

Review

Advocating Urban Transition: A Qualitative Review of Institutional and Grassroots Initiatives in Shaping Climate-Aware Cities

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Abstract: Climate change and its challenges have long been incorporated into the policy-making process. Advocacy actions urge to strengthen the socio-ecological resilience through engagement with stakeholders, feedback recollection, and testing of solutions. Several initiatives have been born to boost cities' actions toward climate change mitigation and adaptation. Institutional coordinated actions such as transnational municipal networks (TMNs) and non-institutional, grassroots movements for climate action, are among them. The study focuses on four TMNs and two grassroots movements, which have an impact on the European and/or worldwide contexts. They are investigated qualitatively, reflecting on the roles and contributions to climate change that they provide both alone and together. The research questions focus on the instruments/elements/factors that they put in place to support the transition, the key messages, and how these are conferred to their key targets. The initiatives have been investigated in both the grey and scientific literature. The main results show that grassroots movements for climate action and TMNs have the potential to better support cities in their climate transition. However, local governments are urged to take advantage of both initiatives' ability to develop networks of support, innovation and a sense of belonging. In conclusion, the research states that the two initiatives should be effectively connected and integrated with a complementary role concerning planning actions.

Keywords: transnational municipal networks; climate initiatives; grassroots movement for climate action; climate change; climate networks



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1. Introduction

Climate change is widely recognized as one of the major issues of the current century. According to the last IPCC report [1], the entire human community is far from being on track to mitigate and adapt to climate change. Likewise, the anthropogenic influence in warming the climate at an unprecedented rate is recognized.

Achieving the objectives of mitigation and adaptation to climate change requires an evolution of the model of city government, moving from a “vertical” approach to an integrated governance approach, based on continuous collaboration between the different territorial actors (the economic world, academia, civil society, public administration). The construction of collaborations and alliances with a larger constellation of actors with a stake in societal issues is part of the debate on socio-ecological resilience. The resilience literature states that the adaptation and flexibility of a system (in this case, cities) increases with the enlargement of the actors participating in extending its capacity to react to challenges [2]. This involves some degree of empowerment of active agents and some level of flexibility of the governing system to accommodate change.

When talking about climate change and its challenges, the resilient approach has long been incorporated in the policy-making process, with dedicated processes of engagement of interested stakeholders, feedback recollection, piloting, and testing of solutions, technologies, and services. It is widely recognized that ecological transition and transformation

can only be achieved through policy change and innovation, rather than the mere implementation of technology: lobbying, sensitization, and support of political action are all moving in this direction. Moreover, the action triggering change is much more effective when it is included in a coherent arrangement of policy intentions, covering the topics of a large number of different countries. This position is what motivated the “green” movement throughout the decades, but it is also what has triggered more structured organizations to come up with various networking initiatives in recent years.

Through the European Climate Pact [3] promoted by the European Commission, the enlargement of the agents involved in this change assumes a fundamental role in the transition towards more sustainable and just territories. Therefore, active collaboration is affirmed as a new way of implementing democracy both at the global and local levels.

In the last years, several initiatives have been created to boost countries’ and cities’ actions toward climate change mitigation and adaptation. A distinction can be made between these: institutional network-based coordinated actions and non-institutional, insurgent ones. The first group includes for instance transnational policies, city networks, also called transnational municipal networks (TMNs), and climate initiatives such as ICLEI, C40, Covenant of Mayors initiatives, and others. The second considers bottom-up led experiences such as Fridays for Future, Extinction Rebellion, and others. As a limitation of the field of investigation, only TMNs were considered to represent institutional experiences.

Both institutional and non-institutional initiatives have been extensively investigated through the literature. However, to the best of our knowledge, there is still a lack of contributions that bring together both experiences with the aim of comparing and understanding how they are intertwined and whether they both contribute to combating climate change operationally.

This contribution is intended to provide this type of analysis, qualitatively, by reflecting on the role and contribution to climate change that those experiences give both individually and together. The emergence of new institutionalized and non-institutionalized initiatives, such as the Green City Accord, calls for a profound reflection on the actual role these experiences are giving to the issue.

This contribution is structured in three sections. The first one gives a brief but up-to-date literature review on both types of initiatives and clarifies the main research questions underlying this study. The second describes the materials and methods used for the analysis, while the third presents the main findings. Starting from the setting of a few hypotheses and research questions originated by the identification of gaps into the Literature Review, the main characteristics of analyzed initiatives have been summarised in the results chapter and are later discussed in the Discussion section, with a specific link with the set RQs. At the end, conclusions are provided, detailing limitations and potential future research.

2. Literature Review and Research Questions

According to several authors [4–7], TMNs are considered crucial in creating the framework for political actions against climate change. TMNs give cities the opportunities to directly group themselves into transnational networks active on a specific theme or objective. The recognized importance of these networks is directly linked with the key role cities play in taking actions to mitigate and adapt to climate change [4,8–12]. Cities seem to be leading the transition more than other levels of administration, imposing themselves as effective drivers of sustainable development not only at the European level but also worldwide [13–18]. There is, therefore, a perception that TMNs are crucial not only for networking between cities but also for providing them with additional support, such as access to financing, action, and knowledge tools. When talking about the proper networking positive aspects, it is recognized that these can boost horizontal learning, which seems to improve urban adaptation measures [8].

