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Institutional barriers to climate change adaptation during Expo 2015, Milan

M.Sc. thesis in the study program: Agricultural Economics

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1. INTRODUCTION

1.1 Background

According to ISTAT¹ data (March 2016) in regard to Milan, from 2001 to 2014, compared to the previous thirty years, nights with minimum temperatures above 20 degrees have increased from 13 to 29. Days with more than 25 degrees have furthered too, from 95 to 113. In the city, precipitation decreased by 27.5% compared to the average of the 1970-2000 period. The average rainfall in very rainy days got cut by about 50% from 202 mm to less than 106 mm (ISTAT, March 2016).

As shown by Wenz et al. (2017), increasing temperatures due to global warming are substantially changing Europe's electricity consumption habits. In particular, the greatest consumption is happening in the south of the continent, Italy included, where temperatures daily peak is likely to keep increasing significantly, and higher electricity consumption is shifting from winter months to summer months.

The warming of the climate system is unequivocal, as it is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level (IPCC, 2014). According to the United Nations Framework Convention on Climate Change (UNFCCC), climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to the natural climate variability observed over comparable time periods (UNFCCC, 2007).

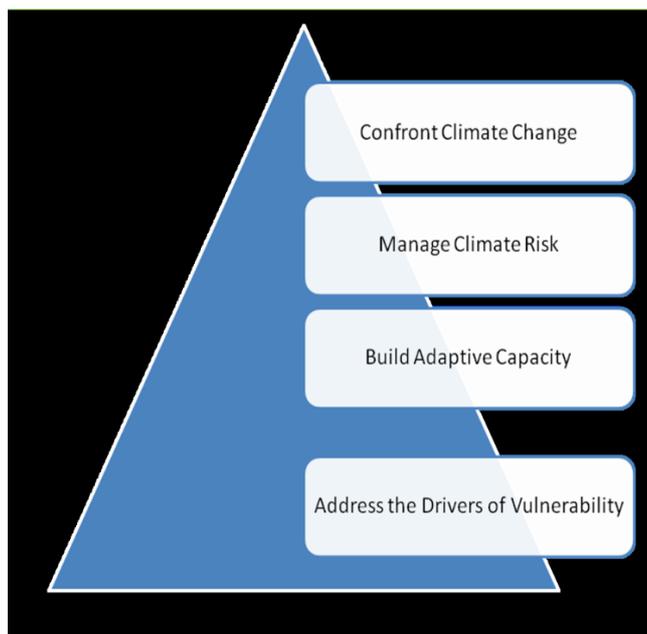
However, societies and individuals have been adapting to their environments throughout history by developing practices, cultures and livelihoods suited to local conditions. In particular, two main policy responses to climate change have been developed: *mitigation* and *adaptation*. While mitigation addresses the root causes of climate change by reducing greenhouse gas emissions, adaptation seeks to lower the risks posed by the consequences of climate changes (BURCH, 2010b). In other words, adaptation is the adjustment of ecosystems or human systems in response to the impacts of current changes in climate caused by human-induced climate change (IPCC, 2012). Both approaches are considered

¹ *Istituto Nazionale di Statistica*. It is the main producer of official statistics in Italy and a member of the European Statistical System, coordinated by Eurostat.

to be necessary in fighting global warming. In fact, notwithstanding a decrease of emissions in the past decade, adaptation is still needed to deal with the global temperature changes that have already been set in motion (BIESBROEK ET AL., 2011).

Adaptation measures may be planned in advance or put in place spontaneously in response to a local pressure and can help reduce vulnerability (BIESBROEK ET AL., 2011). Examples of adaptation measures include: using water resources more efficiently; adapting building codes to weather conditions; building flood defenses and raising the levels of dykes; developing tolerant crops; or choosing forestry species and practices less vulnerable to storms and fires. In this sense, as proposed by SPERANZA (2010), adaptation can be seen as a continuum, where responses change along with their effects and the causes of climate change. As shown in Fig. 1, at one extremity of the triangle, impacts and intrinsic causes of climate change find their place, while at the other end responses to such impacts sit. In the middle, instead, «organizations and individuals can develop an adaptive capacity through knowledge sharing and increasing awareness of climate impacts, and can manage climate risk by integrating climate change in program decision making (climate-proofing projects and investments)» (ICCG, 2012, n°18: 11, from SPERANZA, 2010).

Fig. 1. Continuum of adaptation activities: from development to climate change. Source: International Climate Policy (2012).



1.2 Problem statement and significance of the study

An important part in the study of adaptation is the analysis of barriers to adaptation. Barriers to adaptation are, generally speaking, «those factors and conditions that hamper the process of developing and implementing climate change adaptation» (BIESBROEK ET AL., 2011, 1120-1121).

Scholars of adaptation have identified a large number of different barriers, such as biophysical or technical barriers, and social barriers. Among the social ones, we find cultural, political, economic, informational, and institutional barriers (BIESBROEK ET AL., 2011).

For the specific purpose of this thesis, I focused on *institutional barriers to adaptation* as proposed especially by JANTARASAMI ET AL. (2010), MOSER AND EKSTROM (2014), and BURCH (2010b), whose works have been the starting point of my research.

Empirical studies on barriers at the governance level – as from the analysis of MOSER AND EKSTROM (2014) – identify institutional and governance barriers such as impediments to information flow within organizations, legal bounds and limited jurisdiction as the most frequent cause of barriers in a given social-ecological system. In such government context, the understanding of available adaptation processes and options has emerged as an enabler of adaptive capacity that is actually either missing or underdeveloped (MOSER AND EKSTROM, 2014).

Researchers have stated that dominant types of barriers arising in this specific phase are: lack of mandate or requirements to adaptive capacity, lack of governance structures, institutional fragmentation, and legal bounds. In this sense, it seems that the current law prevents the implementation of options, lengthy process of obtaining permits, and bureaucracy.

Financial problems themselves might frequently have institutional roots. According to BURCH (2010b), adaptation itself is first of all a matter of adapting institutions. In this sense, barriers are often institutional in origin. Her analysis focuses specifically on those regulatory barriers such as incorrect municipality policy tools, planning, system of bylaws, and mis-interaction between multiple level of government. These barriers usually arise from a misunderstanding of the organizational hierarchy, of the priorities and performance criteria set by the job description, and of the mechanism for facilitating inter-

departmental collaboration. If adaptive measures were applied correctly, Burch states, regulatory programs would be capable of employing cost-effective tools, creative solutions, and of developing good ecosystems (BURCH, 2010b). When this does not happen, and thus barriers emerge, municipalities are not empowered to implement climate change strategies and have to wait for key pieces of legislation to pass through higher and lower levels of government.

The critical role of institutional change as a way to promote or overcome barriers to adaptation has been pointed out by numerous scholars in the climate change literature. Such findings suggest that adaptive strategies unequivocally act upon, and change with, changes in both formal structure and/or cultural norms. Nevertheless, no scholar has yet compared cases where institutional change happened with cases where it did not happen. In fact, within the literature on institutional change as a way to address institutional barriers to climate change adaptation, there is no discussion comparing different institutional approaches or situations where an institutional approach was not conceived at all.

The aim of this research has been therefore to fill this gap by comparing a case of institutional change as a way of addressing institutional barriers, with a case where no institutional change occurred. I did so with reference to the case of Expo 2015 and the effect of the special *Expo 2015 Legislative Decree* on the realization of one particular measure of Expo, the *Moving Forest*. Secondly, I will be comparing the *Moving Forest* with the separate case of *Vertical Forest*.

1.3 Case description

The **Moving Forest** consists of over 12.000 trees on a surface area of 300.000 m². The forest is divided into two different areas: the Perimeter and the Piastra. The project represents a measure of climate adaptation because its several sections are meant to cool down the atmosphere and to increase the biodiversity within the Milanese urban area.

Following the literature on barriers to adaptation, potential institutional barriers to adaptation which played a role in the case of the *Moving Forest* were first of all a lack of institutions (therefore norms, instruments and values capable of enabling adaptation), bureaucracy (thus regulatory bounds and structural/operational constraints), and issues of

administrative structure. Finally, adaptation still competed with other interests for priority.

On April 26th, 2013, the then Italian Prime Minister Enrico Letta signed and issued the Legislative Decree No. 43 named *'Urgent measures for the revitalization of Piombino industrial area, in favour of environmental emergencies, of the earthquake zone of May 2012, in order to accelerate the reconstruction in Abruzzo, and for the realization of interventions of Expo 2015*'. The special Expo 2015 Legislative Decree – as I referred to throughout this thesis – was intended as a way of reducing the bureaucratic burden of implementing EXPO. I did consider this as a process of institutional change intended to overcome institutional barriers to (inter alia) the implementation of the Moving Forest. In order to understand the role of the special Expo 2015 Legislative Decree in overcoming institutional barriers for the Moving Forest, I then conducted a main comparison between the Moving Forest (with an institutional change, i.e. the special law) and the Vertical Forest (without a special law).

The **Vertical Forest**, realized by Boeri Architect Studio and inaugurated in Milan in October 2014, is a model of vertical densification of nature within the city, operating in relation to afforestation and naturalization policies in urban landscapes. It consists of two residential towers (tower E and D, respectively 110 and 76 meters high) built in the Milanese Isola district, housing 900 trees (3, 6 or 9 meters high) and over 20,000 plants and a wide range of shrubs and floral plants distributed accordingly to the exposure of the façade to the sun.

Like the Moving Forest, the Vertical Forest project was designed to create a special urban microclimate, to produce moisture and oxygen, to absorb CO₂ and dust particles. Like the Moving Forest, the plants of Vertical Forest have been grown in advance and moved when needed. The two cases are similar as they represent the green side of a rather “grey” wider project (Expo on one hand, Porta Nuova on the other hand). Also, they are “green” in a very adaptive-related way as their principles seem to offer the same ecological benefits. Again, the Vertical Forest, like the Moving Forest, deals with issues of adaptation to climate change and sustainability. Nevertheless, no special law was issued for the realization of Vertical Forest. Both projects are thus subject to institutional barriers and lend themselves to a comparison attempt.

1.4 Research question

The comparison of the two projects addressed the following research question:

Does the observed institutional change overcome institutional barriers to implementing climate change adaptation measures? More specifically, does it change the same aspects of the implementation process that the barriers literature points at?

These questions were asked in order to bring to light the institutional arrangements that provide the conditions for overcoming barriers to adaptation. By answering these questions, the aim was to uncover to what extent – given the cognitive, structural and legislative context – institutional change provides an incentive or a tool to overcome barriers. In other words, the purpose was to understand which institutions exist and how they explain the efforts to overcome existing barriers to climate change adaptation – both through the context, and according to the different stakeholders involved.

1.5 Research objectives

The research question was answered in four main steps. The first step involved laying down the analytical and theoretical foundation for the research. The second step included a case study specific legislative analysis that outlined the context of the special Expo 2015 Legislative Decree. The third step involved a comparison between two case studies. In fact, in order to understand the role of the Legislative Decree in overcoming institutional barriers for the Moving Forest, I compared the Moving Forest case (with a special law) with the Vertical Forest case (without a special law). The fourth step involved collecting data through semi-structured interviews with the aim of uncovering the results of the institutional change based on the responses of stakeholders and the way they described the situation. With this in mind, several objectives were developed:

- identify what barriers exist in the literature and what barriers existed in the Expo 2015 case
- outline the main legal and administrative setting of Expo 2015 Legislative Decree
- uncover how institutional change was organized in the case of Expo 2015
- understand the incentives and deterrents that lead actors to undertake institutional change as a way to overcome institutional barriers
- uncover how different stakeholders or actors frame the issue of institutional barriers

Answering this question aimed at illustrating the role of institutional change in overcoming institutional barriers to adaptation.

1.6 Methods used in the study

Besides the comparison, the Expo 2015 Legislative Decree was analyzed to understand what the law changed in theory. Semi-structured interviews to actors who made ‘Moving Forest’ and ‘Vertical Forest’ a reality were performed to understand how the process implementation of the projects changed with and without the special law.

1.7 Expected results

This study hypothesized that:

- The institutional barriers found in the literature exist in practice (=from the comparisons).
- Institutional barriers can be analyzed and can be solved through institutional change.

1.8 Limitations of the study

The two case studies of Moving Forest and Vertical Forest were rather recent at the time this research was conducted, and had not yet been scientifically addressed. In this sense, it has not been possible to rely on peer reviewed scientific evidences. Instead, this thesis is a case study based on materials coming from a “gray literature” found mostly on institutional web-sites and journalistic sources.

Moreover, the Expo-story is partly hidden in the shadows of trials, crimes, indictments and requests of prosecution. On July 6, 2016, the fiscal police arrested 11 people linked to Expo with charges of mafia infiltrations, frauds, fake contracts, laundering and tax evasion. By July 2017, the number of people investigated by the Milanese judiciary increased. Also the Special Commissioner and Mayor of Milan Giuseppe Sala, one of the protagonists of this research, has been charged with crimes linked to the Mobile Forest. According to the allegations, Sala steered the supply of 6,000 trees by tripling prices in favor of the suppliers. That probably led the Piastra to become a 260 million euros business. Sala was further accused of faking a public act by signing a 13-day backdated official document related to the Piastra. According to the investigation, he did this to complete the Expo's works on time, as there were already delays. The Piastra was one of

the most important contracts, as a building area dedicated to most of the pavilions. The investigations, however, are not yet over and the truth is still unknown. Most suspects continue to dismiss the charges.

The situation partly limited the number of potential interviewees for this research, as most of them were still being investigated when the topic was investigated.

1.9 Structure of the thesis

This thesis is structured in accordance with the main research steps, and thus subdivided into six chapters. This first section gives a comprehensive background of the study, introducing and shedding light on the purpose of the study, stating the research question, the objectives of the research, the methods used and the expected hypothetical results of the study. Chapter 2 illustrates the theoretical framework, based on the review of the literature debate on institutional barriers to climate change adaptation. Chapter 3 provides further background information on the two case studies: the Moving Forest and the Vertical Forest. The first one, which is the very focus of the research, has been analyzed within the context of Expo 2015 and the special Expo 2015 Legislative Decree, which changed the institutional setting where the Moving Forest took place. The Fourth Chapter of the thesis specifies details on methods for data collection and analysis used in the study, on the stakeholder constellation and interviewing techniques adopted. The Fifth Chapter provides an analysis of the findings across the two projects and the different stakeholders. It does so by the use of interviews and texts (i.e. Expo 2015 Legislative Decree) data, in coherence with the literature and the objectives of this study. In Chapter 6 general conclusions are drawn to answer the initial research question. Furthermore, recommendations are provided for the design of future institutional change with regards to climate change adaptation, not-given the potential of its successful implementation. Finally, Chapter 7 sums up the aim, subject, methods, results and most important conclusion drawn.

2. THEORETICAL FRAMEWORK

2.1 Introduction

Before introducing the actual topic of this research, this chapter examines in depth the concepts of climate change adaptation and institutions, and the relationship existing between them. In this way, the chapter offers a definition to barriers to climate change adaptation as proposed by the most relevant literature on this topic.

2.2 A definition to adaptation to climate change

Climate change is a current and concrete phenomenon: temperatures are rising, rainfall regimes are changing, glaciers and snow are melting and the average global sea level is growing. As stated by BUSCH (2011), «eleven of the twelve years from 1995 to 2006 rank among the twelve warmest years since 1850. The total temperature increased from 1850—1899 to 2001—2005 is 0.76 8C» (BUSCH, 2011: 391).

Severe events such as floods and droughts will probably become more frequent and intense (GREGORY ET AL., 2004). It is highly likely that most of the global warming experienced during the mid-twentieth century has been caused by the observed increase in greenhouse gas concentrations due to emissions of human activities. When this is not already happening, the impact of these changes, together with all the vulnerability factors of nature, will have specific consequences on territories, economic sectors, and human health (as documented for example in MCCARTHY ET AL., 2001 and PARMESAN AND YOHE, 2003). However, the vulnerability of populations related with climate change «depends not only on their exposure to specific stressors and their sensitivity to climate change impacts, but also on their ability to adapt to a changing environment» (WEYRICH, 2016: 7).

Apprehension for climate effects led politicians from many countries to consider ways of limiting greenhouse gases. This happened through measures such as the Kyoto Protocol (1997), which aimed at committing its signatory countries to a quantitative reduction of emissions.

Yet, it was soon clear that climate change is something inevitable that cannot be simply mitigated or reduced. Even if emissions were stopped, it would not be possible to get to zero the level of gases in the atmosphere, as this has permanently altered the environment. As a matter of fact, as stated by PAAVOLA (2011), «land use and land use change, deforestation, aviation and marine bunker fuels, and carbon leakage associated with the consumption of imports are examples of issues that remain wholly or largely unaddressed by the current climate change regime» (PAAVOLA, 2011: 14). In the first decade of the 21st century, adaptation to climate change came up as a topic of scientific research, in local to international policy and planning, in the media, and in public awareness. Adaptation and mitigation (i.e. the reduction of greenhouse gas emissions) became complementary actions, and both constitute today priority areas for the EU to address the issue of climate change. According to the IPCC (2007), adaptation is the «adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities» (IPCC 2007a: 869).

Societies, organizations and individuals have hence adjusted their behavior in response to past climatic changes. Due the nature of the world itself, much of this adaptation can then be considered as reactive, being on one side set in motion by past or current events, and being on the other side an anticipatory mean to possible future conditions (ADGER ET AL., 2005). The anticipatory nature of adaptation also emerges in the Climate Action of the European Commission, where for adaptation it is meant action taken in advance to the unfavorable effects of climate change by minimizing or cutting down the size of the damage they can generate, namely by avoiding its costs (WEYRICH, 2016).

On the other side, it also means taking advantage of opportunities that accrue on different scales due to climate change. Adapting to climate change requires the adoption of measures countering the effects and vulnerabilities of climate change, as well as the variability occurring in the absence of climate change. The concept of adaptation, thus, means not only protection against the adverse impacts, but also to create flexibility to change and taking advantage of its possible benefits.

As noted by Adger et al. (2005), adaptation is made up of actions throughout society, within hierarchical levels moving from individuals, to groups, to governments. Far from being spontaneous, these actions are actually constrained by and within institutions in

use, and eventually affect, in fact, decision about all aspects of life, reflecting in the current social norms, regulatory structures, property rights, and context of demographic, cultural, economic and technological change (ADGER ET AL., 2005).

2.3 A definition to institutions

The notion of institutions embodies all those systems of established set and social rules structuring social interactions. Even though the dispute over the definition of institutions has been endless, we can usually find three school of thoughts regarding this concept: the first one, or rule-based conception, looks at institutions as behavioral rules driving and confining one's behavior during a social interaction. The second one, or equilibrium-based conception, considers institutions as equilibria of strategic games. Finally, according to the third school, which is most philosophical, institutions are constitutive rules that designate states and functions to physical entities – by telling us, for example, that cutlery is to be used for eating (HINDRIKS AND GUALA, 2015).

Notwithstanding the diversity of conceptions, «the increasing acknowledgement of the role of institutions in social life involves the recognition that much of human interaction and activity is structured in terms of overt or implicit rules. Without doing much violence to the relevant literature, we may define institutions as systems of established and prevalent social rules that structure social interactions» (HODGSON, 2006: 2). In fact, among institutions we find stable routine, formal and informal rules of behavior, means of enforcing these rules, sanctions, organizations, interaction costs, systems of measures, norms, and laws recognized as such. At some stage, they can generate or dismantle incentives for individuals to engage in certain activities, as they are embedded in the social realm and structure the human interaction (HODGSON, 2006). Due to their nature, they are necessary centerpieces of governance, being themselves governed at the same time, by so doing giving meaning to social life and influencing and channeling attitudes and actions.

In this sense, institutional change can then be defined as the process in which institutions are purposefully altered and re-implemented in a centralized way, either by a single individual or by many individuals or groups interacting through some kind of collective choice (INDERBERG, 2011). Alternatively, institutional change is also that process in which new institutional forms periodically emerge as an evolutionary-decentralized

consequence. «Therefore, by changing their formal structure institutions can be utilized as means to an end» (Inderberg, 2011: 3). Typically, this happens through reforms. Therefore, we can talk about a dynamic perspective, where a different organizational outcome is realized due to changes made in the formal structure.

