined the rights of their inhabitants and constituted the main authorities to guarantee them long before the advent of the nation-state (Glaeser 2011).

After World War II, the approach shifted towards a national plan based on international agreements. Today, however, cities with their rapid expansion are becoming increasingly large, populous and consequently internationally influential and powerful. Some cities represent veritable nation-states in terms of size and economic power, and thus have the power to influence both local politics and to carry significant weight internationally. Cities are increasingly beginning to use common frameworks such as human rights as a recognised moral language for policy implementation and monitoring of development goals. Moreover, they represent the perfect actor because they are spaces of proximity, i.e., closer to the citizens and thus easier to take up their demands and consequently solve them. According to Edward Glaeser, cities are 'proximity, density, closeness' and I would add heterogeneity and uncertainty (Glaeser, 2011).

Moreover, cities have the power to easily create alliances and synergies both locally between urban actors and civil society and internationally. In this way, they can create alliances and networks with which to share best practices for the implementation of sustainable policies. They operate at the local level but represent key actors for the achievement of national as well as international objectives. Indeed, cities are transversally similar and share characteristics and issues, resembling national states in organisation (Smith and Lobo 2019; Algaze 2018). In this regard, some scholars are increasingly considering cities as spaces of sovereignty and citizenship, focusing on urban law and the self-constitutionalisation of cities (Shaw and Štiks 2021).

In 1991, the concept of the global city was coined by Saskia Sassen, which has since developed in the light of increasing globalisation as a strategic territory due to its proximity to people and their issues and its ability to attract social and economic human capital. Although cities act through soft law instruments, they manage to have an impact on a global scale (Swiney 2020, p. 269). An example of these soft law instruments are transnational city networks (TCNs) that facilitate the dissemination of policies among participating cities while also influencing national and international relations (Acuto 2013). An example of these networks are the Human Rights Cities, which I will discuss in more detail in the dedicated chapter, they through soft law agreements use a human rights-based approach to respond to global challenges.

Human Rights Cities are "cities or communities where people in government, organisations and institutions seek to let a human rights framework guide the development of community life" (PDHRE 2007). Through these networks, cities position themselves as centres of human development, social justice and laboratories of political innovation.

These labels of 'Smart' or 'Green' or the link to Human Rights also serve as a marketing tool to promote themselves within a competitive urban context (Giffinger et al. 2010; Shelton et al. 2015; Buck and While 2017). Cities are also particularly vulnerable to environmental disasters and some authors argue that technological innovation can mitigate their impact (Bibri 2019). Therefore, cities are increasingly recognised as a privileged international location for achieving sustainable development (Porras, 2009). In this landscape, cities are beginning to associate in networks of cities to have an impact from the local to the global. Transnational City Networks (TCNs) with a focus on climate change and the inclusion of sustainability in the standards of a smart city assumes centrality. These TCNs such as the Energy Cities or the Covenant of Mayors for Climate or the Climate Leadership Group (C40) overcome the state-centric paradigm by creating alliances of transnationals and pooling resources, knowledge, and best practices. Another international association of cities founded in 2010 is the World Smart Sustainable Cities Organisations (WeGO) which focuses on the link between smart cities and sustainability. In the interview conducted on 08/2/2022 with Kakim Danabayev, it emerged that:

“Activities focus on matchmaking and solving problems to connect experts with cities, sharing knowledge and feasibility studies to develop and share best practices.

They organize Champion Programmes with universities and students to develop innovative solutions and a Training program for city officials with a certificate from the City of Seoul.

In addition, WeGo develops its own index to assess sustainable development that varies according to the differences of each city. To expand its activities, WeGo organises regional activities such as webinars, conferences where solution providers are invited, networking and matchmaking. Connecting climate change with human rights is a good approach that should be considered because they are deeply related to climate change and play a crucial role.

I think cities can be the central actor and citizens can play an important role”.

Smart sustainable cities are monitored with special standards and performance indicators, some created by the United for Sustainable smart city (U4SSC) initiative, which has developed 91 performance indicators (KPIs) to measure the sustainability of smart cities. Cities are then issued certification by various bodies such as the World Council on City Data, in this way these soft law tools are used as a common language that can outline an assessment framework and measurable targets (Huovila et al. 2019). Although standardisation through certification is not legally binding it serves as a form of social regulation and a tool of legitimacy by the community that creates them (Brunsson et al. 2012). Cities, therefore, have enormous potential and due to their dynamism and progressivism are recognised as laboratories for innovations on pressing contemporary issues such as climate change. According to Barber, in cities, governments are less divisive,

more pragmatic, and solution-oriented, which is why they are recognised as places of innovation and problem-solvers. Their strength is their variety and ability to experiment; according to Barber, best practices are situational and oriented to the needs of places and cultures. (Barber 2013).

This is confirmed in the interview with Eva Garcia Chueca, carried out on 08/23/2022 it emerged that:

“Based on the latest developments in the policy field, including theoretical and reflective, cities are now a very important stakeholder that will contribute to change in the field of climate change adaptation. Cities and citizens are stakeholders that need to be considered given the increasing level of urbanisation globally; without them, change will not come. In fact, more and more cities are participating in global summits and conferences where agreements and pacts are made and take on a role that is not just a mere executor of state decisions but central actors that must also be included as creative agents of solutions from the outset. Thus, without citizens sitting at the same table, innovation will not come in the fight against climate change “.

Cities, therefore, are recognised as central actors capable of making an essential contribution to the challenges of our century. Cities have a great responsibility given their impact on the planet, great decision-making power given their proximity to problems and solutions, great political power and hopefully in the future more and more economic power to solve these challenges.

5.2 The role of civil society

“The New Urban Agenda reaffirms the global commitment to sustainable urban development as a critical step for realizing sustainable development in an integrated and coordinated manner at the global, regional, national, subnational and local levels, with the participation of all relevant actors.”

Specifically, civil society has played a crucial role in human rights progress. Indeed, in the history of human rights, civil society united in NGO networks and forums has been the driving force that through lobbying and monitoring has enabled the adoption of human rights (Glasius 2006; Gready 2004). Indeed, NGOs play a crucial role in localisation mechanisms, as they manage to create a bridge between transnational networks and the local community.

In such an overpopulated urban context and an increasing use of technology, civil society assumes power and an important role. These practices move in the direction of a co-governed city with the active participation of citizens. On the other hand, social networks have brought an unprecedented speed of communication that enables the development of networks that can have a greater impact on local policies. Within a city, civil society can assume various functions. First and foremost, civil society represents a kind of intermediary and mediator between citizens and authorities, it can grasp the needs and interests of citizens and is a lifesaver against possible authoritarian governments.

Civil society fully represents the environment in which the relationships and connections between the various actors and different ideas that animate urban discussion develop. Consequently, it is the perfect

ecosystem in which human rights are demanded through monitoring, information, education, lobbying, and protests. Moreover, in recent years, also thanks to technological solutions, there has been a progressive increase in co-governance and collaborative governance tools.

The city represents that space that, although large and expanding, encompasses controversies, and problems that are close and therefore potentially easier to solve than an international scenario.

Civil society assumes the role of a driving force and sponsor of rights, helps to raise awareness and educate and is capable of forming synergetic alliances that can speed up the implementation.

A significant example is when a city manages to implement innovative and often unforeseen policies at the national level. For example, some cities such as Salt Lake City and Seattle have passed laws to reduce greenhouse gases. Mayors have collaborated on national and international fronts and through the USCM (United States Conference of Mayors) have implemented climate policies in line with the Kyoto Protocol despite not joining at the national level. Finally, the example of Brussels is also significant, where a movement called the Picnic Streets, by repeatedly organising illegal picnics blocking the streets, has shown how a bottom-up approach by civil society can irreversibly transform a city, leading in this case to the pedestrianisation of the city centre, increasing the liveability and sustainability of the city.

Specifically, most human rights cities have come into being with the help of civil society and organisations linked to 'The People's Decade for Human Rights Education' (PDHRE).

In the Netherlands, for example, a national human rights network consisting of Dutch organisations committed to children's rights and the disability movement together with Amnesty International and the Dutch Association of Municipalities (VNG) and the municipality of Utrecht itself was created with the aim of empowering municipalities to implement rights in local practices, developing methodologies to be used in the municipal sphere and sharing best practices. This network succeeded in the first years of its work to put local human rights on the national political agenda.

In this context, the role of awareness-raising and education was very important. As a confirmation of this, we can observe the many initiatives in Utrecht and Amsterdam both in schools and for civil society to educate and create a real culture of human rights to become fully aware of them.

5.3 The role of mayors

The mayor is the body responsible for the administration of the municipality or metropolitan area and represents it externally and internationally. In this transitional phase of the cities and in the light of both the urbanistic and symbolic growth, the mayor retains a huge responsibility and power of impetus in guiding both the technologies in a smart city and the rights and consequent quality of life in the city.

As mentioned above, cities and consequently their mayors are potentially at the forefront and advantageous in the implementation of human rights and sustainable policies in cities.

In particular, mayors are progressively assuming greater prominence and importance in the implementation of policies that often deviate from the national direction, focusing on human rights or the implementation of sustainable measures. Barber, for instance, argues that city mayors, individually or jointly, are more capable of responding to transnational challenges than nation-states, because they are not mired in ideological struggles and sovereign rivalries (Barber, 2013).

Increasingly, in a globalised context, municipalities are taking a leading role in addressing global challenges such as climate change, human rights implementation or the recent pandemic. Indeed, by embracing local demands, they have an impact that is often not only local, but national and even international. For instance, a growing number of US mayors, committed to the implementation of social justice through a regional alliance, implement laws based on specific conventions such as the Convention on the Elimination of All Forms of Discrimination Against Women (the Women's Rights Treaty or CEDAW) to address gender inequalities or the Race Convention to address racial inequalities. In this case, regional coalitions of cities around the world came together to fight racism as part of the International Coalition of Cities Against Racism initiative, promoted by UNESCO. US mayors even spoke out against Trump's withdrawal from the Paris Agreement with the famous phrase 'We are still in'. (We Are Still in Declaration, 2017)

Another example is the United Cities and Local Governments (UCLG), which has for many years aimed at adapting the legal framework to people's fundamental rights, complementing the European Charter for the Protection of the Rights of Cities.

Specifically, TNCs focused on combating climate change, such as C40, ICLEI, the Climate Alliance and the Global Covenant of Mayors, bring cities together in a voluntary network to facilitate this. Indeed, some authors consider them "the primary vehicle through which cities participate in the global response to climate change" (Gordon and Johnson, 2018).

Mayors and local leaders play a key role in addressing these challenges.

Actions taken by city leaders to mitigate and adapt to the climate crisis can facilitate the integration and inclusion of migrants and displaced persons in cities, but inaction could further reinforce the vulnerabilities of displaced persons and increase their exposure to inequalities and climate risks.

Mayors are working from the bottom up to respond to the climate crisis that is global as well as local. In this regard, the C40-MMC Global Mayors Task Force on Climate and Migration was born in 2021, bringing together mayors from Barcelona, Bristol, Dakar, Dhaka North, Freetown, Houston, Lima, Los Angeles, and Milan to make the green transition just and inclusive. These examples underline the importance of the role of city authorities and mayors who, as top executives and executive power, have the power to influence the quality of life of citizens.

Increasingly, they frame local issues as human rights problems that can then build on an existing framework to improve monitoring and decision-making. It is widely recognised that the use of human rights improves local governance because human standards provide an existing framework for identifying local problems and sustainably solving them. The use of human rights also interacts with the international level and global networks of governmental actors that rely on them. The positive aspects of this approach to human rights emphasise inclusion, transparency and thus participation and accountability. Furthermore, international law itself foresees an important role for local governments, precisely to focus on the needs of local communities. According to Wexler, there are several reasons why cities are particularly powerful and have such a high potential: their potentially homogeneous political nature, the absence of foreign policy and federalism problems that exist at the national level, their greater ability to generate visible benefits for their constituents, and their structural advantages over possible federal legislative processes (Wexler, 2009). Furthermore, an elected representative also has a personal interest in providing efficient service to their constituents, attracting tourists and international investors by demonstrating compliance with certain human and sustainability standards. On the other hand, during the interview with Jonathan Pinkse, in connection with an example on the reported city of Manchester, some limitations emerged:

“Local politics is very representative of the different interest groups that exist, and this makes it very complicated if the mayor is willing to implement certain policies. Not all citizens might want a radical transition.

Furthermore, cities and mayors are interesting actors as they are aware of local needs and requirements that cannot be captured by national legislation.

Despite this, cities may set ambitious targets, but these clash with national government funding choices that may leave many cities underfunded. Therefore, they still need support from above”.

It is also for this reason that the World Cities Summit Mayors Forum was created, to harness a network of knowledge and create local alliances at the international level.

Of course, the contribution of mayors must not be isolated, given the difficulties they often face in interacting with multiple interests and being influenced by investors and voters. If the social and ecological goals of our time are to be achieved rapidly, a synergetic and holistic approach between all local and global parties is required.