However, some authors reference that there is little proven evidence regarding the totality of the effects of TMNs and city networks [4,7,19,20]. This topic has been partially covered by recent research that aimed to analyze the correlation between network members

and climate planning processes [4] as well as demonstrate the link between TMN membership and mitigation planning [21]. According to Heikkinen et al. [22], TMNs are effective in their advocacy, prompting cities to undertake adaptation and mitigation measures through different suggested activities. As described by Frantzeskaki and colleagues concerning ICLEI [22], TMNs embody three main roles such as (i) knowledge roles (translator, educator, and integrator); (ii) relational roles (connector and mediator); and (iii) game-changing roles. Additionally, some of them prompt cities to take specific steps towards developing planning processes for mitigation and adaptation, containing targets, actions, and implementation strategies. This is the case with the Covenant of Mayors (or Global Covenant of Mayors), which requires its member to provide a Sustainable Energy (and Climate) Action Plan within two years of joining the network. Furthermore, Heikkinen and colleagues have also demonstrated that cities that are part of more than one network are more advanced, at least in adaptation measures. However, the same study also points out that there are disparities in cities in high-capacity and wealthier regions, compared to lagging ones. In general, as other studies have also stated, cities in less wealthy countries tend to participate less in TMN, but even when they do participate, they appear less capable of carrying out planning measures. Some authors argue that they probably lack the necessary resources to join networks and follow their rules [5,6,23]. As, again, proved by Heikkinen and colleagues [4], all networks contain cities that are not contributing through plans and actions in the transition. This means that there is high room for improvement especially in the way networks support cities and somehow control their compliance with membership criteria. As stated by Aylett [24], there is a great variation in the levels of participation among the different municipalities on these types of initiatives.

Other limitation aspects have been evidenced by Romero and colleagues [25], with specific reference to the Covenant of Mayor initiatives. In their research, the authors highlight the disparities in the participation in the initiative at the European level. According to their data, the initiative is not representative of European cities, as mainly Italian and Spanish cities participate in it (around 80% of participation is covered by cities from these countries). The voluntary nature of these initiatives seems to see higher participation from cities that are lacking national support, in terms of planning and policies [25–29].

The advocacy action of organized city networks, their lobbying efforts and their political influence act to direct policy makers, to produce operational guidelines and to enable fragile cities to access shared knowledge on the issue. The action of another type of network, the one commonly referred to as climate activists, is different.

Although the consequences of climate change are well known, some specific groups are still largely absent from the “front lines of climate change policy, advocacy, and research” [30]. This is the case for young people and children, whose well-being is hardly affected by the current climatic crisis. Greta Thunberg and millions of other young activists found this gap and came up with the idea to bring attention to it through protests around the world. Protests have occurred around the world in an orderly fashion, and have served youth groups around the world to self-organise in an ongoing effort to highlight the climate emergency. Climate activist actions peaked in 2018–2019, due to some powerful demonstration actions (see below the description of Extinction Rebellion, and the rise of the Friday for Future movement initiated by Thunberg). That notwithstanding, it is necessary to point out that climate activism is a very well-established practise in Western democracies. What appears to be an empirical evolution of more recent movements is the capacity of such activists to embrace climate change action by including it within a social justice and inclusion framework [31,32]. Climatic justice seems to be the overarching goal of grassroots climate action movement protesters, whose action is directed at triggering emotional notes, mobilising those parts of society that are still sceptical (or indifferent) towards climatic challenges [33], to push politicians to act. Grassroots climate action movements base their advocacy initiatives on forms of civil protest (strikes in the case of Friday for Future, disobedience in the case of Extinction Rebellion, to name but two), renewing the legacy of the anti-war marches and movements of the 1960s. Contemporary movements also add

another layer to the climate justice debate, that of temporality, both the past (where the current disruptions originated) and the future (when life on the planet will be indelibly compromised). Activists' messages indicate that they represent a generation that will have to deal with environmental problems created by previous generations. The urgency of action demands immediate concrete intervention, bringing the focus of their goals to the present, to stop the disruption that already appears to be underway.

Climate activism movements have a clear grassroots base, with an equally clear message and destination: the challenge in achieving climatic transformation is much more about politics than technology [34]. The argument is that without political commitment, a low carbon revolution will only be a plan without implementation. With this in mind, pressures from outside the political structure are needed. Activists believe that their action is more effective in influencing the direction of environmental policies than the traditional decision-making at the international level.

According to the most recent literature on the topic, it seems that both TMNs and grassroots movements for climate action [35] are conceived as pivotal initiatives to boost the development of climate actions, in the form of action plans for the TMNs and outreach and lobbying for the climate movement. However, these initiatives are far from being fully inclusive and representative of European or global actions. Their direct impact on climate change is difficult to measure, although their indirect and awareness-raising effectiveness is clear. Moreover, the value of these initiatives when taken together is unclear, and it is not yet evident whether their tools can be combined for greater contribution to the goal they share. Furthermore, the literature shows a lack of understanding of what precise boundaries and support elements they provide to cities in their transition journey. Finally, to the best of our knowledge, they have never been related even though they seem to share several principles.

This study aims to partially contribute to this discussion by providing a reflection on both experiences, highlighting some commonalities and key features. Two hypotheses are at the core of the contribution:

Hypothesis (H1). *Grassroots movements for climate action and TMNs have the potential to better support cities in their climate transition.*

Hypothesis (H2). *Local governments should take advantage of both initiatives as they have the unique ability to develop networks of support, innovation, and a sense of belonging.*

In synthesis, the two levels of initiatives should be effectively connected and integrated into a complementary role with respect to the actions put in place through planning.

In order to verify these hypotheses, three key questions are addressed.