2.4 How do institutions and adaptations relate?

As explained above, institutions are central for most matters requiring policy responses. In this sense, they assume great significance in relation to climate change and in shaping its adaptation, as they are capable of providing all the coordination tools through which organizations and societies can develop technology, infrastructure, financial and other resources for adaptation (OBERLACK, 2016). Managing the impacts of climate change through adaptation measures has become a policy priority, which is now parallel and integrative to mitigation.

As highlighted by BISARO AND HINKEL (2016), also the recent Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR5) emphasizes in its Summary for Policymakers that governance structures and institutions to resolve conflicts are needed to advance adaptation. More specifically, recent work on adaptation governance has highlighted the importance of institutions for the private provisioning of collective adaptation goods (BISARO AND HINKEL, 2016). Strategies to climate change, in fact, are taken up through the integrated collective action of many institutions and actors.

As well with reference to on the Kyoto Protocol, the Protocol itself hints at institutional complexity in mentioning or prescribing a variety of institutions, programs and activities. Institutions become essential to the capacity of each Party to the Protocol «to promote sustainable development by adopting appropriate ‘policies and measures’ — and, in doing so, to ‘cooperate with other such Parties to enhance the individual and combined effectiveness of their policies and measures’ by actively sharing knowledge and experience on them. Included is the need to enhance energy efficiency in relevant sectors of the national economy» (THYNNE, 2008: 328).

In this sense, this thesis took an institutional approach, considering adaptation as the ability to change behavior towards the environment (thus within the governance

framework itself), to take measures capable of defining who can do what, and to reduce vulnerability to climate change or benefit from new opportunities (THYNNE, 2008).

According to PAAVOLA (2011), how countries deal with climate change is a matter of Environmental Governance. Such a concept refers to the «establishment, reaffirmation or change of diverse institutions in order to manage the use of environmental resources and to solve conflicts over resources» (PAAVOLA, 2011: 17). In and beyond the Kyoto Protocol, adaptation to climate change is thus considered to be led and determined by (global and local) institutional factors such as resources, structure and participation of institutions, human and social capital. «This rational, instrumental approach assumes that if knowledge levels are sufficient, if resources are available, and if the benefits of reducing vulnerability to a changing climate are larger than the costs of adapting, then adaptive measures will be taken» (INDERBERG, 2011: 2). Nevertheless, experience points out that such measures often are either not implemented or fail. Here comes the question: why are these adaptive measures not accomplished? What barriers to adaptation have been neglected?

2.5 A definition to barriers to climate change adaptation

As mentioned in the Introduction, a good and rather simple definition of barriers to climate change adaptation is that offered by BIESBROEK (2011). According to the scholar, «barriers are those factors and conditions that hamper the process of developing and implementing climate change adaptation» (BIESBROEK ET AL., 2011: 1120-1121). In general, many scholars of adaptation have identified a large number of different barriers and numerous case studies have been carried out both on a global and local scale in order to classify and diagnose the barriers that could impede the governance process of comprehension, development, planning and performance of climate change adaptation measures and policies (BURCH, 2010a; MOSER & EKSTROM, 2010; MEASHAM ET AL., 2011; BIESBROEK ET AL., 2014).

According to MOSER AND EKSTROM (2010), barriers arise either from the actor, from the larger context or from the system at risk where the actors lay, and can be overcome by individuals or groups with concerted efforts, social support, creative management, innovative ways of thinking, political will and reprioritization of resources, land uses and institutions. According to EISENACK ET AL. (2014) barriers are specific obstacles to

specified adaptive measures in a given context, requiring specific needs in order to be overcome or avoided – in this sense, barriers are not static, but change over time and context (EISENACK ET AL., 2014).

However, WEYRICH (2016) provides a useful categorization of barriers, which helps us classify the numerous list of barriers into smaller clusters, summarized in Table 1.

Table 1. Main types of barriers to climate change adaptation and their references. Source: Weyrich, 2016: 34.

| Type of barrier | References |
|---|--|
| Conflicting timescales and conflict of interests | <ul style="list-style-type: none"> - Long term changes in the climate system (Biesbroek et al., 2011) - Uncertainty about the nature of risks (Eisenack et al., 2014) - Divergent timeframes, needs, and priorities (Huggel et al., 2011; Measham et al., 2011) |
| Leadership | <ul style="list-style-type: none"> - Lack of effective leadership (Moser and Ekstrom, 2010; Burch, 2010b) - Local leadership VS other levels of leadership (Measham et al., 2011; Moser and Ekstrom, 2014; Eisenack et al., 2014) |
| Resources | <ul style="list-style-type: none"> - Problematic or lacking financial, technical, and human resources (Moser and Ekstrom, 2010 and 2014; Burch, 2010b; Biesbroek et al., 2011) |
| Science | <ul style="list-style-type: none"> - Lack or inaccessibility of information (Biesbroek et al., 2011; Measham et al., 2011; Mahammadzadeh et al., 2013) - Lacking scientific understanding (Ekstrom and Moser, 2014) |
| Communication and awareness | <ul style="list-style-type: none"> - Lack of social and public communication and awareness about the problem, solutions and their implications (Biesbroek et al., 2011; Moser and Ekstrom, 2010 and 2014) - Different understanding (Huggel et al., 2014) |

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- Regulatory barriers (Burch, 2010b; Moser and Ekstrom, 2014)
- Institutional fragmentation (Biesbroek et al., 2011; Koppenjan and Klijn, 2004)
- Institutional void (Hajer, 2003; Biesbroek et al., 2011; Measham et al., 2011)

2.6 The literature on institutional barriers

For the specific purpose of this paper, I drove my interest towards those factors emerging as institutional barriers. In fact, if there are institutional barriers to adaptation, institutions must have a role in creating barriers to adaptation. Further, the critical role of institutional change as a way to promote or overcome barriers to adaptation has been often argued in numerous findings of the climate change literature. As mentioned in the first chapter, such findings suggest that adaptive strategies unequivocally act upon, and change with, changes in both formal structure and/or cultural norms.

Thinking of the adaptation cycle as a process divided into three main phases (i.e. understanding or problem detection, planning or development of option, and managing or implementation of selected option), MOSER AND EKSTROM (2014) have classified barriers by stage. Finally, they found out that institutional barriers arise especially during the planning phase.

Three types of institutional barriers, however, are the most mentioned by the public administration literature. These are related to the concepts of regulatory barriers (BURCH, 2010b; EKSTROM AND MOSER, 2014), institutional fragmentation (BIESBROEK ET AL., 2011; KOPPENJAN AND KLIJN, 2004), and institutional void (HAJER, 2003; BIESBROEK ET AL., 2011; MEASHAM ET AL., 2011).

While the first type of institutional barrier has been already clarified in the first chapter through the analysis of EKSTROM AND MOSER (2014) and BURCH (2010b), the concept of **institutional fragmentation** in particular seems to appear as a persistent barrier in most of case studies, as many adaptation strategies depend on the interaction of different social sectors and policy levels, from local to global. As argued by BIESBROEK ET AL. (2009: 6), «Complex policy problems that include multiple levels and actors, types of policies at various policy arenas and within different policy games are characterized as highly

fragmentized decision-making processes. Within one policy game, actors can have different worldviews, diverging interests and goals, conflicting identities, autonomies and responsibilities». Institutional fragmentation arises then as a barrier as it involves a lack of connection among institutions, organizations, individuals and policies. Responsibility is thus divided across different organizations and decisions have to be made at different levels, with negative consequences for some sectors of governance (BIESBROEK ET AL., 2009).

The second type of barrier, related to **institutional void**, requires instead a more careful explanation, as it may be misunderstood as a lack of treaties and laws. A clear definition of the concept comes from HAJER (2003). As explained by the author, policy making often takes place in an institutional void, or a political space where the action comes about next or across the existing institutions. In such a case, a double dynamic occurs, according to which actors do not only deliberate to solve a situation, but, while deliberating, they also negotiate new institutions, develop new norms, and legitimate the political intervention (HAJER, 2003). This happens due to a “discrepancy between the existing institutional order and the actual practice of policy making” (HAJER, 2003) – in other words, due to variety of reasons (or barriers) that make the current institutions unable to solve problems, by doing so giving birth to a new political space. In the specific case of climate change strategies, an institutional void may emerge when the existing formal legislation does not include adaptation as a measure, thus creating misunderstanding and more difficult communication (BIESBROEK ET AL., 2011).

2.7 A categorization by JANTARASAMI ET AL. (2010): a specific case study fitting EXPO 2015

The aim of this research, however, has been to study the institutional change as a way of addressing institutional barriers with specific reference to Expo 2015 and the effect of the special Expo 2015 Legislative Decree on the realization of the Moving Forest.

In this sense, the study of JANTARASAMI ET AL. (2010) fits particularly to the purpose of this research, as their analysis of several adaptation plans and acts in the US at regional and national level seems to gather the same institutional barriers appearing during Expo 2015 in Milan, together with all the main concepts of institutional barriers already taken into account by the literature mentioned above.

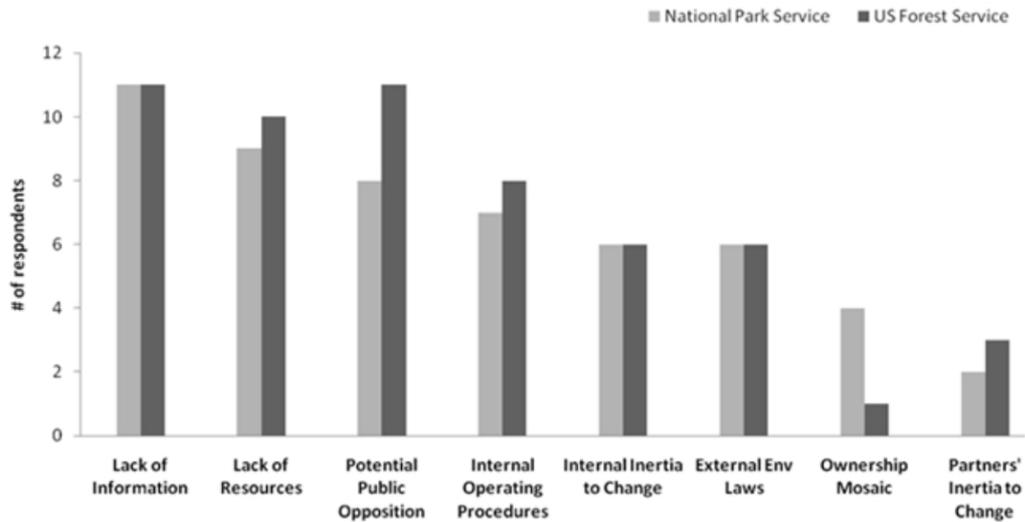
As argued by JANTARASAMI ET AL. (2010), despite the emerging focus on adaptation at a national level, most times there is no success of implementation at the regional and individual unit level. I will define this unit level as municipality. At municipality level, activities related to climate change are not required by rules and, hence, not felt as norms to accomplish. JANTARASAMI ET AL. (2010) explain this lack of successful implementation as related to legislation, organization, and policy barriers. Like within the institutional void of HAJER (2003), short planning horizons and reliance on historical trends at the policy making level may open conflicts between current legal requirements and new management approaches recommended for adaptation. Results of the surveys conducted by JANTARASAMI ET AL. (2010) demonstrated that people perceived internal policy mandates (written policy directions from upper management to implement adaptation projects) as enablers for adaptation. Meaning that the absence of such mandates may be felt as barrier. Other barriers were the internal inertia to changing traditional institutions and resource management (something again relating to institutional void), and most of the internal operating procedures. As it seems to happen in the Expo case, and as already highlighted by BURCH (2010b), administrations often operate within traditional system of job descriptions and standardized procedure. Such bureaucratic rules make it complicated to react fast to changing environment or policy directive (JANTARASAMI ET AL., 2010).

Institutional barriers appeared clearly in the perceptions of agency staff and managers of six units of the two largest federal land holders in Washington State, namely the NPS (National Park Service) and the USFS (US Forest Service), where JANTARASAMI ET AL. (2010) conducted their research. As the authors stated, both the NPS and the USFS are examples of highly institutionalized agencies that «resist change because the rules and norms governing individual behavior serve to maintain the status quo» (JANTARASAMI ET AL., 2010: 2). In particular, «in such agencies, policy directives that merely enable staff to pursue certain activities, such as climate change adaptation plans and projects, may not encourage staff to do so because these activities are not required by rules, and may not be understood as a priority by norms» (JANTARASAMI ET AL., 2010: 2).

Table 2 introduces the breadth of barriers categories declared by the interviewees consulted by JANTARASAMI ET AL. (2010). Following this table is a discussion of the most

critical strategies that, in this regard and according to the authors, could help overcome such barriers within the NPS and USFS context.

Table 2. Interviewee responses regarding barriers to implementing adaptation in Jantarasami et al. (2010). Source: Jantarasami et al., 2010.



The first three categories (lack of information, lack of resources, and potential public opposition) are defined by the authors as ‘input constraints’, meaning that an insufficient knowledge on climate change impacts, insufficient capital resources, and perceived insufficient support from external stakeholder groups might interfere with, delay or even obstruct the adaptation projects (JANTARASAMI ET AL., 2010). This suggests that the barriers firstly perceived by the interviewees are not strictly institutional, since only the following five categories (namely: internal operating procedures, internal inertia to change, external environmental law, ownership mosaic, and partners’ inertia to change) deal more properly with institutional issues. And yet, when participants were asked what it would take to move forward in the face of the barriers they identified, the majority (81% of total) stated that «internal policy mandates and formal agency rules regarding implementation of environmental laws needed to be changed to become more dynamic, flexible, and accommodating of adaptation» (JANTARASAMI ET AL., 2010: 9).

It may be useful at this point to clarify what JANTARASAMI ET AL. (2010) meant exactly when classifying those five institutional categories. As explained by the authors, Internal Inertia to Change and Partners' Inertia to Change refer to difficulty in changing the traditional ways of thinking about resource management, within both the agencies

themselves and their partner agencies. Internal Operating Procedures deals with agencies' formal rules and long decision-making processes; while External Environmental Laws concerns the existing legal constraints. Finally, Ownership Mosaic applies to existing ecosystem boundaries spanning multiple jurisdictions with different rules and management objectives.

The results show that the means for overcoming such barriers to adaptation relate mostly to legislation, hence institutions. First mean to do so, as stated by JANTARASAMI ET AL. (2010), would be to establish clear policy mandates to allow staff to focus on their single issues. When, on the opposite, such formal divisions of labor are lacking, and there is neither an explicit internal mandate nor delegation of authority and responsibilities, unit-level staff may be unable to develop plans and projects outside their management authorities. As a matter of fact, «the slow adoption of climate change adaptation at the individual unit level is not surprising given that the NPS and USFS have long operated through a traditional system of hierarchical authority, well-defined job descriptions, and standard operating procedures. These bureaucratic rules make it difficult to respond quickly to changing environmental problems, external laws, and internal policy directives» (JANTARASAMI ET AL., 2010: 13).

2.8 Summary

Chapter 2 has shown the theoretical framework this thesis relies on. In particular, it has been considered important to explain the concepts of climate change adaptation, institutions, and institutional change, as they represent the very basis of this research. The chapter also explained that, within the literature taken into consideration, the study from JANTARASAMI ET AL. (2010) appeared to be the most fitting to the purpose of this research. In fact, JANTARASAMI ET AL. (2010) had the merit to identify the same barriers I expect to find in *Moving Forest* and *Vertical Forest*. These institutional barriers have been categorized by the authors as: Internal Inertia to Change, Partners' Inertia to Change, Internal Operating Procedures, External Environmental Laws, and Ownership Mosaic.

3. CASE STUDY

3.1 Introduction

While Chapter 2 described the theoretical basis of this thesis, Chapter 3 is going to illustrate the two case studies taken into consideration. The first one, the Moving Forest, found its general context within the wide event Expo 2015. In preparation of the event, the Italian Government issued a special law, the so-called Expo 2015 Legislative Decree, which replaced the previous institutional framework, by so doing creating the condition for the institutional change as explained in the previous chapter. The second case study, the Vertical Forest, serves instead mostly as a counterpart to show how institutional barriers have been overcome during Expo 2015.

3.2 Expo 2015

3.2.1 The history of Expo

The vein of this research finds its context in Expo 2015, the universal exposition hosted in Milan, Italy, whose main theme was *'Feeding the Planet, Energy for Life'*. As DELL'OSSO (2008) tells us, the term Expo has been adopted by those exhibitions recognized and established by the Bureau International des Expositions (referred to as 'BIE' from now on) and hosted for six months by a single organizing country, where many nations and international organizations take part. The hosting country is also choosing the theme, or title, of the event itself (DELL'OSSO, 2008).

As specified by BIE's protocol in 1988: «An exhibition is a display which, whatever its title, has as its principal purpose the education of the public: it may exhibit the means at man's disposal for meeting the needs of civilization, or demonstrate the progress achieved in one or more branches of human endeavor, or show prospects for the future» (DELL'OSSO, 2008). The event is in fact meant to be a showcase for the participating countries, an overview of cultures and peoples around the world, a container of ideas, experiences and stimuli matching the respective theme. The very first Expo was held in London in 1851. Since then, 34 Expos have been organized.

3.2.2 The theme of Expo 2015

The 2015's title '*Feeding the Planet, Energy for Life*' was not fortuitous. Expo 2015 gathered those themes already discussed during the previous exhibitions and translated them in light of the new current global scenario: a major global economic crisis, climate change threats, and challenges of poverty and hunger worldwide. The theme was meant to address the major problems of sustainable development and nutrition as vital energy for the planet, meaning: food safety, to ensure the genuineness of food through strict controls, and food security, or the guarantee for everyone to access the foods and water needed for their own needs (VITALIANO, 2015).

3.2.3 Composition of the exhibition site in 2015

Looking at Expo 2015 more in practice and in its physical dimension, the exhibition site of the event was located in the northwest neighborhood of Milan, on a stretch of land adjacent to the Fair complex in Rho-Pero, covering an area of circa 110 hectares once occupied by industrial edifices.

In occasion of the event, the site has been divided into four macro areas and several micro areas with pavilions, namely: the participants' lots, the thematic areas, and the event areas. 137 nations and 4 international organizations (ONU, European Commission, Caribbean Community, and Pacific Isles Forum) took part at Expo 2015, either in stand-alone pavilions or within larger pavilions. Numerous attendees decided to build their own pavilions in autonomy, i.e. using those lots made available by the organizers to create their personal exhibition structure. In fact, Expo 2015 offered about 170,000 m² dedicated to the lots of national pavilions' building, each one between 500 and 5,000 m² big. A total of 62 lots were available and, among those, 53 pavilions were self-built, including for instance Austria, Israel, Japan, and Vatican City (VITALIANO, 2015). While building their own pavilion, however, countries were required to comply with the "30% rule", intended to devote at least 30% of the entire space to open-air or green areas. They were required, also, to pay attention to recyclable materials, renewable resources, and to include food-catering areas within their batch, developing a proposal coherent with the theme of the exposition (VITALIANO, 2015).

Besides the self-built lots, 9 collective clusters have been created within the exhibition site for countries sharing common agricultural and rural features, hence developing the

same theme (like agricultural and nutrition in barren lands, bio-Mediterranean countries, spices, or cereals and tuberous lands).

3.2.4 Genesis and administrative setting of Expo 2015

Regarding the genesis of the Expo 2015 site, different phases can be identified. The initial concept plan for the exhibition area was presented on September 8, 2009 by the architects Stefano Boeri, Richard Burdett, Mark Rylander, and Jacques Herzog. The master plan was then delivered in April 30, 2010 to BIE, that approved Stefano Boeri as the coordinator of the final project. Event management was entrusted to the company Expo 2015 S.p.A. held by the municipality of Milan; Province of Milan; Lombardy region; Ministry of Economy and Finance; Milan Chamber of Commerce (VITALIANO, 2015). Chief executive officer of the company was Giuseppe Sala, voted major of Milan in 2016.

Expo 2015 S.p.A. was created by a notarial act in December 1, 2008 in Milan, as an implementation of the so-called Berlusconi IV Government Expo Decree, which included the creation of a management structure for Expo 2015. Activities of the company were, among the others, management of the event, and planning and assignment of the finances for the essential works.

