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Middle Eastern Cities in a Time of Climate Crisis

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Introduction. Cities and Urban Regions: Central Actors in the Climate Crisis

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INTRODUCTION

CITIES AND URBAN REGIONS: CENTRAL ACTORS IN THE CLIMATE CRISIS

In 2005, a report on disaster reduction warned of the increased risk for flash floods around the Red Sea and Southern Sinai (Government of Egypt 2005, 3).¹ There was, however, no mention of cities. In October 2015, unpredicted and devastating floods in Alexandria killed six people. In the winter of 2020, floods across Egypt affected 20,000 families and killed forty, with ten victims in Cairo alone (Reliefweb 2020); other informal sources mention even greater fatalities. In 2021, three people died and hundreds were injured by scorpions in Aswan, an event that was attributed by national experts to climate change (Masrawy 2021; see also Guillou 2021). Within the past decade, massive floods, reinforced by the predominance of concrete in Egypt's cities, have threatened the urban landscape and become a real obstacle

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1 We thank Sylvie Fanchette for her comments on this text.

to biodiversity. The lack of proper water drainage and weak coordination between public administrations and service providers only compounds the catastrophe.

Despite a brief reduction in carbon emissions after the outbreak of the COVID-19 pandemic in 2020, global net anthropogenic emissions reached an all-time high (UN News 2022), followed in 2022 by record heat, bringing with it unprecedented disasters. This comes despite earlier warnings by UN Secretary General António Guterres that emissions needed to be halved by 2030 and the global addiction to fossil fuels curbed. Agreeing that the ‘fossil fuel industry is killing us’, we must seriously consider the role of cities, which cause more than 70 per cent of human-caused emissions (UCCRN 2022), in the global climate crisis. Cities host 55 per cent of the world’s population (UCCRN 2022), and their contribution to global warming could continue to rise as two thirds of the world will live in cities by 2050, up from about half now. Meanwhile, many cities are at the forefront of green reforms and will be key to tackling climate change, given that climate vulnerability is a shared global phenomenon and that various regions have different capacities to endure the consequences of climate change. If cities are generally much wealthier than the rest of the territory, a majority of dwellers in the Global South and in the Middle East are predicted to be severely hit by extreme heat waves, floods, loss of biodiversity and its consequences on air, water and soil quality (see El Hady in this volume), not to mention the cross-cutting risks of water shortages. ‘Urban areas and their infrastructure are susceptible to both compounding and cascading risks arising from interactions between extreme events and increasing urbanization’ (IPCC 2022b).

The situation in the Middle East will become dire because the region’s countries and its cities are geographically located in areas of high average temperature, with most countries already marked by strong aridity. This will affect food security, since 70 per cent of agriculture is rain-fed (Borghesi and Ticci 2019). The region’s population is also expected to double by 2070. These two trends may increase the dependence on food imports, making the whole region vulnerable to global price shocks; they may also cause or reinforce internal and international migrations of people seeking protection against extreme weather events and loss of agricultural productivity. Several specific

risks are expected to increase, harming cities and their populations and affecting not only the most underserved who live in precarious neighbourhoods, but also the most climate-vulnerable: children and the elderly (UNICEF 2022).

The region is also experiencing another strong transformation as demographic growth is taking place mostly in cities. The pace of spatial expansion is very high in Palestine, Egypt and Jordan but also in Lebanon, which continues to deal with an ongoing refugee crisis. Today the urbanization rate in the region is still rapidly increasing, with both strong patterns of migration to coastal cities and rapid natural population growth in others.

In addition to sectoral approaches, urbanism and urbanization stand as major social and systemic issues, worthy of inclusion in the UN Framework Convention on Climate Change (UNFCCC). As the population of cities double on average every twenty years and as cities continue to grow spatially, the link to climate change must be examined in two main directions. On the one hand, cities are producers of GHG emissions and, through the extensive use of extracted products, majorly responsible for environmental damages; on the other hand, cities are home to a majority of citizens and must offer viable alternatives to these emissions while supporting individual well-being and social justice. These interwoven challenges are unprecedented, and it was our aim to explore them in a collective volume.