The first one deals with understanding what are the different elements (instruments, factors, risks) that these two initiatives implement in their own experiences. This point is important to verify the common points and the differences in approach.

Research Question (RQ1). *What are the instruments/elements/factors that the different institutional and grassroots movements for climate action put in place to support the transition?*

The second question deals more specifically with the key messages that the two initiatives deliver and how these are conferred to their key targets. This question is important for understanding common points and differences in the key messages they conveyed.

Research Question (RQ2). *What is the core difference in the message that the two experiences provide to the world for making the transition effective?*

The third question deals with the specific targets to which the key messages are conveyed. This question allows understanding if both messages can be conveyed together or not to the key targets.

Research Question (RQ3). *How are the two experiences able to reach their targets? How much they are effective in this?*

The next section underlines the methods used to perform this analysis.

3. Materials, Methods, and Manuscript Structure

According to the hypothesis and the RQs highlighted in the previous section, the analysis has been performed as a qualitative one. It has been based on available documents on the initiative websites, and on both the grey and scientific literature retrieved on the most important scientific search engines, namely Google Scholar, Scopus, Web of Science, Doaj, and Jstor. On these search engines, several keywords have been investigated, among them: “transnational municipal networks”, “grassroots climate initiatives”, “climate rebellion movements”, “climate municipal networks”, “city networks” AND “energy” OR “climate”, “impacts TMNs”, “impacts climate initiatives”. Finally, publications on the specific initiatives chosen for this study were deepened. The results have been filtered according to both the title and the abstract, to create 4 groups of publications to be further investigated: (1) TMNs related publications analyzing case studies; (2) TMNs related publications addressing impacts and evaluation reflections; (3) climate grassroots initiatives cases; and (4) climate grassroots evaluations and impacts related research. The studies not pertaining to one of these macro-groups have been discarded. The grey literature is intended to be publications outside the academic and scientific domains, such as reports and documents provided by government departments and agencies, civil society or non-governmental organizations, private companies, and consultants.

The analysis conducted on the documents included an initial phase of reading and scanning abstracts and conclusions to quickly understand the main points and features of the initiatives as well as to identify the literature gap. Then, a deeper reading has been done to precise our research questions and to cluster information according to them. The last phase of analysis aimed to complete the analytical tables, reported synthetically in the Results section, and to derive the discussion points and conclusion reported in the related parts of this contribution.

For each initiative, a description is provided as well as all the information that supports RQs answering. The next section reports these results. It has been divided into two sub-paragraphs, the first addressing TMNs and the latter addressing grassroots movements for climate action. For each of these sub-sections, a summary table, a description, and key information are provided. The answers to the RQs and the Hypothesis are provided in the Discussion section.

The selection of the different initiatives has been done through several filters:

- (1) Importance and impact of the initiatives. The most important and relevant initiatives at the European and worldwide levels were selected. Initiatives limited to very specific geographical areas or without evident impacts were excluded. In addition, the choice fell on the networks and movements that in the last four years have acted most insistently on the issues of climate change, those that have been mostly taken up and discussed by the media and public debate.
- (2) Timing. From the first filter, recent initiatives were excluded. As an example, the Green City Accord has been analyzed but included only in the Discussion section, as it was interesting but too recent to already have results. Although it is not known if the 100 Resilient Cities initiative will continue in the future, it was taken as one of the cases because of its impact and worldwide importance.
- (3) Availability of documents and publications. From the first two filters initiatives with a relevant lack of information were excluded, for example those with no documents or information available online or in scientific publications.

From these filters, four TMNs have been identified for the purposed of this research, namely: the C40, the ICLEI, Global and European Covenant of Mayors, ICLEI, and the

100 Resilient Cities. Two grassroots initiatives were considered: Friday for Future and Extinction Rebellion.

4. Results

4.1. Top-Down Climate Initiatives

Several TMNs are present at the worldwide level. This manuscript focuses on the most famous ones, due to the availability of data both in the literature and online (see Table 1). The selection foresaw four TMNs: the C40, ICLEI, Global and European Covenant of Mayors, and the 100 Resilient Cities. Appendix A includes a table (Table A1) for addressing the geographical coverage of these initiatives.

All these initiatives can be considered TMNs as their objectives are to: (i) create networks and link together cities across Europe or the world; (ii) support cities in working toward climate change-related goals; (iii) provide some types of directions, instruments and/or counseling activities; and (iv) being directly addressed to cities.

The most famous initiative is the Covenant of Mayors for Climate and Energy (CoM). Launched in 2008 by the European Commission, it has been one of the reference networks for European cities, with “the objective of engaging and supporting mayors to commit in reaching the EU climate and energy targets” [36]. The reference to the main target, mayors, is evident not only because it is part of the name of the initiatives, but also for the attention put into the act of “signing” the participation. A high level of political commitment marks membership in this initiative. CoM started in Europe but was soon extended worldwide, with the name of Global Covenant of Mayors for Climate and Energy in 2016, when the Compact of Mayors joined it [37]. This is a peculiar trait of the CoM: its ability to embed other stand-alone initiatives such as the Compact of Mayors and the Mayors Adapt in 2015 [36]. Its key message is summarised by the first part of the manifesto: “We, Mayors from all over Europe, hereby step up our climate ambitions and commit to delivering action at the pace that science dictates, in a joint effort to keep global temperature rise below 1.5 °C—the highest ambition of the Paris Agreement”. The vision set in the manifesto is to become lighthouses in acting toward decarbonization. However, CoM objectives changed according to the global contingencies, from having a 2020 horizon, they shifted to 2030 and, eventually, to 2050. Although CoM mainly tackles mitigation actions (CO₂ reduction and renewable energies), it expanded towards adaptation measures, such as resilience and general adverse consequences of climate change, thanks to the inclusion of the Mayor Adapt initiative.