However, an illegal shadow seems to have characterized the organization of the event, as for long time the Italian news talked about criminal association and fraud involving the high administration of Expo 2015 S.p.A., low working conditions of the personnel, links between mafia organizations and political leaders in charge of managing the event. The judicial affair has not yet come to an end though, and it is thus complicated, in this regard, to express a criticism to the implementation of Expo 2015 (Reuters, 2016).

3.3 The Moving Forest

During Expo 2015, specific topics concerning global emerging matters arose as a subject of discussion and new projects: not only food security, but also agricultural supply-chain and biodiversity. In the framework of the event, the city of Milan experienced the emergence of a landscape project and new massive nature-based infrastructure realized across the Expo area: the so-called *Moving Forest*, meant to be part of the general theme “Feeding the planet, Energy for Life” as the expression of the relationship between man and nature, especially how nature reacts to human stresses and activities.

The Moving Forest consisted of different landscapes (some more natural, more agricultural or urban) and over 12.000 trees on a surface area of 300.000 square meters. The plants have been grown in advance in nursery gardens and in such a way that made it possible to move them in any moment – hence the name of the Forest. «Oaks, poplars, ash trees, hop hornbeams, bird cherry trees, field maples [...] were transported here in the air-pot containers in which they had been grown, thus reducing the stress of transplanting and avoiding damage to the root system» (ZAGARI AND SELLERI, 2015: 33).

The Moving Forest splits into two main areas: the Perimeter and the Piastra. The Perimeter was the external forest around the exposition city, a project aiming basically at solving the urban planning and infrastructural situation of the Fair complex of Rho-Pero. In fact, this used to be a so-called ‘territory of waste’, little valued due to the vast degradation caused by fences, accumulation of waste, precarious roads, and only very limited green arenas.

The Piastra was divided into 7 sections:

- Inner green ring: the soil has been rendered uneven to increase the screening capacity and water stagnation. It hosts different plants (shrubs, flowers, higher trees) to increase biodiversity;
- Tree rows;
- Phyto-purification pools: consists of 11 pools for purifying first rainwater and surface runoff water, by so doing mitigating pollution;
- Large piazzas;
- Small piazzas: trees create coolness for special events;
- Hortus: 25.000 m² of vegetable gardens with focus on shadow and coolness;
- Mediterranean hill: plants are laid out according to sunlight.

3.3.1 The Moving Forest as a measure of climate change adaptation

The Moving Forest project can be considered as a nature-based solution to environmental issues, considering also that it was conceived for the after-Expo as well, with the aim of mitigating a heavily degraded area and enhancing the biodiversity.

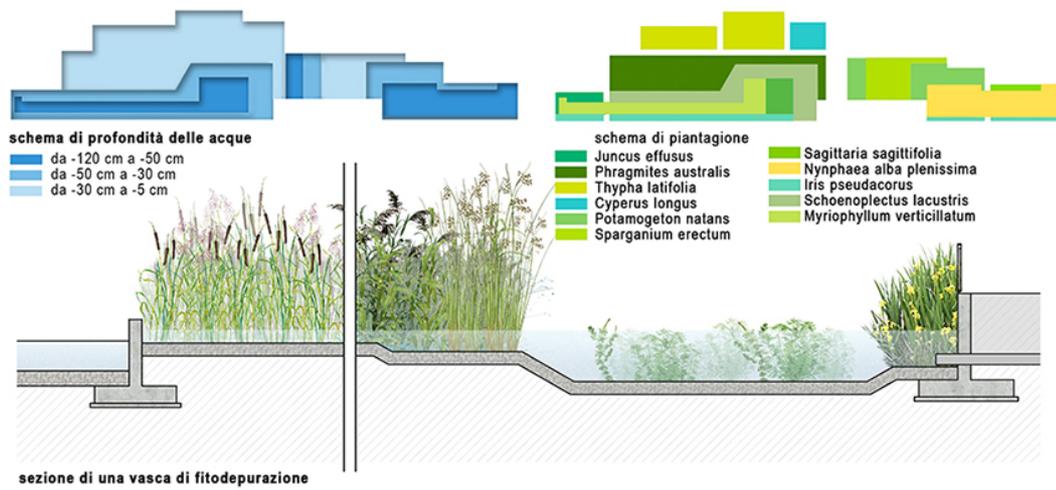
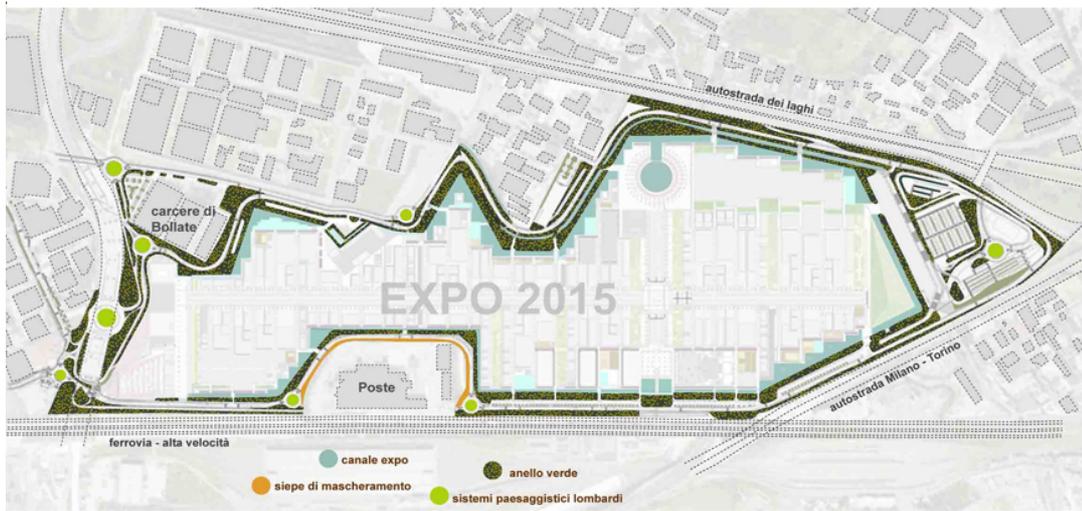
The Expo 2015 Legislative Decree (which will be treated further in the next pages) openly claims that «the environmental sustainability of Expo 2015 is guaranteed by CO₂

emissions compensation during the preparation and realization of the event as well as, in non-temporary buildings, by energy performance and heat coverage, electricity and cooling consumption through renewable sources above the minimum required by law» (Legislative Decree No. 43, Art. 5). This specific element of the law suggests that the Moving Forest plays an important role in order to compensate for environmental shortages of other aspects of Expo (i.e. the temporary buildings) in terms of, for example, heat balance. Hence, during Expo, the beneficiaries of the ecological effects of the Moving Forest were all the visitors of the event, as the Moving Forest contributed to the cooling of the entire area. Furthermore, since the Moving Forest is a permanent infrastructure, we can assume that also in the future the area will be benefitting from its ecological effects.

The Moving Forest can be considered not only as an urban regeneration measure framed within the spirit of the general theme of the event. In fact, above all, its principle may have direct beneficial consequences on the environmental conditions of the Expo area, due to the ventilation and ecological effects it brings along.

Within the site, a park and recreational area for events in the after-Expo were also created, providing new possibilities for the residents and tourists – thereby showcasing an ecological approach that can be replicated elsewhere (ZAGARI AND SELLERI, 2015). For instance, some of the nature-based solutions developed within the forest, like the sections of the Small Piazzas or the Hortus, with its 25.000 square meters of vegetable gardens and trees, have been conceived and developed according to the cooling effect plants may generate. Benedetto Selleri, architect of the Moving Forest, explains that the first idea of the masterplan was based on a system of large greenhouses reproducing the climates of the world (ZAGARI AND SELLERI, 2015). The presence of specific species of trees and shrubs resulted being critical, especially when linked to the creation of humid ecosystems. «They play an important role ecologically which is even more significant in urban environments, since the fruits of some of these species are much sought after by birds. The forest is also characterized by the presence of bird nests, bat-houses for chiropters, and tree-habitats for increasing biodiversity» (ZAGARI AND SELLERI, 2015: 52).

Following Images 1-8: images of the Moving Forest, both Perimeter and Piastra. Source: Panassociati.







3.4 Expo 2015 Legislative Decree

As mentioned in the Introduction, on April 26th, 2013, the then Italian Prime Minister Enrico Letta signed and issued the Legislative Decree No. 43 named *‘Urgent measures for the revitalization of Piombino industrial area, in favour of environmental emergencies, of the earthquake zone of May 2012, in order to accelerate the reconstruction in Abruzzo, and for the realization of interventions of Expo 2015’*.

In particular, Article 5 of the Decree – *‘Measures to quicken up the realization of Expo 2015’* – was strongly invoked by the President of Lombardy Region Roberto Maroni and by the Mayor of Milan Giuliano Pisapia. Through this Article, a series of new institutional mechanisms have been set in motion for Expo 2015 to come about, which modified the previous institutional setting. Among these mechanisms, the creation of a new Sole Commissioner, appointed by the Italian Prime Minister as Giuseppe Sala, unified the pre-existing figures of the special Government Commissioner with that of the General Exhibition Commissioner², in this sense going in the direction of a greater effectiveness, efficiency and speed in delivering Expo 2015 on time.

² Five years before, the Decree-Law No. 112/2008, Art. 14, had appointed Letizia Moratti as the Extraordinary Commissioner for urgent preparatory work. Following the resignation of Letizia Moratti, with D.P.C.M. On August 5, 2011, until December 31, 2016, Giuliano Pisapia was appointed as new Extraordinary Commissioner of the Government, whereas Roberto Formigoni as a General Commissioner for the Expo 2015. The special Expo Legislative Decree mentioned above changed this situation. To the new Sole Extraordinary Commissioner for Expo 2015 were therefore assigned all the powers and functions that were already conferred to Letizia Moratti first, and later on Pisapia and Formigoni (NARDUCCI AND NARDUCCI, 2015).

In particular, the Extraordinary Commissioner was authorized to take over all necessary steps to ensure the availability and functionality of the Expo areas as required by BIE. The Commissioner's provisions were allowed to replace any law, agreement, opinion, intent, omission, authorization or concession, or acts and measures falling within the competence of state, regional, provincial and municipal bodies (Italian Parliament, 2013).

3.4.1 An excursus on Italy and the establishment of Extraordinary Sole Commissioners

A short excursus on the Italian use of the figure of the Extraordinary Sole Commissioner is probably needed. In fact, the special commissioner, according to the Italian law, is an official role appointed by the government to address urgent or extraordinary assignments by centralizing or increasing one's powers and action. Article 11 of Law 400, 1988 clarified first the conditions for the appointment of special commissioners of the government: "to achieve certain specific objectives in relation to programs or guidelines approved by the Parliament or the Council of Ministers or special temporary requirements of operational coordination between public administrations".

Too often, though, such figures have been created as the only mean to the malfunctions of public administration.

It is significant, in this regard, a note from the Court of Auditors in 2001, stating that «The question of the Special Commissioners may have indirectly encouraged the continuation of land-locked cases», as reminded by the Italian TV program 'Report'.

With no doubts, in fact, the creation of an extraordinary commissioner is a symptom that the ordinary administration is not working well. When procedures get too long and complicated, then these commissioners find their specific reason to be, as a solution "on-the-run". In this sense, there have been special commissioners for everything: major events and disasters, infrastructure and social hardships, theatres and parks. The reasons for such a measure include usually emergency situations, unreliability or expiration of officials, need of special skills, or political expediency. The range is wide, but nevertheless does not find more space in the context of this research.

3.5 The Vertical Forest

As said in chapter one, Vertical Forest consists of two residential towers housing 900 and over 20,000 plants and shrubs in the Milanese city center. The maintenance and replacement of all plant material are centralized, while the calculation of irrigation requirements was carried out by examining the climatic and diversified characteristics based on the exposure and the vegetation distribution.

Like for the Moving Forest, also for Vertical Forest beneficiaries of its ecological effects are the direct users of the facilities – i.e. citizens and tourists living in the adjacent areas where the two Forests are located, besides, of course, to whom will want to use the knowledge derived from the effects of the such projects.

The specific idea behind the Vertical Forest, as expressed by his creator and architect Stefano Boeri, was that the impact of such projects in cities and international community could foster the discussion on daily life all over the world, so that to conceive «new skylines of the future» (<https://www.stefanoboeriarchitetti.net>). In fact, in November 2014, the Vertical Forest won the International Highrise Award, prize awarded every two years to the most innovative skyscraper in the world.

3.5.1 The Vertical Forest as part of Porta Nuova Regeneration Project

The Vertical Forest is part of a much wider urban regeneration project: Porta Nuova Project. The project aimed at the upgrading of the whole Milanese area of Porta Nuova, which has led to the completion of Unicredit Tower in recent years, to the construction of Gae Aulenti square and to the improvement of Corso Como.

The construction of the Porta Nuova complex began in 2005 and its execution lasted for about a decade, ending up with the realization of twenty buildings between skyscrapers, offices, cultural centers, urban villas, as well as bicycle and pedestrian routes, and new subway lines. The project, approved in 2004, has been handled by US Hines Real Estate and the Italian headquarters Hines Italia Sgr led by Manfredi Catella, whose shareholding also included the 18% owned by the entrepreneur Salvatore Ligresti.

Image 9: Vertical Forest. Source: LaPresse, Claudio Furlan.



Image 10: Vertical Forest. Source: philippespagnoli.com.

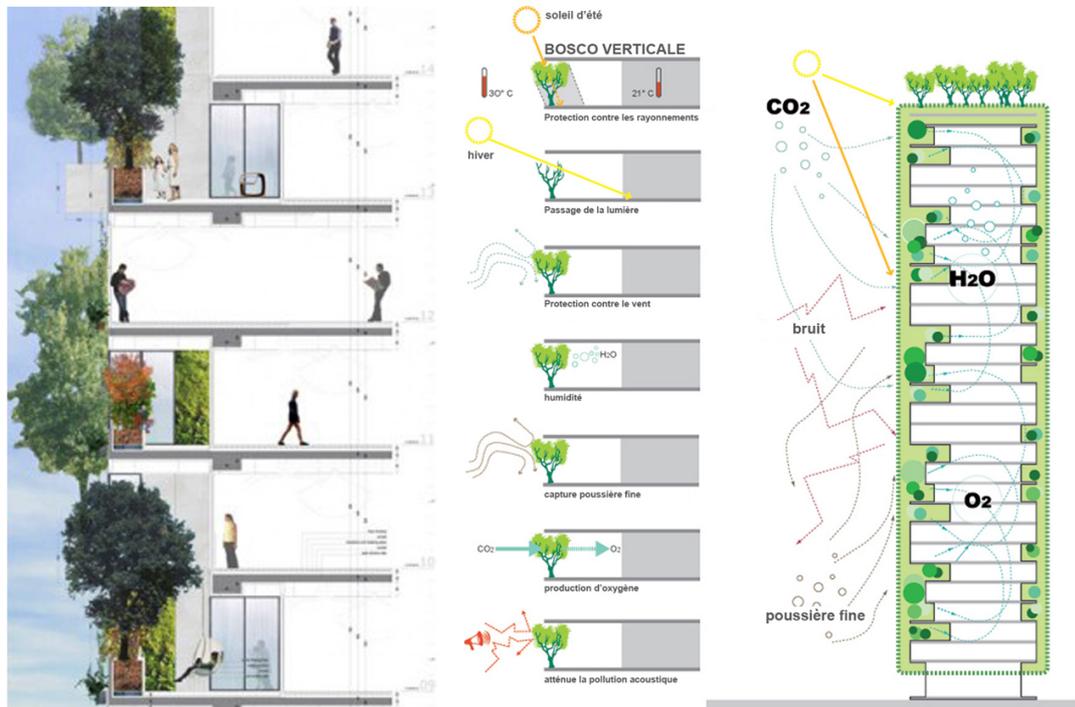
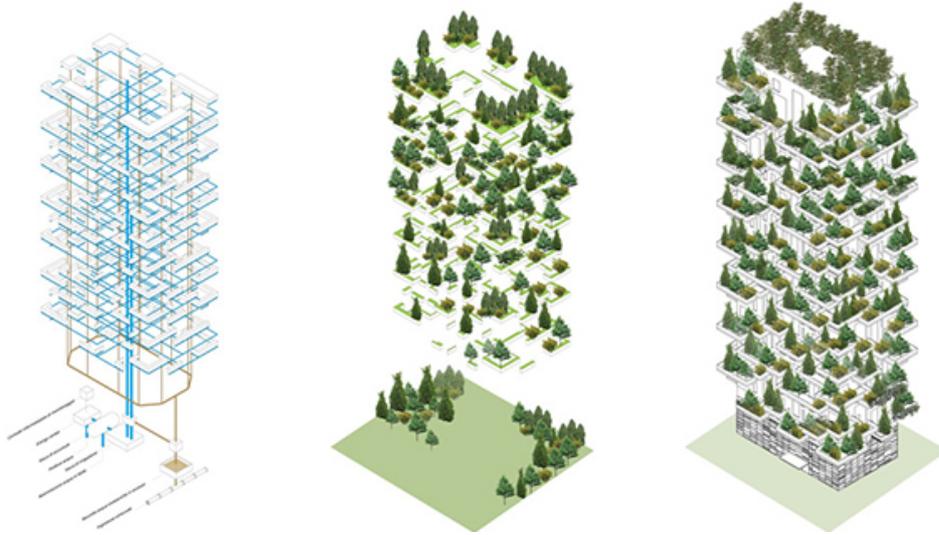


Image 11: Vertical Forest. Source: Forgemaind archimedia photostream.



On 27 February 2015, after almost seven years of crisis, the Qatar Investment Authority (QIA), which already owned 40% of the Porta Nuova Project, acquired the remaining 60% of the funds, as reported by the newspaper *Il Sole 24 Ore* (2015). As mentioned by the newspaper in a different article, «the works for the construction of the two towers designed by the architect Stefano Boeri has been stalled for a few weeks, in the heart of the transformation area of Porta Nuova - project developed by Hines. The real estate colossus from Texas, whose Italian company administered by Manfredi Catella manages the real estate development project, confirms that the firm to which the work was entrusted has given up for economic reasons» (*Il Sole 24 Ore*, 2013).

Today, «the price per square meter for each apartment in the Vertical Forest starts from 7 thousand euros. Already sold 60% of the units sold since the beginning of the placement, for an average value of 9 thousand euros/meter. The average units sold in the two towers in 2012 is 170 square meters. 75% of buyers are residents of the historic Milanese city center» (*Il Sole 24 Ore*, 2012).

3.6 The actors of the Moving Forest and the Vertical Forest

It may be useful, before getting to the next chapter, to introduce the reader to the names of the main actors involved in the realization of the two Forests. In this way, it will be easier to understand the stakeholders chosen for the interviews following the case study analysis.

- Metropolitana Milanese S.p.A. (MM S.p.a.): joint-stock company controlled by the Municipality of Milan. Created in 1955 to design and build subway lines in Milan, they became a leader in Italy in the field of civil engineering, urban and extra-urban planning, tram and railway lines. For Expo 2015, they took care of the planning of main urbanization works, management and safety coordination during the event, and dismantling, besides dealing with BIE timelines and budget compliance. (<https://www.mmspa.eu>);
- Expo S.p.A.: company of total public ownership (capital is divided between Ministry of Economy and Finance, Municipality of Milan, and Lombardy Region) in charge of the realization, organization and management of Expo 2015. Born in 2008, the company was closed down in 2016. As defined by the Decree 22/10/2008, the company: organized and managed the event itself, the detailed financial plan of the essential works, and the technical and administrative offices. (www.expo2015.org);
- PAN ASSOCIATI: private company working in the field of bio-architectural landscape design and territorial redevelopment. Founder of the company was Benedetto Selleri, who designed the Moving Forest and built it in collaboration with different utility companies. (<http://www.panassociati.net/>);
- Boeri Architect Studio: private company working in the field of architecture and urban planning. The Vertical Forest of Milan has been one of their best-known projects;
- ZH General Construction Company S.p.a. and Colombo Construction Company: they took care of the construction of the Vertical Forest. Colombo replaced ZH when the company abandoned the project due to financial problems;
- Municipality of Milan and Lombardy Region: they have been critical stakeholders in the governance of the realization of both projects. While they partly share the ownership of the Moving Forest, the Municipality was the only owner of the Vertical Forest.