6. Multilevel Instruments

Multi-level governance is defined as "a system of continuous negotiations between different territorial levels: supranational, national, regional and local" (Hooghe, 1996).

This section analyses some multilevel instruments put in place by the European Union that can be used by cities to obtain funding based on their commitment to implement climate change mitigation and adaptation practices, in line with the Net Zero strategy and the European Green Deal.

6.1 European Union instruments

Today, two out of three Europeans live in cities and, as a result, urban areas are increasingly facing numerous environmental challenges. The European Union and in particular the Commission, recognising the key role of local authorities in improving the environment and their potential, have developed several instruments to solve these problems and encourage local actors to act and address this period of great transition. These tools are embedded in the broader agenda of the European Green Deal, the European New Bauhaus, and the Zero Pollution Action Plan.

The European Green Capital Award was conceived as an initiative to promote and reward the efforts of local actors to improve the environment and quality of life in cities. This award is the result of an initiative by 15 European cities (Tallinn, Helsinki, Riga, Vilnius, Berlin, Warsaw, Madrid, Ljubljana, Prague, Vienna, Kiel, Kotka, Dartford, Tartu, and Glasgow) and the Association of Estonian Cities. The award recognises cities at the forefront of urban environmental protection through the achievement of increasingly ambitious environmental improvement goals. The award is based on the assessment of several environmental indicators: air quality, noise, water, sustainable land and land use, waste and circular economy, nature and biodiversity, green growth and eco-innovation, climate change mitigation and adaptation, sustainable urban mobility, energy performance and environmental governance. Winning the award brings numerous benefits, including an increased international profile and prestige with the consequent creation of networks and alliances.

The European Commission's Green Leaf Award, on the other hand, examines six thematic areas: Nature, Biodiversity, Sustainable Land Use and Soil, Air Quality and Noise, Water, Waste and Circular Economy, Climate Change and Energy Performance, and Sustainable Urban Mobility. This tool is fundamental in assessing a city's commitment to the environment and its ability to generate growth and jobs. The competition, developed after the success of the Green Capital Award, which favours smaller cities, is open to all European cities with a population between 20,000 and 100,000 inhabitants. These tools should be a strong incentive for cities to implement sustainable policies in line with the achievement of the 2030 Agenda goals and to achieve climate neutrality by 2050.

Recently, as part of the Horizon Europe research and innovation programme for 2021-2027, a new way of bringing concrete solutions to urban challenges was implemented through the 100-climate neutral and smart cities programme. It is a tool based on proposing new forms of collaborative governance and citizen involvement for the realisation of climate-neutral smart cities. According to the European Union, cities play an increasingly central role in achieving the European Green Deal goal of climate neutrality by

2050. Considering that cities occupy only 4 percent of the EU's surface area but are home to 75 per cent of Europeans and consume over 65 per cent of the world's energy while emitting 70 per cent of global emissions, the role played by individual cities becomes crucial in reducing emissions and ensuring a significant increase in the quality of life to reach 55 per cent by 2030. The mission is therefore to engage citizens, businesses, local and national authorities, and investors in a multi-level governance model to achieve 100 climate neutral smart cities by 2030. In effect, cities, and local governments, by sustaining their role as vehicles for climate action in collaboration with partners, can have the capital, access to finance and private investment opportunities that will enable them to raise their shared climate ambition (Bazaz et al., 2018).

Cities thus become centres of experimentation and innovation that can serve as a model and inspiration for other cities, creating synergies and alliances between different actors through a cross-sectoral approach. The opportunity for funding to compete only occurs after a smart city Contract has been drawn up, which represents a real plan of action, including the climate neutrality investment plan that the city wants to implement in all sectors: from energy to transport, waste management or construction.

6.2 Human Right Cities

Introduction

Ever since the Universal Declaration of Human Rights in 1948, universal, inalienable, and indivisible human rights have remained the responsibility of nation-states, which have institutionalised them in various treaties by making regional courts and international bodies responsible for their observance (Donnelly 2018; Steiner and Alston 2008). Over the years, international human rights have gradually expanded and become the 'commonly shared bulwark' (Hunt 2008; Neier 2012) used by social movements against all the world's ills, including in recent times climate change. Human rights have become increasingly central and in the 1990s the NGO People's Movement for Human Rights Learning (PDHRE) collaborated with organisations and local authorities around the world to create human rights cities. In 1997, in Argentina, the city of Rosario, local NGOs and the mayor jointly signed a document expressing their commitment to building a human rights community while promoting respect for human rights, equity and peace, and declaring Rosario the movement's first human rights city (Marks, Modrowski and Lichem 2008; PDHRE 2007). Human rights cities have since developed in Europe, Asia, Africa and the United States. To date, the charter, which echoes the ideals of Lefebvre's Right to the City, i.e. the city as a collective space, has been signed by more than 400 cities. Currently, in Europe, the cities that have self-declared themselves as human rights cities are Graz, Salzburg and Vienna in Austria; York in the UK; Utrecht and Middelburg in the Netherlands; Lund in Sweden; and Barcelona in Spain.

A human rights city is defined as "a municipality that has adopted human rights principles and laws as guiding norms of governance. Citizens therefore take an active role by formulating proposals and

collaborating with political actors, thus promoting participatory democracy, local justice and improving the quality of life'. (What we do - HRCN (humanrightscities.net) Another definition emerged in 2011 from the World Forum of Human Rights Cities in Gwangju, South Korea, where they are defined as "a local community and socio-political process in a local context in which human rights play a key role as fundamental values and guiding principles".

Although each experience had its own process, with marked differences, modelled on the possibilities and needs of the city. Lacking for all of them are accountability mechanisms, the possibility of formal accreditation, and minimum standards to be met. Two main types of processes can be distinguished. The first informal in which cities focus on a specific human right but generically and informally, examples are rainbow cities, refugee cities or green cities. The formal process, on the other hand, takes the form of an official declaration that acts as a statement of intent. This differs from the former by the adoption of the Universal Declaration of Human Rights as a governance norm and/or in combination with other human rights conventions and, above all, by the socio-political process that occurs when the community and city government, through collaboration and joint planning, manage to integrate these fundamental values and human rights into urban planning and management. Thus, one can distinguish an autonomous model in which the city locates human rights autonomously. The vertically organised multilevel governance model in which a local government cooperates consistently with all levels of governance up to the international level in the implementation of human rights. While the horizontal network model is based on the promising development of intergovernmental initiatives. Several elements are relevant in distinguishing a human rights city. The commitment must be formal and the process transparent, structures are also needed to ensure continuity during election cycles. Specifically, governing bodies must explicitly shape their policies with human rights in mind and establish a human rights culture that develops in society and among citizens.

Localisation and multilevel interaction

The problem with human rights and international law has always been its application. Indeed, the application of international law is seen as something abstract or distant from the places where it is applied. Although international accountability and monitoring mechanisms have been strengthened in recent years (Soo-hoo and Stolz 2008), top-down approaches retain their limitations and criticality, especially in approaching problems that are often far removed from the places where decisions are made. On the contrary, bottom-up approaches, also thanks to the important role of networks and NGOs, are gradually being consolidated. Indeed, instead of being 'imposed' from above by national initiatives. Standards are disseminated and consolidated through the collaboration of formal and informal networks of activists and government officials.

As Judith Resnik states, "laws, like people, migrate" (Judith Resnik 2016) and this is how alliances and networks are formed that through the sharing of practices and inspirations implement these virtuous models.

Human rights cities are a perfect example of this, as the Montreal Charter of Rights was taken up by the European Charter for the Protection of Human Rights in Cities.

According to Benjamin Barber, cities are increasingly interconnected by formal governance structures and voluntary associations (Barber 2013), these networks provide a forum for sharing ideas and planning local initiatives and can create multi-level governance alliances to implement human rights or climate change commitments. As Barber states, cities have the potential to address global problems in ways that nations cannot. Human rights, as Barbara Oomen states, are invoked by urban actors as inspiring norms and as a moral language that often translates into a legal obligation.

Since the 1990s, there has been a growing realisation that human rights, although formulated in international documents, must be realised in local situations, in the places where people live and work (De Feyter et al. 2011: 14). Morten Kjaerum, former director of the European Union Agency for Fundamental Rights, described the process of human rights development since World War II as "a continuous transformation from a landscape to an architecture in which the local level is becoming increasingly important and special". Indeed, during the interview conducted on 09/5/2022 with Morten Kjaerum it emerged that:

“The human rights journey will never end, the circle has almost come full circle: from the international machinery we have come to the national implementation agenda we had in the 90s and 00s, now with the localisation of human rights at the city level, basically realising Eleanor Roosevelt's 1958 vision "human rights are only important if they are realised where people live and work".

This is where the climate agenda comes in, which will be implemented strongly because the climate agenda is also very localised. The cities have been pushing the climate agenda a lot, it's hard to say, but I think we will see a shift in the human rights agenda in the implementation and realisation that is more and more local. Cities because are committed to the extension of human rights, for three reasons. They want to be good or against authoritarian, populist, and illiberal regimes or they are against neoliberal economics and new public management and want to rethink politics. In Northern European countries, talking about rights and climate change has a driving force; the goals of sustainable development, human rights, and climate are seen as interrelated guiding instruments. Furthermore, the UN's recent recognition of a healthy environment as a human right can certainly be a very useful key instrument. Climate change, a clean environment, and biodiversity are all interconnected, but although theoretically, one can, digging in and trying to operationalise them is very difficult”.

This change is because threats to human rights have local origins, just as the claims and problems of citizens are local. Human rights and the fight against climate change are intrinsically linked to the local governance, and in this regard, international organisations have recently confirmed the importance of local authorities' obligations on a par with national ones.

Municipalities are therefore the ideal actor to integrate human rights and consequently the fight against climate change into local policies. The responsibility is twofold: on the one hand the respect of rights and standards, and on the other hand, local institutions maintain a positive duty in creating a culture of

human and consequently environmental rights. This mutual commitment inevitably leads to synergies between vertical and horizontal governance that develop awareness, responsibility, and shared values.

Over the years, several convergent elements necessary for the localisation of rights have been identified, so that it is not limited to a purely symbolic act.

A strong political will on the part of the local government to institutionalise human rights should inspire the overall political strategy of the local government, while also creating municipal bodies or services that can guarantee the continuity of implementation and, finally, a civil society that is active in both promoting and monitoring results.

Potentials and Criticalities

Human rights cities reverse the traditional analysis. Instead of focusing on the national government as the main driver of change, human rights cities reflect a bottom-up approach in which local communities articulate a commitment to human rights and decide how to implement and give expression to their commitment. Rather than relying on laws and policies imposed by the national government, the human rights cities movement promotes human rights through the dissemination of human rights principles and strategies within and between networks of cities and activists and other formal and informal channels. These channels transcend the artificial boundaries of national borders. Cities, as natural crossroads of new ideas, are in a unique position to be involved in transnational discussions on fundamental rights.

The potential of such human rights-based bottom-up approaches is manifold. Thanks to them, the city improves its governance by using human rights to guide choices and mobilising civil society, thus promoting a model of an inclusive, transparent city based on the principles of equality, non-discrimination, accountability, and active participation in line with the SDGs. This creates an interactive and interconnected reality that through networking can have a greater impact both locally and internationally. According to the OHCHR, human rights are fundamental to promoting and developing sustainable urbanisation, which if well governed has the potential to improve the lives of urban populations.

Human rights cities do multi-level networking, knowledge exchange and analysis, and engage in monitoring and dissemination. Through the Excellence Knowledge Centre, information, experiences, and best practices are shared, and there is a constant dialogue between cities and interconnection between specialised actors on specific competencies that can guarantee access to methodologies and tools for the development of human rights cities.

Over the years, a few criticisms of human rights have been developed that are considered too vague, too abstract, too Western, too legalistic, too progressive, and too difficult to apply (Donnelly 2013; Helfer 2002; Hopgood 2013). These are often considered not universal but deeply anchored in Western Enlightenment culture and consequently not representative of conceptions of right and wrong in contexts and cultures other than the West. (An Na'im 1995; Ishay 2009). Furthermore, some authors recognise an elitist

rhetoric behind the assertion of rights. Thus, the rights of those who have more influence on decision-making processes are more protected (e.g., property rights are more protected), so that the realisation of human rights often depends on power relations and different levels of governance. Furthermore, there are fears that human rights cities may become merely symbolic gestures of moral urbanism and rhetoric without possible accountability, leaving injustices unresolved. Using human rights only for urban marketing to attract investment and have an international profile without implementing practical solutions. Moreover, another criticism of the human rights approach is that the so-called megacities, i.e., cities with at least 10 million inhabitants, which will face the greatest urbanisation problems, are not in Europe and may not adhere to this universal moral language that may be distant and divorced from their culture and needs.

