Article

Sustainability, Adaptation and the Local State: An Overview

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ABSTRACT

Local governments face multiple issues, which are revealed most clearly in urban areas. There, climate change is exacerbating existing problems such as deepening inequality, infrastructural needs and housing affordability, which are in turn overlain across permanent issues of segregation, transportation provision, pollution and resource depletion. This paper explores published examples of urban adaptation that demonstrate the complexity of these policy challenges, and the value of an equally rich approach such as the local state. The paper notes that examples of transformational policy-making in US cities point to highly interventionist approaches rather than strongly participative regimes.

KEYWORDS: climate change; sustainability research; adaptation; cities; jurisdictions

INTRODUCTION

Climate change is now at the core of much sustainability research [1], and significant attention has as a result been paid to processes of adaptation: these we can summarize as efforts to "avert negative consequences" or "take advantage of beneficial ones" in situations where climate change is producing new natural and social conditions [2]. While adaptive challenges are ubiquitous, it is in cities that we see both opportunities but also problems: while they are places with many financial and intellectual resources, these are the locations with the largest and densest populations and the fiercest competition for affordable housing and an acceptable quality of life. It is this competition that forces more residents into marginal locations and places them in jeopardy; it is these urban residents who are often most in need of support brought about via adaptative change [3].

As urban growth has continued to place more households into cities, they are facing the threats linked to climate change, which can include, depending upon the location, rising sea levels, increased runoff and flooding, rising temperatures and a greater possibility of drought, plus second order outcomes such as an increased probability of fires, tornadoes and hurricanes and a heightened risk of diseases such as malaria [4]. Adaptive plans can, as we will see below, take many forms. Some are

grandiose, such as the flood control barriers across the Thames, while others are coping strategies undertaken by individual households, such as raising a home above likely flood levels or even just accepting that the ground floor is likely to be flooded and using it accordingly. Adapting may involve very localized fixes or may suggest quite broad policy responses. Large threats, such as inundation of coastal regions, may exceed the capacity of communities to act, in which case adaptation might, in the long-term, demand permanent evacuation.

There is a large and proliferating literature on urban adaptation [5], yet we can see two sorts of critique emerging within sustainability research. One is academic in nature, while the other emphasizes alternative approaches to adaptive practice, notably resilience planning. It is the goal of this paper to build on these critiques, showing that they can best be understood by a more nuanced analysis of how municipalities operate in this and related policy fields. The paper is organized as follows: in this Introduction, the critiques of adaptation are presented, and a number of case studies are examined. These are used to demonstrate why it is necessary to use an analytical perspective such as the local state in order to understand how municipalities operate.

Adaptation

Despite much formal emphasis upon climate change mitigation at the national and international levels, adaptation planning has increased in visibility since the millennium and in cities on all continents. It is however not possible to argue that it is mainstream urban policy, for reasons which will be discussed below. Further, as Woodruff *et al.* have shown, adaptive policy making is increasingly being augmented by resilience planning, especially in the US [6]. Indeed, they argue that many municipalities may, in time, become more focused on resilience than adaptation, a point developed in the next section. We can see at least three critiques of adaptation within the sustainability literature and in related fields; in shorthand, we can suggest that one relates to "science", one to "economics", and one to "governance".

Science: In essence, this critique argues that we face a complex reality which in turn puts pressure on the field to incorporate different intellectual approaches to policy development. One particular challenge addressed in the literature relates to the way in which politics is addressed—or ignored—in the research on adaptation: Peet *et al.* write that "so much of this work in practice is a recycling of an older sort of cultural ecology—systems theory dressed up as new institutionalism—in which there is much talk of adaptive capacity, resiliency and flexibility of local social systems, but almost no serious account of political economy and the operations of power" [7]. As we will see in the case studies discussed in this paper, apparently rational policy proposals must always be considered in the context of the question "rational for whom"?