This publication is a collection of scientific papers and essays touching on the urban realm of climate change in cities of the Middle East in relation to other global cities. The climate crisis does not wait, and this book is a modest tribute to the dramatic intellectual, practical and financial efforts that will need to be carried out in the next few years if we want to limit global warming to 1.5°C above pre-industrial levels or, in the worst scenario, to 2.5–2.8°C (UNEP 2022). In addition, this publication promotes critical thinking on the city's fabric, mobility and waste production. Its authors consider the city in relation to infrastructural developments in the productive spheres of the region's countries and to urban redevelopment at a larger territorial level. The 'urban' is no longer contained in cities and does manifest itself, even with unachieved citizenship or urbanity and outrageous rates of vacancy, through the complete built-up coverage of many

other territories. If Cairo's gated communities are meant to host a minority of its population, they nevertheless occupy 40 per cent of all land in the GCR region (Vilard 2022).

Let us try to briefly analyze the main factors and impacts of climate change and address its links with urbanization. We wish to touch upon decision-making mechanisms and to discuss climate-oriented planning. In this book, we understand climate change as a complex socio-economic and physical reality imposing itself on most aspects of social life, particularly in cities.

DESPITE COMMON SENSE: CLIMATE CHANGE FACTORS AND IMPACTS

Reducing global greenhouse gas emissions is often described in some countries of the Global South as being of the responsibility of the Global North. Climate change is a direct consequence of capitalist, state-led models of industrialization, post-industrialization and development; countries in the Global North have not yet respected their commitments towards countries that disproportionately shoulder the burden of the climate crisis. A major contradiction thus resides in the production modes and urbanization trends that, in the Middle East, have embraced this global trend of limitless growth, mostly manifested in suburban infrastructures that support oil-dependent individual mobility and related mega-projects. Accordingly, social and natural scientists have to venture into the critiques of both the financialization and technicalization of the discourses and solutions to climate change. The Anthropocene (Latour 2014) results in rapid changes that tend to make territories increasingly uninhabitable.

Let us first look at carbon dioxide (CO₂) emissions in the region. According to a 2019 IEMed report, such countries as Turkey, Israel or Libya were larger per capita emitters than some Southern European countries. Fossil-driven economies and war also have devastating impacts on the environment, the largest extractive powers of the region ranking among the most polluting and most polluted countries in the world. Adding to this reality, threats to animal and plant life indeed fit well under the umbrella term of a global 'biodiversity collapse'. This also means that the region's ecological footprint should be taken very seriously.

Our common assumption is that citizens lack control over the sources of pollution and the channels of solid waste disposal while a very strong path dependency on extractive industries now dominates urbanization models. In the region, and mostly in arid areas, the desert is seen by the state and developers as a reserve of wealth, but local authorities and citizens are mainly absent from this decision-making process, with the exception of Jordan and to some degree Lebanon and Kuwait. There is an intrinsic logic between the feeling of a land dominated by the desert (Sims 2014) and extended sprawl dedicated to the type of car-dependent urbanization that has existed for a while in the countries of the Persian Gulf (as shown here by Pascal Menoret). This logic, however, has become common sense in Cairo's urbanization (Sims and Zaazaa in this volume). The same applies to the concentration of hazards attributable to waste in cities; very few cities other than Cairo can boast the success of the informal Zabbaleen networks of waste collectors and recyclers (see Badir and Florin; Iskandar in this volume). These successes, however, do not prevent very heavy concentrations of fine particulate matter ($PM_{2.5}$) attributed to open waste burning (Larsen 2019). As climate change and urbanization are a multidisciplinary issue, we explore other areas of enquiry, including public health.