Human rights cities despite the mentioned criticalities have the potential, given their proximity of intervention, to localise human rights (De Feyter et al. 2011) and align them with local practices, cultures, and beliefs (Goodale and Merry 2007), thus countering the criticism of imperialism levelled at them. Furthermore, to criticisms of elitism, human rights cities respond by creating multi-level alliances that manage to overcome the elitist and legalistic human rights paradigm by involving civil society. The interaction and synergies between local and global as stated by some authors (Goodale and Merry 2007; Keck and Sikkink 1998) can consolidate both local and international struggles. This can happen in two ways. Horizontally when local authorities and civil society cooperate in city networks thus creating a 'paradiplomacy' relationship (Lecours 2002). Cities can cooperate directly with international organisations, thus going beyond nation-states by creating vertical development. Furthermore, cities may decide to have a more progressive soul than the national government and influence it by lobbying for the ratification of certain treaties deemed useful and not yet adopted at the national level (Berends et al. 2013; Davis 2007; Oomen and Baumgartel 2014; Kamuf Ward in Global Urban Justice 2016). Moreover, international authorities increasingly relate directly with local authorities, fuelling a process of localisation. Therefore, Barbara Oomen insists on the potential of local actors and the localisation of rights as they have the tools to closely coordinate urban policies and authorities, creating synergies between local and global (Grigolo 2010).

As Barbara Oomen states in an urban entrepreneurship context, the reference to rights and their localisation can open "avenues to international networks, sources of funding and expertise" making them more attractive given their cosmopolitan identity to investment and collaboration. Moreover, being part of an international network of cities facilitates synergetic cooperation between local and international and the sharing of knowledge and best practices.

One of the dangers that some authors focus on is that these values become abstract without real implementation or rather are used as a tool to control local states and their partners develop strategies and techniques to direct the ebbs and flows of contention that constantly arise from the urban base" (Uitermark, Nicholls and Loopmans 2012). Oomen notes that the model of human rights cities allows municipalities to

create multi-level vertical alliances, bypassing states that may not be as supportive in implementing human rights ideals or in the case of climate change measures to counter it. A case in point is Montreal and cities in the United States that have formalised human rights commitments bypassing and overriding the will of their national governments. Many US cities have endorsed the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) and the Convention on the Rights of the Child (CRC), even though the US has not ratified the treaties (Davis).

Cities have enormous potential as places of governance through activism, politics and alliances. A set of inclusive, shared and co-created processes opposed to the usual political bargaining and intrinsically linked to economic interests. Demonstrating this over the past two decades, civil society, municipalities and regions have gone beyond basic international obligations to set minimum standards for the implementation and realisation of rights (Papisca 2011: 94 in Global Urban Justice). Horizontal local efforts need to be combined with vertical multi-level governance efforts to trigger synergies that can have a significant impact. Cities are the natural place to integrate human rights into policies and service delivery. They are the level of government closest to the people and have primary responsibility for providing public services. They also possess institutional and managerial expertise and the capacity to engage with multiple stakeholders and to develop and refine policies in ways that courts and national and regional governments cannot. There is a risk, however, that human rights are not respected when dealing with contentious issues, budgetary constraints, or powerful special interests, or likewise there is a risk of focusing only on certain rights to the exclusion of others.

Multilevel networks such as human rights cities play a central role in creating a human rights culture, i.e., in educating and raising awareness, also fostering participation and thus transparency and monitoring. Some events can be perfect examples such as human rights cafés, human rights weeks, human rights education programmes, human rights film festivals, debates and training sessions, and conferences. Human rights-based policies have a positive impact on the quality of life and thus contribute to a positive link between human rights and economic prosperity, having intersectionality as a strong point. Human rights guarantee also enhance political credibility and prestige and provide opportunities for investment and international recognition.

7. Case Study: Barcelona the Human Right Smart Sustainable City

7.1 Introduction

The choice of Barcelona as a case study city is particularly significant because it is representative of a successful and virtuous model that has often differed from other experiences, managing to integrate various good practices in the world of Smart Cities.

Indeed, Barcelona, in its smart city development process, is overcoming technocentrism and various criticisms by moving away from the first smart city experiments and focusing more on the human, inclusive,

green, and sustainable aspects, focusing on human rights, and active and democratic participation. Barcelona represents the perfect case study for understanding the elements included in the thesis, it has a strong attachment to human rights and democratic participation, thus managing to implement numerous projects through no longer top-down but bottom-up approaches aimed at combating climate change. For this reason, it represents a virtuous profile that deserves to be deeply investigated.

The case of Barcelona takes on greater interest in the light of its progressive efforts to position itself as a leading European city. Barcelona's development offers an interesting insight into how a focus on human rights and a human-centered approach can radically change the approach to smart cities and innovation. Specifically, the case study aims to provide an accurate overview of Barcelona's process as a smart city and the main virtuous projects and the related regulatory framework, partially confirming the research questions of the thesis. It then describes the different phases that have followed one another over the years, describing their main components and characteristics such as smart districts, the main top-down and bottom-up initiatives, digital services, infrastructures, and digital systems for democratising data and active participation. In doing so, it intends to seek an answer to the research questions: how cities and bottom-up approaches have the potential in combating climate change and the implementation of the SDGs, and how a human rights-based approach is essential to create a smart city that is truly sustainable economically, socially and above all, given the urgency of the topic, sustainable. The case study aims to confirm Barcelona as a perfect example of the smart city of the future that succeeds in eliminating the previous criticisms of smart cities, highlighted earlier in the introductory chapter, by integrating economic, social, and environmental sustainability, creating a virtuous model that is recognisable worldwide.

7.2 Smart city, between evolution and innovation

Barcelona's path to becoming a smart city began, according to some authors (Batalla and Ribera Fumaz 2012), with an approach to urban regeneration as early as 1999 when it won the Gold Medal of the Royal Institute of British Architects also thanks to the investment opportunities provided by the 1992 Olympics. During these years the "Barcelona Model" emerged, i.e., a model of urban regeneration of large degraded urban areas that was initially elevated to best practice by many authors (Balibrea, 2001; García Ramón and Albet, 2000; Marshall, 2007; De Jong and Edelenbos, 2007). During these years, Barcelona started its smart city journey to become a globally competitive global city. Initially led by an entrepreneurial government Barcelona wanted to exploit technological innovations to establish itself globally. Mayor Joan Clos's idea was to massively use technology to make the city as efficient as possible with a strong focus on private entrepreneurship, e-government, and city branding, which ended up damaging the city's social demands and public leadership. (Batalla and Ribera-Fumaz 2012).

In 2011, with the advent of a new mayor Xavier Trias, Barcelona continued the path of technological efficiency, promoting itself as a benchmark for other cities. The goal was to create a strong urban innovation

economy around the smart city concept that would facilitate the exit from the economic crisis of 2008. The mayor establishes the smart city Barcelona team with the will to create numerous projects related to mobility, e-government, and infrastructures such as integrated sensors, fibre optics, and open data; in fact, the objective remained to create an efficient city that would be able to assume a strong identity at an international level, thus creating international collaborations and participating in various international events such as the Smart City Expo.

In 2013, the city council defined Barcelona as a smart city 'a self-sufficient city of productive neighbourhoods at human speed, within a hyper-connected metropolitan area with zero emissions' (Adjuntament 2013). The desire was to strengthen the Barcelona model and, above all, the international brand, which is why the government sought funding from the private sector by setting itself up as a test bed for technologies to make them scalable in the world. In doing so, the city opened itself totally to private actors, favouring their interests to the detriment of the public interest. Indeed, Barcelona's objective of improving its city branding to characterise itself as an international city included 22 projects financed by public-private partnerships. Indeed, Barcelona, because of its ability to be the perfect urban laboratory where to test IoT-related innovations, was awarded the European Capital of Innovation (iCapital) in 2014 for its commitment to the implementation of cutting-edge digital infrastructures. Obviously, these innovations were often implemented without a long-term view and without including citizens in the decision-making process, which has led, despite some achievements, to several distortions. To give a few examples, smart LED lighting systems as well as smart parking systems did not bring the desired results and savings precisely because of the lack of foresight with which they were designed, imposed from above with the sole aim of improving the city's branding and attracting private investment. These top-down projects, however, did not involve the citizens and often created a negative social impact by encouraging gentrification processes, changing the existing social stratum, and leading to various social manifestations.

With the advent of the current mayor Ada Colau, the situation has changed from a city of innovation to a city of people, more human. In fact, given her commitment as an activist-militant for the right to housing, the mayor has focused more on the human aspect and the enhancement of public interests. The plan called 'Barcelona Ciutat Digital' of 2016 instead of focusing on technological efficiency focuses on people and democratic participation. The left-wing mayor together with her collaborators initiated a participatory, decentralised, and inclusive model that instead of promoting private innovation favours strong social innovation, advancing technology but involving local communities with bottom-up processes that aim to improve citizens' quality of life. In fact, technology is used to empower citizens by making public administration transparent and accessible. This is done by promoting the democratisation of data through open data and thus the protection of citizens' data from private interests and the use of them for the benefit of citizens and the public interest. Compared to the previous mayor, Ada Colau has taken a holistic approach to the smart city by going beyond private interests and mere technological innovation. Technology is not used

to use and control citizens but to involve them in planning and decision-making processes with the use of, for example, platforms such as Decidem, based on blockchain to ensure data security and ownership.

Barcelona has also joined the Decode initiative with the aim of developing open technologies and business models to counter the overwhelming power and monopolies of private companies. One of the objectives of this strategy is the digital empowerment of citizens and their involvement in design, for example Barcelona carries out numerous participatory processes on different topics in the city's public Fab Labs. In fact, digital innovation wants to be a driver for the creation of an ecosystem of start-ups that manage to innovate from the bottom to create the so-called Industry 4.0. Although Barcelona has always been a participatory city, before 2016 participation was top-down, excluding the citizen from the decision-making process, since 2016 the approach has become bottom-up, thus guaranteeing true citizen participation.

As a confirmation of this, Eduardo Costa, during an interview on 08/26/2022 stated that:

“The transformation of the city must necessarily go through bottom-up processes, directly including citizens. The interest of citizens, understood as all those who live in the city, must be listened to so that distortions are not created that turn into criticism and protests and can still block the decision-making process later”.

Although the previous junta was also committed to transparency with citizens, the type of participation was totally different; whereas before, results and initiatives were presented in the form of advertisements and spots, now they are co-created in collaboration with the citizens themselves. There has thus been a change in governance from a top-down system, with strong political leadership from the mayor and ownership of processes by the municipality, to a decentralised bottom-up approach, which has been expressed in projects such as Decidim Barcelona and Repensem el 22@. The new junta's approach rejects the idea of commercialising Barcelona to private citizens and prefers instead to try to solve urban problems, not by imposing decisions or technologies from above but by using them in collaboration and co-creation with citizens.

To have a clear overview of the evolution of Barcelona's smart city model, an interview was conducted on 08/30/2022 with Josep Miquel Piquè Huerta. During the interview it emerged that:

“In 2007 with Hereu's leadership there is an evolution and development of a movement that also included the smart city concept with the leadership of the municipal IT institute. Obviously, Hereu was working on a totally new smart city concept and therefore the focus was on the smart city as a digital tool to better manage urban services and urban utilities with a focus on infrastructure”.

In the second phase with Trias, the focus was more economically oriented, with several initiatives such as the Smart City Expo and the focus was on how to create an economy and become a global model. In 2015 with Ada Colau the idea was to focus more on citizens, there was a more social approach to digital democracy and participation in terms of inclusion of citizens. Thus, the urban dimension was united with the

economic dimension and the social dimension. Data-driven cities can be used to empower citizens through a knowledge-based approach or as is more often the case in Asia to control people.

The evolution, however, has not only been Barcelona's but the entire smart city world. These different phases have also crossed international events that were increasingly focused towards a more citizens-centered side. The process of Barcelona as a Smart City is still evolving, given the overview just presented it is possible to say that the leadership of the Municipality and a strong political will have been essential in outlining the focus strategies. The partnerships that are created are multiple and must include all actors to create a winning multi-level innovation ecosystem that moves from a triple helix system (Etzkowitz & Leydesdorff 1998) the Public, Private, and Universities to a fivefold helix system including not only the actors mentioned above but also civil society split into two organised actors (third sector) and the unorganised (Iaione & De Nictolis 2016).

7.2.1 Project 22@ the smart neighbourhood

This project, born in 2000, offers an interesting view of how the city has also evolved in different aspects of governance to implement innovative projects. 22@ Poblenou represents the innovation district in Barcelona as part of the industrial renewal plan that the city had initiated thanks to funding from the 1992 Olympics, which aimed to regenerate the old industrial area of Poblenou. This 1982,700 m² industrial area was called the 'Catalan Manchester' due to its industrial and poor nature and was transformed into a hub for innovation and experimentation in the fields of ICT, art media and design, medical technology, biotechnology, and energy management. The project, therefore, had a twofold objective, to improve the quality of life of the inhabitants and to enhance Barcelona's attractiveness and competitiveness on an international level.

Initially, the project was characterised by a top-down orientation of governance, but it was immediately imbued with a triple helix ecosystem of collaboration and innovation. Indeed, synergies between local businesses and networks were created early on, such as the Barcelona Urban Innovation Lab&Dev, which, using public-private partnerships, develops projects for the benefit of businesses and the city by encouraging private companies to invest. This ecosystem expanded thanks to the intervention of the mayor who moved the art and media faculties within the district, thus creating a virtuous spiral that led to the opening of shops, start-ups, and art centres that accelerated the process of renewal of the smart district.