Economics: A lack of political language within the literature may be surprising, given that concepts of justice and the achievement of justice are at the core of original conceptions of sustainability [8]. Yet it is also the case that the language of politics has been marginalized by the vocabulary of business. Gotham and Lewis state:

> "...*the dominance of corporate-driven sustainable development discourse is troubling because of the extremely narrow urban policy repertoire based on capital subsidies, place promotion, supply-side intervention, and local boosterism. 'It becomes extremely difficult to mobilize a population around issues that do not relate directly to sustainability' without the ideas, logic and language (e.g., critiquing inequalities, injustices, institutional discrimination, and the exploitative nature of global capitalism) that can be used as 'rallying points' on other issues (p. 603)*" [9].

While cities are thus key sites for policy development, their size and complexity guarantees that they are also far from simple entities. The large literature that has identified municipalities as key actors in future adaptive planning [5], sidesteps a range of problems in this regard. These can be identified as being related to governance, and to conceptual rethinking.

Governance: The policy challenges which face urban administrations are frequently linked to "multi-level governance" [10]. Yet this reduces enormous complexity to a relatively simple diagnosis, one that is incapable of capturing the dynamics of policy development in an era of fiscal austerity and even climate denial: as Romero-Lankao, Bulkeley and colleagues point out "across multiscale networks of actors such as government officials, utilities, developers, and grassroots organizations, an uneven distribution of the power to shape and transform cities often dampens the possibilities for transformative climate change responses" [11].

As we will see in the second half of this paper, understanding the implementation of climate change policies—relating both to adaptation and mitigation—cannot be accomplished solely through the lens of those policies. Overlapping bureaucracies, economic interests and an effective civil society have, typically, operated, over long timespans. Climate change issues do not replace these existing relations. They are added to the policy mix, and that mix must be fully understood if policy implementation is to be successful.

Resilience

In addition to the scrutiny that has been given to adaptation, we can also point to the body of literature devoted to resilience. While that could command a full length analysis, we can point to the work of Woodruff *et al.*, who have assessed 44 adaptive plans in US cities and contrasted them with 10 resilience plans [6]. It is especially noteworthy that these

researchers claim that resilience is the more dynamic approach to climate change policy in US cities. If we take this claim at face value, we can interpret it in several ways. One is that adaptive planning could be considered to be ineffective. The second is more complex, and invites us to invoke the kind of critical scholarship already mentioned.

The two fields have an empirical basis in common, especially in regard to urban policy to ameliorate climate change. However, while sustainability can be viewed as a normative or aspirational proposition, resilience is viewed more often as an empirical measure. In fields from engineering to social psychology, researchers have sought insight to why some communities possess resilience and others do not. That does not however imply that it is value-neutral—indeed, this empirical base has caused it to be identified as a potentially conservative concept [12]. Kaika writes:

> "...we [sh]ould stop focusing on how to make citizens more resilient 'no matter what stresses they encounter', as this would only mean that they can take more suffering, deprivation or environmental degradation in the future. If we took this statement seriously, we would need to focus instead on identifying the actors and processes that produce the **need** to build resilience in the first place. And we would try to change these factors instead" ([13], p. 95; original emphases).

A detailed empirical example of this perspective is presented by Fernández et al. in a research study of Santiago, which demonstrates that high resilience may be embedded within social inequality, and, as such, is also unsustainable [14].

This criticism might raise fundamental questions about why resilience has grown in importance if it might lack analytical power. As Woodruff et al show, resilience plans tend to be narrow and focused on strengthening populations rather than creating holistic plans which integrate different facets, such as linking transportation and housing improvements [6]. Once again, a more critical approach would suggest that a focus on creating resilience is entirely consistent with the kinds of austerity policies which have proliferated in the millennium. Providing tools to communities to allow them to cope with stresses brought about by climate change is cheaper than actually dealing with those threats. This is consistent with the identification of different engineering approaches to risk, such as the switch from fail-safe technologies to safe-to-fail strategies [15]. This involves moving from a reliance upon safety systems and complex back-ups (as existed—and failed—at Fukushima) to a recognition that whatever can go awry will eventually do so. In a contrasting safe-to-fail situation, the challenge facing the engineer is to design a system where the result of something going wrong is reduced from a catastrophe to a predictable and manageable challenge. An example would be to ensure that in the likely event of another hurricane striking the city of New Orleans directly, the

risk of flooding is minimized via recreating natural conditions that impede storm surge [16], but subsequently, a heavier burden is then placed upon residents to follow mandatory evacuation notices and take other strategies to prepare for disaster [17].