Many cities of the Middle East are coastal and survive on commercial trade. Climate-related disruptions can therefore result in economic and social problems that hamper their day-to-day activity. Moreover, other environmental challenges associated with over-fishing or polluted waterfronts stem from the dire environmental situation and contribute to the rapidly rising costs of adaptation and to mortality and morbidity rates. According to the IPCC (2022a), the 'exposure of people, assets and infrastructure to climate hazards is increasing in Africa compounded by rapid urbanization, infrastructure deficit, and growing population in informal settlements'. The 2022 IPCC report reminds us that risks to coastal cities are projected to increase by at least one order of magnitude by 2100 if significant adaptation and mitigation action does not take place. The half of the Egyptian population that lives in the Nile Delta now faces rising sea levels, population expansion and degraded soil quality in addition to looming water shortages. This compounded risk

might cause a silent displacement of population as a result of climate change, and it already hampers food security. Two articles included here highlight this multifactorial structural change in the Nile Delta, caused as much by climate change as by a government-encouraged intensification of economic activities on fertile and wet lands. The initial vulnerability of river deltas that was originally also their source of wealth and fertility (see Fanchette in this volume) becomes a real hazard with sea-level rise, salinization and the rapid shrinking of lakes and wetlands. City centres are not as impacted as the peripheries, which undergo a never-ending process of land take. This suggests that vast urban regions in the Ecoumenopolis (Denis 2007) are characterized by massive local and international investments in land, turning them into urban sources of exchange value, something observed across Lebanon (see Public Works' contribution to this volume), in mega-cities and mega-city regions and beyond the Middle East (Huybrechts in this volume).

Current urbanization projections suggest that cities in the Global South, especially in East Asia, South Asia and Africa, could be at the receiving end of 96 per cent of an over three-billion-person increase in urban population by 2050 (Arku and Marais 2021). At the same time, many solutions introduced in those cities are serving European export markets, with large-scale investments and low responsiveness to local demands and challenges. Large infrastructural investments such as the creation of monorails, high-speed trains and fossil fuel-dependent means of transport may be warranted while and some localized cycling initiatives are burgeoning (Moussa in this volume). Yet almost no support is given to incentives for low or zero-carbon mobility, especially in mega-cities that have become unwalkable. In a way, the urban markets of mobility partake in the overwhelming dogma of auto-mobility, despite low levels of car ownership in comparison to Western European countries.

CITIES AND CLIMATE CHANGE IN LOCAL AGENDAS

The conversion of undeveloped land into urban land triggers local warming effects by altering the biophysical properties of the land surface, adding to non-local GHG-induced warming. Urban adaptation strategies seek to deliver local climate benefits by perturbing the

energy balance of the urban surface (Zhao 2018). Egypt represents the epitome of urban expansion presented as economic prosperity and urban development. According to an official government statement (El Sakty 2021), Egypt will soon witness the inauguration of its new capital. The new administrative capital project area is 168,000 acres in size, equivalent to the area of Singapore. It ostensibly uses benchmarks in construction and urban development from around the world. The same government source states, for example, that the new capital will contain a central park of 8 km², six times larger than Hyde Park in London. It will also feature an ‘entertainment city’ three-and-a-half times larger than that of Universal Studios (El Sakty 2021). What does that mean in terms of water and energy footprint? What kind of economy is this creating? Is this really the solution to such urban challenges as overpopulation and water shortages? Is this a sustainable model of urban governance?

Moreover, if social justice is to be aligned with solutions to climate change, this book clearly demonstrates that current urban developments fail to alleviate various housing crises (Shawkat 2020). Aggravated expansion in the form of gated communities, roads and infrastructure is a net contributor to the large cities’ GHG emissions, as it is in other countries. The rapid pace of urban growth and real estate investments makes Egypt a pathfinder of over-urbanization without catering to the needs of the 60 per cent living in dilapidated or precarious neighbourhoods. We can assume that the politics of urban regeneration is clearly reinforcing these spatial and environmental inequalities. The new capital, accompanied by more than forty-five new cities in Egypt (see Sims in this volume), is the government’s answer to the expansion of informal settlements, even if the reality of land markets does not tackle these populations’ needs. New cities are encouraging urban sprawl through a ‘Riyadh’ or ‘Los Angeles’ model of urbanization that is entirely unsustainable. Many authors have written about the urban assets of precarious neighbourhoods, one of them being the density of the urban fabric. These writings have been ignored, as they seem to fundamentally challenge not only the urban dream of the self-segregated city but also the credit industry and models erected by the private housing sector, encouraged by various administrations and housing markets.