3.7 Summary

Chapter 3 has hopefully introduced the reader to the two case studies of this thesis, while building a connection to the theoretical framework of Chapter 2. As showed, the implementation of the Moving Forest through the Special Law involved the partial repeal of certain rules and norms. This repeal did not occur for the Vertical Forest, as no special

law was issued in that case. Starting from the basic hypothesis that institutional barriers always occur, it is clear that such barriers have been overcome by the special Decree in the Moving Forest case. In this sense, we can say that we have '*barriers + law*'.

Contrary to this, for the Vertical Forest we have *only barriers* and actors left alone in dealing with such barriers. Such barriers appear to be less clear, as no law clearly addressed them. Nevertheless, we can have a sense of the existing problems through the story of the project itself. It is mostly about financing issues and delays in the completion. Such barriers account for a link with the literature reviewed in the Chapter 2.

For this research's line of argument, we want the Vertical Forest to show what it means to carry out adaptation measures under baseline conditions, with all the bureaucratic hurdles that are involved in this sort of situations. At the same time, we need the Moving Forest to prove whether doing what the special Decree did is helpful in removing such hurdles. This will be proved in the next chapter.

4. METHODS

4.1 Introduction

This chapter explains the methods employed to conduct the empirical research. Qualitative data collection through a literature review, a case study comparison and semi-structured interviews were the main methods used to answer the research question and objectives of this study. In general, the research design was developed considering the current caveats of climate adaptation and its institutional barriers mentioned in the previous chapters. The aim was to understand the role of institutional change as a way to address institutional barriers to adaptation by bringing together perspectives from various stakeholders in the field. In order to address these goals, a specific methodology was developed on the basis of a combination of case study qualitative techniques as following. First of all, a research question was developed along with specific objectives. Secondly, within each case study (Moving Forest on one side, Vertical Forest on the other side), a proposed method for stakeholder analysis was applied consistently, thereby allowing for the comparison of results and a better understanding across the cases. For data collection, guideline-based in-depth interviews were chosen. Before the interviews themselves, in-person preparatory meetings to understand the stakeholder constellation gave further insights on the arrangement of the final interviews and the selection of respondents.

4.2 On case study methods

According to SCHLUTER (2009), qualitative case study methodologies dominate the empirical research in institutional change. Moreover, qualitative data can help to discover explicit institutional dimensions as well as implicit or intangible factors such as mental models and social norms (SCHLUTER, 2009). However, the two main approaches that guide case study methodology have been proposed by STAKE (1995) and by YIN (2003). Both recognize that one of the advantages of this approach is the close collaboration between the researcher and the participant. This enables participants to tell their stories and views of reality, which helps the researcher understand their action (BAXTER AND JACK, 2008). According to YIN (2003), a key difference with other research methodologies, is that case studies seek to study phenomena in their contexts, rather than being independent from the context. They seek to explore individuals, organizations, or programs, thereby helping deconstruct and reconstruct various phenomena (YIN, 2003).

With regards to the type of case study to be conducted, the methodology allows the researcher to *describe* a case, to *explore* a case, or to *compare* between cases. YIN (2003) and STAKE (1995) use different terms to describe the variety of case studies. In particular, this research employed the following types:

- *Descriptive case study*: used to describe an intervention or phenomenon and the real-life context in which it occurred (YIN, 2003).
- *Multiple case studies*: used to explore differences within and between cases. The goal is to replicate findings across cases. YIN (2003) describes how multiple case studies can be used to either, «(a) predict similar results (a literal replication) or (b) predict contrasting results but for predictable reasons (a theoretical replication)» (YIN, 2003:47).
- *Instrumental case study*: used to accomplish something other than understanding the particular situation where it takes place. It provides insight into an issue or helps to refine a theory, facilitating the understanding of something else (BAXTER AND JACK, 2008). The case is often looked at in depth, its contexts scrutinized, its ordinary activities detailed, and because it helps the researcher pursue the external interest – which is, in this case, the understanding of institutional change in overcoming barriers to climate change adaptation.

4.3 Stakeholder sampling

The qualitative study case research methodology usually demands for some form of qualitative interviewing to contribute to the body of knowledge the study is based on. In fact, the interviewee is called to share rich descriptions of phenomena while leaving the interpretation to the researcher (SBU, 2014). The first step for data collection included therefore identifying the key actors to interview. This entailed selecting people from each of the stakeholder groups which made Moving Forest and Vertical Forest a reality, and which were most likely to contribute with insightful information.

Let us first explore what the literature says in regard to the role of stakeholders. In fact, a better understanding of the stakeholder constellation is much connected to a better understanding of the context of the research. A large body of the literature discusses organizations in terms of stakeholder models. Moreover, it defines stakeholders as any group or individual who can affect or is affected by the achievement of the organization's objectives (FREEMAN, 1984).

According to the definition proposed by FREEMAN (1984), on the one hand, stakeholders are people or organizations who are directly involved and who direct and influence the outcome of a specific system. On the other hand, stakeholders are also those who are affected by such an outcome (FREEMAN, 1984). In this sense, actors belonging to the first group, who are crucial to the system and the organization, can be categorized as primary stakeholders: these are usually employees, management owners, suppliers, sponsors and local communities (FREEMAN, 1984). The second groups are instead classified as secondary stakeholders: competitors, media, government, consumer advocate groups and special interest groups (FREEMAN, 1984).

Stakeholder analysis, together with its various approaches, is often referred to as a useful method to get the understanding of the constellation of the actors involved within a system. For the purpose of this thesis, and to better map the relationship between the stakeholders in order to identify the file rouge of knowledge flow, the Social Network Analysis has served as a reference method for conducting a Snowball sampling technique. This method helped visualize stakeholders and their relationship within and outside of the system.

In fact, a social network incorporates people, groups, and organizations (so-called *nodes of concern*) that are connected by links, according to the social contacts existing among them (HOVLAND, 2007). In this sense, social network analysis is the mapping and measuring of relationships and flows between people, groups, organizations, computers or other information/knowledge processing entities (KREBS, 2012). Snowball sampling simplifies this analysis by turning it into a chain-referral process. As explained by LELEA ET AL. (2014), «Snowball sampling is a method commonly used where initial contact persons are asked for recommendations of people linked to them in their work [...], and where one individual contacted in the research process might assist the researcher with locating others relevant for the research» (LELEA ET AL., 2014: 5).

For this purpose, the following usual key stages were included into the process of Snowball Sampling:

- Identifying the network of people to be analyzed (be this an organization, a team, or a department).

- Gathering background information throughout preliminary interviews.
- Get in touch with crucial actors in the network to identify the relationships and knowledge flows between them.

To gather information about the relationship between actors, preliminary interviews have been used. The responses have been then portrayed into a map. The development of the social network progressed in parallel with the interviews: the more information I was able to get from the first stakeholders, the more connections I could create with successive people and organizations, and the more names I could gather to get in touch with. The matter has been to keep up the flow of information.

Eventually, it was possible to visualize how the actors were connected to each other. The process involved the following organizations: Metropolitana Milanese S.p.A. (MM S.p.a.), Expo S.p.A., the Municipality, the Region, and PAN ASSOCIATI + utility companies on one side; Boeri Architect Studio, again the Municipality and the construction companies on the other side (see Chapter 3 for details on the actors). In addition, enquiries were addressed to several other domain experts (predominantly journalists, consultants and academics) about the state of the art of the works for both the Moving Forest and the Vertical Forest.

4.3.1 Stakeholder constellation in figures

Fig. 2 and 3 try to visually portray the relationships among the several stakeholders in both cases. At the center of each figure, the product finds its place: the Moving Forest on one hand, the Vertical Forest on the second hand. Four main actor groups (or *nodes of concern*) gather around the product. Their participation in the realization of the product is highlighted by the dotted grey line.

The primary stakeholders (Providers, Users/Beneficiaries, and Governance) are circled in blue to distinguish them from the secondary stakeholders (Influencers), here circled in green. Players of these four groups (and names of the organization) are placed next to their identity circle.

Thus, for example, in the Moving Forest map we find that: Managers and Suppliers are the members of the Providers group; Steering Groups, Region, and Municipality are part

of the Governance; Employees and Local Community sit into the Users/Beneficiaries; and, finally, Media, Local Interest Groups and Consultants/Academics are the main Influencers. The red spotted lines indicate the relationship among the stakeholders I had the opportunity to talk to. The direction of the arrow marks the orientation of the flow of information: who knows who, who gave the contact of whom.

Fig. 2 Stakeholders map for Moving Forest. Source: own production.

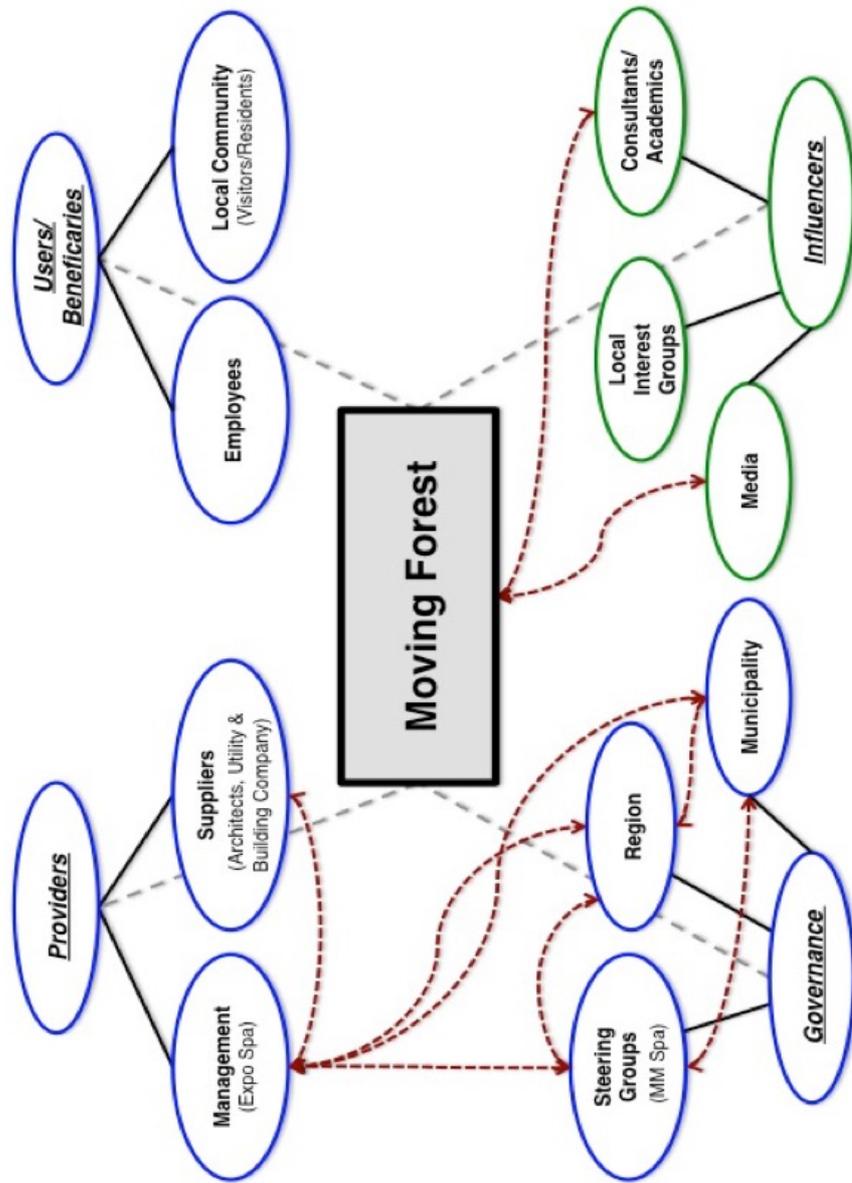
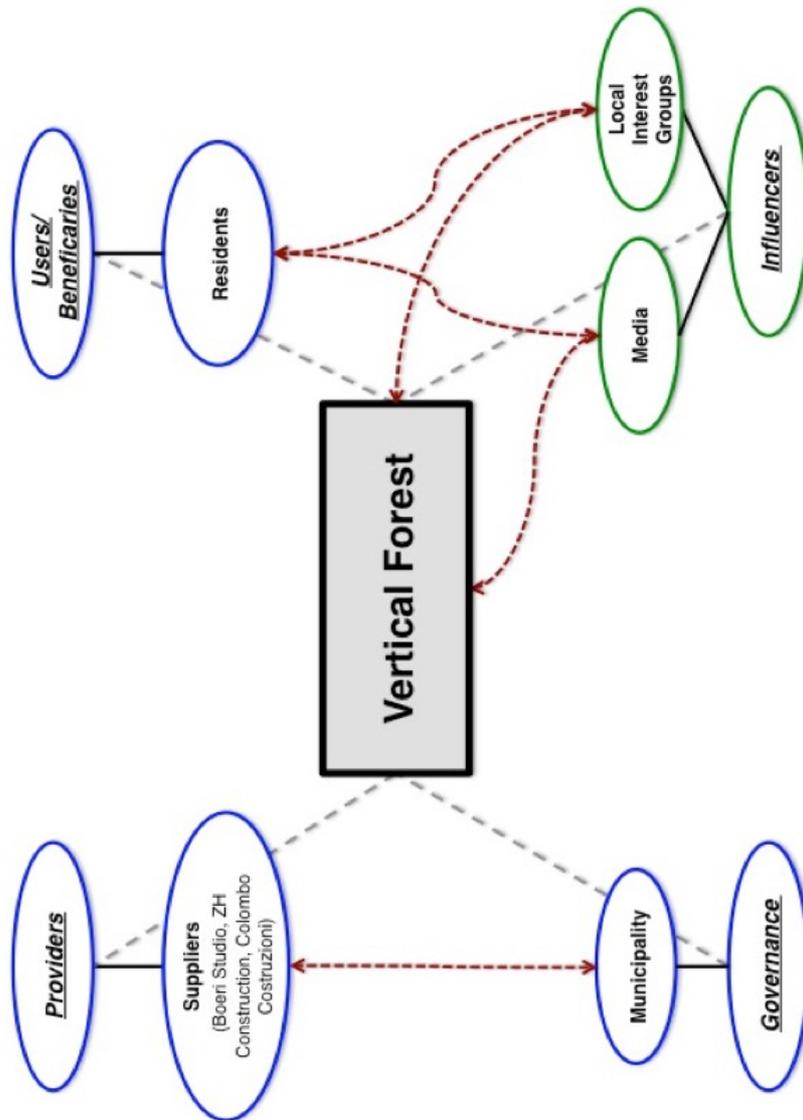


Fig. 3 Stakeholders map for Vertical Forest. Source: own production.



4.4 In-depth interviews

The interviews aimed at understanding how the process of the two projects' implementation changed with and without the special law. This process included both formal interviews as well as informal interviews with employees and volunteers identified through the stakeholder analysis. The interviews were then undertaken based on availability of actors and carried out either face-to-face, over the phone or by email based on the interviewee preferences and availabilities. Questions were prepared in advance based on the interview guideline. During this process, careful translation of the questions and concepts in Italian were cross-checked for equivalence with other official and translated documents in the literature.

Key governance bodies and organizations at a local and regional level were chosen as important stakeholders in the development of institutional arrangements. This included, as a result of the stakeholder mapping, actors from the Milanese municipality, from the Region, from Metropolitana Milanese S.p.A. (MM S.p.a.), from Expo S.p.A. and from the utility companies. In some cases, it was decided internally by the organization which actor within the organization would answer the questions.

Qualitative interviews have been categorized by the literature in a variety of ways, mostly as unstructured, semi-structured and structured (DI CICCIO-BLOOM AND CRABTREE, 2006). However, in the frame of this study, semi-structured in-depth interviews were chosen as an appropriate tool as it offers sufficient flexibility to approach different respondents differently while still covering the same areas of data collection (MOHD NOOR, 2008). Such interviews are important to describe and explain relationships between people and their environment (SBU, 2014). Open-ended questions were used to allow respondents to answer in their own words. This also helped understand how each respondent constructs reality and how they act and make decisions accordingly (SBU, 2014). In fact, there are a number of advantages to using the semi-structured interviews. First of all, they give interviewers some choice in the wording. Secondly, they allow the exploration of the perceptions of respondents and enable probing for more clarification of the inconsistencies within respondents' accounts (HUTCHINSON AND SKODAL WILSON, 1992). Finally, they can be considered as a precious tool for ensuring reliability of the data as they also help respondents recall information for questions involving memory (SMITH, 1992).

The rationale for using in-depth interviews with key stakeholders in the field is based on similar exploratory research in the literature. For example, a study on strategies that might facilitate the transformation of barriers into enablers of action by BURCH (2010a) used semi-structured in-depth interviews with broad open-ended interview guidelines. As mentioned by the author, participants were invited on the basis of three criteria: employment with the municipality under study, involvement in the creation of the contextual policy in the city, and the position in the organizational structure that pertains directly to aspects of climate change or adaptation. The interviews pertained to capacity, climate change action, the success/failure of these actions, organizational culture, structure, and the broader inter-jurisdictional context, and included both explicit and implicit questions that addressed strategies for overcoming barriers. BIESBROEK ET AL. (2014) also used interviews with stakeholders working in the administrative sector in a study barriers to climate change adaptation in the Netherlands. JANTARASAMI ET AL. (2010) conducted qualitative interviews to establish perceptions of barriers to the implementation of climate change adaptation policies among land managers.

Overall results suggested that adaptation is proceeding in some organizational contexts, although many barriers have been observed. Competing priorities and lack of clear governmental roles have already been identified to be substantial challenges associated with climate change adaptation. With this in mind, the above-mentioned studies were used as a guiding tool for the qualitative methods of this research.

4.5 Interview guidelines and their adaptation

An interview guideline allowed to maintain consistency in data collection for comparative purposes, while a series of open-ended questions put up with flexibility for respondents to address themes and topics they deemed important. Based on the theoretical framework, preliminary versions of the interview guidelines were elaborated where a standard description of the project to the potential interviewees was developed. The literature explored helped frame the questions that were asked to the interviewees, so that to allow a merging between barriers found in the literature and barriers identified or just perceived by the stakeholders involved.

Based on the literature review, I intentionally sought distinct subjects with differing primary duties, responsibilities, and decision-making authority to obtain their perceptions about institutional change at different levels. In particular, the interviews conducted were

categorized into two different groups. The first group consists of actors who participate directly in the creation of Moving Forest, while the second group represents actors who took part in the realization of Vertical Forest.

Slightly different interview guidelines were designed to approach the two groups, but both included clusters of questions on: institutional barriers to climate adaptation; the role of the law (or its absence) in overcoming such barriers; personal solutions and attitude towards such barriers, such as:

- *Are institutional barriers significant? Do you recognize them as a problem?*
- *Did any barrier exist in Moving Forest/Vertical Forest? If yes, which one/s?*
- *Have these barriers been overcome by the law? Did the law change the procedures? If yes, how?*
- *What barriers/important aspects existed during the realization of this project that have not been taken into account by the law?*
- *What would it take to move forward in the face of these barriers (without the law)?*

When carrying out interviews, I tried to create a comfortable atmosphere to make the process look as a conversation rather than some formalized procedure. The interviews were also opened with general questions about the interviewee's duties within Moving Forest or Vertical Forest.

4.6 Summary

Chapter 4 presented the materials and methods used to conduct the study and usually taken into account when conducting a qualitative case study. These included the identification of stakeholders through Snowballing sampling and semi-structured in-depth interviews. The interviews followed a general guideline which has been proposed to the two groups belonging to the two different case studies. Preparatory meetings and interviews shed light on the interests and factual constraints of the stakeholders involved both in Moving Forest and in Vertical Forest. The interactions of relevant actors, namely the utility companies, project managers, and politicians, were taken into account and analyzed. This process resulted in a refined understanding of the influence, constraints, and awareness of the stakeholders and the decision-making rules applied across the two projects. Overall, this procedure served to prepare the analysis following in Chapter 5,

which will be presenting the results based on the analysis of the Expo 2015 Legislative Decree, on one side, and on the interviews, on the other side.