Summary

A lacuna in much of the adaption literature rests with the overly positive characterization of municipalities as locations with the capacity to develop meaningful climate-positive policies [10]. This paper will argue that while many cities do undertake varied forms of planning exercises, this does not mean that there is the expertise, with either technical or social systems, to assemble sophisticated adaptive strategies. And more critically, rhetorical interest in climate change—manifested for instance in membership within climate networks [18]—does not automatically translate into meaningful policy outcomes. Indeed, the likelihood that breakthrough adaptive policy will automatically emerge in cities is limited. This inference rests on the very simple insight that changing how we view the plight of the most vulnerable in the context of climate change would require that we change how we view the plight of the most vulnerable throughout our urban areas. While cities usually have policies and plans in place that encourage economic development, it is accepted that low-income residents will experience noisier and more dangerous neighborhoods, with poorer infrastructure and fewer housing choices [19]. While there is much discussion of the possibility of 'transformational' policies in the context of climate change, these clearly present a challenge to existing realities and those who benefit from them [20]. Radical policies will therefore face many forms of denial and even resistance.

Romero-Lankao *et al.* go further, observing that "an increasing number of works within the literature acknowledge that the challenges of sustainability and resilience exceed the capability of traditional sustainability and resilience science and practice" ([21], p. 1224). The next section will start to explore these claims, with the first of several case studies taken from the peer-reviewed literature.

LOCAL GOVERNMENT AND STAKEHOLDER ATTITUDES

Local governments—especially urban areas—are responsible for climate change impacts even in situations where regional or national powers intercede, as municipalities are first responders—and they are typically left to deal with matters once other government entities have left the area. Yet even this insight minimizes the complexities of the task that faces a town or city which is trying to develop a climate change adaptation plan. While academics in public administration may imply that governance is a rational process, it is more likely to be a scene of competition and, often, conflict [22].

A fascinating example of this is provided by research undertaken by Yarnal and colleagues in the context of Sarasota FL [23]. This is a

community of 700,000 close to the Gulf of Mexico where development is heavily concentrated close to the water, reflecting the choices of both tourists and retirees. Despite being close to an active hurricane corridor, it had not seen significant storm damage between 1944 and 2010. It is, however, now facing the consequences of sea level rise, which will result in an assault upon the real estate market, and an increased risk of storm damage, which will have detrimental impacts on tourism and insurance premiums. Yarnal and colleagues interacted with different stakeholders in the area via different focus groups designed to solicit views on different adaptive strategies.

The focus groups indicated clearly that different stakeholders have very different risk assessments and consequently very different policy perspectives. These are summarized in Table 1.

Table 1. Focus Group participant views on Climate Change adaptation.

Groups	Constituency	Outlook
1	**Business**	"Sustainability without sacrificing profitability"
2	**Emergency Management**	Relocate where possible, "harden" where not
3	**Environment**	Increase residential density to preserve natural environment
4	**Government**	Safe-to-fail plans
5	**Planners**	Status quo

Extracted from Frazier *et al.* 2010 [23].

Group 1: This Group was composed of business interests, broadly construed. As might be imagined, members were concerned about the costs of any adaptation plans which might occur prior to putative losses: their position is summarized by the researchers as advancing 'sustainability without sacrificing profitability'. They were in favor of land swaps between business interests needing to be close to the water and those able to relocate inland; wanted to strengthen commitments from government to underwrite hazard insurance and guarantee any financial losses resulting from storm damage; and were in favor of busting the county's Comprehensive Plan to permit new development inland.

