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Informal Settlements: Home to Cities' Principal Recyclers/Waste Managers and Climate Champions

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INFORMAL SETTLEMENTS: HOME TO CITIES' PRINCIPAL RECYCLERS/WASTE MANAGERS AND CLIMATE CHAMPIONS

INTRODUCTION

Cities in the Global South have been grappling with how to address the proliferation of informal settlements. They need to apply solutions to contexts that are extremely diverse with regard to location, size, density, building quality, illegality and risk. Their approaches are primarily based on spatial, financial and infrastructure considerations and seldom on economic, social and occupational factors. Tailoring upgrading solutions has become a daunting task for cities.

Gases emitted by waste constitute 3 to 5 per cent of total global greenhouse gas (GHG) emissions. As the linkages between solid waste, informal sector actors and climate change have begun to be more widely understood and appreciated, several global and national policies are being revised. One of the major ways that solid waste contributes to climate change is its generation of GHG emissions.

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The 1.6 billion tons of carbon dioxide-equivalent (CO₂-equivalent) emissions estimated for 2016 are anticipated to increase to 2.6 billion tons by 2050. Emissions from solid waste treatment and disposal, primarily driven by disposal in open dumps and landfills without landfill gas collection systems, account for about 5 per cent of total global GHG emissions (Kaza et al. 2018). The UN-Habitat Waste Wise Cities Tool (UN-Habitat 2021) affirms that recycling is a central pillar in the transition towards a circular economy, in which governments and the private sector cooperate in order to create long-term, sustainable economies. In many ways, recycling is seen as a final effort to effectively utilize resources after people try to both reduce their consumption and find more efficient processes in production. Recycling is a vital way to reduce the environmental impact of natural resource extraction, which is rapidly damaging natural ecosystems. By investing in recycling and transforming already extracted resources, economies can make significant strides in decoupling economic growth from resource use. National and local governments in several countries, such as Brazil and India, have moved in this direction. In Cairo, after the failure of the privatization of waste services by large corporations between 2000 and 2015, the city's informal recyclers (the Zabbaleen) once more provided the much-needed services of municipal solid waste collection, including transporting, sorting and recycling the waste, and did so under imperfect conditions.

Community-based adaptation strategies at the local level enhance the capacity for effective intervention and increase climate resilience. This resilience itself is based on significant, citywide mitigation through recycling. Importantly, it is predicated on long-term synergies between the UN's Sustainable Development Goals (SDGs) and climate change.

This paper analyses six informal settlements in Cairo that have become home to hundreds of thousands of people engaged in an occupation that is critical to the city's public health: the management of municipal solid waste. These neighbourhoods are located at strategic points in the city and currently act as transfer stations that handle 60 per cent of the materials recycling economy of the Greater Cairo Region (GCR). Residents are perceived as garbage collectors, but the only reason they conduct door-to-door collection, transport, sorting and processing is that they are recyclers, i.e., they harvest materials.

INFORMAL HOUSING AND INFORMAL RECYCLING

Addressing informal dwellings should ideally lead to considering how reform proposals impact the informal settlements' continuity in public health service to the city of Cairo, as well as their role in achieving numerous SDGs, namely numbers 1, 2, 3, 4, 5, 8, 9, 10, 11, 15.¹ This should go hand in hand with considering the massive feedstock they provide to formal recycling plants around the country, the trading networks they create with other urban agglomerations of materials in the Delta, Upper Egypt and the two coasts, and their contribution to the reduction of global warming through the lesser extraction of fossil fuels (plastics) and the reduction of other extractive industries (trees to produce paper). In short, addressing informal settlements should provide a broader view of the economic, environmental and social dimensions of their role in the city (UN-Habitat 2010).

Is it possible to imagine such an approach for Cairo? Informal settlement programmes currently grapple with the complexities of incorporating land-use patterns, siting new housing locations, choosing between in situ upgrading and new housing construction, providing infrastructure, mobility and services, and dealing with a host of other urban planning aspects. These programmes seek to improve the physical living conditions of people by using a lens that is currently biased towards housing.

Cairo and other cities in the South (e.g. Dharavi in Mumbai, India, or Belo Horizonte in Minas Gerais, Brazil) have seen informal settlements spring up around specific occupations. The tanners' neighbourhood behind Cairo's aqueduct is one example. The Rod El-Farag vegetable market is another, as are the six recycling neighbourhoods in the city.

The current informal waste system in Cairo has been left to grow and evolve with the organic growth of the city for over seventy years. This system responded with adaptability and agility to the physical growth of the city and the growth of materials in its waste stream. Officials tacitly acknowledged the need to allow traditional recyclers to keep operating the city's waste system and admitted that no other

1. See <https://sdgs.un.org>.

alternative could operate as regularly. The movement of materials between the informal and formal value chains has positioned waste at a crucial place in both the Egyptian economy and the debate on how materials extraction impacts climate change.