5. RESULTS

5.1 Introduction

The overarching objective of this study is to analyze the determinants of institutional change using data collected from the experiences of the Moving Forest and the Vertical Forest. As said, such determinants are based on the analysis of the Expo 2015 Legislative Decree and on the answers obtained during the interviews. In view of the above, this chapter presents two modules. The first one illustrates the legal characteristics of the Decree, which changed the institutional setting existing before Expo 2015. In the second one, the results of the interviews are presented. Both modules relate to an own new barrier classification based on the five categories encountered by JANTARASAMI ET AL. (2010).

5.2 MODULE 1: Results based on the analysis of the Legislative Decree

5.2.1 Introduction to Module 1

As explained by JANTARASAMI ET AL. (2010), the absence of job divisions and mandates and the presence, on the contrary, of slow bureaucratic rules, is unlikely to yield the depth or scale of transformation required to produce an a more sustainable development path following a major step-change or system readjustment.

If we wanted to apply the interviewee responses summarized above to a general daily reality of administering cities, the results would show that the approach to climate change adaptation would not change much if municipal employees had no time or inclination to add additional complex tasks to already over-burdened staff. I did assume, in fact, that the data from JANTARASAMI ET AL. (2010) are capable of pairing with the case of Expo 2015, and in particular with reference to the Expo 2015 Legislative Decree explained throughout the case study chapter of this research.

On the frame of this research's purpose, the Decree has been unpacked into its individual parts. By doing so, I aimed at understanding what barriers this law has addressed and eschewed. This paved the way to the formulation of a first comparison between theoretical barriers assumed by JANTARASAMI ET AL. (2010), and those emerging within the Milanese case.

5.2.2 How do the Expo 2015 Legislative Decree and the literature relate?

By looking at the Decree, its instructions encompass the overall governance of Expo 2015, which means: a) general regulations concerning the relationship between Expo S.p.A. and BIE; b) specific regulations concerning creation and maintenance of the pavilions, and in particular the Italian pavilion; c) specific regulations concerning infrastructures such as highways and junctions to Milan city.

Yet, beyond such an overall governance, some specific directives mentioned within the Law get a notable relevance in relation to the literature on institutional barriers, especially the ones found by JANTARASAMI ET AL. (2010). Among these, the figure of the Sole Commissioner – already mentioned in the case study chapter – stands probably as the most significant one.

As said, the creation of such Commissioner unified the role of the special Government Commissioner with that of the General Exhibition Commissioner, in this sense going in the direction of a greater effectiveness, efficiency and speed in delivering Expo 2015 on time. Among the special powers of the Commissioner, there were: supervisory functions and impulse on the works; possibility of convening the conference services; relationship with the BIE to inform about the status of the works. However, the Commissioner's function and power usually acquire sense within the logic of the creation of his mandate. As a matter of fact, he is called upon to exercise all the powers subject to the mandate, but at the same time he cannot, by law, go beyond any of his specific functions.

In this context, the analysis provided by AVANZINI (2013) on the figure of the Extraordinary Commissioner can be enlightening. As stated by the author, the activity of the commissioner is rather indefinite. As a matter of fact, on one hand his role is only valid within the timeframe required to complete the work, while on the other hand, the measures he adopted during this timeframe do not exhaust their effectiveness at the end of the commissioning phase, but are permanent instead. In fact, «given the broad and not predictable nature of the powers of the Commissioner, he cannot be qualified as a commissioner *ad acta* (namely appointed through the issuance of a specific series of acts). Such qualification, besides being merely descriptive, is with no much value, since the commissioner has a competence that we could define as general, which acquires meaning

only within the mission to which it tends» (AVANZINI, 2013: 66). Therefore, the exercise of the substitutionary powers is rather controversial, since they do not directly account for the emergency or extraordinariness of the situation, but are related to the inability to act in time or to comply with obligations – that characterizes the ordinary administration (AVANZINI, 2013).

The protocol related to the figure of the Extraordinary Commissioner refers to the Legislative Decree No. 67/1997, Art. 13. A precondition for electing a Commissioner is the inertia of the administrations ordinarily in charge of taking the necessary measures to carry out the work. According to the above-mentioned decree, if this is not done within a 45-days period, the Commissioner will replace the ordinary or extraordinary authorities, making use of their pertaining structures.

This reminds not only that Jantarasami's “inertia to change” reappears in the Italian case, but it also provides an explanation of the replacement of the former and first Extraordinary Commissioner for Expo 2015 (Giuliano Pisapia) with the Extraordinary Commissioner for Expo 2015 (Giuseppe Sala).

Indeed, as confirmed by AVANZINI (2013), Art. 13 of Legislative Decree 67/1997 introduced not only a chance for local and regional authorities to get together and to focus on powers. It provided also a principle of genuine cooperation according to which the ordinary administration is not allowed to intervene in the evaluation concerning the actual necessity or appropriateness of the measure taken by the Commissioner with regards to the final objective. As Giuseppe Sala for Expo 2015, any Commissioner has the right to replace the usually ordinary administrations and to be in charge of solving “situations or incidents involving the creation of essential works” or in charge of overcoming obstacles that hamper “the participation of the Member States or the smooth running of the event”. The identification of these conditions, however, is always left to the Commissioner himself.

Law No. 43 of 26 April 2013, Art. 5 modified the governance of Expo by «unifying the figures of the Extraordinary Commissioner for the Government (Giuliano Pisapia) with that of the General Commissioner for the Exposition (Roberto Formigoni), and by

creating the figure of the Sole Extraordinary Commissioner (Giuseppe Sala)» (AVANZINI, 2013: 68).

Giuseppe Sala was therefore appointed in replacement of the previous Extraordinary and General delegates of the Government for Expo 2015. However, in practice, little or nothing changed. There has been no difference of decision-making powers between the various Commissioners, nor a difference regarding the implementation of practical proceedings. Giuseppe Sala has been elected, so to speak, so that to attend Expo 2015 24 hours a day, summing up the two previously separate roles of management and supervision of the event. In fact, Article 5 of the Decree-Law No. 43, 26 April 2013, provided for the establishment of a Sole Delegate Commissioner of the Government in which the functions and powers of Extraordinary Commissioner and General Commissioner would converge. On 6 May 2013, Giuseppe Sala was appointed Commissioner until 31 December 2016. The ‘*sole*’ title, therefore, refers only to the fact that the two figures have been merged.

A common refrain during the interviews of JANTARASAMI ET AL. (2010), was that of frustration with the inconsistencies between current legal requirements and new management approaches recommended for adaptation. Interviewees communicated a strong sense of disillusionment with regards to this inconsistency, since bureaucratic rules and traditional internal operating approaches have been embedded in the political way thinking for too long to create new climate change action plans. As said above, some interviewees went so far as to suggest that facilitating improved adaptation in the future would require changing the legislation pattern, by cutting the bureaucracy and creating clear mandates.

That is exactly what the Expo 2015 Legislative Decree did: it created specific mandates with the power to communicate and decide how to implement actions and by skipping some standardized over-long legal procedures that would have slowed down the realization of the event. This is especially clear when the Decree declaims the followings:

- 1) *“Where necessary, the Commissioner may, by way of an order, derogate from existing legislation [...]. These ordinances [...] are immediately effective”* (Legislative Decree No. 43, Art. 5);

- 2) *“By May 31, 2013, the Sole Commissioner will nominate up to three delegates, with high and recognized professionalism in the legal-economic and engineering disciplines, or with proven institutional experience, to ensure the proper and efficient realization of Expo 2015”* (Legislative Decree No. 43, Art. 5);
- 3) *“To those temporary buildings connected to the event Expo 2015, for which there is the obligation of removal or dismantling after the event, the following rules do not apply: Legislative Decree of 19 August 2005 no. 192 about to the compliance with the limits of primary energy, compulsory energetic certification, and the satisfaction of the minimum transmittance required”* (Legislative Decree No. 43, Art. 5).

It is not difficult, at this point, to find a relationship between some of the barriers identified by JANTARASAMI ET AL. (2010) and the barriers that the Expo Law tried to overcome.

5.2.3 Three-categories classification based on the five barriers from JANTARASAMI ET AL. (2010)

The points reported above, together with the general need of creating a new law from scratch, easily relates to the absence of internal policy mandates often mentioned by JANTARASAMI ET AL. (2010). This absence may operate as a category *per sé* within the barrier Ownership Mosaic, and to those barriers belonging to the categories Internal and Partners' Inertia to Change, Internal Operating Procedures, and External Environmental Law. Nevertheless, while the classification made by JANTARASAMI ET AL. (2010) makes sense in their specific study, using the same classification would have been an effort going too much beyond the frame of this actual research. That is why, the five original categories have been assembled in three different groups, namely: Ownership Mosaic, Inertia to Change, and External Environmental Law.

Hence, the effort consisted in understanding first whether these barriers existed not only for Moving Forest, but also for Vertical Forest, and, secondly, how they have been overcome without the presence of an institutional change.

Considering that, the relationship between institutional barriers and the Expo 2015 Decree more comprehensive has been visualized it as follows:

Table 3. Relationship between institutional barriers and Expo 2015 Law. Source: own production.

| Barriers identified by Jantarasami et al. 2010 | Are they overcome by the Expo 2015 Law? |
|--|---|
| Ownership Mosaic | ✓ |
| Inertia to change | ✓ |
| External environmental law | ✓ |

5.2.3.1 Ownership Mosaic in the Decree

On one hand, the very first group (**Ownership Mosaic**) somehow speaks for itself and has in different measures been solved by the special law, that turned it from barrier to enablers. This is true especially when talking of the absence of mandates, overcome by the designation of the Sole Commissioner, its special powers and delegates, that covered also the adaptation measures which would have been under very different jurisdictions otherwise. Direct consequence of this, is the suppression of the barrier ‘ownership mosaic’, addressed by the law very explicitly, as the establishment of the Commissioner brought together different managerial positions into one.

5.2.3.2 Inertia to change in the Decree

Less straightforward, and yet still addressed quite explicitly, is the overthrow of the group **Inertia to change**. In fact, the overcoming of this barrier, the definition of which lies in the explanation provided by JANTARASAMI ET AL. (2010), is evident from some specific passages of the Art. 5 of the Expo 2015 Decree-Law. In particular, in order to ensure compliance with the timeframe set for Expo 2015 and the fulfilment of the international obligations assumed by the Italian Government, Art. 5 stated the following:

- That specific waivers in the field of public contracts have been applied to the Commissioner and to Expo S.p.A. concerning contracts for works and supply of services. In particular, exceptions to the Articles 26, 30, 93 and 140 of the Decree-Law No. 163 of 12/04/2006 applied. These articles, respectively and in a simplified manner, concerned:
 - Art. 26 on sponsorship contracts: the sponsorship contracts are governed by the principles of the "European Sponsorship Treaty", which states that the reliance and execution of public works must respect the principles of

free competition and equal treatment, non-discrimination and transparency.

- Art. 30 on service concessions: as above, the choice of the service concessionaire must also be in accordance with the principles of the Treaty.
 - Art. 93 on the structure for contracts and for works concessions: the project, throughout its preliminary, final and executive phase, must follow and meet specific requirements of performance, which are verified by cost, size, functions, and environmental investigations.
 - Art. 140 on the entrustment procedures in case of failure: in the event of failure, the parties involved in the original contract may be consulted in order to start a new contract to complete the works.
 - Since the Expo 2015 Law explicitly made an exception for these articles, the Commissioner was not obliged to follow the above principles, and had therefore the ability to freely choose the various sponsors and service dealers. Moreover, he was neither obliged to follow the fundamental steps in the execution of the project, in its preliminary, final or executive phase, or in case of failure of the project.
- Art. 5 also stated that, with regards to judgments concerning the measures on public contracts taken by the Commissioner, the procedures of Art. 125, Decree-Law No. 104/2010 would apply. The Art. 125, *Additional provisional provisions for disputes related to strategic infrastructures*, claimed that: «When a precautionary injunction is applied, the potential consequences of the measure should be taken into account concerning all the interests and interested that may be harmed, as well as concerning the critical national interest in carrying out the works» (Art. 125, Decree-Law No. 104/2010).
- This step further stresses the warranty position for Expo 2015 S.p.A. and the Commissioner.
- In addition, in relation to the specific nature of the business activity, an Economic Fund have been set up to pay contractual costs with reporting obligation. To do so, an official responsible for the fund has been appointed, whose activity is governed by the Art. 33 of the Decree-Law No. 254 of

04/09/2002. This article defined role and task of the so-called ‘cashiers’ who are usually responsible for paying the contractual costs in urgent cases.

→ This specific step did not only create an exceptional mandate (by doing so, entering the barrier group 1), but it also simplified and speeded up the internal accounting procedures. Moreover, the aspect of reporting (for instance on plant purchase, on transaction costs, on furrows creation, or on contracts) is one of the main problems coming up when dealing with institutional barrier and, thus, with bureaucracy. And cutting bureaucracy means precisely slimming down processes such as accounting.

5.2.3.3 External Environmental Law in the Decree

Regarding the barrier **External Environmental Law**, the relationship with the decree is not that explicit. Nevertheless, as reported above, Art. 5 gave an exemption from energy standards for those buildings that would have been removed after the event. In addition to this, the law also mentioned regulations related to waste and environmental recovery works.

These regulations permitted the use of secondary raw materials with simplified procedures, as provided by Articles 214 and 216 of Legislative Decree No. 152 of 03/04/2006 about the Environmental Impact Assessment Procedures. Simplified procedures are another type of waiver concerning the authorization to perform a waste recovery activity. In fact, they replaced the authorization for the exercise of an activity, as provided for in Art. 208-209-210-211 of the Legislative Decree 152/2006. The result for Expo 2015 was the non-necessity of an official verification – otherwise mandatory – of the existence of the requirements and the conditions required. It follows that who applied for such simplified procedures, underwrote that the machinery for the waste recovery operations obtained all the necessary permissions to operate, thus taking on the responsibility for any statements that would not correspond to the truth.

5.2.1 Conclusions for Module 1

An important dimension has come into light by the analysis of the Decree. Although the turnover of commissioner figures meant somehow an alternation of power games, this alternation is relevant to this research in terms of the institutional barriers it solved. Rather than power, then, the very potential dilemma for Expo 2015 was the slowness of decision-

making procedures. The answer to this slowness has been the creation of an exceptional Commissioner and the cut of bureaucracy, which find their counterpart in JANTARASAMI ET AL. (2010) – especially what they defined as absence of mandates and fragmentation.

At this point, the question is: did the special law change anything in the process governing the construction and realization of Expo? And, if so, what? Unpacking the law and just looking at it only helped understand the managerial dimension of Expo 2015. In fact, on the other side, it is not as clear what role these barriers had within the procedures of the event. That is why, in order to understand those elements coming not always to light when dealing with written texts, semi-structured interviews to stakeholders of the Moving Forest have been performed. Secondly, while the legal framework of the pre-existing-to-Expo institutional situation offers already a primary answer to this thesis' interest, it may not be enough to understand why and what for a new law was created. For this reason, and for a better understanding of the Milanese environmental governance, the Moving Forest study case has been compared with the Vertical Forest study case.

5.3 MODULE 2: Results based on the interview analysis

5.3.1 Introduction to Module 2

Based on the stakeholder mapping in Chapter 4, actors from various sectors were interviewed including city and regional political bodies, private and public entities as well as local interest groups, consultants, and the media. As the interview guidelines showed in Chapter 4, interviewees were asked about the various institutional measures put in place during Expo 2015, about questions relating to barriers to climate change adaptation for both Moving Forest and Vertical Forest as well as about the associated incentives and deterrents coming from actions of institutional change. The results of the interviews reflected the objectives laid out for this research as outlined in the Introduction. These were: 1) identification of those barriers the literature pointed at; 2) identification of those barriers emerging in practice, during the realization of Moving Forest and Vertical Forest, respectively; and 3) strategies and solutions to overcome the barriers encountered. The overview of this second Module follows the three-barriers-categorization from JANTARASAMI ET AL. (2010), highlighting for each barrier the feedback the interviewees gave. This is then followed by the barriers that did not appear directly in the literature, but that were anyhow perceived by the interviewees.

5.3.2 Institutional barriers

5.3.2.1 Category 1: *Ownership Mosaic*

In JANTARASAMI ET AL. (2010), the category *Ownership Mosaic* applied mostly to those existing ecosystem boundaries spanning multiple jurisdictions with different rules and management objectives. Within the frame this research, *Ownership Mosaic* has been considered as complex policy problems characterized by highly fragmented decision-making processes involving multiple levels and actors, types of policies at various policy arenas and within different policy games. As outlined by the literature, and in particular by BIESBROEK (2011), institutional fragmentation becomes in fact a barrier as it may lead to a lack of connection among these multiple levels of institutions, organizations, individuals and policies. In such cases, responsibility is thus divided across different organizations and decisions have to be made at different levels, with negative consequences for the results of the governance (BIESBROEK ET AL., 2011).

Institutional fragmentation and the resulting ownership mosaic often culminate in the absence of clear internal policy mandates. What should be a coherent policy direction from the upper management to implement, in this case adaptation projects, happens to be a rather equivocal and ambiguous trajectory, if sometimes non-existing at all. The lack of definite formal divisions of labor and explicit internal mandate, as well as the absence of delegation of authority and responsibilities, leads then to the inability to develop plans and projects.

After analysis of the legal texts, this thesis assumed that a potential *Ownership Mosaic* existed as the Expo Special Law addressed it concretely. This was true especially when the Decree postmarked the absence of mandates and overcame this by explicitly designating the new policy mandate of the Sole Commissioner – an action which brought together different managerial positions into one and suppressed the initial institutional barrier of *Ownership Mosaic*.

In fact, this barrier ended up being real also in practice. When asked about the *raison d'être* of policy mandates, almost all interviewees regarded their absence as a formal barrier. Respondents said that leadership can help overcome barriers, and that lack of or ineffective leadership can also create some others. Most of them, especially the ones

coming from Expo S.p.a., MM S.p.a. and the Municipality, agreed that «Crucial key factors for the success of a process conveying the realization of new criteria and goals, like climate change adaptation, are directorship and capacity of conduction. Citizens and actors often converge their actions only on options they perceive to be under someone's control. The inability to identify and agree upon goals and criteria can become a significant barrier at this point. The definition of adaptation goals is already difficult – to accomplish these goals is even more challenging».

A member of MM S.p.a. said that «This has much to do with the preparation of new strategies and policies, be these for a massive international event like Expo or for the development of national and local plans dedicated to remodeling the approach to climate change». Another representative from MM S.p.a. added that: «It's really important that the government, both on a national and local level, designs mandates and roles where these are missing and when strategies need to have a new vision, especially when it comes to issue of climate change».

Throughout the interviews it was clear that the opinions and value system of a leader (and of the Commissioner in particular) would make a strong difference as to the success of the process.

Nonetheless, some respondents showed the opposite concern. When talking about Vertical Forest, one speaker coming from the influencers' group said that «Actually, I would not stress too much the importance of a Commissioner and, in general, of specific policy mandates. As a matter of fact, the creation of a policy mandate may constrain the discretion of the administration. Secondly, and most importantly, what really precludes the application of a policy is not its mandates, but the resources, the time, the pressure from the society, the goals and incentives, external norms, the organizations constraints. These are the factors that indeed influence the decision-making process, and not the precision of a mandate». This position was then supported by some suppliers from Moving Forest, who further commented: «Since policy mandates are prerogative to administrative organizations and institutions, then, the impact of such roles largely depends on the relationship between the organization and its environment, and not on the personal nature of the potential Commissioner selected for the mandate. Somehow, the need to design policy mandates is already a sign that institutions are not working well.

We need to get two steps back: when the administrative organization are able to bring policy actions into conformity, they do not feel the necessity to create extra roles to do that, and the community do not feel like they need someone else to replace the inability of their actual administrators».