Group 2: This Group was composed of emergency managers, public works staff and a representative of the Red Cross. Because infrastructure is concentrated in the western part of the County, close to the Gulf, and because evacuation planning is hampered by a very limited road network, representatives of this constituency saw themselves to be "locked in" to the existing pattern of land-use, with the result that their adaptation planning was focused upon strengthening and hardening coastal defenses—a "fail-safe" strategy.

Group 3: Members of this Group represented scientific research, environmental organizations and public health interests. It too recognized the potential of land swaps but with the intention of preserving natural areas and farming interests inland: members advocated for increasing residential densities to the north of the County where flood risks are lower.

Group 4: This Group contained city manager and sustainability manager personnel. Their emphasis was upon successful adaptation to emerging threats to the community from storm surge. Accepting that land-uses were unlikely to be altered in the immediate future, members of this Group advocated for safe-to-fail strategies that would allow natural events to fall short of becoming disasters. Examples included investment in highway links that would permit evacuation, redesigning the County's sewage pumping system to protect drinking water after a storm, and educational programs to point out the cost-benefit limits to living in a hazardous location.

Group 5: The last Group represented City, County and Regional planning interests as these are codified within land-use plans, especially the 2050 Sarasota Comprehensive Plan. According to the researchers, planners saw that there is little to be done without a complete overhaul of the latter, which is politically unlikely. Their most practical suggestion was to provide funding to elevate buildings likely to face flood damage.

Assessment of the Focus Groups

The members of the different groups represented different interests and interpreted the climate change challenge in different ways. This is not a surprise; what is however of concern is that even professionals with local knowledge could generate adaptive proposals that are both contradictory and, in consequence, quite likely to produce negative results. For instance, members of the environmental group (Group 3) were keen to protect natural attributes and to increase residential densities, in line with current thinking on sustainable urban development [24]. However, this would increase the size of the population at risk and in competition to evacuate.

Members of the Emergency Management group (Group 2) saw little chance of generating changes to the communities in question, and therefore favored shoring up infrastructure (in the manner seen in New Orleans prior to Hurricane Katrina, as discussed below). This can give a sense of security—which may be false—but certainly adds to a view that the amount of investment in infrastructure demands that communities must remain in place—the so-called "sunk costs" problem. Once this is entrenched, it is extremely hard for a community to contemplate mass outmigration [25].

The representatives of the local business community (Group 1) are, inevitably, committed to maintaining their income but aim to do so in the face of a contradiction. On the one hand, they are keen for the public sector to continue to be seen to support hazard insurance. Naturally, this encourages residents to stay in risky locations with the expectation that any losses that they incur will be made good. On the other hand, the business representatives also request that a plan for 'post-disaster financial assistance' be developed to bring about rapid recovery and redevelopment ([23], p. 512). While these strategies are mutually compatible, they are both antithetical to the principles of adaptation,

insofar as they actually encourage residents and businesses to literally discount future threats and to make long-term plans with the expectation that the costs of redevelopment after a disaster will be met by third parties—in this case, the taxpayer.

The only Group proposing meaningful adaptation plans was number 4, consisting of Governmental representatives. These contained both small and large-scale proposals: a re-alignment of an Interstate highway to facilitate evacuation as an example of the latter, and small but important changes such as ensuring that there is technology in place to keep sewage pumps operating during a storm-surge, which can disrupt both water and power supplies.

The coherence of these proposals stands in contrast to the reported views of the Planners. We might expect these to be, along with the Emergency Managers, the most sensitive to the adaptation process. Both, however, showed themselves to be paralyzed by what they perceive to be a rigid status quo. While this interpretation is likely to be correct, it provides in addition a crucial insight into the realities of local government in the US (and in many other nations, although that assertion would require more discussion than is possible here). For the planners, the municipal Comprehensive Plan is a distillation of the varied interests that co-exist within a locality plus the statutory obligations placed upon that municipality through legislation and funding imperatives. It is in other words a manifestation of numerous forms of self-interest set within the context of what is obligatory—it is a statement of what competing interests want within the limits of what is legally possible. In most jurisdictions within the US (and, again, in many other nations), the concerns of business are paramount, which dictates the extent to which the present is prioritized over the future and the extent to which economic interests predominate over those of residents. These are not automatically in conflict, but as we shall see this is common.