Any kind of city can join CoM. To support cities in maintaining their commitment, the initiative mainly asks for two things: the redaction of a Sustainable Energy Action Plan (SEAP), which assesses the current situation and sets the starting point, and the monitoring of results on a four-year basis, which is through emission inventories named Baseline Emission Inventory (BEM) and Monitoring Emission inventories (MEI) [36,38]. However, as evidenced by Rivas et al., no final monitoring reports are required [38], causing different shortcomings in the effectiveness of the initiative.

The support provided to cities by the CoM is mainly given by Coordinators: local authorities (e.g., regions, and others) that decide to be part of the initiative by giving support to a selection of signatory cities. In general, they can help cities financially or, mainly, in completing the assessment and the monitoring reports. Finally, the initiative also includes Supporters, which are local associations, networks, agencies that promote and mobilize several types of additional contributions, such as financial, organizational, and knowledge-based, for their cities’ members. According to the official data included on the website, there are more than 10,500 signatories, 230 Coordinators, and 233 Supporters divided into 53 countries. Of this, however, only 6225 SEAPs have been submitted and only 2536 monitoring reports. As stated by Rivas et al. [38], this is a sign that several barriers are still present.

The C40 Cities Climate Leadership Group initiative is a network of mayors “of nearly 100 world-leading cities collaborating to deliver the urgent action needed right now to

confront the climate crisis”, born in 2005 [38]. The main difference with the CoM is that the C40 foresees an entry selection: only cities that are frontrunners in climate change actions can enter the network. The C40 Leadership Standards for 2021–2024, required to enter the initiative, are (i) having an updated climate action plan in line with the Paris Agreement (with also the necessity to demonstrate that the plan is periodically revised); (ii) in 2024 (intermediate check) being on track to reach 2030 targets and effectively implement the action plan; (iii) boldly addressing the climate crisis; (iv) innovating and addressing emissions also beyond the direct actions of the city government; and (v) commitment of the mayor and the city in meeting Paris Agreements [39]. To support member cities, the C40 takes several actions such as defining updated Agendas, establishing task forces for special themes or events (for example, a Task Force for COVID-19 recovery), giving advice to cities for the redaction of their Action Plan, providing advocacy and networking for the supply of finance, and creating a relationship with key financial institutions. Finally, it supports cities in building new initiatives and in networking and learning from others through workshops and summits. It also has a Knowledge Hub providing practical knowledge and solutions to cities on adaptation, air quality, buildings, diplomacy, energy, planning methods, transport, food, waste, finance, and others. According to the 2020 annual report [40], 88 cities are part of the full initiative, having committed to climate actions in line with the Paris Agreements and more than 75 cities and regions committed to one or more declarations of the initiative. The dimension of the initiative is worldwide, with a stronger global dimension than the CoM.

Another high level TMN is the ICLEI—Local Government for Sustainability network. In contrast with the previous ones, ICLEI is mainly built to create a network of cities around the sustainability topic. Its first aim is to “build connections across levels of government, sectors and stakeholder groups, sparking city-to-city, city-to-region, local-to-global and local-to-national connections. By linking subnational, national and global actors, policies, commitments and initiatives, ICLEI strengthens action at all levels, in support of sustainable urban development” [41]. As stated in their reference reports [18,42], cities are involved in five interconnected thematic pathways: (1) low emission development, (2) nature-based development, (3) circular development, (4) resilient development, and (5) equitable and people centered development. These pathways are expressed as manifesto lines of actions, with key points, stakeholders, and partnerships. Like the others, this network targets cities with the possibility to open to different dimensions, such as regions. It seems, in fact, that more than a strong political commitment based on mayors’ signatures, ICLEI asks for a coral engagement of the government together with the community and the cross-levels. In addition, ICLEI provides a lot of support in policy creation, not only in network constitution. A fee is at the base of the membership, for a network that is global and includes more than 2500 cities, towns, and regions. According to Frantzeskaki et al. [22], ICLEI embeds three core roles as an intermediary: a knowledge role, a game-changing role, and a relational role. From the knowledge perspective, authors evidence how ICLEI is a key intermediary in translating scientific knowledge to policy practices and solutions, making easier the link between these elements and groups of actors. It also provides a policy translation across levels, especially between the local and the global one. Within the knowledge role, authors [22] cite their contribution as educators (of city officers) and as integrators of multiple knowledge forms. The game-changing role is mainly referred to as allowing the co-creation of solutions, policies, and strategies, but also allowing frontier experimentations and learning-by-doing practices. Finally, the third role is the relational one, intended as creating networks among cities and staff as well as mediating across policies’ levels.