Unfortunately, however, this rapid process of innovation led to a radical change in the previous social and urban environment that resulted in the replacement of the social fabric instead of integration (Zarlenga et al., 2013). For this reason, there was resistance from the inhabitants of the neighbourhood who accused the municipality of excessively favouring private interests at the expense of those of the citizens. In fact, as noted by some authors (Cruz i Gallach and Martí Costa, 2010 in smart city and Smart citizens; Marti-Costa and Pradel, 2011), the 22@ project failed to integrate the population into the innovation processes, creating

exclusion processes and the disruption of the neighbourhood's social identity. In line with these protests, grassroots initiatives such as the 'Poblenou Urban District' or the 'Mapa creatiu del Poblenou' (Creative Map of Poblenou) were born, which by bringing together the neighbourhood's artists in these platforms aimed to limit the commercial and corporatist side of the project. This project initially aimed to involve private actors in the research, improvement, and innovation of urban services. Numerous initiatives were also developed for residents such as direct communication initiatives or the development of Living Labs such as 22@Urban Lab. This participatory innovation lab is part of the BUILD programme in which companies are encouraged to create innovative solutions, products, and services that can then be tested, used by the municipality, and marketed. Ongoing projects since 2001 span the fields of telecommunications, environment, and mobility, encouraging an ecosystem-based innovative business culture that includes universities, private companies, and the public sector.

Despite the growth and marked improvement of the area, some of the targets set have not been fully achieved and the area has suffered profound commercialisation to the detriment of citizens. There have been some distortions such as the steep increase in housing to the exclusion of residents that have led to some protests in the neighbourhood. Unfortunately, part of the old buildings, both residential and industrial, have been demolished and there has been a massive exodus of residents, thus damaging the social fabric and identity of the place and undermining social sustainability.

In fact, at least in the early stages of the project, the government failed to design the plan exclusively with the private sector to the exclusion of citizens and their interests or needs. Today, however, thanks also to the human-centred and people-centred tendency of the Colau junta, participation takes on a central value. In fact, in an interview with Kostandinovic Neda, it emerged that the entire Urban Ecology area has an inbuilt participatory process with a transversal department, each area, and each major project such as the 22@ has its own participation department. Furthermore, K. Neda reports that:

“Since the project was 20 years old, the KPIs changed and therefore they noticed that the project was only 50 percent developed and needed updating and consequently improvement. Furthermore, he confirms that in line with this objective, an amendment to the 22@ master plan was approved in April 2022 that implemented more social housing to ward off the dangers of gentrification and increased green and sustainable strategies”.

The municipality to respond to the new urban social economic challenges that have emerged over the years first initiated a participatory process with all the agents of the Repensem 22@ territory that through an open and inclusive methodology, more than 1000 people from different sectors and organisations participated. One of the objectives of the new plan is to consolidate a quadruple helix governance model (citizens, economic sector, university, and public administration) that is inclusive and includes all the project actors

With the modernisation of the project, the 22@ in Poblenou becomes more productive, more inclusive, and more sustainable. In fact, the new renovation plan aims to maintain the previous dynamism and

economic potential while improving an urban fabric of environmental quality that enhances the daily life of citizens and local productive activities. This new plan MpPGM (Metropolitan General Plan) has included social, neighbourhood, and economic agents in the area, also establishing a special desk for citizens and businesses to facilitate knowledge and accessibility of the project. The objectives of this new plan include better management and governance of processes, more agile development and improved environmental quality, promotion of the district's innovative, productive, and creative economic potential, and enhancement of Poblenou's identity, culture, and heritage (Ajuntament Barcelona 2018).

In line with these objectives, 30 percent of the land, formerly totally private, has been recovered and is now public intending to create new green areas and social housing for the benefit of citizens. In this way, through a system of incentives for the housing market, an improvement in infrastructure and the quality of urban services, and the use of public space by citizens are promoted (Pique Huerta et al. 2019). During the interview with Jose Miquel Pique Huerta, it emerged that:

“Also, regarding the 22@ project, it has undergone the same evolutionary process as the smart city, and now through the participatory Repensem22@ project it is being made greener, more inclusive, and citizen-oriented”.

Initially, 22@ succeeded in improving the urban fabric by creating new jobs, creating new businesses and new housing and public spaces, and improving services and infrastructure. However, in the early stages of the project, this created negative externalities for residents by favouring private and urban marketing interests, excluding residents from the decision-making process, and creating distrust in public institutions. This highly speculative urban development to attract investment and strengthen economic competitiveness as well as global attractiveness has led to damage to social sustainability and the social fabric in the neighbourhood. On the contrary, the second phase of the project, also but not only thanks to the junta's people-centered approach, began with a strong attachment to participatory processes that ensure as also stated by Konstandinovic Neda:

“Participatory processes assure the implementation of this kind of strategies, working close to citizens assures you of their will and maintenance and their participation”.

7.3 Barcelona towards Climate Sustainability “This is not a drill”

In terms of sustainability, Barcelona also offers an excellent case study to investigate the evolution of the smart city and how cities can move towards climate sustainability. The city, as a coastal, Mediterranean, and densely populated city (241.8 inhabitants/sq km), is particularly affected by climate change.

The city of Barcelona will witness a sharp rise in temperature 16 times higher than today, and an increase in fires, leading to a loss of biodiversity and deterioration of air quality. A loss of beaches between 30 and 46%. A drastic decrease in precipitation of up to 26% and an increase in the demand for drinking water resources of 18 hm³ per year by 2050. On the other hand, extreme precipitation events will occur

more frequently, leading to dangerous flooding that will put more stress on the city's main infrastructures, such as the sewage system, marine canals, and roads. (Climate Emergency Declaration 2020).

The Spanish government's efforts to mitigate climate change began in 1992 with the establishment of the National Climate Council (CNC) and in 2001 with the foundation of the Spanish Climate Change Laboratory. Between 2006 and 2009, these two bodies approved the first National Climate Change Plan in line with the European communications on adaptation to climate change in the Green and White Papers. Despite mitigation and adaptation plans, there have been several extreme weather events that have alerted the city to the dangers. In 2008, the Barcelona Urban Infrastructure Resilience Council (TISU) was also established, responsible for planning certain areas critical to the city's sustainability and resilience. In addition, the Barcelona Green Infrastructure and Biodiversity Plan 2020 (GIBP), based on the European Biodiversity Strategy 2020, was published in 2013 to enhance the city's ecological, environmental, social, and economic services by creating interconnected green infrastructures that can improve the quality of life of residents and create a healthier and greener city. This strategy involved citizens in the planting of trees and the creation and maintenance of urban gardens and vegetable gardens through communication, education, and the participation of a network of businesses, civic and professional associations, foundations, universities, schools, and various local government departments.

This document was then followed by the Stimulus Programme for the Promotion of Green Infrastructure (Ajuntament de Barcelona, 2017) then expanded by the 2017/2037 Tree Master Plan, which covers the management, maintenance, and enhancement of trees in public and private areas. This strategy, also called 'Trees for Living', was developed by integrating an ecosystem of stakeholders, which the Barcelona government used: The 'Participatory Council for Sustainability, Citizens' Council for Sustainability, and the 'Barcelona More Sustainable' (B+S) network that brings together schools, NGOs, businesses, universities, and citizens. This has ensured an inclusive, participatory, and socially equitable process. The benefits of these strategies for climate change mitigation and adaptation are manifold: urban and global warming is mitigated, flooding is prevented, the air is purified, and CO₂ is stored, noise pollution is reduced, biodiversity is improved, ecosystem resilience is increased, and the water cycle is balanced. This creates an urban environment that is finally integrated with nature again. In addition to green spaces and green corridors, much urban agriculture and gardening systems are created, not only to reconnect the urban environment with the natural environment but also to educate and raise awareness of resilience and the importance of nature. To accomplish these challenges, the city of Barcelona relies on the Department of the Environment and the Department of Housing, which deal with green, accessibility, gentrification, and green gentrification. Barcelona is therefore working to ensure that this greening and local development does not result in gentrification and green gentrification, i.e., an increase in housing prices relative to the increased desirability of the area due to greening and innovation.

In this regard, the Barcelona for Urban Environmental Justice and Sustainability (Anguelovski et al., 2017) found a dependency between green gentrification and the existing context and environment, concluding that the population groups most at risk of gentrification are those with low and middle incomes. Intending to avoid gentrification phenomena due to increased attractiveness, since 2016, the municipality has been building 6,100 public housing units and purchasing more than 1,000 flats to preserve the housing stock while keeping prices affordable to make the city's innovation socially equitable and sustainable. In addition to the above-mentioned initiatives, the Department of Housing, together with Mayor Ada Colau, is developing a strategy to combat gentrification. Monitoring and lowering prices, they want to make it less profitable to buy property, thus preventing the danger of social exclusion. In an interview conducted on 09/13/2022 with Kostandinovic Neda it emerged that:

“The Catalan government can put a limit on the price of rents for the whole Catalan territory. The Ada Colau junta has put a lot of effort into gentrification and today Barcelona allocates 30 percent of new housing and renovations to social housing (300/400 social housing units per year) and, where prices are rising, adjusts property taxes for low-income families. In Sant Antoni they have limited the size of individual units, thus ensuring that large shops do not expand over an entire block, leaving space for small local businesses”.

Given the emergency situation, on 15 January 2020, the city of Barcelona issued a Declaration of Climate Emergency that makes explicit the seriousness of the situation and defines future plans, with the ambitious goal of not only wanting to meet the goals of the Paris Agreement but to go even further. Climate change is seen as a global responsibility that we all must face. This declaration, as stated on the City Council's website, is the result of a process of reflection and co-responsibility by the Climate Emergency Committee, established in 2019 as a working group in accordance with the City Council's Regulation on Citizen Participation. The committee, established to address the climate emergency, was attended by more than 300 citizens representing over 200 organisations, making the sessions also available on the Decidim platform. Although citizens, in cooperation with the municipality, are key actors, the city is working to involve all actors and stakeholders, each in their area of competence. These projects were then aligned with the new 'Barcelona Nature Climate Plan 2030' of 2021, a strategic and participatory tool that takes forward the GIBP objectives to create a functional and ecological city with equitable, accessible, and connected green areas to maximise social and environmental services related to nature management, biodiversity, health, and climate change adaptation.

In this regard, the plan defines a package of more than 240 measures to reduce greenhouse gas emissions by 45 per cent by 2030, compared to 2005, and to achieve carbon neutrality by 2050. The plan also aims to create 160 hectares between 2015 and 2030, increase the natural area by 100 hectares, create 10 biodiversity refuges, increase engagement in nature conservation activities, and develop 40 projects together with residents related to the 'Mans al verd' programme.

To tackle climate change and improve the quality of life in Barcelona, the main political strategies have focused on increasing green spaces and counteracting the increase in population density.

In this regard, it emerged in the interview with Michele Grigolo that:

“Barcelona is also an ideal case for the city's role in promoting a sustainable environment, combating Climate Change, and integrating environmental issues into urban contexts. There is an invitation to cities to insert themselves in this context, as subnational actors, autonomously beyond the states, cities have a capacity for action and a political vision that can go beyond the state or sometimes be critical of the state”.

Since 2019 Barcelona has also started a project called Climate Shelters, funded by the European Commission under the Urban Innovation Actions (UIA) programme. This project aims to improve climate resilience by creating a network of climate shelters to protect the most fragile population during the hottest seasons. Thus, 11 schools were transformed into climate shelters open to all residents, involving children, teachers, and parents in the design. In particular, 74 trees have been planted, 26 new water sources installed and 1,000 square metres of natural space reclaimed, creating 2,213 square metres of shade. In addition, there are already 197 shelters (parks, gardens, museums, libraries) that can be reached by almost the entire population within a 10-minute walk.

Barcelona has undertaken a progressive commitment over the years to combat climate change. With the declaration of climate emergency, there is a leap forward and a taking of responsibility by the city, which is thus putting itself at the forefront of the fight against climate change. In this regard, it emerged during the interview with Eva Garcia Chueca that:

“Although Barcelona does not make an explicit link between its sustainability practices and human rights, I think the connection is implicit. In fact, the new urban model wants to put citizens at the centre, both in terms of improving urban life and the need for green areas and a healthy environment. It would be helpful if the connection is made explicit using the specific words 'human rights’”.

One of the most important projects that includes the concepts of smart innovation and sustainability is the Superblock and its expansion into the city with the Superilla project.

7.3.1 Superilla

An important strategy to improve greening and urban sustainability in cooperation with citizens is the Superilla Plan which combines mitigation and adaptation. The intention is to return the city to citizens by promoting an inclusive transformation towards sustainable mobility, connecting different neighbourhoods and green areas. The Superblock project will bring one million square metres of public use for the local population and 40 hectares of green space. Soon this project will be extended, through the Superilla project, to the whole of Barcelona, with the development of superblocks in the different neighbourhoods of the city. The objective, as communicated on the City Council's website, is to recover for citizens part of the space

currently occupied by private vehicles and to create a healthy, greener, less polluted, fairer, and safer public space that promotes social relations and the local economy.