These neighbourhoods have historically emerged as discrete enclaves that soon became assimilated into the city. They now feature dimensions and urban morphologies that are not only linked to the city's physical planning but also to the economic and social development of the country and its population.

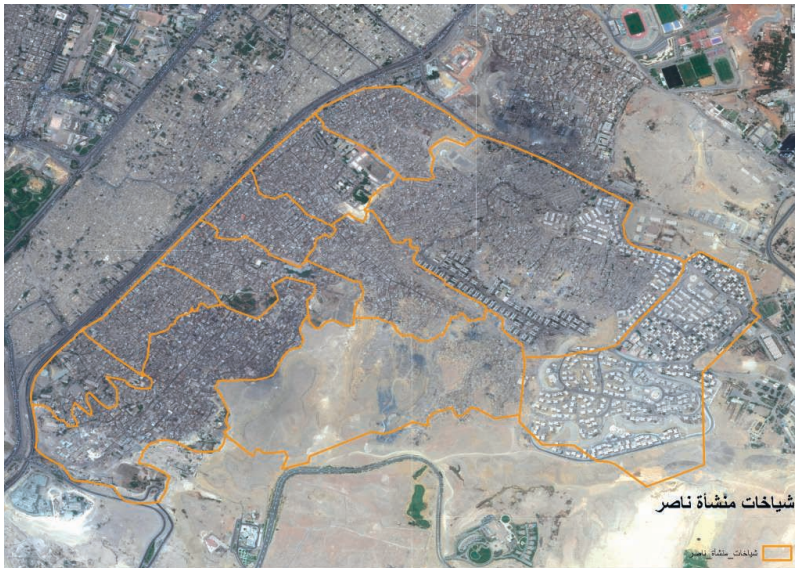


Figure 1. Map of Manshiyet Nasser's nine *shiyâkhat*². Source: MURIS 2015.

A more granular look at the six recycling neighbourhoods of Cairo shows the huge recycling industry that they incorporate. They act as one massive facility, subdivided into thousands of small and medium family-owned enterprises located close to where materials are generated in order to reduce transportation costs, which limits the impacts of GHGs. Dwellings are designed to accommodate sorting and

2. The *shiyâkha* is the smallest statistical unit in urban areas.

recycling businesses on the first floor, while living quarters are situated on the second and third floors. Additional floors provide rental income or serve as storage for recyclable materials when these are in excess or when recycling markets are less profitable because of a drop in prices.

These neighbourhoods – with their land-use patterns, housing construction and spatial planning – were all self-designed, self-built, self-organized and self-financed by the city's informal dwellers. The income from recycling has therefore led to a massive provision of housing stock in Cairo, and it is doubtful whether formal financing, public or private, could have bankrolled that volume of construction. Recycling revenues have also provided vast financing for small and medium enterprises (SMEs) with no access to formal financing institutions. Harvesting the city's materials from its so-called waste has historically acted as a huge financing mechanism for housing, small businesses, transportation and other infrastructure needs of informal residents.

These businesses are intrinsically linked to the public health of the city, the economic and financial functioning of its waste system and the economic development of an informal sector which represents 55 to 60 per cent of the Egyptian economy (Ministry of Planning and Economic Development 2022). By contrast, waste management systems in cities in the Global North have banished sorting and treatment from the heart of the city and have established centralized facilities that are managed and financed through taxation, user fees and subsidies. Their efficiency targets are not based on the number of jobs or local businesses they support but rather on the volume of materials they can incinerate or bury in landfill. This significantly reduces the amount of waste that is recycled.

The number of Cairo recyclers' SMEs grew from eight in 1983 to over ten thousand in 2010 (CID Consulting 2010). This growth was self-financed and self-managed. In addition to collecting, transporting, sorting, selling and processing mixed household materials, these businesses purchase source-segregated waste from commercial and institutional waste generators, roamers, scavengers and intermediaries. They sell these either as end products or as inputs for other manufacturing activities in large-scale industries or small informal enterprises. Through sorting and recycling, they turn so-called waste



Figure 2. European model of transfer station.

into valuable materials that set off a value chain which reverberates across Egypt and beyond. And, remarkably, they recycle 80 per cent of what they collect (Klundert and Lardinois 1995). This happens at great human cost, since these recyclers are exposed to unimaginable health hazards and harassment by a chain of exploiters, from law enforcement

to moneylenders and housing agencies. They have a deep experience with exploitation and exclusion.

Unlike formally designed waste management systems, traditional waste management systems are socially constructed and spring from a symbiotic relationship between the people who operate them and their city. They are market-based and derive from local knowledge while providing the most economically challenged residents with incomes, trades and economic growth opportunities. Cairo's informal waste workers achieve the highest recycling rates recorded in cities worldwide and create employment for significantly higher numbers of people than official employment schemes have ever done: seven direct jobs and ten indirect jobs are created for every ton of waste collected (Waste and Skat 2007).