The last TMN analyzed is the 100 Resilient Cities (100RC). In contrast with the other TMNs, the 100 Resilient Cities is the only one being properly funded and led, since its birth in 2013, by a private foundation, The Rockefeller Foundation. Even if its future survivance is not confirmed, this experience is important in the TMNs history as it was the first one directly targeting resilience, both in its shocks and stresses, and providing support

to cities in defining innovative strategies. As happened for the C40 and the CoM initiatives, the 100RC also required an application and cities needed to go through a first evaluation process to enter the initiative. As reported by Galderisi et al. [43], “the 100RC Initiative was designed to financially and technically support cities all over the world in enhancing their resilience in the face of multiple and complex challenges”. As also reported by the authors, the 100RC partnered with ARUP to provide several instruments to signatory cities, such as a City Resilience Framework and a City Resilience Index [44]. This initiative provided cities with a high degree of support, especially in the beginning phases. Indeed, while selected, a Chief Resilience Officer was appointed to support the city in building its Resilience Strategy. This strategy was generally based, as for the CoM, on a baseline assessment of resilience and then on the proper definition of the Resilience Strategy. As for the C40 Climate Action Plan, the 100RC Resilience Strategy was also intended as a living document, to be updated through time [45,46].

Table 1. Summary of main investigated aspects of institutional initiatives.

Initiative	Instruments/Supporting Factors	Main Targets	Key Message
Covenant of Mayors (voluntary–no baseline required)	Sustainable Energy Action Plan, Baseline Emission Inventory, Monitoring Emission Inventory Local Coordinators and Supporters	Mayors of cities	To step up climate ambitions and become lighthouse cities in the climate and energy transition. Four keywords: commit, engage, act, network.
C40 Cities (voluntary–baseline required)	1.5 °C Climate Action Plan, several thematic networks to which cities can apply, Adaptation Academia, global summits and workshops, specific task forces and groups of practitioners	Mayors of frontrunner cities	“C40’s aim is to identify world’s climate best practice in pioneering cities and rapidly replicate it all around the world” [40].
ICLEI (voluntary–membership)	Several activities across five thematic pathways, several groups and offices across Europe and the world	Local and regional governments	To “build connections across levels of government, sectors and stakeholder groups, sparking city-to-city, city-to-region, local-to-global and local-to-national connections” [41].
100 Resilient Cities (voluntary–entry selection)	City Resilience Framework, City Resilience Index, Resilience Strategy, Chief Resilience Officer and local supporting team	Local governments	“100RC Initiative was designed to financially and technically support cities all over the world in enhancing their resilience in the face of multiple and complex challenges” [43].
The Green City Accord (included as cited in the Conclusion paragraph)	Five key themes with key performance indicators, Green City Accord monitoring framework	Mayors of cities	“The Green City Accord is a movement of European mayors committed to making cities cleaner and healthier. It aims to improve the quality of life for all Europeans and accelerate the implementation of relevant EU environmental laws” [47].

4.2. Grassroots Movements for Climate Action

It is increasingly common to observe citizens—especially young citizens—organizing to bring institutional attention to a specific urban climate goal that is not yet included in policy [48,49]. In a phase of reflection and uncertainty about the future, between coexistence and overcoming the pandemic, as well as awareness of the challenges of climate change [50], it is urged not to ignore these emerging forces from activists of the urban scene. Despite the great analytical effort to read these forms of movements from the [6,51–53] bottom-up, what still seems to be neglected is the identification of their operational capacity: the understanding of the reasons why the practices materialize, whether in an integrated way, in conflict, or by filling gaps, thus acting in subsidiarity towards the transition; what these “critical agents of change towards resilient future” [54] are saying, who leads them, and in what relationship they enter in relation to the city; and, finally, the institutional role to be entrusted to these subjects, in terms of their power to convey the message to their targets. For the purpose of this analysis, this study takes into consideration a specific field of bottom-up initiatives against climate change: grassroots movements for climate action (see Table 2). This choice is motivated primarily by the exponential growth of the climate movement that arose in the world in the years 2018 and 2019, becoming one of the most widespread environmental social movements in history [51].

Table 2. Summary of main investigated aspects of grassroots climate initiatives.

Initiative	Instruments/Supporting Factors	Main Targets	Key Message
Friday for Future	Strong leadership, strikes, marches, large extensive social media coverage	Political leaders, decision makers, media	call for urgent action to prevent global warming; call to accelerate the efforts of power groups to reduce greenhouse gas emission
Extinction Rebellion	Nonviolent protests, civil disobedience, city and strategic infrastructures shutdowns, hunger strikes, mass arrests	Political leaders, decision makers, media	climate change to be declared a national emergency; to stop the loss of biodiversity by reducing greenhouse gas emissions to zero by 2025; that a citizens’ assembly is created to monitor progress

On Friday, 20 August 2018, then-16-year-old Swedish Greta Thunberg refuses to go to school and begins protesting in front of the Swedish Parliament building. With her handwritten “school climate strike” sign, she accuses the government of failing to meet the Paris Agreement goals and calls for radical action to prevent global warming [33].

The initiative repeats every Friday, eventually gaining numerous followers through social media coverage, and soon goes viral, spawning the Friday for Future (F4F) movement. On 15 March 2019, the first global climate strike gathers more than 1.5 million young people, in over 2000 locations, expressing their resistance to the failure to act on the climate emergency [55,56]. In addition to strikes, the movement has evolved to create different formats to initiate dialogue with schools, universities, politicians, city councils, media, and businesses.

The movement now has a participant base of approximately 7.6 million young people around the world, as also indicated in the map that is updated in real time on their website, which also includes also other green movements [57]. Their demands are varied and can be summarised in the urgency of action to accelerate the efforts of power groups to reduce greenhouse gas emissions and respect the Paris Agreements. Their message proclaims a sense of urgency: in the present, society is called for immediate radical action to interrupt the insurgency of heavy impacts of climate change. The targets of F4F are mainly politicians, political and global leaders throughout the world. Their message is mostly conveyed during international meetings (e.g., World Summits, COPs), where powerful speeches are

communicated by the main leaders of the movements, often using radical expressions and wording, to clearly sentence the gravity of the climatic situation, but also to call both leaders and peer to action. The catastrophic tone and rhetoric of climate movements are also recognized as a way of recruiting participants through self-identification in a common cause.