5.3.2.2 Category 2: *Inertia to change*

JANTARASAMI ET AL. (2010) talked about different types of Inertia. In their work, *Internal Inertia to Change* and *Partners' Inertia to Change* referred to the difficulty of changing the traditional ways of thinking about resource management, within both the agencies themselves and their partner agencies. *Internal Operating Procedures* dealt instead with agencies' formal rules and long decision-making processes. Such *Inertias* have for sure something to do with the broader category of institutional void, which, as defined by HAJER (2003), is that specific situation making the current institutions unable to solve problems (HAJER, 2003). In the specific case of climate change strategies, an institutional void may emerge when the existing formal legislation does not include adaptation as a measure, thus creating misunderstanding and more difficult communication (BIESBROEK ET AL., 2011). Internal operating procedures within the municipality appear to be old and rather bounded to bureaucracy, structural and operational constraints which are no longer able to accommodate change – in this case, to welcome a strategy of adaptation to climate change. This causes an inertia to change traditional institutions and resource management. As a matter of fact, administrations often operate within traditional system of job descriptions and standardized procedure and rules. Such bureaucratic rules make it complicated to react fast to changing environment or policy directive (JANTARASAMI ET AL., 2010). Such legislation-inertia relates much with that discrepancy between the existing institutional order and the actual practice of policy making claimed by the institutional void literature. Not seldom across their research, in fact, JANTARASAMI ET AL. (2010) highlighted that «barriers related to legislation include potential conflicts between current legal requirements and the new management approaches recommended for adaptation, which may limit management options» (JANTARASAMI ET AL., 2010).

In Module 1, the three types of Inertia mentioned by JANTARASAMI ET AL. (2010) have been merged in one general group named *inertia to change*. As mentioned in the previous paragraphs, the fact that the Expo Special Law created some specific exceptions to the previous legal and institutional settings stresses already *per sé* how that this setting was slow and not prepared yet. Also, as discussed, a precondition for electing a Commissioner

was the inertia of the administrations ordinarily in charge of taking the necessary measures to carry out the work. According to the Decree, if the election were not done within a 45-days period, the Commissioner would have replaced the ordinary or extraordinary authorities, taking control of their pertaining structures.

During the interviews I conducted, almost all respondents perceived *inertia* and *internal operating procedures* to be formal barriers. For stakeholders coming both from Moving Forest and Vertical Forest, the prevalence of barriers associated with governance, institutional arrangements and regulatory issues illustrated that the current structure of institutions and regulatory policies might not be appropriate to achieve adaptation objectives. For example, one respondent stated: «How can we integrate adaptive strategies if our internal policies are not ready – and seem to be too slow for – to engage in adaptive strategies?».

Inertia was most of the times recognized as a constraint when it limited the ability of local institutions to adapt to climate change through planning concerns their institutional context. In fact, the policy framework in which local government operates is largely imposed by higher levels of governance, such as provincial, state and national policies³.

As some participants from the Governance and the Management explained: «We understand the urgency of climate change adaptation strategies. And yet, until the institutional situation stays what it is at the moment, therefore clearly not prepared to a quick change in case of events like Expo 2015, we will not move forwards in the issue of climate change».

Again, a supplier stated that: «Existing policies have been offering only limited strategies to adapt to climate change. Without a legal basis to adjust the local environmental planning, it will be difficult to offer adaptation in the face of competing interests like

³ This is due to the Italian political and territorial structure. Italy is already divided into 20 Regions, which are autonomous entities but subject to the control of the central State and have marked disparities between North and South. In addition to regions, the State is subdivided into provinces and municipalities (FRANCESCHELLI, 2013). This proliferation of intermediate territorial entities and variable geometries has further intensified the over-territorialization of administrative competencies, producing conflicts of power and disadvantages at the governance level. However, the institutions establishing the development of a climate change strategy are still predominantly elaborated and strengthened by the National Government, which at the time of the interviews, did acknowledge climate change as a fact but had not converted this acknowledgement into a suitable local planning. This was particularly noted by participants when discussing the air quality and lifestyle in Milan.

Moving Forest and Vertical Forest, which represented a specific preoccupation of only a specific moment».

5.3.2.3 Category 3: External Environmental Law

According to JANTARASAMI ET AL. (2010), the barrier *External Environmental Laws* concerned the existing legal constraints which eventually limit the possibility of respond quickly to environmental issues. This categorization remained the same within this research, and it has not been translated differently or merged with other barriers.

I recognized the presence of this barrier in the Art. 5 of the Expo Special Law, which gave an exemption from energy standards for those buildings that would have been removed after the event. In addition to this, the Law also mentioned some regulation related to waste and environmental recovery works. Nevertheless, as already mentioned, the relationship between the barrier and the Decree is not that immediate.

In fact, and in contrast to the literature, no respondents perceived that external environmental laws acted as barriers, although, when asked in more detail about how laws and their waivers affect the ability to implement adaptation, the overall reaction tended to see the legal constraints of such laws.

To sum up, the first two categories among the one pointed out by JANTARASAMI ET AL. (2010) (i.e. *ownership mosaic* and *inertia to change*) were the most mentioned in the interviews regarding the barriers emerging in Moving Forest and Vertical Forest. This double cluster connected to governance and institutional barriers (e.g. institutional crowdedness, inability to make changes, contradictory mandates, lack of leadership, restricted jurisdictions or fragmentation) was mostly observed during the interviews.

Interviewees were also encouraged to discuss whether they found that the Legislative Decree enabled or impeded the aforementioned barriers. Responses were classified as barriers when participants described the institutional change as reducing the flexibility to implement adaptation/action. In this regard, feedbacks and knowledge about the institutional change varied widely. A participant coming from the local community, for example, although recalling the existence of the Commissioner, was aware neither of the Decree, nor that such a Decree created the new policy mandate. On the other side, among the respondents who were informed of the Decree, a considerable majority acknowledged

a positive effect made by the Decree both on the general proceeding of Expo 2015 and on their personal experience as employees. One representative of MM S.p.a., for instance, claimed that «The regulatory exceptions and waivers adopted for the call for tenders had the only purpose of shortening the relocation of roles, even by overlapping certain activities. However, it did not, in any moment, override any of the Community principles (see L. 71/2013) which, in fact, were never disregarded during Expo 2015». Again, a delegate of the Municipality, said that «Expo 2015 was also the result of a normative and regulatory support activity, and the nature of this support was not only merely directed at making exceptions. not just of a derogatory nature. Expo 2015 should be firstly acknowledged as the work of many institutional actors involved who, each within their respective roles, achieved exceptional results».

In contrast to this majority, a few respondents who were aware of the Decree and mainly coming from the operative levels, argued that no specific direction was actually provided by the mandate, and that the Commissioner's directives were unclear because they lacked specific guidance about implementing actions.

5.3.3 Other barriers: input constraints

Other barriers were pointed out during the interviews – barriers that do not directly appear in the literature. In fact, JANTARASAMI ET AL. (2010) mentioned that barriers such as lack of information, lack of resources and potential public opposition existed during their case study, but they were defined as 'input constraints', meaning that an insufficient knowledge on climate change, insufficient capital resources, and perceived insufficient support from external stakeholder groups might interfere with, delay or even obstruct the adaptation projects. Next to this, JANTARASAMI ET AL. (2010) claimed that the lack of successful implementation of adaptation strategies was mostly related to legislation, organization, and policy limits – hence specifically to institutional barriers, and not to input constraints. Nonetheless, during the interviews carried out for Moving Forest and Vertical Forest, barriers considerable as input constraints were mentioned often.

5.3.3.1. Input constraint 1: Resources

The most frequent category of barriers encountered during Moving Forest and Vertical Forest were related to resource issues (e.g. limited budget, limited human capital resulting in disorder and disorganization in the coordination of the numerous people and

corporations partaking in the event). A member of Expo S.p.a. said: «For my part, the greatest barrier was that we did not have enough resources to work with and coordinate so many companies coming from other cities and countries, and to do so in a such a short time».

For the Vertical Forest, the lack of financial resources mainly resulted in a lack of staff capacity. «Resources are always important, but become even more important when it comes to the planning and management (especially implementation and monitoring) of climate change adaptation. Resources include financial means but also technical and informational resources, technology, staff expertise, and time. During the realization of the Vertical Forest, these were basically all missing».

While the lack of resources and the decrease in funds coming from higher authorities was described as a barrier especially by the Municipality, the position of the Region members was different. «The Region secured copious funding for local infrastructures and public transport and has pledged big efforts into Expo. And while we have been providing financial resources for our respective delegated functions, we felt also it would be correct to leave cities like Milan to the management of its specific subjects in order to stay as close as possible to its citizens», said one representative of the Region. According to the Municipality, though, these resources were not enough.

As claimed by MEASHAM ET AL. (2011), «Municipalities are frequently highly constrained in terms of their financial capacity. In part, this stems from the wide range of activities in which they are engaged. It is also due to their lack of institutional autonomy as already described. This lack of resources has been linked to reactive management of facilities and infrastructure. Municipal authorities are frequently tasked with managing state or province infrastructure, in addition to local infrastructure, yet their lack of authority and stressed resources inhibits effective life-cycle planning. These resource constraints can lead to self-perpetuating short-term technical fixes rather than long-term integrated approaches to addressing problems» (MEASHAM ET AL., 2011: 894).

5.3.3.2. Input constraint 2: Awareness

The third category was linked to a lack of awareness (lack of knowledge about adaptation or climate change, leading to the prioritization of other more forward pressing issues of urban planning). It resulted to be less common than other clusters of barriers as it has

been mentioned only by whom was closely connected to the green sector (e.g. the architects of Moving Forest and Vertical Forest, or people from the environmental monitoring). Employees from Boeri Architect Studio said: «Adaptation actions have not yet been implemented in legislation and are therefore, in practice, they end up being voluntary undertakings which have to compete with other non-mandatory issues. This probably also suggests that, in some cases, knowledge and responsibility for tracking and responding to climate change are not evenly distributed across local government departments (*i.e., thus getting back to the question of ownership mosaic*)».

However, adaptation was claimed to be the major consideration for both Moving Forest and Vertical Forest. For this reason, the realization and monitoring of the two Forests, waste management and pollution control had been assigned to the environment department of the Municipality.

Out of the context of the two case studies, yet, it was evident from the interviews that adaptation represented not necessarily an area of priority as it had to compete with other interests of local government planning. This was connected to a certain hesitancy to encompassing the issue due to (perceived) more urgent issues the government had to deal with. These competing priorities arose from many sources, including the different perspectives and areas of operation among council staff and elected officials.

The importance of climate strategies, both adaptation and mitigation, was also affected remarkably by how the issue was raised and packed to the public by the Government.

Generally, interview respondents reported that climate change is usually considered alongside other topics which are often seen as more important. For example, one interviewee commented: «Our environmental councilors do have an idea of climate change and of its impacts and risks. Nonetheless, they usually focus on different topics. For sure, so far, they did not really concentrate on adaptation».

Other respondents said that: «We have to learn that everyone has different interests, thus that goals and values are numerous and not always in harmony neither with each other nor with climate change issues. Pro-environmental values positively influence at least the

willingness to accept climate change policies, but they are not always compatible with other values, other goals, and other aspirations».

When asked more in details, respondents recognized that most environmental values and goals are subsidiary to other values, goals, problems, and concerns. An architect from Boeri Studio said that «Councils and consequently citizens tend to undervalue the economic and social cost of climate change, as long as this does not influence directly their context. That is why, throughout the mitigation and adaptation process, communication and information about problems, solutions, and their meaning are fundamental factors of the adaptation process and its acceptance».

In fact, a large body of the literature stresses the significance of effectual and productive communication as regards to climate change to increase awareness and understanding, and effectively initiate public participation. On the other side, misconceived and wrong information, misinterpretation of conveyed information, lack or insufficient communication can critically delay or impede social interactions among those involved in the adaptation process, both in the high and low levels (MOSER, 2010).

Nonetheless, Councilors from the Municipality, when asked about their general take on climate change, pointed out that both the Moving Forest and the Vertical were very much illustrative examples of the alertness of local governments toward the environment. In fact, «With the legislation of 2014, Milan acquired the status of Metropolitan City. One of the important novelties introduced by the legislation was the attribution to the Metropolitan City of functions related to environmental and territorial planning and the management of infrastructural networks. Actually, already in 2008, in view of Expo 2015, Milan started enforcing strategies and policies addressing climate change and a better urban planning. Besides the Moving Forest and the Vertical Forest, we have been developing a new traffic regulation system to stimulate public transport and encourage alternative mobility, as well as two new metropolitan lines, ecological public transports and new policies on car sharing, bike sharing, pedestrian islands, heating and energy sources».

5.3.3.3. Input constraint 3: Distrust

Far less frequently notified, but still encountered during the interviews, are barriers related specifically to politics mistrust. For example, a representative from the

Municipality stated that «The delays of the political parties governing Milan prior to Mayor Pisapia have been the very barrier eventually. In fact, such delays, together with the general political instability of the country, dramatically slowed down the preparation for Expo 2015».

As stated by GIFFORD (2011), trust is often an essential key factor for enduring relationships and the development of new strategy such climate change adaptation. «When it is absent, as it sometimes is between citizens and their government officials, resistance in one form or another follows. Trust is important for changing behavior, and although its role as an influence on pro-environmental behavior is complex (GIFFORD, 2007a), in general, behavior change requires one to trust others not to take advantage; to trust that the change is effective, valuable, and equitable (e.g., BRANN AND FODDY, 1987; FODDY AND DAWES, 2008); and to trust that the other has public-service motives and is honest (TERWEL ET AL., 2009). In sum, when trust sours, the probability of adopting positive climate change behavior diminishes» (GIFFORD, 2011: 295).

5.3.4 Solutions offered during the interviews

In the final step of the interviews, participants were asked to focus on strategies and solutions to overcome the barriers they identified.

5.3.4.1 Approach 1

The results showed notable similarities in responses among most respondents. Although some stated concerns that the process of amending laws is usually so political that it may risk to just reproduce the preference of the leading faction, the large majority stated that internal policy mandates and formal agency rules needed to be changed to become more dynamic, flexible, and to perform adaptation. They believed, in fact, the Expo Decree Law was the only solution to implement adaptation in most circumstances. Respondents from Vertical Forest, too, said that the creation of a mandate would have not only speeded up many aspects of the project implementation, but also it would have played as a controlling agent over the dispersion of human and financial resources.

5.3.4.2 Approach 2

Other solutions proposed engaged in reductions of costs and clarification of conflicts of interests. In fact, when other problems are considered by the Municipality as more urgent

(e.g. urban renewal, societal pressure, grandiosity of the event), there is usually little space left to focusing on climate change adaptation. Ultimately, prioritization of strategies helps overcome barriers related to overlapping goals, such as adapting and renovating the city at the same time.

5.3.5 Conclusions for Module 2: interview results analysis

5.3.5.1 Results per case study type

Based on the responses received during the interviews, both in the phase ‘identification of the barrier’ and the phase ‘possible solution’, a first analysis of the interviews has been produced. This is shown in the tables below, which give a general overview of the interviews’ results according to stakeholder type and barrier type. The different signs (+, -, +/-) depict the stakeholders’ reactions to the barriers, as it follows:

- + = barrier was acknowledged/mentioned;
- - = barrier was not acknowledged/mentioned;
- +/- = vision of the barrier was ambiguous, barrier was mentioned only after brainstorming with the interviewer;
- n/a = not available.

Table 4. Overview of the interviews for Moving Forest based on barrier and stakeholder type.

| | Management (Expo Spa) (MM Spa) | Suppliers | Governance (Region) (Municipality) | Influencers | Users |
|--------------------|--------------------------------------|-----------|--|-------------|-------|
| Lack of resources | + | + | (-) (+) | + | + |
| Ownership mosaic | + | - | + | - | - |
| Inertia | + | + | + | + | - |
| Lack of awareness | (-) (+) | + | - | + | - |
| Political distrust | - | - | + | + | - |
| Ext. env. law | +/- | +/- | - | - | - |

Table 5. Overview of the interviews for Vertical Forest based on barrier and stakeholder type.

| | Management (Building Company) | Suppliers | Governance (Municipality) | Influencers | Users (Residents) |
|--------------------|-------------------------------------|-----------|------------------------------|-------------|----------------------|
| Lack of resources | n/a | + | + | + | - |
| Ownership mosaic | n/a | + | + | - | - |
| Inertia | n/a | + | + | + | + |
| Lack of awareness | n/a | + | - | + | + |
| Political distrust | n/a | - | - | - | - |
| Ext. env. law | n/a | - | - | - | - |

As from **Table 4, dedicated to Moving Forest**, *inertia to change* was the most mentioned institutional barrier by the stakeholders, as it was pointed out by the management, by the suppliers, by the steering groups, by the Region, by the Municipality and by the influencers. The only stakeholders who did not mention it were the users. We can suppose that this was due to the fact that, although the barriers certainly have consequences for the users, it is unlikely that such users and any outsider had a knowledge of the Expo machine deep enough to be able to connect certain problems to their related organizational and decision-making processes.

The frequency of the barrier *inertia to change* emerged, almost at the same level, as much as that of *ownership mosaic*. This barrier, in fact, was mentioned most frequently then *inertia* within the same group of stakeholders (within the Municipality and the management, in fact, more actors were willing to acknowledged this as a problem to future adaptation implementation), but less frequently when considering the groups separately. Among the suppliers, the influencers and the users, in fact, no one really recognized the ownership mosaic as a formal barrier, although we can still assume that the reason for this is the same as the one applying to the users in the case of the inertia. Regarding the external environmental law, as mentioned above, no respondent perceived

this firstly as a barrier, at least until asked more in details a second time. In this sense, the barrier has been mapped with both a minus and a plus (due to the difference between the first and the second response in the first 3 groups of stakeholders). As regards to the non-institutional barriers, *lack of resources* was by far the most frequently encountered barrier, followed by *lack of awareness* and *political distrust*. The two mostly encountered barriers for Moving Forest were thus *lack of resources* and *inertia*.

The situation slightly differs for **Vertical Forest (Table 5)**, where *inertia* was by far the most encountered, as it was mentioned by all the actors interviewed. This is followed, at the same level, by *lack of resources* and *lack of awareness* and, only thirdly, by *ownership mosaic*. *Political distrust* and *external environmental law* were instead not mentioned at all – and this was probably due to the difference between the two projects. Vertical Forest, in fact, did not require any compliance with other laws, nor it dealt with any political process like it happened with Expo 2015.

5.3.5.2 Results per stakeholder type

First of all, when looking at the qualitative dimension, **Users'** responses differed from the ones the other actors gave, and their visions were different if we take Moving Forest and Vertical Forest separately. In fact, often, users did not acknowledge barriers as problems. As said above, this probably depends on the fact that they have not been present during the realization of both Moving Forest and Vertical Forest. Instead, they experienced the venues only once they were ready to be respectively visited and inhabited. In this sense, although the barriers for sure had an effect also on the users, they did not witness the very decision-process and clue moments of Moving Forest and Vertical Forest. When the users of Vertical Forest mentioned *inertia* and *lack of awareness* as barriers, they did not really take into account the decision-process happening during the realization of the two towers, but rather those general inertia and lack of awareness that do not allow cities to have green infrastructures. Not yet at least. On the other side, users from Moving Forest mentioned the lack of resources as a barrier – they claimed – because they felt influenced by what the media said on the general works for Expo 2015.

Secondly, the whole **Governance** stakeholder group had fairly homogenous vision on barriers, both if we look at Region vs. Municipality in Moving Forest and Municipality in the two separate case studies. This was not too surprising, as all respondents belonging to a specific organization or group expressed the same concerns and involvement towards

the same questions. In fact, at the time of this research, Municipality and Region belonged to the political left and, on some topics, I expected the respondents to give me the position generally adopted by their political party (see Chapter 6 for further discussion on this topic).

Finally, **Governance** and **Management** expressed diverging positions on: 1) the role of political trust; and 2) the role of barriers to environmental laws. Regarding point 1, political distrust appeared to be a thing especially for the Governance. This was somehow again related to a 'party line', especially when the respondents justified the barriers as delays coming from the opposite political parties governing Milan and Lombardy prior to the left. Regarding point 2, although the response from the Management was rather ambiguous, I could assume that the Governance would have never acknowledged the External Environmental Law as a barrier, fearing admitting an inconsistency within the laws they themselves produced. However, these questions will be further unfolded in the following pages.