We therefore need to challenge the usual discourse on new ecocities, which contradicts the reality on the ground and is not aimed at the majority. Moreover, new planned developments fail to answer the major question of internal mobility: their urban fabric is not designed to be walkable, and cars are often the only means of transportation. Let us remember that smart cities are a new investment field for international corporations and are therefore aligned with the ‘developer’s spirit’ at the expense of compactness and social justice.

According to the current generation of researchers, housing renovation and urban upgrading could be effective tools, provided that they be monitored and co-managed by the affected communities. Yet this wish for an inclusive approach seems out of hand in the absence of elected or independent local bodies.² The current model of urban expansion is pointing to an economic model that is extractive rather than circular, even though Egypt’s 2030 strategy promotes sustainable development in a cross-cutting approach with all government policies (MPED 2020). Urban expansion leads to consumption, production and an intensive use of water by the construction sector (see Zaazaa). This is followed by the increased energy demand generated by the construction sector, in addition to the creation of road networks and accompanying infrastructure. Expansion generates a radical climate impact in the form of emissions and urban heat islands (National Geographic Society 2022).

With more than 80 per cent of the global GDP generated in cities, urbanization could contribute to sustainable growth through increased productivity and innovation if managed well (World Bank 2022). In Greater Cairo, where over twenty million people live and work, the climate stress factors are increasing daily due to massive urbanization and over-motorization. Although Cairo is not directly threatened by rising sea levels, other climate factors can hit the city at a larger scale, for example flash floods and weather events, as well as deteriorating air quality and overheating due to a rapid increase in temperature and longer periods of heatwaves.³

2 Regular local elections take place in Jordan, Kuwait and Lebanon.

3 The duration of heatwaves in Egypt is expected to increase (between 9 and 77 days) (UNICEF 2022, 10).

In the following pages, we will examine the logic and outcomes of the massive urbanization that stems mostly from financial motivations and worsens the environmental situation despite some success in the pursuit of Sustainable Development Goals.⁴

HOW DECISIONS ARE MADE

Despite an overall awareness of the looming climate crisis, tools for climate financing remain elusive. Green bonds are issued to finance large-scale infrastructure projects to build more bridges and bigger roads, thereby creating more disparities while ignoring environmental or social justice. Proceeds from Egyptian green bonds have supported fourteen infrastructure projects valued at USD 403.26 million. These projects can be grouped into two categories: monorails as a supposedly sustainable form of transport, and wastewater treatment plants in new urban communities. These projects, however, only mostly serve rapid urban expansion and magnify its climate impacts. Additional such investments can only make it harder to deal with the climate crisis.

With its social democratic views on climate change, the Friedrich-Ebert-Stiftung calls for a just, socio-ecological transformation in our cities and societies. However, this transition and the urgency of moving towards it can be either gradualist or emergency-based (Rode 2019). Gradualism as part of climate action refers to decarbonization over several decades. This approach includes net-zero emissions targets by 2050 and a range of economic policy instruments, for instance emissions trading and carbon taxes. This course of action could have been valid a decade ago, but it is framed instead by political and financial realism, a less productive alternative to a more responsible, scientific approach (Rode 2019).

4. In 2021, Egypt was among the ten countries that submitted a Voluntary National Review (VNR). In doing so, it strives to lay the foundations for a more resilient economy and community capable of weathering unexpected adverse shocks. It has also taken some steps in the implementation of the SDGs by undertaking reforms in different areas (CAPMAS 2016). The Sustainable Development Strategy report also advised involving all stakeholders in the process from an early stage, ensuring a planning phase, and allowing each group of stakeholders to set their own indicators, baseline and targets.