F4F's experience started a snowball effect of other small or large activist networks, which over time organized to demonstrate against climate challenges and to raise awareness of local governments for action. Earth Uprising is one of them, a network of about 50 active members around the world, protesting through strikes and motivational speeches, but at the same time offering educational programs on environmental issues aimed at young people. On this last point, they act in collaboration with educational institutions, but also with the support of sponsors to support microgrant funds for educational projects and expenses of the protesters.

Shortly thereafter, other parts of the population began to show sympathy and solidarity to these youth movements: Parents for Future [58], Teachers for Future [59], Artists for Future [60], Farmers for Future [61], and Scientists for Future [62] all pledged to build a broad social alliance for climate policy and bold politics. Besides a large digital network of exchanges and knowledge provision, these movements reaffirm the need to strengthen the physical-relational dimension of governance experiences, which in the current contingency is likely to remain in the background compared to the digital dimension. A clear example of this claim is the Extinction Rebellion initiative.

Extinction Rebellion (XR) is an international movement that uses nonviolent actions of civil disobedience to push institutional actors and the media to act and communicate urgently towards the current climate and ecological crisis [34]. The founders of Extinction Rebellion are 15 activists who came up with the idea in April 2018 during the protests of the RisingUp! Movement. The movement, born in October 2018 in London, defines itself as "a-political", even though the government is the target of its demands, and "decentralized", having hundreds of volunteers and 650 autonomous local groups in 45 countries [63]. The group is composed of various age groups, professionals and representatives of different communities, including Christian branches. Extinction Rebellion presents three main statements: that climate change is declared a national emergency, that the loss of biodiversity be stopped by reducing greenhouse gas emissions to zero by 2025, and that a citizens' assembly is created to monitor progress. At the heart of the project is the desire to make environmental protests more aggressive and concrete, to attract more attention and better communicate the urgency of the problem. City and strategic infrastructures shutdowns, hunger strikes, and mass arrests are some of the tactics that have been used by XR to get attention from the public on the urgency of climate issues [63]. For example, the November 2018 week of protests (<https://www.theguardian.com/environment/2018/nov/17/thousands-gather-to-block-london-bridges-in-climate-rebellion> (accessed on 10 December 2021)) was a great communication success despite, or thanks to, the 85 people arrested, and was instrumental in the UK Parliament declaring an environmental and climate emergency.

In response to the solicitations, several cities have declared themselves to be in a climate emergency status (first Great Britain, then Ireland, rising to 12 states worldwide, including 4 in Europe). The declaration of climate emergency recognizes locally the need for action against climate change. In addition, it introduces the tool of climate impact assessment to assess the integration of measures to combat climate change in local policies. This declaration became the worldwide tangible output of the protests, leading to different outcomes and degrees of implementation throughout the countries.

5. Discussion

Starting from the hypothesis and research questions expressed above, this part of the manuscript discusses the potentialities of grassroots movements for climate action and TMNs together, in supporting cities in their climate transition. Possible limitations and risks are also highlighted at the end of this paragraph.

Research Question (RQ1). *What are the instruments/elements/factors that the different institutional and grassroots movements for climate action put in place to support the transition?*

Two instruments are most used for TMNs: (i) on the one hand, “hard tools” such as key performance indicators, monitoring frameworks and action plans, that aim to provide support in the drafting of plans and strategies; (ii) on the other hand, “soft tools” for advocacy and support, such as working teams, academia and others, supporting officers and networks. The latter exist mainly at two levels: (i) the level of the network itself, with the role of setting general targets, agendas, manifestos, but also of forming working group and task forces, with the aim of supporting all the cities in the network in a global transition; and (ii) the level of cities, with the function of supporting the individual administrations in the construction and drafting of plans and monitoring systems. However, monitoring of individual cities and policy actions is, in most cases, self-organized by the cities themselves. This leaves ample room for possible blockages and interruptions of administrative action and threats of abandonment of planned actions.

Grassroots movements, on the other hand, set their action precisely on the verification of the effective operation of governments (at various levels) following the declarations and strategic objectives set by larger agendas. They base their action mainly on communication and advocacy tools. Even in such a case, the phase of setting up the group (not of cities, but of activists) is of great importance: starting with a strong leadership and personality, commitment, and shared needs, an activist base is built. Group formation and recruiting take place through the construction of shared identity based not so much on measurable goals (as in the case of the key indicators of TMN) but on shared ideals and values. The methodologies to voice their demands are purely informal: litigation, demonstrations, strikes, and occupation of public land make explicit the importance of making the problem manifest and communicable, via radical forms of communication, using body language and performance. The physical and corporeal dimension of the message has a digital counterpart, which is just as radical, widespread on all possible channels. Opposition, conflict, and dissent are an integral part of the methodology. Especially in XR, resistance to “power” is also expressed in the form of mass arrests and blockades of large infrastructures. An interesting approach is to interpret these experiences from the perspective of bottom-up small wins, as recently defined by Bours et al. [64].

If TMNs have the task of accompanying cities and their staffs in setting goals and transition strategies, bottom-up movements act when these goals are hidden under agendas with no operational basis, or in the absence of real political commitment to achieve the set goals. In this relation, they have the potential to work together in setting more effective goals and actions to be taken, also taking into consideration new instruments such as media, influencers, and, more in general, the potentialities of informal communications.