To summarize, this example is used here to show that adaptation to climate change impacts should be of compelling self-interest to stakeholders, especially those living in a jurisdiction where such impacts are likely to be of existential importance; there is, however, both a range of possible interpretations of what such adaptive strategies might be, and a deep misunderstanding of what might constitute an effective strategy or strategies: as Cole and O'Riordan observe, "no-one knows what a sustainable coastal society and economy could look like, let alone how it might be achieved" ([26], p. 379). To understand why this should be, the next section addresses the complexities of governance in our political-economic system and introduces the category of the local state to make sense of these issues.

LOCAL STATES

Sustainability research is largely focused upon achieving the goals that have been developed in practical and academic contexts. The means of

achieving these goals is less frequently discussed within the literature. In many contexts, more attention is paid to the identification of empirical challenges than to policy development; for example, while literally hundreds of research papers focus upon empirical observation of the urban heat island, relatively few explore successful mitigation or adaptation strategies designed to improve the quality of life in that context [27]. Because many sustainability scholars have their intellectual roots in the natural sciences, they are commensurately less familiar with the social sciences, and have less experience with the arcana of the many social science approaches to policy development.

A key insight is that while adaptive strategies are often determined by individuals and their families, it is the policy context and geographical setting in which people operate that is key to understanding their vulnerability [28]. This must include, first, the economic position of the subject, as vulnerability is very responsive to prosperity: this is true in a cascading manner, contrasting the Global South with more affluent regions, but also taking into account regional development within nations, urban-rural differences, the location of individual neighborhoods, and so forth. Clearly, a successful analysis of vulnerability—and policy—must incorporate a great deal of complexity, which must include local government practice and the relationship of the locality with national bureaucracies (and perhaps transnational decision-makers).

While much analysis of climate policy has focused on cities, much less attention has been given to systematic analysis of local governments and no studies have placed themselves in the context of "the local state". As we will see, the latter is a valuable analytical device which can incorporate the dynamics of people in places, paying attention to local practice, relations with the national state, local interests of all kinds, and, not least, the civil society of the locale.

The analysis of the local state originated in the UK in the 1970s, during a period of economic downturn which was manifested in high unemployment and austerity—even bankruptcy—in many cities throughout Europe and the US [29]. Existing conceptualizations of the national state were found to be too general, and those of cities too much focused upon narrow components such as urban social movements or suburban flight. During the next two decades, a number of studies promoted ways of thinking about cities as jurisdictions competing with national governments about policy; this was an era when the concept of municipal foreign policy emerged, which has subsequently informed research on relations between jurisdictions in climate networks [17]. The local state was conceptualized as a political, economic and social entity—usually a city—in which market forces, social demands and fiscal controls all competed to direct the governmental pathway.

While a good deal of interesting research emerged from this work, it has never been a dominant approach. The emphasis given to the individual—in the context of identity politics—on the one hand, and to

global concepts on the other (such as, for instance, neoliberalism) has left municipalities as the targets of less synoptic research, and narrower investigations of topics such as racially-driven segregation and homelessness [29]. This notwithstanding, the author's bibliometric searches indicate that while there is no body of published research in climate science invoking the term "local state", it is still invoked analytically in some contexts: see Appendix.

As noted, one goal of this paper is to argue that the local state is still a valuable approach to the complexities of climate and adaptation. This is underlined by a recent assessment of water policy in Los Angeles (LA) that calls for analysts to "bring the local state back in" [30]. While the authors start off from a different analytical position—namely a critique of neo-Marxism (which regards everything as determined by capitalist interests)—their assessment of LA is especially relevant to this discussion. They show that it is desirable to read the history of LA through its political and business leaders' obligation to secure the city's own water supply. This is more than an example of how a jurisdiction shapes nature to its needs; it is a loose blueprint for how the local state can be examined in other environmental settings, including the pressing question of how cities respond to nature when it is not so easily molded and when adaptive strategies become more urgent.