6. DISCUSSION

6.1 Introduction

The previous chapters, which detailed the cases and the findings, have demonstrated the application of the proposed literature within two different contexts (Moving Forest and Vertical Forest, respectively). This was done with the intention of comparing cases where institutional change (or no institutional change at all) is applied to overcome barriers to adaptation. Chapter 6 integrates the research findings within the context of the research question, and examines how this research project contributed to the theory (and the practice) on institutional barriers to climate change adaptation.

With this in mind, the aim of this chapter is to answer the research question, *‘Does the observed institutional change overcome institutional barriers to implementing climate change adaptation measures? More specifically, does it change the same aspects of the implementation process that the barriers literature points at?’*.

First of all, the limitations of the research are explored and subdivided into single analyses looking at the data, at the methods, and finally at the conceptualization unfolding throughout the study. A discussion is presented on how the research outcomes have provided answers to each of the questions, and how these answers are related to the literature. Recommendations and proposals for further research are also presented at the end of this chapter.

6.2 Limitations of the data

For this specific thesis, methods and data are very tightly linked, as I have displayed and analyzed the results of the interviews without processing them through a sophisticated coding method.

It is important to underline that this research came about two years after Expo 2015 and Vertical Forest took place, thus almost ten years after the beginning of the administrative and procedural preparations of the two projects. Respondents were asked to rebuild mechanisms, actions and procedures occurring in those years, and not for everyone it was easy to reconstruct them clearly.

Moreover, as said in the Introduction, the Expo-story is partly hidden in the shadows of trials, crimes, indictments and requests of prosecution. Although an adequate number of respondents could be found eventually, the ongoing investigations affected the fieldwork in two ways. First, they limited the number of potential interviews, as many key actors of Expo 2015 were still being investigated when this research was conducted. Second, they made it more difficult to win the respondents' trust: those who agreed to be interviewed needed first to be convinced that I was really a student, and not an undercover journalist or police officer.

In this sense, the effort of reconstructing the data resulting from the interviews was a long and laborious one and, although it led to satisfactory results, it could have been simpler.

6.3 Limitations of the methods

Various methods have been used to perform my analysis. These methods, however, did not correspond to the methods used by the same literature on institutional barriers to adaptation this thesis took inspiration from. The problem identified within this research, in fact, was the need for a multi-layered analysis approach, necessary to investigate complex environments like Expo 2015, its institutional preparation, the written normative texts, the laws mentioned within the Special Law, and, next to this, everything concerning the realization and actual existence of Vertical Forest.

Therefore, to unpack the context around the two cases, a mixed-methods multiple case study approach was adopted. For each case, the integration of the information gathered using the analysis of the Law and the semi-structured interviews aimed at and finally resulted in the understanding of the institutional contexts. The network analysis highlighted the many relations existing between the stakeholders, and showed on what level the stakeholders interacted, as well as the frequency with which they would do that.

The practical feedback and the existing literature supported the validity of the analysis results for each of the cases. First of all, a close match between reality and the literature demonstrated that the Law analysis was successful in unpacking the arena where the institutional change for Moving Forest took place. In addition, the empirical data generated by this analysis allowed important insight into the stakeholder network. The

key findings derived from the research study and the use of this specific methods and materials are presented in the paragraphs immediately below.

First of all, stakeholder mapping in environments such as Expo's and Vertical Forest's represented in hindsight an over-simplification of the reality and ignored important information found in the context of the infrastructures throughout the interviews. Stakeholder network is in fact usually highly dependent on the context, and the context is represented for Expo 2015 by politics and political interest. The mapping helped to describe the specific interaction between actors and which kind of outcomes are produced or expected, as well as the repetitive nature of interactions and the multiple action situations observed helped to uncover the specific institutional arrangements.

Nonetheless, it is important to keep in mind that, for this case study, the actors of the action situation were the visitors and residents of the two infrastructures, the employees of the various companies working at the realization of the Forests, and the politics. In this sense, in terms of specific voices to be heard during the interview, a clear distinction was found between regular employees and the representatives of the Municipality and the Region. The last ones seemed in fact to be more aware of the specific requirements and conditions necessary to produce an institutional change, as well as they seemed to be more aware of the situation and of the terms – they had, in general, a better understanding of what the interviews were about.

On the other side, they also seemed to have a strategy in mind, which ended up promoting their party and the path taken by the party itself, and discrediting any other path, even when the questions asked never meant to take such a direction. This became a problem especially during specific interviews, where the answers were often driven by a political preference rather than a clean point of view on the issue. Such an outcome was anyway somehow expected when I decided to use semi-structured interviews as a method for involving my stakeholders. In fact, if on one hand the flexibility of such a method generated a large amount of details, which is positive when one looks at the quantity of the information. Yet, that also required a significant amount of interpretation, in order to read “between the lines” and disentangle the multiple motives behind the respondent's responses.

It would therefore be better to apply a more detailed stakeholder analysis to further differentiate stakeholders on multiple dimensions, and to unpack the fundamental differences between the various actors involved. In this way, it would be possible to produce not only an understanding of the most important stakeholders, but also an insight of where, how, and why, certain stakeholders become more important compared to others. A more contingent approach to stakeholder engagement, where individuals are engaged based on their positions, would possibly be more efficient and effective. It follows that a correct stakeholder involvement is a vital piece of information in developing a research study as it highlights the underlying reasons why stakeholders perceive issues as important or urgent, and lead to different methods of addressing the issues.

Moreover, the interviews took place both in person and over the phone, when the interviewee was not physically available. As for the latter, the communicative interaction was clearly limited only to verbal codes, thus losing the possibility of observation of non-verbal behavior and involving greater effort in data analysis. I often noticed that the absence of personal contact has increased also the chances of misunderstanding: I would be asked to give further explanations on the object of my study and this would be resulting in influencing the possible response. Nevertheless, due to logistics reasons, these interviews could only happen via phone, as they took place during the summer break and many of the respondents were on vacation.

6.3 Limitations of the conceptualization

By conceptualization it is meant the logical process linking the literature used and the formation of the guidelines of the interviews for Moving Forest and Vertical Forest cases. First of all, for practical reasons, I considered it appropriate to merge the five barriers of JANTARASAMI ET AL. (2010) into three final categories (*ownership mosaic, inertia to change, external environmental law*).

Under ideal conditions, where all the stakeholders actively would take part in the interviews with no time limits, it would have been possible to analyze each barrier individually, and at a greater detail. Conditions are usually hardly ideal, though. In the present setting, grouping barriers has contributed to simplifying the language substantially, without significant losses in terms of content, leading to an analytical framework and to interview guidelines respondents could indeed relate to.

What made the difference, however, was that other barriers not initially considered emerged during the interviews: the so-called input constraints *resources*, *awareness*, and *political distrust*. The fact that these barriers emerged required further research, a further literature review *a posteriori*, and therefore additional time to dedicate to the study.

6.4 Implications for the available research

Although further research has become necessary and doubts exist about the preferences of the respondents, there are reasons to believe that these gray areas have not excessively affected the results. The literature review has demonstrated how institutional change has gained a prominent role as a mechanism for authorities to deal with barriers to adaptation. The same results to which the past literature got, came to light in this case study.

Similarly to what argued by BIESBROEK (2011), institutional fragmentation reappeared in Moving Forest as a persistent barrier where adaptive strategies dealt with and depended on the interaction of different social and policy sectors (BIESBROEK ET AL., 2011). Within the policy game of Expo 2015, the different actors had different worldviews, diverging interests and goals, conflicting identities, autonomies and responsibilities, thus producing a lack of connection with particular effects at the institutional level.

As predicted by HAJER (2003), Expo 2015 was an example of institutional void, where the existing formal legislation was not strong enough or wide enough to develop measures of adaptation to climate change, thus creating a discrepancy with the actual needs of policy making. In this sense, the institutional void was filled through the creation of a new legislation that somehow served to contradict the previous one.

JANTARASAMI ET AL. (2010) had the merit of categorizing *ownership mosaic*, *inertia to change*, and *external environmental law* as the most important institutional barriers when it comes to climate change adaptation. In fact, they might have a role in enhancing, or not, the possibility of an adaptive change. These are also the barriers that, at a first sight, appeared to be the ones existing for Expo 2015. As a matter of fact, all three of them were treated within the analyzed Special Law. And this Law, as discussed, was indeed meant as a tool to create the possibilities for an institutional change which would have overcome the barriers and made adaptation more feasible. It was itself the institutional change.

JANTARASAMI ET AL. (2010) got to their results after examining stakeholders' perceptions of institutional barriers to implementing adaptation strategies. Upon conducting 32 semi-structured interviews with regional managers and agency staff, they found that «internal barriers, including unclear mandates from superiors and bureaucratic rules and procedures, are perceived as greater constraints than external barriers related to existing federal environmental laws. Respondents perceived process-oriented environmental laws, such as the National Environmental Policy Act, as enablers of adaptation strategies, and prescriptive laws, such as the Endangered Species Act, as barriers. Our results suggest that climate change adaptation is more often discussed than pursued, and that institutional barriers within agencies limit what can be accomplished» (JANTARASAMI ET AL., 2010: 1).

According to the conclusions of JANTARASAMI ET AL. (2010), the creation of policy mandates, thus the overcome of ownership mosaic, is a key factor for implementing climate adaptation. Without clear internal mandates and a delegation of roles and responsibilities, in fact, interviewees said that they would have been unable to devote their capacity for climate change adaptation. The results of their work finally concluded that institutional barriers could be overcome by: «(1) establishing a clear agency policy mandate for adaptation that requires climate change adaptation to be a primary concern, not just a supplementary criterion to be considered in planning processes; (2) educating employees about adaptation to generate internal support; (3) creating formal divisions of labor to allow staff to focus exclusively on climate change issues; and (4) providing requisite funding and staff to support adaptation strategies» (JANTARASAMI ET AL., 2010: 14).

Said so, on the one hand, the results of this research became relevant when compared to the results obtained by BIESBROEK (2011), HAJER (2003), and JANTARASAMI ET AL. (2010), because they came to very similar conclusions. On the other hand, however, such conclusions take on a different significance within the context of Expo 2015.

Answering the first research question only based on the analysis of the Law, '*Does institutional change overcome institutional barriers to implementing climate change adaptation measures?*', the response would be rather straightforward. An institutional

change like the one happened for Expo 2015, which developed the Special Law for implementing the Expo event itself, certainly addressed institutional barriers such as:

- Ownership Mosaic, by creating the mandate of the Commissioner and his special powers and responsibilities,
- Inertia to change, by reducing the bureaucratic burden of the previous institutional setting and speeding up processes,
- and External Environmental Law, by creating exceptions which made possible things otherwise non-allowed.

In overcoming these barriers, which were the same barriers mentioned by JANTARASAMI ET AL. (2010), the institutional change paved the way to the realization of Expo 2015, thus to the Moving Forest, which was the very adaptive measure to climate change.

Nonetheless, the situation becomes more complex when compared to the responses received during the interviews, thus moving forward to the second research question *'Does the observed institutional change change the same aspects of the implementation process that the barriers literature points at?'*

The answer split in two. On one side, I could say that yes, it does. The institutional change set in motion by the Expo 2015 Legislative Decree changed the same barriers found in the literature.

But without considering institutional change, besides the institutional barriers pointed at by the literature, this research found out that non-institutional barriers were important as well, although not considered within the Decree. Insufficient resources, lack of awareness, and political distrust, which were not mentioned by the Law, were object of discussion during the interviews as often as ownership mosaic, inertia, and external environmental law. JANTARASAMI ET AL. (2010) claimed that these were actually input constraints that might interfere with, delay or even obstruct the adaptation projects and that depends on the presence of institutional barriers. Nonetheless, as some interviewee stated, «what really precludes the application of a policy (*like adaptation*) is not its mandates (*thus institutional barriers*), but the resources, the time, the pressure from the society, the goals and incentives, external norms, the organizations constraints (*thus non-institutional barriers*)».

If we then want to look only at institutional barriers, this specific study has shown that that inertia had a more important role than ownership mosaic. Or, better, that ownership mosaic appeared to be a consequence of inertia.

As for the Vertical Forest, its achievement has been possible also without institutional change because this was a private infrastructure that would have in the future created money through the rent of its residents. The Moving Forest was instead part of the public infrastructures belonging to the Expo area. Because of the importance of the event Expo, the Decree was issued ad hoc for overcoming those institutional barriers that, otherwise, would have slowed down the realization of the event.

6.4 Recommendations for future research

Several implications have come to light for the future research on institutional barriers to climate change adaptation, in Italy as well as other international contexts. Concerning methods, it would be interesting to replicate the same study by using a focus group instead of semi-structured individual interviews. The aim would then be to gather opinions, attitudes and reactions of the respondents about the same subject, and to check whether specific group dynamics lead to the same results this research got to. To do that, on the other hand, it would be necessary to find only respondents who are already familiar with the topic being discussed, so that they would be able to share an experience and to activate interaction dynamics.

Beyond the methods, the results of this research opened various questions that call for deeper attention. With due caution, one could conclude that contexts where institutional void emerges, or special events like Expo occur, or the two together, could be able to trigger positive change towards adaptation to climate.

In the specific case of Expo 2015, the special law, despite its complexity, certainly had the merit of producing, finally, a measure of adaptation to climate change. But if we had to define the profound and, at the same time, general value of the special law itself, in particular for what concerns a strategy towards climate change, some concerns would emerge. One might wonder whether this law worked because it has been issued by the state, or because, in addition to being issued by the state, it was dedicated to a specific

international event held in Milan. One might wonder, too, whether special laws, due to their “specialty”, always leads to positive results. In this case, it would be interesting to examine if and when a special law is advisable to produce adaptation also in other regions. In fact, the recommendation is that the future research focuses on the nature of the special laws themselves and tries to understand whether they happen to be a feature (that of the extraordinary that manages the ordinary) which, in Italy but also elsewhere, is applied every time an institutional void emerges. History teaches us that major changes at the institutional level occur through incremental small episodes of adjustment and political and cultural mobilization that accrue into substantial transformation. If this already had, or it is having now, consequences in terms of the environment and climate change, then these small institutional changes require more consideration than they have received so far.

6.5 Summary

Chapter 6 considered the research findings within the context of the research question. By doing so, on one side the chapter drew the answer to the research question of this study (*‘Does the observed institutional change overcome institutional barriers to implementing climate change adaptation measures? More specifically, does it change the same aspects of the implementation process that the barriers literature points at?’*).

On the other side, Chapter 6 also reflected on the several limitations of this thesis (on a data, methodological, and conceptual point of view). However, linking these limitations with the results obtained, I asked myself whether they affected somehow the insights produced by the research. If there were not such problems, what would the results have been? Would they still be the same? For example, could a different type of respondents stress different barriers, therefore delivering different results?

I attempted to recruit a typology of respondents that was stratified in terms of job position, gender, and role within the frame of Moving Forest and Vertical Forest. Probably, under conditions of plentiful subjects, my analysis would have been richer, but the results would have not been different. Probably, it would have been more difficult to delve into each of the many respondents’ thoughts and experience in as much depth. Actually, as BECKER (2007) has indicated, all representations – including those offered in an interview - are perfect for something (BECKER, 2007). Taking into account that qualitative research is

always affected by some constraints, I assumed, then, that the voices considered during the interviews perfectly represented also the thoughts of those subjects who were missing.

7. SUMMARY OF THE THESIS

In the first decade of the 21st century, adaptation has become a policy priority to manage the impacts of climate change along with mitigation. With regards to that, the literature on adaptation governance has often highlighted the importance of institutions for the planning of adaptive policies. However, at the same time, it also identified a large number of different barriers that could impede the development of such adaptation policies.

For the specific purpose of this thesis, I concentrated on institutional barriers to adaptation and on the role of institutional change as a way to overcome such barriers. In this frame, the theoretical insights of JANTARASAMI ET AL. (2010) appeared to be the most fitting to the purpose of my research. According to the authors, in fact, the most common institutional barriers usually deal with unclear mandates from superiors and bureaucratic rules and procedures, hence with an internal inertia to changing traditional institutions and resource management. In this sense, such institutional inertia relates with potential conflicts between the current legal requirements and the new management approaches recommended for adaptation, which may limit management options (JANTARASAMI ET AL., 2010). Based on the literature, a categorization of the main institutional barriers to adaptation has been formulated. These were: *Ownership Mosaic*, *Inertia to change*, and *External Environmental Law*.

The theoretical framework has been applied to the study case of Expo 2015 in Milan, where institutional change has turned into a way of addressing institutional barriers. In fact, I assumed that the *Expo 2015 Legislative Decree* was meant to change the terms of the pre-existing institutional setting to overcome institutional barriers to a specific measure of adaptation, the so-called *Moving Forest*.

The objective of this work was then to analyze the determinants of institutional change put in place for accomplishing the Moving Forest. On the other side, and on a secondary level, this has been compared with a second separated case of Milanese adaptive measure to climate change: the *Vertical Forest*. The comparison has been attempted as, although both Forests have been subject to institutional barriers, no institutional change occurred for the realization of the Vertical Forest.

The comparison was based on the results of the methods utilized: first the analysis of the Expo 2015 Legislative Decree; secondly, the conduction of semi-structured interviews to stakeholders of the two case studies.

The results of data collected aimed at answering the following research question: *Does the observed institutional change overcome institutional barriers to implementing climate change adaptation measures? More specifically, does it change the same aspects of the implementation process that the barriers literature points at?*

The institutional change occurring during Expo 2015, which was represented by the Expo 2015 Legislative Decree, did address and overcome institutional barriers to implement a climate adaptation measure, represented by the Moving Forest. The Decree did so by changing the same aspects stressed in the literature. In fact, the institutional barriers found for Expo 2015 were the same mentioned in the literature, meaning: Ownership Mosaic, Inertia to change, and External Environmental Law. However, the Decree did not address other non-institutional barriers (such as insufficient resources, lack of awareness, and political distrust), which have been object of discussion during the interviews as often as the institutional barriers. As for the Vertical Forest, the same barriers, both institutional and non-institutional, has been claimed to exist by the respondents. Nonetheless, the realization of the Vertical Forest has been achieved because this was a private infrastructure that would have in the future created money through the rent of its residents.

On the other hand, the Moving Forest was part of the public infrastructures belonging to the Expo area. And Expo 2015 has been an opportunity for Milan to regenerate its urban landscape through the specific measure of the Moving Forest.

Yet, because of the extraordinariness of the event, the Decree was issued ad hoc for cutting down all the bureaucracy passages that could have made the actual building of the Expo area longer and more difficult to achieve. Eventually, the Decree created exceptions not possible otherwise. In fact, no proper awareness usually exists that public green infrastructures are as strategic as schools and hospitals. As Benedetto Selleri, architect and author of the Moving Forest, claimed during an interview at the very beginning of this research: «Municipalities are afraid that especially what comes afterwards the

realization of such projects, like their maintenance, becomes a cost. For this same reason, ecological operations are always the last ones to be realized».

In this sense, a focus of the future research should be to examine, first, if and when a special law is advisable to produce adaptation also in other regions, and, secondly, whether they are a feature that, in Italy but also elsewhere, is applied every time institutional barriers emerge.