From an impact perspective, it is possible to say that both TMNs and grassroots initiatives have influenced and produced changes in their field, especially in cities’ documents and agendas. TMNs, in particular, have supported cities in the production of scenarios and planning documents, including actions and key steps, while grassroots initiatives have contributed to making climate part of the agenda, as happened, for example, in Bologna with the setting of the Climate Emergency state, raised from the Extinction Rebellion movement [65].

Research Question (RQ2). *What is the core difference in the message that the two experiences provide to the world for making the transition effective?*

Contemporary climate movements differ from the past mainly because they put climate issues and their resolution on a social justice level. They are less environmental movements per se, and more anti-inequality movements that see climate justice as the concrete ground on which to fight. In 2019, Fridays for Future became the center of media attention, but the added value was that it was able to model itself on even radically different territories, reaching out to vulnerable areas and users who traditionally are not given a voice. The presence of a widespread and extended network allowed people living in remote

territories to adhere and be the spokespersons of the message towards the local political class. The same approach can be attributed to TMNs, whose vision is wide-ranging, but then generally translated into transitional pathways that can be thematic.

The message for both levels is political: TMNs intercept the political dimension from within, including mayors themselves among the signatories, as members of the network. It follows that the commitment of the government is a founding aspect and the basis of any programmed action. It must be underlined, however, the fact that the prestige of political adhesion to some networks could hide objectives that go beyond the achievement of climate agendas, especially concerning private-led or for-profit networks. Moreover, for bottom-up initiatives, the political dimension has to do with a commitment issue. However, in this case, it is measured by the actions put on the ground locally, on which, according to the activists, assessments must be made as to whether the goals can be achieved. Otherwise, in the absence of political actions, the risk is always to glimpse only speeches and agendas, without real progress or, to quote Thunberg, “useless blah, blah, blah”.

One of the axes on which TMNs and grassroots movements for climate action converge is education and training, as necessary and pervasive responses for the construction of co-created knowledge, not only for dissemination purposes. Specific actions are undertaken on this, both by the movements (collaborations with schools of various degrees) and by the networks (training and construction of shared scientific bases between cities).

Research Question (RQ3). *How are the two experiences able to reach their targets? How much are they effective in this?*

For TMNs, the targets are not only achieved but embedded in the network itself. The fame of these initiatives is also growing in the light of how funding is obtained, especially at the European level. Being part of these networks makes it possible to get to know other realities and mutual knowledge can lead to collaboration in the realization of certain objectives and participation in European calls for proposals. The TMNs envisage that targets proceed with thematic planning once they have joined the network. On this, it must be said that all environmental planning falls under voluntary planning. This is one of the reasons why small or distant cities rarely get into planning processes of this kind. It is often convenient for them to be part of these networks, but they can bring little contribution in terms of concrete administrative actions.

With regard to grassroots movements, politicians and leaders, high profile figures, and representatives of the most diverse groups (businesses and oil companies, but also religious communities) are strongly urged by the demonstration actions. Their responsibility is to have the grassroots message diffused in society, as well as materialized in tangible, immediate actions. At the moment, there is strong attention from local governments to the activists' demands (a clear example is the media coverage of climate movements actions during the last COP 26), but this does not seem to be followed by incisive operational action. The experience of Extinction Rebellion is the one that has been most able to implant in the public actor the request for a commitment in the form of a declaration of climate emergency and the stable use of climate assemblies.

In both cases, it is difficult to measure the effectiveness in reaching decarbonization goals, precisely because of the indirect nature of the advocacy action proposed by the initiatives. However, in both cases, there is a direct response in terms of policy actions provoked (declarations of climate emergency, adaptation plans), which can be directly traced back to the action of these drives. The aspect that seems to be missing, however, is a system-wide transformation in socio-technical systems related to the provision, support, and development of actions to combat climate change.

The success of some experiences has over time expanded participation and engagement—especially at the local level—as well as adherence to initiatives proposed by both climate activists and TMNs. However, it remains to be reflected in the amount of additional work that is required from local governments, often already suffocated by bureaucratic resistance and lack of trained staff.

In light of the above considerations, it can be stated that TMNs assume more of a role of constant accompaniment and awareness-raising for adaptation and mitigation measures, while the grassroots movement are geared toward offering specific arguments to an issue or problem to be addressed through political action. However, this action is effective only if connected and integrated with a complementary role with respect to the actions put in place through planning.

6. Conclusions and Further Research

In conclusion, this research presents a qualitative review of two key types of climate advocacy initiatives: grassroots climate movements and TMNs. In particular, this research highlights the main constitutive elements, targets, and factors with the aim to understand how these two experiences can support cities transition. It is possible to recall the two hypotheses that drove the analysis, trying to give them an answer.

Hypothesis (H1). *Grassroots movements for climate action and TMNs have the potential to better support cities in their climate transition.*

The proposed hypothesis has been addressed in the Discussion section. Both types of initiatives have aspects in common, especially targets and methods, with key differences that come from the different nature of them: the first one, TMNs, being institutionalized and the second, grassroots initiatives, being spontaneous. Even with those differences, both initiatives agree on the necessity of taking effective actions against climate change. These actions are perceived from both as imperatives. In addition, this links the discussion to the second hypothesis.