Citizens in line with the municipality's people-centered vision thus become true protagonists. The aim is to create a city in which public spaces, streets, and squares are places for social encounters, play, and cultural, economic, and social exchange.

Superilla, to drastically cut emissions, is therefore reducing the use of private cars and incorporating sustainable means of transport to return urban space to citizens. One of the challenges of the project is that this transformation will inevitably lead to a change in the habits of citizens, who although many are in favour, may be reluctant to change their habits completely. For this reason, the participatory process aims to generate balance in decision-making by harnessing a network of people and organisations by going beyond urban planning criteria to integrate criteria of sustainability, social justice, and equity. In fact, as stated by Kostandinovic Neda in the interview conducted on 09/13/2022:

“The city of Barcelona coexists with several problems: a very high level of air pollution, high levels of noise pollution, overheating of the city in summer, a high number of traffic accidents and finally a lack of green spaces. Despite this, Barcelona is organised in such a way that all basic needs are within a ten-minute walk (city size 10x10km²). Fifty per cent of trips in the city are made on foot, 25 per cent by public transport, and the remainder by private vehicle. This implies that streets must be rethought on the scale of the walking citizen.

Because of this, the Superblock model was born with an initial phase from 2015 to 2020 in which the objective was to expand knowledge of the project. The Superblock theory aims to reorganise heavy traffic and introduce new and increased uses of public streets. In 2016, 9 blocks in the Poblenou neighbourhood were reorganised as a pilot experiment, and later in 2018 in the Sant Antoni area. The aim is for the entire city to be covered by these green axes so that the entire population has access within 200 metres to one of these squares or green axes. Given the impossibility of doing a single implementation in the city, it was done area by area and some controversy ensued. The strategy then evolved into axes no longer for superblocks. In 2021, the new phase began with the goal of having 21 new axes, intersections, and squares throughout the city by 2030. The plan was to divide the road in two, 50% for pedestrians and 50% for cars, with a speed limit of 30 km/h and always giving priority to pedestrians. This gives public space back to the citizens who now meet in the streets of their neighbourhoods and create community. These interventions are carried out through tactical urbanism where there is still no permanent transformation of urban areas. Tactical urbanism is ten times cheaper than structural urbanism and varies according to the materials used, e.g., wood, paint.

For Sant Antoni, a very dense neighbourhood with no parks or green areas, an intervention was made all over the neighbourhood to avoid complaints from citizens. In the transformation of Sant Antoni, 24,000 square metres of public space were given over to pedestrian priority at a particularly critical road junction. As a result, air pollution has decreased by 43% in NO₂ and 4% in PM₁₀, noise pollution has also decreased by an average of 5 decibels (5 decibels is half the noise we hear) and 82% fewer vehicles pass through the intersection.

To sum up, the idea is therefore to create a grid of green infrastructure to improve mobility, walk and the use of public transport such as the tram and metro throughout the city by almost completely eliminating the use of private vehicles, improving accessibility to public spaces for all and making roads and crossings safe. Initially, 70% of the population was against the superblocks project, but this was because they had not received enough information about it. From 2017 to 2018, the participation process overlapped in two different areas and was very intensive for the team, involving existing stakeholder groups in each neighbourhood called "group impulsors" and later involving the rest of the citizens. Participation as a methodology in this government and city council is currently the main concern because we want a city for citizens and not for cars. Superblocks have been very successful and are a strategy for the whole city, not just for one neighbourhood, transforming the way people live. This is also the reason why participation and interest in Superblocks and Superillia have increased over the years, making citizen participation self-sustaining. Participation in the process ensures implementation; working closely with citizens ensures readiness, retention, and participation. Although the top-down approach and political leadership are necessary, the bottom-up approach is essential for the reasons mentioned above. Our current government is now truly people-centered, we want people to participate and be put at the centre by becoming protagonists, re-appropriating spaces and living them”.

Therefore, the participatory process with residents and local groups was initiated in 2021. More than 20 participatory actions were carried out, involving more than 1,500 people in the process. In addition, information and participatory campaigns were carried out with 455 out of 717 local businesses to inform and listen to concerns and complaints about planning, timing and to discuss implementation mechanisms. To evaluate the results of the process between December 2021 and January 2022, a survey was conducted to which 52 of the 200 people contacted responded. In general, the answers to the various questions were positive, with the exception of the question on citizen satisfaction, which received the lowest score, showing that the participatory process still needs to be expanded and completed in line with the continuation of the work.

In this regard, in order to clarify some issues related to participatory processes, an interview was conducted with the *Collectiu Superillia Poblenou*, which describes itself as a heterogeneous group of people united to actively participate in the creation project according to their interests and desires.

During the interview on 08/22/2022 with Patrick from the *Collectiu Superillia Poblenou* he exposed that:

"Initially in their neighbourhood there was no participative process, so the citizens immediately reacted with strong criticism. That is why the organisation was born to support the creation of the superblock. The government was still politically undecided about the actual implementation given the negative media attention. So, the collective pledged to sponsor the project and get people involved, and at the beginning of Ada Colau's second term more political interest developed, and they started to promote it. Although to this day there is a lot of urban marketing about the superblock concept, in our neighbourhood it has really improved the quality of life and the way people use their cars and common spaces. Moreover, once you experience it, it also raises awareness about the environment, air quality, and what spaces should be

allowed for cars. In fact, although in Barcelona we have a pollution problem there is still a lot of resistance and scepticism and a fear for the change of habits that this urban transformation would bring. People, however, living inside a superblock understand that public space is different and where there was no community before it is formed. Another critical issue that arises is tactical urbanism, not having a single budget to directly implement the project for the whole city they only carry out the work where they had already planned an intervention and had the budget available. People don't like change and are sceptical about speculation and related gentrification, but you have to be brave because when you live there you realise it's a great success."

Barcelona's commitment to an innovative and sustainable transformation of the city is, especially in recent years, oriented towards citizens and their interests and goes along with the revitalisation of the relationship with human rights.

7.4 Barcelona between human rights and participatory digital democracy

The human rights movement in Barcelona began thanks to the strong political leadership of Pasqual Maragall i Mirà (1982-1997), a member of the Catalan Socialist Party who initiated the movement to adopt the human rights framework. Later with Mayor Joan Clos in 1998, it proved to be in the vanguard by creating the Civil Rights Department and establishing itself as the City of Rights.

In 2000, it hosted the Conference of Cities for Human Rights and also participated in the development of the European Charter for the Protection of Human Rights signed in Saint Denis the same year.

In the same year, the city signed the ECHR and in 2003 created the Network of Cities for Human Rights committed to the implementation of human rights in the province of Barcelona, immediately assuming a leadership role on the international scene.

In 2003, with the advent of a centre-right liberal party, there was a weakening of the human rights movement. In fact, as Michele Grigolo, observes in an interview on 08/26/2022:

“Despite the fact that Barcelona has a progressive culture and sub-layer given also by its history as a centre of anti-Franco resistance, the adoption of human rights policies in Barcelona is a process that has varied greatly according to the political forces in the field. With the convergence and union phase in 2011 with Trias there was an attempt to water down human rights with a neoliberal and marketing or political branding discourse”.

In fact, although Barcelona boasts a social context particularly suited to participatory governance, it has varied according to the political force and a development vision that focused more on economic growth, tourism, and urban marketing, i.e., making the city attractive for investment and appealing to international markets”. (Grigolo, M. 2011).

Two different styles of government were identified, the conservative right, often more focused on the commercial and economic side, making active participation a mere consultation based on slogans and top-down communications, to the detriment of social inclusion and the most vulnerable groups. And one

implemented by socialist politicians that is more democratic, participatory, and attentive to the needs of the population. The goal behind Human Rights Cities is to localise human rights, developing and integrating the values of the Universal Declaration of Human Rights into the city and municipal policies. To achieve this goal, several new services have been created by the Civil Rights Department, including the Office for Non-Discrimination (OND) and the Office for Religious Affairs (OAR), i.e., a place where citizens can file complaints about human rights violations. These instruments based on the ECHR, international, EU, and Spanish standards offer a participatory tool for citizens to file complaints.

In line with these instruments, two municipal plans were created in 2004: one for LGBT rights and one for Roma, creating two consultative councils, the Municipal Council of Gay, Lesbian, Bisexual and Transgender People and the Municipal Council of Roma People of Barcelona. Furthermore, in 2008, the Human Rights Observatory was created in collaboration with local NGOs and civil society, also establishing an Ombudsman. These instruments stabilised and reinforced the role of human rights, specifically the Ombudsman has the task of supervising the municipal administration, and the Observatory monitors and reports on the state of human rights in Europe. These instruments have been accompanied over the years by a vast network of different organisations working from the bottom up and on a multi-level level, keeping the municipality at the centre.

Subsequently, the Institute of Human Rights of Catalonia, the Observatory on Conflicts and Human Rights, the Commission for the Defence of Individual Rights, and numerous civil society initiatives such as El Casal dels Infants del Raval for children's rights and the ECOM Barcelona Federation that deals with people with disabilities have been created. In addition, Barcelona is home to the Committee for Social Inclusion, Participatory Democracy, and Human Rights of United Cities and Local Governments (UCLG), a global organisation that creates a global network between different cities by sharing practices and knowledge. This network helps local governments build alliances and partnerships, also benefiting since 2011 from the Global-Charter Agenda for Human Rights in the City, which associates every human right with an implementation plan.

Barcelona, in addition to being the headquarters of the UCLG, works in collaboration with Eurocities, a coalition of European cities, and the Rainbow Cities network for the protection of LGBT rights. Therefore, it can be said that human rights are well embedded in the city, city society and different municipal bodies and are used to raise awareness of problems and possible solutions. This could be done, given the existing framework, to raise awareness and propose solutions regarding climate change and the increasingly urgent implementation of the SDGs to accelerate the implementation process.

Raising awareness of the links between climate change and human rights, such as health or the right to live in a healthy environment, could lead to greater interest and consciousness in public policy-making and the promotion of greater civil society engagement. Between 2011 and 2015, Xavier Trias, with a conservative majority, came into government and produced a new Charter of the Rights and Duties of

Citizenship based on the Spanish Constitution and international treaties. Despite recognising a human rights influence, the charter, by insisting on the concept of citizenship and obligation, excludes some citizens and is recognised as a conservative turn in local politics. Indeed, one of the limitations found in this type of bottom-up approach to human rights is that they depend on the vision and strategy of those implementing them. Furthermore, danger could be that, depending on the government's position, some rights are preferred over others, e.g., socio-economic rights have often been poorly implemented.

In recent times, human rights have been influenced by new discourses on bottom-up and participatory governance leading to greater involvement of the local community and civil society. Barcelona has well embodied this by becoming in recent years, especially with the last junta led by Ada Colau, a permanent living lab, and laboratory of participatory democracy.

Human rights are in fact also used to promote social inclusion, considering the worrying and growing urbanisation with which the identity policies often proposed by the right-wing clash. The exclusion and diversification of people living in cities, in fact, produce fragmentation and isolation of vulnerable groups that worsen the situation by undermining social cohesion and the stability of local government, thus multiplying inequalities. (Grigolo 2019). Human rights thus assume greater importance because they can articulate a universal and moral language that goes beyond the legalistic constraints of citizenship.

Through the efforts of Mayor Ada Colau, the city has defined itself not only as a city of human rights, but also as a city of refuge.

During the years of Ada Colau's junta, human rights made a comeback by including many human rights experts with a human-centric vision in the government. This junta also took up the concept of the right to the city, linking it to human rights in the city and Article 1 ECHR, which states that human rights belong to the residents of the city regardless of the legalistic requirement of citizenship. This connection to the right to the city is also related to the resident-led bottom-up processes that are widely used in the city of Barcelona.

During the interview with Eva Garcia Chueca, conducted on 08/23/2022 it emerged that:

“The love affair between Barcelona and human rights is not new: it started in the 1990s and in the last two terms it has changed its approach by including many non-party political figures with a human rights background. Furthermore, the city government has become more open and transparent from the citizens' point of view. I agree with you that, although the link between human rights and climate change is not explicit, one possibility could be to entrust the ombudsman, whose purpose is to verify that the government's actions are in line with human rights, with the task of dealing with climate change issues; in fact, we are already working on some similar issues”.

In this regard, Michele Grigolo also confirmed during the interview that:

“Colau comes from a movementist background and, drawing on the culture of human rights, has sought to revitalise and radicalise the approach to human rights in the city, also restructuring the organisation of human rights in the administration with the creation of the agency for equality and citizenship, applying it to the discourse of housing and putting technology at the service of the population”.

Considering this, some experiences of digital democracy and active participation are briefly discussed.