In Egypt, over two hundred³ formal industrial manufacturing plants contribute to the Gross Domestic Product (GDP), generate employment, and increase exports. This industry relies on the informal economy that moves materials through collection, sorting, recovery, processing and transporting. It is their principal local supplier of feedstock.

3. Federation of Egyptian Industries (FEI) data, 2020, <http://www.fei.org.eg/index.php/ar/chambers-ar-1/628-chemical-chamber-ar>.



Figure 3. Masaken Othman, Sixth of October. Government housing for residents relocated from Manshiyet Nasser. Source: CID Consulting 2015.

RELOCATION IS NOT THE SOLUTION FOR CLIMATE CHANGE ADAPTATION

In the late 1990s, some of the homes in Manshiyet Nasser were found to be at risk of collapsing off the limestone cliff on which they were situated. Official resettlement plans removed residents to neighbourhoods that had been spatially planned and designed to house people with no particular occupation and therefore did not require space to sort recyclables, store them, or process them. As a result, public spaces were used for these recovery and recycling activities.

Recyclers who were relocated to these neighbourhoods used the physical space around their new ‘formal’ dwellings to practice their traditional trade. Formal neighbourhoods soon exhibited the same ‘squalor’ that informal neighbourhoods had displayed. They acquired a bad reputation, and their residents were depicted as people who enjoyed garbage and were immune to its negative health impacts. Transportation costs for the recyclers increased to the point where regular door-to-door service became prohibitively expensive; recyclers soon lost their routes to competing intruders and were downgraded to roamers and bin scavengers on the streets of Cairo.

Official urban planners now find themselves in a quandary, and the negative environmental aspects of informal businesses force difficult choices upon them. Do they move all informal businesses above a certain volume of activity out of the city to new industrial zones and

provide housing nearby, as they did for instance for the Robeiki tanning enterprises? In that model, a large cluster of traditional leather tanners was moved from Cairo to a new, designated industrial zone near the industrial city of Tenth of Ramadan. But does the government have the capacity to undertake such massive, complicated, costly operations, given the need to engage in complex discussions, consultations and negotiations that include legal, financial, physical, social, environmental and economic considerations? Or do urban planners want to explore innovative models of in situ upgrading of informal settlements, based on the businesses created by their residents?

The case of the Cairo recyclers presents unique opportunities for planners to address these issues in a manner which would protect the public health and well-being of the city's twenty million residents. Such a scheme would turn the six recycling neighbourhoods into a distinctly Egyptian model of urban planning that would uphold the neighbourhoods' functions as both recycling transfer stations and residential areas. It would remove the current negative image of the Zabbaleen's work as well as the negative health and environmental consequences of their activity. It would also avoid relocating residents and those small businesses that are non-polluting.

WASTE AND CLIMATE CHANGE

The impact of climate change and the responses to the challenges it poses are closely linked to urban issues. Solving these issues requires a linkage between well-being, prosperity, and adaptation or mitigation. The United Nations' SDGs provide a framework for linking global warming at a temperature between 1.5 °C and 2 °C with development goals that revolve around poverty eradication, reduced inequalities and climate action.

The waste-processing operations undertaken by the Cairo recyclers and other urban poor constitute adaptation options that reduce the vulnerability of these communities while increasing the city's resilience. What is not managed by the urban poor ends up in landfills or unmanaged dumpsites. Current practice shows that open burning is expected to triple from 49 million metric tons in 2016 to 133 million metric tons in 2040, increasing the release of toxic gases (such as methane) and chemicals and doubling plastic leakage into the ocean.



Figure 4. Plastic: a major threat to biodiversity and a factor of climate change. Source: Center for International Environmental Law.

This discussion confirms the findings of the Intergovernmental Panel on Climate Change (IPCC; see Pörtner et al. 2022) that targeted development planning across the range of innovation and investment in social policy. Nature-based solutions and grey/physical infrastructure can significantly increase the adaptive capacity of urban settlements and cities and their contribution to climate-resilient development. The report also points to how urban adaptation measures provide opportunities to contribute to climate-resilient development pathways that enhance social capital, livelihoods and human and ecological health and contribute to low-carbon futures. Urban planning, social policy and nature-based solutions bring great flexibility, with co-benefits for climate mitigation and sustainable development.

This requires governance structures and processes to respond to those urban populations currently living in informality, beyond the direct reach of formal climate policies (Satterthwaite et al. 2018). The Cairo recyclers are evidence of the necessary emergence of an informal urban ‘green economy’ in the absence of formal service provisions. Not only does this green economy provide the city with a critically important service, it is also efficient and low-carbon (Brown and McGranahan 2016). Keeping the Cairo recyclers close to the heart of the city is therefore an important policy decision that is directly related to urban planning and the environment.

These insights from the waste sector suggest that adaptation pathway approaches for 1.5° C futures need to combine considerations of inclusiveness, site-specific solutions and urban/environmental justice mechanisms in order to achieve climate and urban justice.

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