Hypothesis (H2). *Local governments should take advantage of both initiatives, as they have the unique ability to develop networks of support, innovation, and sense of belonging.*

This hypothesis is confirmed by the analysis performed. So far, the two types of initiatives have been maintained separated. Recent decisions from cities across Europe are going towards the support of grassroots climate initiatives, for example, in the form of declaring the climate emergency, to show room for collaboration, and for working together in making the transition effective. The theme of temporality seems relevant here: both activities claim that it is necessary to act now, as the “future” has become a political category of the present. The rhetoric of the message, of which movements and networks are the spokespersons, is based on a critique that draws on a topos of urgency, since the space for maneuvering decreases abruptly and rapidly. Especially in the charismatic words of climate movement leaders, their rhetoric implies that catastrophe is already upon us [56]. This posture, however, implies a certain risk of acting in a regime of urgency, an attitude that runs the risk of neglecting a substantial and necessary part of the transition, i.e., leaving the emergency regime behind and fostering a long-term strategic planning that is not only vertical on the climate emergency but includes it transversally in every aspect of future development. When talking about sustainable development, in fact, it is useful to recognize that the urban crisis should no longer be understood as a contingent and removable event, but as a perennial condition, a permanent situation of emergence. These global challenges burden a complex reality that deeply intertwines the health, socio-economic, communication, and environmental dimensions. This requires a mix of technical and advocacy instruments to allow for both the development of forward-looking visions and the incorporation of contingent actions, including from bottom-up stimuli.

Finally, the study highlights the constant emergence of new movements on both sides. As an example, a recent initiative is the Green City Accord (GCA). It is the most recent TMN created in Europe, by the European Commission. GCA aggregates European mayors aiming to improve greener and healthier cities in Europe. Similar to the CoM, the GCA is also directly targeting cities’ mayors and requires them to sign an accord, entailing a strong political commitment. It is open to all cities in Europe with more than 20,000 inhabitants,

including agglomerations. This initiative is aimed to contribute directly to the achievement of the Green Deal and the SDGs, through the commitment in five key areas: air quality, nature/biodiversity, water, waste/circular economy, and noise. A specific monitoring framework is detailed in the application process, requiring cities to provide a baseline assessment and periodic reporting, based on a predefined set of indicators [47]. The novelty of this initiative, which was created in 2020, does not already allow for reporting deep feedback on barriers, however, it is possible to argue that the structure is very similar to the CoM one. Thus, it will be important to take into consideration all the already known barriers of the CoM to reduce shortcomings and to improve the quality of such an initiative. This recent birth should take the form of a mixed initiative if the important role of TMNs together with grassroots climate initiatives is detected. Instead of building another “new and similar” network, which will require new work of assessment from municipalities, it should be possible to work in collaboration with already existing actions and with highly conscious young people in the world. This research will proceed in the future analyzing more closely potential methodologies of collaboration among these two initiatives as well as the forms in which this relation can take place also on an impact perspective on local agendas, procedures, and documents.

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Appendix A

This appendix includes a table providing a geographical coverage of the TMNs analyzed. Please note that the 100RC program is not covered as the website is no longer available (26 January 2022). All data have been derived from the initiative’s websites. Data on number of municipalities have been taken from the official website of the country.

Table A1. Summary of geographical distribution of institutional initiatives.

Country (EU-27)	N° of Municipalities	Covenant of Mayor	C40	ICLEI
Austria	2095	29 municipalities (24 with Action Plan submitted)	-	3
Belgium	581	572 municipalities (367 with Action Plan submitted)	-	6
Bulgaria	265	45 municipalities (25 with Action Plan submitted)	-	1
Croatia	428	100 municipalities (66 with Action Plan submitted)	-	1

Table A1. Cont.

Country (EU-27)	N° of Municipalities	Covenant of Mayor	C40	ICLEI
Cyprus	39	26 municipalities (24 with Action Plan submitted)	-	1
Czech Republic	205	90 municipalities (16 with Action Plan submitted)	-	2
Denmark	98	43 municipalities (33 with Action Plan submitted)	1	4
Estonia	79	8 municipalities (5 with Action Plan submitted)	-	1
Finland	309	17 municipalities (13 with Action Plan submitted)	-	13
France	34,965	190 municipalities (102 with Action Plan submitted)	1	14
Germany	11,116	88 municipalities (66 with Action Plan submitted)	2	20
Greece	325	227 municipalities (145 with Action Plan submitted)	1	3
Hungary	3154	221 municipalities (142 with Action Plan submitted)	-	3
Ireland	95	22 municipalities (16 with Action Plan submitted)	-	1
Italy	7914	5068 municipalities (3855 with Action Plan submitted)	3	9
Latvia	110	24 municipalities (21 with Action Plan submitted)	-	-
Lithuania	60	17 municipalities (14 with Action Plan submitted)	-	-
Luxembourg	102	13 municipalities (1 with Action Plan submitted)	-	1
Malta	68	36 municipalities (24 with Action Plan submitted)	-	-
Netherlands	400	37 municipalities (20 with Action Plan submitted)	2	4
Poland	2478	86 municipalities (40 with Action Plan submitted)	1	3
Portugal	308	172 municipalities (123 with Action Plan submitted)	1	10
Romania	3176	186 municipalities (76 with Action Plan submitted)	-	2
Slovakia	2890	40 municipalities (6 with Action Plan submitted)	-	-
Slovenia	212	62 municipalities (47 with Action Plan submitted)	-	2
Spain	8112	2846 municipalities (1855 with Action Plan submitted)	2	10
Sweden	290	68 municipalities (56 with Action Plan submitted)	1	11

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