7.4.1 Open Data

Barcelona is committed to implementing open governance initiatives and projects. One of these focuses on open data to openly share data collected at city level. The Open Data strategy aims to open government information to the public. The data provided in a free and simplified manner concerns the territory, population, management and procedural indicators, urban environment and documentary data excluding all those contrary to government regulations and security, privacy, and property data. This project aims to increase the transparency of the municipality towards citizens, public administration, and businesses. Allows citizens to collect data on environmental variables (air, pollution, temperature, noise pollution, humidity) by enabling real-time environmental monitoring on an open-source platform with open hardware and software. It aims to design a network and data management platform scalable to other cities, creating a communication network between sensors and identifying a framework based on open standards to make data available to society to improve services, create awareness and increase social and commercial value. This democratisation of technology and an open innovation approach (Chesbrough and Appleyard, 2007) has led companies to change the innovation paradigm, an example being the many living labs in Barcelona. It has furthermore brought numerous benefits, including the empowerment of citizens and the sharing of knowledge and best practices. In addition to the democratisation of technology, there has also been an increase in the use of participatory democracy with platforms that effectively empower citizens.

7.4.2 Decidim

In 2016, Decidim ('We decide'), the digital participatory democracy platform promoted by the municipality of Barcelona, was launched. Based on democratic quality criteria, it enables the management of the municipality's participatory processes in a single platform, encouraging participation. Today, the platform has more than 32,000 participants, 1300 proposals, 1300 face-to-face meetings, 190,000 supports collected, and more than 9000 citizen proposals accepted. There are also 38 participatory processes around 15 municipal participatory bodies and a dozen citizens' initiatives. The software is free and on Github, so it is possible to copy, use and modify it, and consequently it is controllable by the community. The Decidim community is an open and collaborative community, an ecosystem of citizens, associations, hackers and small companies and organisations.

The fundamental characteristics are accessibility, transparency, traceability, and integrity, i.e., that all content is accessible and downloadable and cannot be manipulated. The platform gives a guarantee of democratic quality by ensuring non-discrimination and equal opportunities between participants and proposals, inclusiveness, and the impossibility of censorship. In addition, the platform has a high degree of privacy, personal data is controlled by the users, is not shared externally and there are no external cookies. These features, as an antithesis to the current era of surveillance capitalism (Shoshana Zuboff 2019) and private control of data, have become particularly important in the context of digital democracy. Decidim therefore guarantees an open software licence, an ethical use of data and guarantees a democratic participatory platform. This digital participatory platform is used by more than 80 local and regional administrations and over 40 social organisations. Its modularity, flexibility, free software and open development model make it particularly well suited for scalability. (Ajuntament Barcelona 2019).

Decidim is run by a community of people and organisations related to democratic governance that has achieved international reach. This community model formed by a productive ecosystem of diverse actors aims to include the participation of citizens and local communities. Decidim today represents a fundamental public service for democratic governance that guarantees inclusive participation and direct democracy through the co-production of public policies. The transformation of the city is carried out by listening to citizens' needs and developing an open participatory model with free, open, and democratic people-centred technologies. Through this platform, it is possible to create participatory budgeting, collaborative planning of regulations, public consultations, discuss urban spaces, create digital assemblies, working groups, referendums and integrate online and offline participation. The modularity of the platform makes it possible to combine the different tools available to organise different types of democratic projects.

In Barcelona, the platform has more than 28,000 participants, 1,288,999 page views, 290,520 visitors, 19 participatory processes, 821 public meetings channelled through the platform and 12,173 proposals, of which more than 8,923 have already become public policies grouped into 5,339 outcomes whose level of implementation can be monitored by citizens. (Barandiaran et al., 2018) Decidim aims not only to improve participatory democracy in the state but also to provide social empowerment for citizens to be able to take collective action separately from public administrations. This platform according to some authors (Barandiaran, X., Calleja-López, A. & Monterde, A. 2018) fits between two interconnected phenomena. On the one hand, the weakening of representative democracy due to the relative difficulties in interfacing with global phenomena such as climate change, subordination to market forces and private actors. On the other, there is a progressive strengthening of cognitive capitalism, i.e., the exploitation of information, knowledge, and social relations to create economic value. Decidim, with its characteristics, counteracts these concepts by using open software, sharing knowledge and guaranteeing data ownership. This initiative aligns with the others described above and confirms the pioneering role that Barcelona is playing in the development of a human-scale, democratic, innovative and sustainable smart city model.

Conclusions

Climate change is a reality that can no longer be ignored. It is necessary to restore a human-nature relationship, and technology must do its part if it is driven by a people-centred and human rights-based approach. Indeed, it is necessary to rethink the smart cities of the future by integrating a human rights-based approach and an integrated human-nature relationship. In this context, cities are the actor around which most of the century's challenges will revolve. During the writing of this paper, it has become evident that cities have the power to play a fundamental role in fighting climate change and implementing SDGs due to their proximity to both the problems and the solutions, as they can have an impact not only locally but globally. In addition, bottom-up approaches by cities, civil society, and mayors are crucial and should be encouraged. Notwithstanding, top-down and bottom-up approaches are complementary and combining and developing tools at multiple levels can strengthen collaboration and through synergies, the development of innovative solutions. Consequently, both cities and bottom-up approaches need to be considered as a change in governance that can provide a wide range of benefits.

One of the limitations of the study is the link between human rights and climate change. Although the link is clear and necessary, it remains difficult to move from the theoretical to the practical level. Nonetheless, during the writing of this thesis, the possibility of using ombudsmen in cities such as Barcelona to monitor climate change issues in parallel with human rights issues has arisen. More broadly, a human rights-based approach is critical to building the smart cities of the future, while also serving to raise awareness among citizens and authorities about the urgency of the climate crisis. Of critical importance in this context is the recent declaration from UN, which identifies access to a healthy environment as a universal human right. Human rights indeed provide a discursive platform; a framework that already exists and is enshrined in law, which could help shape the work of government from a climate perspective as well. It will be interesting to see how future studies will focus more on the practical aspect of this connection. At the same time, given the challenges of urbanisation that climate change will bring to cities and the problem of 'climate refugees', a discourse based on the right to the city is necessary to shift human rights towards social and global justice.

In this regard, Barcelona has been an international showcase in recent years for the transition to a Smart City that is technological, innovative and efficient, while paying attention to sustainability, climate issues and human rights. Indeed, the city has implemented collaborations and key projects necessary for innovation and ongoing climate change. From a sustainability perspective, Barcelona's projects are moving towards the ambitious goal of going beyond the Paris Agreement and being at the forefront of cities most committed to transforming their city into a greener and more sustainable one. Through its projects and strategies such as the Superblocks, Barcelona aims to reshape the city by proposing a new urban model that is green, sustainable, inclusive and focused on the needs of its citizens. Barcelona's experience confirms that there is still much to be done and that this requires the involvement of all possible levels and actors. This

includes the introduction of new regulations, new taxation that incorporates environmental costs, and more investment to reverse the current economic and energy model. Barcelona is a leader in reviving the discourse on human rights, especially with the Junta Colau, also with projects related to participatory governance in the use of open data (Open Data) and citizen involvement through participatory democracy (Decidim). Thus, the empirical analysis through the interviews and the different perspectives that were gathered, allowed me to gain critical insight and confirm the research questions.

In conclusion, climate change will have a significant impact on health, quality of life and consequently on the perception of human rights, especially in terms of inequalities. Therefore, it is necessary - and the projects described so far demonstrate this - to incorporate a human rights and nature-based approach in the design of the smart cities of the future and to involve all possible stakeholders in the design and creation of solutions to ensure that no one is left behind.

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Annex

CC: Climate Change

IPCC: Intergovernmental Panel on Climate Change

GHG: greenhouse gas emissions

SDGs: Sustainable Development Goals

OHCHR: Office of the UN High Commissioner for Human Rights

USD: United States dollar

GDP: Gross domestic product

Interviews

The experts interviewed were as follows:

- Eduardo Costa, Professor of Knowledge Management at the Federal University of Santa Catarina, Brazil of the book *Human and Sustainable Smart Cities*
- Eva Garcia Chueca, Senior Research Fellow of the Global Cities Programme at CIDOB, expert in Human rights and citizenship, and Deputy Director of the Ombudsman's Office of Barcelona. E' stata intervistata in quanto
- Jonatan Pinkse is a Professor of strategy, innovation, and entrepreneurship at and Executive Director of the Manchester Institute of Innovation Research (MIOIR) and an expert in sustainable economy.
- Josep Miquel Piquè Huerta, ex-president of IASP (International Association of Science Parks and Areas of Innovation) and Executive President of La Salle Technova Innovation Park. Ex CEO of the district Innovation 22@ of Barcelona.
- Kakim Danabayev, member of World Smart Sustainable City Organization (WeGo)
- Michele Grigolo is Senior Lecturer in Sociology with an international academic career, esperto di Diritti Umani, le città and equality.
- Mortem Kjaerum, Lawyer and expert on Human rights has been Director of the Raoul Wallenberg Institute of Human Rights and Humanitarian Law in Sweden since 2015 and the first Director of the European Union Agency for Fundamental Rights (FRA) in Vienna.
- Neda Kostandinovic, member of Barcelona City Council, division of Sustainability of Urban Ecology Department
- Patrick Kappert member of the Collectiu Superillia Poblenou in Barcelona
- Sara Heitlinger, lecturer in computer science and specialist in sustainable human-computer interaction (HCI) and design led participatory research.

Questions list:

During the interview, semi-structured interviews were used, changing direction slightly according to the interviewee's experience.

- Do you think that the broad participation in Barcelona slows down the decision-making process, or is it necessary to involve the population in the projects and ensure their implementation?
- Do you think the reversal we are seeing in the use of increasingly bottom-up rather than top-down approaches can be significant in understanding how to better structure the fight against climate change?
 - Can people's participation in smart cities and the rise of bottom-up approaches and all the tools to improve citizen engagement and participation (Decidim, Open Data) change the classic co-principal relationship in the city and community management of the commons?
- Do you think that citizen participation has changed according to the government's approach?
- Do you think that establishing a link between human rights and climate change can help cities, especially a city like Barcelona that is very focused on this approach, to fight climate change? Perhaps by leveraging existing human rights structures?
- Do you think that cities, as centers of power, can be the new global actor to fight some global challenges like climate change?
- Do you think a link between human rights and climate change is important to address CC?
- Do you think that the history of human rights in Barcelona has influenced the emergence of today's Smart City?
- How have attitudes towards human rights in Barcelona changed over the years?
- How necessary is a human rights approach to the creation of the smart city?
- Has the human rights culture in Barcelona influenced the attention given today to citizen participation and participatory practices such as Decidim or Open Data?
- Do you think it is important to establish a link between human rights and cc in the face of increasing urbanization?
 - How human rights can be used to combat climate change.
- How is Barcelona addressing climate change, with what tools and policies, including green infrastructure and other projects?
 - What policies have been put in place and what tools has the government used to combat climate change?
- In which way superblocks are changing the cities?
- How Barcelona Smart City - moved from technocentric to a more human-centric approach?
 - People's participation in smart cities and the importance of bottom-up approaches and all tools to promote active engagement and citizen participation (Decidim, Open Data)

Summary

Introduction

The objective of this research is to observe how cities and thus the smart cities of the future represent the new centres of economic and political power as well as proximity actors that can play a fundamental role in solving the problems of our time. The necessity of bottom-up approaches and synergies with European multi-level instruments is investigated. In addition, the importance of recreating a human-nature relationship in the city and a human rights-based approach to combating climate change is investigated. Indeed, the creation of this link allows for greater societal awareness and could lead to the use of existing structures and frameworks to simultaneously counteract human rights and climate change. Specifically, the following research questions arose:

- How cities, as centres of power, and new smart cities have a significant impact on climate change and the implementation of the SDGs?
- How bottom-up approaches be the new decentralised paradigm for implementing the SDGs and combating climate change?
- How can a human rights-based approach help combat Climate Change?

Climate change is a crucial problem

According to reports (AR6 IPCC 2022) by the Intergovernmental Panel on Climate Change (IPCC), climate change is now underway, and scientific evidence in the latest report identifies humans as the proponent and cause of global warming and related climate change, which is progressively becoming more extreme and frequent. Scientist underline that if action is not taken quickly to drastically reduce global emissions, the business-as-usual scenario, risks making it impossible to limit the increase to 1.5°C compared to pre-industrial times, resulting in irreversible damage to us and the planet. In particular, the IPCC's Sixth Assessment Report estimates a greater than 50% probability that the 1.5° C warming threshold will be exceeded after 2030, ahead of the previous report. Indeed, we live in an era of profound transition and crucial transformations within a capitalist economic system that, despite its many economic and developmental advantages, has retained many contradictions and distortions within it.

The global effects of climate change represent the visible evidence of an irrational disharmony between humanity and the environment. Besides the capitalist scenario, we also live in an era that is still unofficially referred to as the Anthropocene. The Anthropocene is informally identified as the current geological epoch in which the earth's environment is modified by the effects of human activity. In the wake of globalisation and the new age of the Anthropocene, it has become increasingly clear that prosperous social and economic development relies on the ability of the biosphere to sustain it. Incremental changes and adaptations on current development pathways may be insufficient for achieving sustainability. In this age,

humans evolved rapidly, concentrating progressively in super-technological urban areas, often leaving the human factor and the human-nature relationship behind.