Few infrastructural or adaptation plans are being developed through consultations with diverse and marginalized urban communities (for such a recent project, see Abosira et al. in this volume). In addition, many secondary settlements and precarious neighbourhoods 'need global support for local governance, more information and more direct sources of finance to meet the vision of global climate agreements' (IPCC 2022c, 921). In the case of Egypt, the choice has been made instead to further build out the road network and to construct monorails and high-speed lines through the desert, crossing the boundaries of both historic and modern city cores. As for many planning decisions globally, worsening predictions for climate and global emissions 'would require a prerequisite development of scenarios [...] and development pathways' (IPCC 2022c, 921). This leads to a reflection on the absence of a participatory process in planning and climate-oriented decision making. Against this model, Aqaba and other Jordanian municipalities offer a chance for city resilience through real efforts for participatory planning, while Bethlehem and other cities in Palestine opened up spaces for a collective reflection on the role of public spaces and slow mobility. In Lebanon, land across the whole country is massively allocated to developers, neglecting the central role played by forests, wetlands and fields in the country's independence and its protection from the impacts of climate change (see Public Works' contribution to this book).

Within one decade, research on 'sustainable cities' has given place to a new concern for climate change. Ten years ago, CEDEJ dedicated a special issue of *Égypte/Monde Arabe* (Barthel and Monquid 2011) to contextual paths for sustainability. The authors took stock of the potentials of the inner city of Cairo which is overlooked by such mega-visions as the Cairo 2050 strategy, marked by disdain for high densities and a preference for a regeneration that is blind to the existing urban fabric. This vision is consistent with a competitive metropolitan agenda adopted by the major cities of the region (Deboulet et al. 2016). The lack of compromise with land resources and the environment squanders the last chances for the metropolis to have recovery spaces. Indeed, the speed of demolitions correlates with an unprecedented urban expansion, establishing the metropolis

within a widening urban corridor that leaves little consideration for the existing built areas, which are seen as out of date and unprofitable.

WAYS OUT, OR: SMART CITIES WON'T SAVE US

'Unless drastic action is taken to eliminate net emissions of greenhouse gases from human activity and remove historical emissions from the atmosphere, the impacts of global climate change will continue for a long time to come' (Mayrhuber et al. 2018). The consequences of exposure to extreme temperatures on human health are dire and lead to increased morbidity rates (WHO 2021). Climate change experts and political bodies have been inclined to position themselves on the debate between adaptation and mitigation. Our goal in this book is rather to enlarge our consideration for the reciprocal impacts of current urbanization and climate change.

We fully agree with the mounting pressures to adopt behaviours (both individual and for economic actors) that would drastically reduce net emissions and carbon footprints in all domains. Urban environments in the Middle East urge us to stop considering nature as a field for production, exploitation or profit. Protecting life and protecting the natural environment should be a priority.

Exposure to high temperatures over extended periods has become the rule in most of the Middle East. This is especially the case in cities where most building materials are made from concrete, reinforcing the internal heat exacerbated by lacking ventilation. Many authors have underlined the tendency to cut trees to widen roads and produce coal in Egypt. This has reduced green space per capita to 17 cm² in Cairo and 39 cm² in the cities of the Canal Region (EIPR 2022).

Empty spaces are pervaded by construction sites, even if the buildings themselves remain empty. Very high densities and the absence of cross-ventilation make daily life harder. Ghodbane's article in this volume demonstrates the capacity of ordinary dwellers to minimize heat when access to air conditioning is not possible. Their skills are nonetheless misunderstood by professional architects, while masons are more able to address their needs. This is a topic of concern for planning – several metropolises have adopted plans to combat heat and ambitious policies of 'no net-land take' (Huybrechts in this volume). It is of concern for the construction sector, too, which needs

major changes. Radical decarbonization through the use of such naturally sourced materials as straw and clay is now technically feasible and necessary.

Another example is air pollution (see El Gerzawy in this volume), whose public discussion is swept aside to the point that the vast majority of city-dwellers in the region is not informed about it. While some states do monitor air pollutants (Larsen 2019) in the region, access to information is limited and no local agenda has yet been set up. In many countries, there is a need for coordination between public health and urban authorities. While urban expansion is galloping and suburbanization becomes dominant, with its massive need for infrastructure, services and industries (Keil 2018), air quality and transparency will probably become a major public issue.