REFERENCES

- ADGER, W. N., ARNELL, N. W., TOMPKINS, E. L. (2005): Successful adaptation to climate change across scales. *Global Environmental Change*, 15 (2), 77-86.
- ADGER, W. N., AGRAWALA, S., MIRZA, M. M. Q., CONDE, C., O'BRIEN, K., PULHIN, J., PULWARTY, R., SMIT, B., TAKAHASHI, K. (2007): Assessment of adaptation practices, options, constraints and capacity. *Climate Change 2007: Impacts, Adaptation and Vulnerability*.
- In: PARRY; M. L., CANZIANI; O. F., PALUTIKOF; J. P., VAN DER LINDEN; P. J., HANSON; C.E. (Eds): *Contribution of Working Group II to the fourth assessment report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK, 717–743.
- ADGER, W. N., BARNETT, J. (2009): Four reasons for concern about adaptation to climate change. *Environment and Planning A*, 41(12), 2800-2805.
- ADGER, W. N., DESSAI, S., GOULDEN, M., HULME, M., LORENZONI, I., NELSON, D. R., NAESS, L. O., WOLF, J., WREFORD, A. (2009a): Are there social limits to adaptation to climate change? *Climatic Change*, 93, 335-354.
- ADGER, W. N., LORENZONI, I., O'BRIEN, K. (Eds.) (2009b): *Adapting to Climate Change: Thresholds, Values and Governance*. Cambridge: Cambridge University Press.
- AVANZINI, G. (2013): *Il commissario straordinario*. Mondadori, Milano.
- BAXTER, P., JACK, S. (2008): Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers . *The Qualitative Report*, 13(4), 544-559
- BECKER, H. (2007): *Telling about society*, Chicago, IL: University of Chicago Press.
- BIERMANN, F., BOAS, I. (2010): Preparing for a warmer world: towards a global governance system to protect climate refugees. *Global Environ Politics* 2010, 10:60-88.
- BIESBROEK, G. ET AL., (2009): Institutional governance barriers for the development and the implementation of climate adaptation strategies. Working paper for the International

Human Dimensions Programme (IHDP) conference “Earth System Governance: People, Places, and the Planet”, December 2-4, Amsterdam, the Netherlands, 1-14.

BIESBROEK, R., KLOSTERMANN, J., TERMEER, C., KABAT, P. (2011): Barriers to climate change adaptation in the Netherlands. *Climate law*, 2(2), 181-199.

BIESBROEK, G. R., TERMEER, C. J., KLOSTERMANN, J. E., KABAT, P. (2014): Analytical lenses on barriers in the governance of climate change adaptation. *Mitigation and adaptation strategies for global change*, 19(7), 1011-1032.

BIESBROEK, G. R., TERMEER, C. J. A. M., KLOSTERMANN, J. E. M., KABAT, P. (2014): Rethinking barriers to adaptation: mechanism-based explanation of impasses in the governance of an innovative adaptation measure. *Glob. Environ. Change*, 26, 108-118.

BISARO, A., HINKEL, J. (2016): Governance of social dilemmas in climate change adaptation, *Nature Climate Change*, 6, 354-359.

BOERI ARCHITECT STUDIO (n.a.): The Vertical Forest, URL: <https://www.stefano boeri architetti.net/it/vertical-foresting/>. Last accessed: October 2017.

BURCH, S. (2010): Transforming barriers into enablers of action on climate change: insights from three municipal case studies in British Columbia, Canada. *Global Environmental Change*, 20 (2), 287-297.

BURCH, S. (2010a): In pursuit of resilient, low carbon communities: An examination of barriers to action in three Canadian cities. *Energy Policy*, 38(12), 7575-7585.

BURCH, S. (2010b): Transforming barriers into enablers of action on climate change: Insights from three municipal case studies in British Columbia, Canada. *Global Environmental Change*, 20(2), 287-297.

BUSCH, T. (2011): Organizational adaptation to disruptions in the natural environment: The case of climate change. *Scandinavian Journal of Management*, 27, 389-404.

BRANN, P., FODDY, M. (1987): Trust and the consumption of a deteriorating common resource. *Journal of Conflict Resolution*, 31, 615-630.

DELL'OSSO, R., (2008): Expo. Da Londra 1851 a Shanghai 2010 verso Milano 2015, Maggioli Editore, Rimini, Italy.

DiCICCO-BLOOM, B., CRABTREE, B. F. (2006): The qualitative research interview. *Med Educ.*, 40, 314-321.

EISENACK, K. (2012): Potentials of Social-Ecological Systems. *Human/Nature Interactions in the Anthropocene*, Routledge. 107-122.

EISENACK, K., STECKER, R. (2011): A framework for analyzing climate change adaptations as actions. *Mitigation and Adaptation Strategies for Global Change*, 1-18.

EISENACK, K., MOSER, S. C., HOFFMANN, E., KLEIN, R. J., OBERLACK, C., PECHAN, A., ROTTER, M., TERMEER, C. J. (2014): Explaining and overcoming barriers to climate change adaptation. *Nature Climate Change*, 4 (10), 867-872.

EKSTROM, J. A., MOSER, S. C., & TORN, M. (2011): Barriers to Adaptation: A Diagnostic Framework. Final Project Report. California Energy Commission, Sacramento, CA, USA.

EKSTROM, J. A., MOSER, S. C. (2012): Identifying and Overcoming Barriers to Climate Change Adaptation in San Francisco Bay: Results from Case Studies. California Energy Commission, Sacramento, CA, USA.

EKSTROM, J. A., MOSER, S. C. (2014): Identifying and overcoming barriers in urban climate adaptation: Case study findings from the San Francisco Bay Area, California, USA. *Urban Climate*, 9, 54-74.

ENGLE, N. L., LEMOS, M. C. (2010): Unpacking governance: Building adaptive capacity to climate change of river basins in Brazil. *Global Environmental Change*, 20, 4-13.

EUROPEAN ENVIRONMENT AGENCY (2012): Urban Adaptation to Climate Change in Europe: Challenges and Opportunities for Cities Together with Supportive National and

European Policies. EEA Report, No. 2/2012, European Environment Agency (EEA), Copenhagen, Denmark.

EUROPEAN ENVIRONMENT AGENCY (2015): Exploring Nature-Based Solutions: The Role of Green Infrastructure in Mitigating the Impacts of Weather and Climate Change-Related Natural Hazards. EEA Technical Report No 12/2015, European Environment Agency, Copenhagen, Denmark.

FODDY, M., DAWES, R. M. (2008): Group-based trust in social dilemmas. - In BIEL, A., ECK, D., GÄRLING, T., GUSTAFFSON, M. (Eds.): New issues and paradigms in research in social dilemma, New York, NY: Springer, 57-71.

FONTANA, G. (2002): Il Programma Urban e l'innovazione delle politiche urbane in Italia in Palermo. Il senso dell'esperienza: interpretazioni e proposte. Primo Quaderno, Franco Angeli, Milano, Italy.

FRANCESCHELLI, F. (2013): Il ruolo delle Regioni nella lotta al riscaldamento globale. Franco Angeli, Milano, Italy.

FREEMAN, R. E., (1984): Strategic Management: A Stakeholder Approach, Cambridge University Press, New York, NY.

GAWEL, E., HEUSON, C., LEHMANN, P. (2012): Efficient public adaptation to climate change: An investigation of drivers and barriers from a Public Choice perspective, UFZ-Diskussionspapiere, No. 14/2012.

GIFFORD, R. (2007a): Environmental psychology: Principles and practice (4th ed.). Colville, WA: Optimal Books.

GREGORY, J. M., ET AL. (2004): A new method for diagnosing radiative forcing and climate sensitivity, Geophys. Res. Lett., 31, L03205.

HAGEDORN, K., (2008): Particular requirements for institutional analysis in nature-related sectors. Eur. Rev. Agric. Econ. 35 (3), 357-384.

HAJER, M. (2003): Policy without polity? Policy analysis and the institutional void. Policy Sciences, June 2003, 36 (2), 175-195.

HINDRIKS, F., & GUALA, F. (2015): Institutions, rules, and equilibria: a unified theory. *Journal of Institutional Economics*, 11 (3), 459-480.

HODGSON, G. M. (2006): What Are Institutions? *Journal of Economic Issues*, 40, 1, 1-25.

HOVLAND, I. (2007): Making a difference: M&E of policy research. ODI Working Paper 281. London: Overseas Development Institute.

HUTCHINSON, S., SKODAL-WILSON, H. (1992): Validity threats in scheduled semistructured research interviews. *Nursing Research*, 2, 117-119.

IL SOLE 24 ORE (2012): Prende vita il bosco sul grattacielo di Boeri a Milano. La posa della prima pianta, URL: <http://www.casa24.ilsole24ore.com/art/mercato-immobiliare/2012-06-13/nasce-bosco-grattacielo-milano-153351.php?uuid=AbeqTirF&fromSearch>. Last accessed: November 2017.

IL SOLE 24 ORE (2013): Cantieri in difficoltà, la crisi delle costruzioni rallenta il Bosco Verticale a Milan, URL: <http://www.casa24.ilsole24ore.com/art/mercato-immobiliare/2013-05-16/cantieri-difficolta-crisi-costruzioni-120154.php?uuid=AbC82MwH&fromSearch>. Last accessed: November 2017.

IL SOLE 24 ORE (2015): Il Qatar è proprietario unico del complesso Porta Nuova, URL: <http://www.ilsole24ore.com/art/casa/2015-02-27/qatar-proprietario-unico-complesso-141306.shtml?uuid=Ab28ZrJL&fromSearch>). Last accessed: November 2017.

INDERBERG, T. H. (2011): Institutional constraints to adaptive capacity: adaptability to climate change in the Norwegian electricity sector. *Local Environment*, 16 (4), 303-319.

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) (2007): *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [PARRY M. L., CANZIANI, O. F., PALUTIKOF, J. P., VAN DER LINDEN, P. J., HANSON, C.E. (Eds.)]. Cambridge University Press, NY.

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) (2012): *Glossary of terms*. - In: FIELD, C.B., BARROS, V., STOCKER, T.F., QIN, D., DOKKEN, D.J., EBI, K.L., MASTRANDREA, M.D., MACH, K.J., PLATTNER, G.-K., ALLEN, S.K., TIGNOR, M., & MIDGLEY, P.M. (Eds.): *Managing the Risks of Extreme Events and Disasters to Advance*

Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, UK and NY.

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) (2012): Summary for Policymakers.

- In: FIELD, C.B., BARROS, V., STOCKER, T.F., QIN, D., DOKKEN, D.J., EBI, K.L., MASTRANDREA, M.D., MACH, K.J., PLATTNER, G.-K., ALLEN, S.K., TIGNOR, M., & MIDGLEY, P.M. (Eds.): Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, UK and NY.

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) (2014): Climate Change 2014: Impacts, Adaptation and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [BARROS, V.R., FIELD, C.B., DOKKEN, D.J., MASTRANDREA, M.D., MACH, K.J., BILIR, T.E., CHATTERJEE, M., EBI, K.L., ESTRADA, Y.O., GENOVA, R.C., GIRMA, B., KISSEL, E.S., LEVY, A.N., MACCRACKEN, S., MASTRANDREA, P.R., WHITE, L.L. (Eds.)]. Cambridge University Press, UK and NY.

ISTAT (2016): Giornata Mondiale dell'Acqua, Statistiche dell'Istat, 21 marzo 2016, URL: www.istat.it. Last accessed: December 2017.

JANTARASAMI, L. C., LAWLER, J. J., THOMAS, C. W. (2010): Institutional barriers to climate change adaptation in U.S. National Parks and Forests. *Ecology and Society*, 15 (4), 33. URL: <http://www.ecologyandsociety.org/vol15/iss4/art33/>. Last accessed: October 2017.

KLIJN, E. H., KOPPENJAN, J. F. M. (2014): Complexity in governance network theory. *Complexity, Governance & Networks*, 1 (1), 61-70.

KREBS, V. (2012): Organizational Network, Analysis Consultant, August 2012.

LAWRENCE, J., ET AL. (2015): Adapting to changing climate risk by local government in New Zealand: institutional practice barriers and enablers, *Local Environment*, 20 (3), 298-320.

LEBEL, L., ET AL., 2006. Governance and the capacity to manage resilience in regional

social–ecological systems. *Ecology and Society*, 11 (1), 19, URL: <http://www.ecologyandsociety.org/vol11/iss1/art19/>. Last accessed: October 2017.

ITALIAN PARLIAMENT (2013): Legislative Decree 26 April 2013, n. 43, Disposizioni urgenti per il rilancio dell'area industriale di Piombino, di contrasto ad emergenze ambientali, in favore delle zone terremotate del maggio 2012 e per accelerare la ricostruzione in Abruzzo e la realizzazione degli interventi per Expo 2015. (13G00086), *Gazzetta Ufficiale della Repubblica Italiana*.

ITALIAN PARLIAMENT (1988): Legislative Decree 23 August 1988, n. 400, Disciplina dell'attività di Governo e ordinamento della Presidenza del Consiglio dei Ministri. *Gazzetta Ufficiale della Repubblica Italiana*.

ITALIAN PARLIAMENT (2006): Legislative Decree 12 April 2006, n. 163, Codice dei contratti pubblici relativi a lavori, servizi e forniture in attuazione delle direttive 2004/17/CE e 2004/18/CE. *Gazzetta Ufficiale della Repubblica Italiana*.

ITALIAN PARLIAMENT (2010): Legislative Decree 2 July 2010, n. 104, Attuazione dell'articolo 44 della legge 18 giugno 2009, n. 69, recante delega al governo per il riordino del processo amministrativo, (G.U. 7 luglio 2010, n. 156) secondo le modifiche introdotte dal D.Lgs. 58 del 31 marzo 2011 (G.U. 29 aprile 2011, n. 98) entrata in vigore il 30 aprile 2011, e dal D.Lgs. 195 del 15 novembre 2011. (G.U. 273 del 23 novembre 2011), entrata in vigore 8 dicembre 2011. *Gazzetta Ufficiale della Repubblica Italiana*.

ITALIAN PARLIAMENT (2002): Legislative Decree 4 September 2002, n. 254, Regolamento concernente le gestioni dei consegnatari e dei cassieri delle amministrazioni dello Stato. *Gazzetta Ufficiale della Repubblica Italiana*.

ITALIAN PARLIAMENT (2006): Legislative Decree 3 April 2006, n. 152, Norme in materia ambientale. *Gazzetta Ufficiale della Repubblica Italiana*.

ITALIAN PARLIAMENT (2013): Expo 2015, URL: <http://leg16.camera.it/465?area=23&tema=51&Expo+2015>. Last accessed: November 2017.

LELEA, M. A. ET AL. (2014): Methodologies for stakeholder analysis – for application in transdisciplinary research projects focusing on actors in food supply chains. German Institute for Tropical and Subtropical Agriculture (DITSL). Witzenhausen, Germany.

MCCARTHY, J. J., ET AL. (2001): *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. Cambridge University Press, Cambridge, UK.

METROPOLITANE MILANESI S.P.A. (n.a.): Expo 2015, URL: <https://www.mmspa.eu> and <https://www.expo2015.org>. Last accessed: October 2017.

MOHD NOOR, K. B. (2008): Case Study: A Strategic Research Methodology. *American Journal of Applied Sciences*, 5 (11), 1602-1604.

MORGERA, E., KULOVESI, K., MUNEZ, M. (2011): Environmental integration and multi-faceted international dimensions of EU Law: unpacking the EU's 2009 Climate and Energy Package. *Common Market Law Review*, 48 (3), 829-91.

MOSER, S. C. (2010): Now more than ever: the need for more societally relevant research on vulnerability and adaptation to climate change. *Applied Geography*, 30 (4), 464-474.

MOSER, S. C., EKSTROM, J. A. (2010): A framework to diagnose barriers to climate change adaptation. *Proceedings of the National Academy of Sciences*, 107, 22026-22031.

MOSER, S. C., JEFFRESS WILLIAMS, S., BOESCH, D. F. (2012): Wicked challenges at land's end: managing coastal vulnerability under climate change. *Annual Review of Environment and Resources*, 37 (1), 51-78.

MEASHAM, T., PRESTON, B., SMITH, T., BROOKE, C., GORDDARD, R., WITHYCOMBE, G., MORRISON, C. (2011): Adapting to climate change through local municipal planning: barriers and challenges. *Mitigation and Adaptation Strategies for Global Change*, 16 (8), 889-909.

NARDUCCI, F., NARDUCCI, R. (2015): *Guida normativa per l'amministrazione locale 2015*. Maggioli Editore, Rimini, Italy.

OBERLACK, C. (2016): Diagnosing institutional barriers and opportunities for adaptation to climate change. *Mitigation and Adaptation Strategies for Global Change*, Springer, 22 (5), 805-838.

OSTROM, E. (2009): A Polycentric Approach for Coping with Climate Change. Background Paper to the 2010 World Development Report, Policy Research Working Paper 5095, World Bank, Washington, DC.

PAAVOLA, J. (2007): Institutions and environmental governance: A reconceptualization. *Ecological economics*, 63, 93-103.

PAAVOLA, J. (2011): Climate change: the ultimate tragedy of the commons? Sustainability Research Institute (SRI), School of Earth and Environment, The University of Leeds, Leeds, LS2 9JT, UK.

PAN ASSOCIATI STUDIO (n.a.): The Moving Forest, URL: <http://www.panassociati.net/>. Last Accessed: September 2017.

PARMESAN, C., YOHE, G. (2003): A Globally Coherent Fingerprint of Climate Change Impacts across Natural Systems. *Nature*, 421, 37-42.

REUTERS (2016): Inchiesta infiltrazioni mafia, amministrazione giudiziaria per comparto Fiera Milano (Investigation for mafia infiltration, judicial administration in Fiera Milano), URL: <https://it.reuters.com/article/topNews/idITKCN12B22D>. Last accessed: November 2017.

ROGGERO, M. (2015): Adapting institutions: exploring climate adaptation through institutional economics and set relations. *Ecological Economics*, 118, 114-122.

ROMERO-LANKAO, P. ET AL. (2013): Institutional capacity for climate change responses: An examination of construction and pathways in Mexico City and Santiago. *Environment and Planning C: Government and Policy* 2013, 31, 785-805.

SBU (2014): Evaluation and synthesis of studies using qualitative methods of analysis. Stockholm: Swedish Agency for Health Technology Assessment and Assessment of Social Services. SBU, Sweden.

SCHLUTER, A. (2009): Institutional Change and Ecological Economics: The Role of

Mental Models and Sufficient Reason. *Institutions and Sustainability*, 315-339.

SMITH, L. (1992): Ethical issues in interviewing. *Journal of Advanced Nursing*, 17, 98-103.

SPERANZA, I. C. (2010): Resilient adaptation to climate change in African agriculture, *DIE*, 54, Bonn.

STAKE, R. (1995): The art of case study research. Thousand Oaks, CA: Sage, 49-68.

STAVINS, R. N. (1997): Policy Instruments for Climate Change: How Can National Governments Address a Global Problem? *University of Chicago Legal Forum*, 1997, 10.

TERWEL, B. W., HARINCK, F., ELLEMERS, N., DAAMEN, D. D. L. (2009): How organizational motives and communications affect public trust in organizations: The case of carbon dioxide capture and storage. *Journal of Environmental Psychology*, 29, 290-299.

THOMSEN, D. C., SMITH T. F., KEYS, N. (2012) Adaptation or manipulation? Unpacking climate change response strategies. *Ecology and Society* 17 (3), 20.

THYNNE, I. (2008): Symposium introduction. Climate change, governance and environmental services: institutional perspectives, issues and challenges. *Public Admin. Dev.*, 28, 327-339

WEYRICH, P. (2016): Barriers to Climate Change Adaptation in Urban Areas in Germany. Report 26. Climate Service Center Germany, Hamburg.

WENZ L. ET AL. (2017): North–south polarization of European electricity consumption under future warming, *PNAS*, 114 (38) E7910-E7918.

UNFCCC (1998): Kyoto Protocol to the United Nations Framework Convention on Climate Change. Report of the Conference of the Parties on its third session, held at Kyoto from 1 to 11 December 1997. Addendum. Part Two: Action taken by the Conference of the Parties at its third session. UNFCCC, Bonn, Germany.

UNFCCC (2007): Uniting on climate. A guide to the Climate Change Convention and the Kyoto Protocol. UNFCCC, Bonn, Germany.

- YIN, R. (2003): Case study research. Design and method. Thousand Oak, CA: Sage, US.
- YOHE, G. (2009): Toward an integrated framework derived for a risk-management approach to climate change. An editorial comment. *Climatic Change*, 95 (3-4), 325-339.
- YOUNG, O. (2002). The Institutional dimensions of environmental change: fit, interplay, and scale. MA: MIT Press, Cambridge, UK.
- YOUNG, O., KING, L., SCHROEDER, H. (2008): Institutions and environmental change-principal findings, applications, and research frontiers. MA: MIT Press, Cambridge, UK.
- VITALIANO, F. (2015): Foody presenta l'Expo. Numeri e storie da record. Giunti Junior, Firenze, Italy.
- ZAGARI, F., SELLERI, B. (2015): Moving forest. Expo Milano 2015 landscape. Libria, Milano, Italy.

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