Because of these great transformations and evolutions, our society is facing enormous challenges. One of the most important of the 21st century is the massive and unstoppable urbanisation, which together with Climate Change will amplify every crisis and inequality in a self-feeding way. Climate Change, Sustainability and Green economy are just some of the words that are beginning to enter the common vocabulary. This is because Climate Change is no longer just an academic issue, but a catastrophe taking place on a global scale that cannot be ignored. Indeed, it must be tackled immediately, with all available tools, integrating local approaches that, being closer to the problems, suffer its direct effects and can more easily propose and find effective and innovative solutions.

Cities and smart cities have a role to play

In the near future cities will play a crucial role. According to many studies, urbanisation, and centralisation of the population in cities is increasing rapidly and it is expected that by 2050 more than two thirds of all people will call cities home. As a result, we will see a weakening of the right to the city and an exacerbation of all issues related to the so-called Tragedy of the Commons.

The tragedy of the Commons is commonly defined as a situation in which the selfish actions of individuals lead to the complete collapse of the resource over which they are competing. Therefore, increasing urbanisation combined with Climate Change could lead to the disruption of cities as we know them today with a worrying increase of inequalities.

In this context, Smart Cities as a new form of city that is more efficient both technologically and socially, could play a decisive role. To date, the concept of smart city has not had a convergence of definitions and is very often elusive and contradictory. Smart cities represent the evolution of the current urban space that with technology and data can help the development of the city and improve the quality of life of its citizens. Despite the progress these cities are making, opinions are still divided. In the research fields of human rights, urban planning, politics and sociology, smart cities are often criticised. The main issues raised are the excessive presence of private actors, technocentrism and for prioritising the needs of the wealthiest citizens while neglecting the less privileged. This concerns fundamental human rights, not only from a technological point of view, but also those related to Climate Change and sustainable development. Despite of the many criticisms that have been raised against surveillance capitalism, digital exclusion, data privacy, the overwhelming power of private individuals and the lack of the human factor, to date it represents a valid evolution of the urban space. With various adjustments, it can really improve the lives of citizens and facilitate problem-solving using technology.

Today, the smart city as a concept has become a reality - at least in developed countries - that, while it succeeds in addressing sustainability issues, still fails to fully integrate with the human side.

The smart city, in fact, will totally disrupt our relationship with the city, consequently affecting our fundamental rights and the management of common goods. In this case, the Tragedy of the Commons will occur in a super-populated and super-intelligent environment that will still have to adapt to humanity and its rights. It will be necessary to rethink the city model of the future by integrating social, environmental, and economic sustainability issues with the technological efficiency model of the smart city. Therefore, integrating it with a human-centric model that considers the changes and the human rights that will be damaged.

In a circumstance where half of the world's population will be concentrated in an urban context, their role in addressing the enormous ecological and socio-economic challenges of our society will be crucial. The city will have to reorganise itself to accommodate the many climate refugees, people of different nationalities and cultures, by developing spaces, services, infrastructure, and urban and environmental design in line with the new needs. Moreover, in recent decades, decentralisation policies around the world have brought unprecedented responsibilities and challenges to cities in formulating and implementing social policies.

Considering the data and the important role that cities, civil society and the synergies between local and global are assuming, the strategic importance of cities in the development of climate and social policies becomes increasingly evident.

As Oomen says "Cities [can] do what nation-states have failed to do".

It is estimated that cities are increasing in both number and size, sometimes resembling full-fledged nations. Of course, the continued expansion of cities is linked to their power and the role they can assume in various spheres, from policy generation, as engines of the economy and as laboratories of social innovation and cultural integration.

Cities have already shown that they are able to create important networks and alliances, such as the Conference of Mayors, Cities for Human Rights, and the Green Cities Network. They often succeed, even better than at the national level, in addressing the most complicated challenges of our time, such as rampant inequality, mass migration, human rights and climate change that amplify any existing tragedy or inequality.

Linking Human Rights and Climate Change

The idea of the studies underlying this thesis is that human rights and related climate change have enormous potential to be addressed in a decentralised bottom-up approach. Human rights are necessary to rethink the cities of the future from a human-centric perspective that goes beyond technocentrism and overcomes the current criticism on smart cities. In this context, cities have assumed an exceptional power and role in researching, defining, implementing, and ultimately monitoring policies on human rights, sustainability, and global social justice. Despite the crucial importance of cities as economic and development engines and centres of power, scholars have only recently begun to take an interest in this field. The New Urban Agenda, which aims to ensure that all inhabitants, of present and future generations, without

discrimination of any kind, are able to inhabit and produce just, safe, healthy, accessible, affordable, resilient and sustainable cities, further broadened the dialogue on these issues.

Without urgent and transformative political action at all levels, the current situation will only get worse. The urgency of new approaches for transformative change in cities has not been emphasised enough. The urban context will certainly be a determining factor of our near future and it will be important to take all those actions aimed at mitigating and counteracting the negative effects of a dangerous urbanisation that risks emphasising the current deviations of our time, especially in light of the strong impact that Climate Change will have in this context. It will be important to address the challenges of urbanisation by maintaining a collaborative, multi-governmental and multi-level approach, taking the New Urban Agenda and the SDGs as a reference and maintaining a strong focus on human rights.

Specifically, the thesis aims to demonstrate the crucial importance that cities and bottom-up approaches will have in promoting and advancing the New Urban Agenda for Sustainability and the implementation of the SDGs. Research has focused more on the technological aspect of cities of the future, but has not yet addressed in depth the human-nature relationship that will be created in a super-technological and super-populated urban space.

Bottom-up, multilevel and human rights-based approaches can make a difference in creating good practices that can truly have an impact from the local to the global, from the bottom up in a globalised landscape. In this panorama, there is a need for a human rights-based approach to combating climate change and the consequent correlation between the two. The Intergovernmental Panel on Climate Change, in its six reports, has repeatedly emphasised that climate change is real, is happening, and above all, is a consequence of greenhouse gas emissions caused by human activity. Considering irrefutable scientific evidence, the inability and inaction of governments to act against climate change represents the greatest intergenerational violation of human rights in history. Future generations and young people will be the most disadvantaged, as they will not have the possibility to defend themselves against the violation of their rights. Similarly, the most vulnerable, discriminated countries and communities will suffer the most from the effects of climate change, as they will not have the means to adapt, eventually exacerbating inequalities and disparities. Today, Climate Change affects and disrupts the lives of millions of people, who are victims of catastrophic events: storms, hurricanes, floods, tsunamis, heat waves, fires, rising sea levels, migration of populations, and changing habitats are only the visible tip of a huge iceberg. The impact on the population and on the marginalised will be devastating, amplifying existing inequalities and severely damaging human rights. The effects will be intercorrelated, intersectional and self-feeding, creating a spiral that is likely to worsen over time and irreversibly damage current and future generations.

Specifically, the countries of the global South paradoxically bear the least responsibility for the climate crisis, despite suffering its most catastrophic effects. Climate Change damages the right to housing, destroying homes and irreversibly altering the environment in which we live. The right to live in a safe environment and, more generally, the right to life is thus damaged. Consequently, the right to health will also be affected. Due to the change in the natural environment, there will be a reduction in the food supply and consequently an increase in malnutrition and an increase in food- and water-related diseases. Furthermore, it should not be underestimated that exposure to these catastrophic events could lead to eco-anxiety and post-traumatic stress disorder. Climate change therefore damages the following human rights: life, health, water, self-determination, food, property, culture and education. Regarding the impacts of policies, according to an OHCHR report, adaptation measures that aim to improve the resilience of society and the environment to Climate Change may also violate human rights. Indeed, by failing to take full account of socially disadvantaged groups, they risk further exacerbating already existing social inequalities. It is therefore important to be aware that adaptation policies may have highly negative impacts on the right to non-discrimination, equality, culture, housing, and property, despite good faith. It is crucial to fully recognise the link between climate change and human rights, as it enables the use of existing international standards and frameworks to address possible human rights violations. For this reason, the pronouncement of 28 July 2022, in which the UN General Assembly adopted a historic resolution formalising access to a clean, healthy and sustainable environment as a universal human right, seems crucial.

Urbanisation, Human rights and SDGs

The world's urban population has grown exponentially since 1950, making urbanisation the trend of the 21st century. This rapid urbanisation brings with it enormous challenges. Cities cover only 2% of the earth's surface but are home to over 54% of the global population and consume three quarters of global resources being responsible for 75% of greenhouse gas emissions. (World Urbanization Prospects). To address these challenges, the United Nations has developed the Sustainable Development Goals, which represent the world's shared plan to end extreme poverty, reduce inequality and protect the planet by 2030. Specifically, the SDG 11 aims to make cities and human settlements inclusive, safe, resilient and sustainable by 2030. These concepts and the importance of human rights are part of the goals of the 2030 Agenda for Sustainable Development and also of the Urban Agenda adopted in 2016. Each Sustainable Development Goal can, in fact, be associated with one or more human rights. The Sustainable Development Goals also address health risks caused by urbanisation, including air pollution, noise, high population density, inadequate housing, inadequate water supply and sewage disposal. Urbanisation represents a great opportunity globally, but only if human rights-based and sustainability approaches are promoted and respected. Human rights frameworks and approaches are needed to also address environmental issues and to implement equitable, resilient, green and sustainable urbanisation.

Sustainable urbanisation based on human rights would transform cities into an accessible, inclusive, and equitable place for all.

Right to city

Given the growing urbanisation and the growing importance of cities and smart cities, a rights-based urban discourse becomes even more relevant. In order to counter this technological and 'inhuman' drift, the concept was taken up in the European Charter for the Protection of Human Rights in the City, drafted by the Human Rights Cities movement, which in its first article defines the right to the city as 'the right to conditions that enable (city dwellers) their political, social and ecological development' (Art. 1). In other words, the right to the city is a moral claim, based on fundamental principles of justice, which opposes the injustices of a capitalist and neo-liberal system, and thus represents a right to social justice. According to scholars, this is the only way to create an authentically humanising urbanism.

The Right to a Sustainable smart city

Considering the presented context, development is extremely linked to the environment in which we live. For this reason, the right to the city must evolve to include issues of environmental sustainability. Every city dweller has the right to live in a city that is sustainable and implements preventive and adaptive measures to ensure adequate living standards.

The right to a sustainable city also includes the need to increase democratic participation and to rethink governance towards a co-creative and collaborative model, which also thanks to new technologies manages to avoid marginalisation.

Some Smart Cities, with the help of new technologies, aim to make the city inclusive in participation, implementing co-governance practices and making cities more efficient and thus also sustainable.

Local instruments

Cities, when implementing local and urban policies, increasingly use soft law instruments to address urgent global problems at the local level (e.g. Climate Change or Covid-19), while consolidating their global positioning.

Role of cities and mayors

From ancient Athens to the medieval city-states, cities defined the rights of their inhabitants and constituted the main authorities to guarantee them long before the advent of the nation-state. After World War II, the approach shifted towards a national plan based on international agreements. Today, however, cities with their rapid expansion are becoming increasingly large, populous, and consequently internationally influential and powerful. Some cities represent veritable nation-states in terms of size and economic power, and thus have the power to influence both local politics and to carry significant weight

internationally. In this way, they can create alliances and networks with which to share best practices for the implementation of sustainable policies. They operate at the local level but represent key actors for the achievement of national as well as international objectives. In this landscape, cities are beginning to associate in networks of cities to have an impact from the local to the global. Transnational City Networks (TCNs) with a focus on climate change and the inclusion of sustainability in the standards of a smart city assume centrality.

Cities, therefore, are recognised as central actors capable of making an essential contribution to the challenges of our century. Cities have a great responsibility given their impact on the planet, great decision-making power given their proximity to problems and solutions, great political power and hopefully in the future more and more economic power to solve these challenges.

In particular, mayors are progressively assuming greater prominence and importance in the implementation of policies that often deviate from the national direction, focusing on human rights or the implementation of sustainable measures. Increasingly, in a globalised context, municipalities are taking a leading role in addressing global challenges such as climate change, human rights implementation, or the recent pandemic.

Multilevel Instruments

Multi-level governance is defined as a system of continuous negotiations between different territorial levels: supranational, national, regional and local. Multi-level instruments have the potential to create synergies between different levels to create innovative solutions. Europe has in recent years put in place several instruments to encourage cities to take the initiative. Some examples are the European Green Capital Award and the European Commission's Green Leaf Award, conceived as an initiative to promote and reward the efforts of local actors to improve the environment and quality of life in cities. Recently, as part of the Horizon Europe research and innovation programme for 2021-2027, a new way of bringing concrete solutions to urban challenges was implemented through the 100-climate neutral and smart cities programme. This instrument aims to fund 100 cities to become climate neutral and smart by 2030 and to ensure that these cities act as hubs of experimentation and innovation to enable all European cities to follow suit by 2050.