As noted above, the challenge is in the region's cities, given their rapid growth. Solutions will mostly come from within cities and increasingly from municipal and local authorities. Such international networks as the International Council for Local Environmental Initiatives (ICLEI) or United Cities and Local Governments (UCLG) may provide technical or ideological support for policy shifts that seek to change the way cities operate, convince them to reduce GHG emissions and preserve biodiversity (see Díaz-Bone in this volume). Considering the specificities of Middle Eastern cities and their high vulnerability to climate change, urgent and drastic measures are required, taking in consideration extant climate injustices. We must reconsider the use of purely technical one-size-fits-all strategies. The climate crisis is a human construct, and it would be vain to fight it only with technical solutions, without trying to adapt socio-technical arrangements and disrupt the entrenched 'system of automobility' (Urry 2004).

The FES's publication on *Managing Urbanization* (Brandi 2021) states that the 2030 agenda, together with the Paris Agreement, can help unlock the potential of cities as change agents in the climate agenda. A first goal is to align urbanization with the preservation of natural resources and the protection of the local environment by adhering to planetary limits. A second dimension is ensuring the social, political and economic inclusion of urban dwellers, which includes access to food, clean drinking water, sanitation and such basic

services as healthcare, education and jobs. Third, the privatization of the public sphere results in further inequalities and exclusion, as these spaces are meant to be a reserve of the biosphere (Brandi 2021). This third dimension relates to preserving the socio-cultural identity and spatial diversity of cities and urban societies.

The first part of the book addresses a range of urban climate crisis challenges in three main directions: urbanization, waste and housing. David Sims explores the relation between urban sprawl and low densities in Greater Cairo and analyses car-oriented mobility and its contribution to GHG emissions. Pascal Menoret looks at fossil energy dependency as a socio-political construct in Riyadh. Ahmed Zaazaa examines the current overproduction of high-end housing in Cairo and studies its 'environmental price'. Public Works Studio, a collective of urbanists and architects, writes on public land policy, privatization and instrumental re-classification as key to understanding ecological and livelihood losses in Lebanon. Sylvie Fanchette compares the Nile Delta with Asian Deltas, which are all exposed to high hazards and environmental deteriorations. Florian Bonnefoi studies coastal defences in the Nile Delta from the vantage point of adaptation and long-term resilience of cities and other fragile environments. Dalila Ghodbane looks at climate adaptation from the perspective of city-dwellers through low-tech building practices and considers the role of various building practitioners in climate resilience. Romani Badr and Bénédicte Florin write about waste pickers in Cairo; as waste remains a major source of emission and pollution, the mindful circular industry of the Zabbaleen calls for support and recognition.

The second part of the book offers fresh perspectives on recent civil society initiatives on climate emergency and urban challenges. León Díaz-Bone, representative of the ICLEI network of local authorities, proposes a pathway to take stock of Sustainable Development Goals and recent climate agreements. Nabeel El Hady writes on behalf of generations of students and delivers key messages for learning from water and biodiversity through nature-based solutions. Eric Huybrechts shares his perspective as a planner consulting with public agencies in many capitals and mega-cities. Layla Iskandar stresses the unique contribution of the Zabbaleen in creating a circular economy. Still not sufficient, this informal system has all the ingredients

for becoming a viable alternative. Heba Attia Moussa examines low-carbon mobility, especially biking, as an alternative to car and oil dependency, while thinking about the difficulties posed by slow mobility in suburban spaces, which European transfer models do not consider. Mohamed Abosira, Ibrahim Garcia, Iman Hassan, Kareem Ibrahim, Sara Sayed and Sara Seyam reflect on climate change- and gender-sensible design of public spaces in Damietta region. Two interventions by Ragia El-Gerzawy and Ahmed El Dorghamy respectively focus on the complex relation between air pollution and heat-island reduction with the climate crisis.

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