The next section uses the examples of published research on New Orleans (NOLA) to point to the importance of grounding sustainability research—and adaptation in particular—in this more advanced analytical context. NOLA presents a particular challenge to researchers who are concerned to understand the complexity of relations between cities and nature.

NOLA AND ADAPTATION: A LOCAL STATE DISCUSSION

If LA was the paradigmatic case of urban growth in first half of the 20th century, then NOLA may prove to be the exemplar of the first decade of this century. LA grew rapidly and portrayed itself as a place of glamor, but by the millennium its eponymous school of urbanists predicted a "nightmare" of "greed...catastrophe....and strife" ([30], p. 553). NOLA, in contrast, saw relatively little academic attention prior to 2005. It was notable for two things: its cultural elements, and its extreme vulnerability. Its boosters have foregrounded its tourist attractions, and downplayed the threats from floods from the north and storms from the south [31]. The city's Anglo elites have employed a variety of different strategies to ensure survival, although often at the expense of its poorer African American residents. In 1927, these elites were powerful enough to destroy the levees on the Mississippi so that flooding would not threaten the city; subsequently they were successful in obtaining Federal support to create the infrastructure which protected the city until Hurricane Katrina.

Throughout the second half of the 20th century, the evolving elites— then focused on real estate—oversaw plans which reshaped the city,

which included developing low-income neighborhoods in newly-drained areas protected by the complex infrastructure built by the Corps of Engineers [32]. Yet in 2005, this all collapsed amidst the most redolent example of ill-adaptation in the modern era, as a middling-strength hurricane passed only close to the city. While affluent and mobile residents evacuated, hundreds of those who remained died; the city was extensively flooded and remained ungoverned for a significant amount of time. This in turn was followed by a prolonged period of readjustment, as some residents carried on as before, but others were not permitted to re-enter their neighborhoods [16].

Even as the floodwaters receded, national political figures committed funds to rebuilding, tactlessly comparing the flooded city to Heritage site Venice [33], while at the same moment academics—notably economist Edward Glaeser—argued against the logic of reconstruction, pointing out that a second Great Migration was already underway and that it behooved the Federal government to complete the task via subsidies to encourage individuals to leave the city [34]. This remains one of the most ambitious examples of adaptive advocacy to date, which recognizes the impermanence of human investments: economic needs (such as a port) may change, engineering solutions (such as levees) can reveal themselves to be outmoded, and residents can suddenly face a risk calculus that no longer suggests that they should remain.

As we know, NOLA has of course been rebuilt, at a cost in excess of $100 billion. This has occurred despite the fact that it faces the newer challenges of a rising sea-level and more active hurricanes to be added to a sinking skyline (resulting from ground water depletion). By any logic, the city is not sustainable: so, we must ask why it continues to attract investment. Has it in fact anything to tell us about adaption?

The NOLA example is valuable because it shows how the existential threat that flooding has always posed to the city does not exist in plain sight. Interestingly, Lauria's detailed discussion of the city's pre-Katrina politics mentions it not at all [35]. Rather, sustainability issues have served only to offer contrast for the other social and economic tensions which structure the city's politics. Simply put, these have long been defined by national development interests attempting to extract profit from the city, often at the expense of the economic needs of the African American population, which has long been one of the poorest in the country. A key example of this was the multiple attempts to remove the Iberville public housing projects, which had been constructed in 1937 using Federal New Deal funds. Although targeted for Anglo households, the apartments transitioned to African American occupation as the city re-segregated during the era of suburban development. As they abutted the city center, they were seen by developers to be antithetical to tourism and convention business, and plans were continually floated to evict the tenants ([35], p. 134). These efforts dated back to the 1980s but were still being proposed at the millennium. Katrina provided the opportunity to raze the 23 acre site,

a gentrification process now completed with the recent creation of a mixed-use redevelopment [36].