Human Rights Cities are a transnational network of cities that engage in the implementation of human rights locally. This represents a multilevel instrument that connects different levels to solve global problems from below. A human rights city is defined as a municipality that has adopted human rights principles and laws as guiding norms of governance. Human Rights Cities are the perfect example of how cities are able to localise rights even by opposing and going against the nation state. This could also be applied to the fight against climate change given the potential of cities.

The problem with human rights and international law has always been its application, top-down approaches retain their limitations and criticality, especially in approaching problems that are often far

removed from the places where decisions are made. On the contrary, bottom-up approaches, also thanks to the important role of networks and NGOs, are gradually being consolidated. Human rights and the fight against Climate Change are in fact intrinsically linked to local governance, and in this regard, international organisations have recently confirmed the importance of local authorities' obligations on a par with national ones.

Municipalities are therefore the ideal actor to integrate human rights and consequently the fight against climate change into local policies. Cities have enormous potential as places of governance through activism, politics, and alliances.

Case Study: Barcelona the Human Right Smart Sustainable City

The choice of Barcelona as a case study is particularly significant because it is representative of a virtuous and successful model that has often differed from other experiences, managing to integrate various good practices in the world of smart cities. The analysis of this case study provides confirmation and assessment of the research questions.

Indeed, Barcelona, in its smart city development process, is overcoming technocentrism and various criticisms by moving away from the first smart city experiments and focusing more on the human, inclusive, green and sustainable aspects, focusing on human rights, active and democratic participation. Barcelona represents the perfect case study for understanding the elements included in the thesis, it has a strong attachment to human rights and democratic participation, thus managing to implement numerous projects through no longer top-down but bottom-up approaches aimed at combating climate change. The case of Barcelona takes on greater interest in the light of its progressive efforts to position itself as a leading European city. Barcelona's development offers an interesting insight into how a focus on human rights and a human-centred approach can radically change the approach to smart cities and innovation. Barcelona has followed an evolution of its smart city process from a more technocentric one to a more economic one with a focus on international branding and the current one focusing on the social and human side.

The 22@ project through its development succeeds in offering an overview of the city's evolution from an innovation perspective. Initially, 22@ succeeded in improving the urban fabric by creating new jobs, creating new businesses and new housing and public spaces, and improving services and infrastructure. However, in the early stages of the project, this created negative externalities for residents by favouring private and urban marketing interests, excluding residents from the decision-making process, and creating distrust in public institutions. This highly speculative urban development with the aim of attracting investment and strengthening economic competitiveness as well as global attractiveness has led to damage to social sustainability and the social fabric in the neighbourhood. On the contrary, the second phase of the project, also but not only thanks to the people-centred approach of the Colau junta, started with a strong

attachment to participatory processes. The Project has therefore integrated a more human-centric vision by redefining its objectives and focusing more on creating a greener, sustainable and inclusive project.

Barcelona towards Climate Sustainability “This is not a drill”

In terms of sustainability, Barcelona also offers an excellent case study to investigate the evolution of the smart city and how cities can move towards climate sustainability.

The city of Barcelona will witness: a sharp rise in temperature 16 times higher than today, and an increase in fires, leading to a loss of biodiversity and deterioration of air quality. A loss of beaches between 30 and 46%. A drastic decrease in precipitation of up to 26% and an increase in the demand for drinking water resources of 18 hm³ per year by 2050. On the other hand, extreme precipitation events will occur more frequently, leading to dangerous flooding that will put more stress on the city's main infrastructures, such as the sewage system, marine canals and roads. (Climate Emergency Declaration 2020).

Barcelona has recently implemented several plans including, the Barcelona Green Infrastructure and Biodiversity Plan 2020, published in 2013 to enhance the city's ecological, environmental, social and economic services by creating interconnected green infrastructures that can improve the quality of life of residents and create a healthier and greener city. This document was then followed by the Stimulus Programme for the Promotion of Green Infrastructure, then expanded by the 2017/2037 Tree Master Plan, which covers the management, maintenance, and enhancement of trees in public and private areas. This strategy, also called 'Trees for Living', was developed by integrating an ecosystem of stakeholders, which the Barcelona government used: The 'Participatory Council for Sustainability, Citizens' Council for Sustainability and the 'Barcelona More Sustainable' (B+S) network that brings together schools, NGOs, businesses, universities, and citizens. To accomplish these challenges, the city of Barcelona relies on the Department of the Environment and the Department of Housing, which deal with green, accessibility, gentrification, and green gentrification. Barcelona is therefore working to ensure that this greening and local development does not result in gentrification and green gentrification, i.e., an increase in housing prices relative to the increased desirability of the area due to greening and innovation. In this regard, the Barcelona for Urban Environmental Justice and Sustainability found a dependency between green gentrification and the existing context and environment, concluding that the population groups most at risk of gentrification are those with low and middle incomes. Ada Colau's Junta in this regard is implementing many policies to prevent the renewal and greening of the city from translating into gentrification that could damage the social fabric.

Given the emergency situation, on 15 January 2020, the city of Barcelona issued a Declaration of Climate Emergency that makes explicit the seriousness of the situation and defines future plans, with the ambitious goal of not only wanting to meet the goals of the Paris Agreement, but to go even further. These

projects were then aligned with the new 'Barcelona Nature Climate Plan 2030' of 2021, a strategic and participatory tool that takes forward the GIBP objectives to create a functional and ecological city with equitable, accessible, and connected green areas in order to maximise social and environmental services related to nature management, biodiversity, health and climate change adaptation.

One of the most important projects that includes the concepts of smart innovation and sustainability is the Superblock and its expansion into the city with the Superilla project.

Superilla

An important strategy with the objective of improving greening and urban sustainability in cooperation with citizens is the Superilla Plan that combines mitigation and adaptation. The intention is to return the city to citizens by promoting an inclusive transformation towards sustainable mobility, connecting different neighbourhoods and green areas. The Superblock project will bring one million square metres of public use for the local population and 40 hectares of green space. The objective is to recover for citizens part of the space currently occupied by private vehicles and to create a healthy, greener, and less polluted and safer public space that promotes social relations and the local economy. Citizens in line with the municipality's people-centred vision thus become true protagonists. The aim is to create a city in which public spaces, streets and squares are places for social encounters, play and cultural, economic, and social exchange. Superilla, with the aim of drastically cutting emissions, is therefore reducing the use of private cars and incorporating sustainable means of transport to return urban space to citizens. Barcelona's commitment to an innovative and sustainable transformation of the city is, especially in recent years, oriented towards citizens and their interests and goes along with the revitalisation of the relationship with human rights.

Barcelona between human rights and participatory digital democracy

Although Barcelona has always had a deep human rights culture in recent years, particularly with the Colau Junta, it has revitalised the human rights discourse by implementing digital participatory democracy practices. In this context, raising awareness of the links between climate change and human rights, such as health or the right to live in a healthy environment, could lead to greater interest and awareness in public policy-making and the promotion of greater civil society engagement. In recent times, human rights have been influenced by new discourses on bottom-up and participatory governance leading to greater involvement of the local community and civil society. Barcelona has well embodied this by becoming in recent years, especially with the last junta led by Ada Colau, a permanent living lab and laboratory of participatory democracy.

The exclusion and diversification of people living in cities, in fact, produce fragmentation and isolation of vulnerable groups that worsen the situation by undermining social cohesion and the stability of local government, thus multiplying inequalities. During the years of Ada Colau's junta, human rights made a

comeback by including many human rights experts with a human-centric vision in the government. Considering this, some experiences of digital democracy and active participation are briefly discussed.

Open Data

Barcelona is committed to implementing open governance initiatives and projects. One of these focuses on open data to openly share data collected at city level. The Open Data strategy aims to open government information to the public. This project aims to increase the transparency of the municipality towards citizens, public administration, and businesses; allows citizens to collect data on environmental variables (air, pollution, temperature, noise pollution, humidity) by enabling real-time environmental monitoring on an open-source platform with open hardware and software and aims to design a network and data management platform scalable to other cities, creating a communication network between sensors and identifying a framework based on open standards to make data available to society to improve services, create awareness and increase social and commercial value. It has furthermore brought numerous benefits, including the empowerment of citizens and the sharing of knowledge and best practices. In addition to the democratisation of technology, there has also been an increase in the use of participatory democracy with platforms that effectively empower citizens.

Decidim

In 2016, Decidim ('We decide'), the digital participatory democracy platform promoted by the municipality of Barcelona, was launched. Based on democratic quality criteria, it enables the management of the municipality's participatory processes in a single platform, encouraging participation. Today, the platform has more than 32,000 participants, 1300 proposals, 1300 face-to-face meetings, 190,000 supports collected, and more than 9000 citizen proposals accepted. There are also 38 participatory processes around 15 municipal participatory bodies and a dozen citizens' initiatives. The Decidim community is an open and collaborative community, an ecosystem of citizens, associations, hackers and small companies and organisations. The fundamental characteristics are accessibility, transparency, traceability, and integrity, i.e., that all content is accessible and downloadable and cannot be manipulated. The platform gives a guarantee of democratic quality by ensuring non-discrimination and equal opportunities between participants and proposals, inclusiveness, and the impossibility of censorship. In addition, the platform has a high degree of privacy, personal data is controlled by the users, is not shared externally and there are no external cookies. These features, as an antithesis to the current era of surveillance capitalism and private control of data, have become particularly important in the context of digital democracy. Its modularity, flexibility, free software, and open development model make it particularly well suited for scalability. Decidim today represents a fundamental public service for democratic governance that guarantees inclusive participation and direct democracy through the co-production of public policies. Through this platform, it is possible to create participatory budgeting, collaborative planning of regulations, public consultations, discuss urban spaces,

create digital assemblies, working groups, referendums and integrate online and offline participation. The modularity of the platform makes it possible to combine the different tools available to organise different types of democratic projects. Decidim aims not only to improve participatory democracy in the state but also to provide social empowerment for citizens to be able to take collective action separately from public administrations. This initiative aligns with the others described above and confirms the pioneering role that Barcelona is playing in the development of a human-scale, democratic, innovative and sustainable smart city model.

Conclusion

Climate change is a reality that can no longer be ignored. It is necessary to restore a human-nature relationship, and technology must do its part if it is driven by a people-centred and human rights-based approach. Indeed, it is necessary to rethink the smart cities of the future by integrating a human rights-based approach and an integrated human-nature relationship. In this context, cities are the actor around which most of the century's challenges will revolve. During the writing of this paper, it has become evident that cities have the power to play a fundamental role in fighting climate change and implementing SDGs due to their proximity to both the problems and the solutions, as they can have an impact not only locally but globally. In addition, bottom-up approaches by cities, civil society, and mayors are crucial and should be encouraged. Notwithstanding, top-down and bottom-up approaches are complementary and combining and developing tools at multiple levels can strengthen collaboration and through synergies, the development of innovative solutions. Consequently, both cities and bottom-up approaches need to be considered as a change in governance that can provide a wide range of benefits.

One of the limitations of the study is the link between human rights and climate change. Although the link is clear and necessary, it remains difficult to move from the theoretical to the practical level. Nonetheless, during the writing of this thesis, the possibility of using ombudsmen in cities such as Barcelona to monitor climate change issues in parallel with human rights issues has arisen. More broadly, a human rights-based approach is critical to building the smart cities of the future, while also serving to raise awareness among citizens and authorities about the urgency of the climate crisis. Of critical importance in this context is the recent declaration from UN, which identifies access to a healthy environment as a universal human right. Human rights indeed provide a discursive platform; a framework that already exists and is enshrined in law, which could help shape the work of government from a climate perspective as well. It will be interesting to see how future studies will focus more on the practical aspect of this connection. At the same time, given the challenges of urbanisation that climate change will bring to cities and the problem of 'climate refugees', a discourse based on the right to the city is necessary to shift human rights towards social and global justice.

In this regard, Barcelona has been an international showcase in recent years for the transition to a Smart City that is technological, innovative and efficient, while paying attention to sustainability, climate issues and human rights. Indeed, the city has implemented collaborations and key projects necessary for innovation and ongoing climate change. From a sustainability perspective, Barcelona's projects are moving towards the ambitious goal of going beyond the Paris Agreement and being at the forefront of cities most committed to transforming their city into a greener and more sustainable one. Through its projects and strategies such as the Superblocks, Barcelona aims to reshape the city by proposing a new urban model that is green, sustainable, inclusive and focused on the needs of its citizens. Barcelona's experience confirms that there is still much to be done and that this requires the involvement of all possible levels and actors. This includes the introduction of new regulations, new taxation that incorporates environmental costs, and more investment to reverse the current economic and energy model. Barcelona is a leader in reviving the discourse on human rights, especially with the Junta Colau, also with projects related to participatory governance in the use of open data (Open Data) and citizen involvement through participatory democracy (Decidim). Thus, the empirical analysis through the interviews and the different perspectives that were gathered, allowed me to gain critical insight and confirm the research questions.

In conclusion, climate change will have a significant impact on health, quality of life and consequently on the perception of human rights, especially in terms of inequalities. Therefore, it is necessary - and the projects described so far demonstrate this - to incorporate a human rights and nature-based approach in the design of the smart cities of the future and to involve all possible stakeholders in the design and creation of solutions to ensure that no one is left behind.