In short, NOLA shows how a city's environmental issues cannot be considered separately from all the long-standing issues manifested within the local state. Predictions of devastation from a hurricane were discounted because it was known that they would only impact the most vulnerable neighborhoods. Since 2005, Federal, State and local forces have converged to accomplish the development goals promoted by the urban elite for decades. What Katrina has accomplished is the most brutal form of urban adaptation, essentially clearing the poorest and most vulnerable neighborhoods whilst streamlining the 'tourist experience' for convention visitors and gamblers [37].

SUSTAINABILITY AND THE LOCAL STATE

The example of NOLA is extreme yet valuable, insofar as it shows in graphic terms how a city both manifests, and reproduces, the social, political and economic forces that are responsible for its creation. It shows the way in which the striations within society become visible within a city's neighborhoods, and—especially important in this context—it shows why sustainability goals are often subordinated to other concerns, both economic and political. This was especially visible in NOLA in the months after Katrina as the process of assembling a plan for the city's reconstruction began.

As noted, what were to become the most devastated portions of the city were created from swampland during development of the city's port facilities [32]. Decades later, efforts were made to dramatically reduce residential densities in these neighborhoods under the auspices of the first post-Katrina planning attempt, known as Bring New Orleans Back (BNOB). While reducing density in an urban area close to a downtown is antithetical to most sustainability norms, the goal of limiting reconstruction in the Lower Ninth—perceived to be a dangerous location due to the problems of toxicity and mold overlaid across the permanent threats of future flooding—was finessed by emphasizing the possibilities of greening [38]. The BNOB plan mentioned open space and ways to access this, specifically via the construction of bike paths. Such plans have become commonplace in many cities, and are often linked to other sustainability goals, such as reducing vehicle use, limiting carbon generation and increasing exercise opportunities. The latter are not unimportant in NOLA, a city with one of the highest rates of obesity in the US [39].

In another urban setting, the BNOB plans, with their distinctive green dots, might have been hailed as innovative for their sustainability goals. In NOLA, however, the reception was hostility of the highest order. Interpreted—rightly—as an attempt to reduce the size of the population at risk, sustainability and adaptation planning was rebranded as 'ethnic cleansing' and strenuously rejected [38]. Much the same reaction occurred

with the construction of a community garden in another African American neighborhood [39].

LOCAL STATES AND ADAPTATION

This discussion of New Orleans post-Katrina is useful for three reasons: first, it emphasizes that policy on adaptation exists within complex networks and interests; second, it underscores that the convergence of local geographies and local interests will produce different outcomes from one example to another, such that policy development will always be complex and conflicted; and third, it offers some interesting intellectual challenges to the manner in which we will have to think about the processes of adaptation in coming decades.

First, the conceptual apparatus of the local state offers the possibility of identifying conflicting interests rather than rational policy evolution. Perhaps the simplest example of this is to contrast the way in which Federal policy towards extreme events has changed over several decades. Nearly a century ago, New Deal thinking encouraged "big plans"—for example to control watersheds within large integrated projects. Federal spending was key to schemes such as the Tennessee Valley Authority or power generation in the Southwest. Yet since the taxpayer revolts of the 1970s, it has become harder to provide funds for proactive projects linked to infrastructure or disaster mitigation. In contrast, a form of braggadocio has tended to produce impulsive commitments for reconstruction, as was seen after Hurricanes Katrina, Sandy and Ivan.

Changes in civil society have occurred, and environmental activism has also changed. While the drift in Federal spending has tended to work against adaptive thinking (by flinging money at reconstruction), in a different way something analogous has occurred with social movements. While these were once heavily centered on particular spaces and places, the drift to global thinking—especially in the context of climate change— has tended to cause environmental thought to limit itself on the one hand to small-scale tactical ideas—such as drinking straws—or vast strategic proposals, such as a Green New Deal.

The third and most controversial aspect of situating the issue of adaptation within the framework of the local state comes as we address the future. If we accept that successful adaptation will often involve large-scale changes to land uses and/or fundamental urban design concepts, then it is instructive to look to those municipalities whose stakeholders have shown an ability to generate change in the past. While such change is unlikely to have been operationalized under the specific label of 'climate change adaptation', there are numerous examples where municipalities have acted to adapt to some event, either recently past or imminent. In the lexicon of urban development, one often referred to is Haussmann's major restoration of 19th century Paris. While this removed a great deal of slum housing and installed new technologies such as the railways, it also arbitrarily displaced many thousands of residents [40].

If we consider instead American cities in a more recent past, 20th century examples might include the reconstruction of San Francisco after the fire of 1906; the urban renewal regime of Robert Moses in New York across several decades in mid-century; and the creation of an Urban Growth Boundary around Portland, Oregon. Each example might provide additional support for the claim that city administrations are the dynamic actors that can get things done in ways no longer possible at a national or transnational level. Yet these transformative plans remind us, as with the examples of LA and NOLA, that those who get things done within the local state often do so by maximizing economic interests, which in turn usually involves minimizing community decision-making. In perhaps the most egregious instance, the elites in San Francisco attempted to forcibly remove all Chinese immigrants from the city in order to obliterate Chinatown and to streamline the redevelopment of the city center—an openly racist move which began within days of the earthquake and fire which destroyed most of the city. Only the intervention of the Chinese government blocked this attempt [41].

The Moses regime in New York is perhaps the most paradigmatic example of what Glaeser terms "great cities needing great builders" [42]. Moses transformed New York from a 19th century to a 20th century city, adapting it from the horse to the automobile. As Glaeser notes, "he built 13 bridges, 416 miles of parkways, 658 playgrounds, and 150,000 housing units, spending $150 billion in today's dollars" [43]. He did this in large measure as an unelected official who did as he liked with regard to the neighborhoods he destroyed; his monuments are also of course remembered for being the motivation for Jane Jacobs's critique of draconian plans [42].

The third example briefly touched upon here—the delineation of an urban-rural growth boundary around Portland OR—is much more subtle but equally transformative. The boundary defines where urban land-uses can and cannot occur. It is part of a longstanding blueprint to structure the metropolitan area (one to which Moses contributed as a transport consultant in mid-century). While Portland is frequently lauded as one of the greenest cities in the US, due to its bike lanes and other manifestations of sustainability, this has also involved transforming the city from old blue-collar industries to new tech employers, and from being a relatively affordable real estate market to an expensive one. This has had significant demographic impacts, effectively pricing most minorities out of the housing market [44].

These three examples have been chosen to underscore two things. The first is that the local state is a valuable way of thinking about cities and local governments, as it helps us approach the complexities and conflicts that exist in any long-established locality. And therefore, when we look at dynamic and transformative plans, we find that places accomplishing change may do so without a great deal of communal input or without

many just outcomes. Advocates of dynamic adaptation may in consequence be careful of what they wish for.

CONCLUSIONS

This paper has argued that much of the discussion of plan and policy-making for sustainability in all its forms must involve frustration because it focuses upon inputs rather than outputs: that is to say, upon rational plans and not social, political and economic realities. In the context of climate change adaptation, we can see that rationality is subjective and is determined by stakeholder interests rather than a single objective reality. This comes into sharper focus if we place these plans into the context of the local state, where economic imperatives, local and national legislation and political interests all contribute to the current situation, and will in turn shape the future.

Adaptive planning may well be the most crucial challenge facing our communities in this century. But the challenge will not be identifying what is to be done but how it is to be accomplished. The local state framework contains no predictive capacity; it cannot point to the future. However, from the past we can see that in the US, bold plans have often been socially unjust and lacking in community input. The challenge for the 21st century is to develop ambitious plans which are ambitious yet just.

CONFLICTS OF INTEREST

The author declares that there is no conflict of interest.

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APPENDIX

A bibliometric study was undertaken in March 2019 to identify the prevalence of the term "local state" within the title or Abstracts of indexed publications recorded by the Web of Science core social science data base for publications between 2015 and 2019. This was accessed on 2019 Mar 24. 31 publications were identified in a manual search that removed all papers that referred to "state and local" government. In total, these 31 papers were cited 101 times. A significant proportion of these publications relate to local government in China, where the state is visibly powerful at the national and the local level, and where, in consequence, the local state heuristic is self-evidently useful.

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