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Farming and the city: the changing imaginary of the city and Maputo's irrigated urban agriculture from 1960 to 2020

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ABSTRACT

Irrigated urban agriculture using various water sources has been consistently present throughout Maputo's history. Grounded in Infulene Valley, we delve into how urban planning has evolved since 1960 and trace the implications of these policies on urban farming and the livelihoods dependent on it. Documenting the imaginaries of the city over four eras of Maputo's development, we find that agriculture occupied a prominent place in the post-colonial city, and continues to be significant, despite its vague recognition within urban planning, after the shift to neoliberalism. We advocate for acknowledging urban irrigated agriculture as an intrinsic feature of the city.

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Introduction

African cities in scientific literature are primarily investigated through the themes of informality, urban land use, public health, and sanitation (Andersen et al. 2015; Jenkins, 2013; Myers, 2011; Shannon, 2019). However, Redwood (2008) identified urban agriculture as a gap in research within southern African urban planning, and attributes it to the pervasive influence of European colonial systems – which historically propagated a disdain for urban farming as a practice that warranted discouragement or neglect – on African urban planners (Redwood, 2008). Besides this gap in knowledge, there is another gap in how urban farming and urban food systems in African cities have been addressed by urban planning and dominant governance ideals, which often appear detached from people's lived experiences on the ground (Veldwisch et al., 2024).

In African urban planning, there is a significant underestimation of the importance of irrigated urban agriculture (IUA), a trend that puts it at risk of being planned away from the cities. This disregard is rooted in the prevailing narrative, informed by the paradigm of development and modernity, premised upon a dichotomy between modernization and underdevelopment, urban and rural, and formal and informal. This could explain why urban farming is frequently perceived as contradictory in its own terms by African planners and administrators, with its very presence being viewed as undermining

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urban development and a minor or irrelevant sector (Shannon et al., 2020). Despite this, IUA continues to be a dynamic and viable livelihood strategy, particularly for economically disadvantaged urban dwellers because it provides competitive profit due to its proximity to markets but is still categorized as a public health hazard due to risks deriving from their informality and unregulated access to water (Drechsel & Dongus, 2010), lack of political acknowledgement (Drechsel & Dongus, 2010; Halloran & Magid, 2013), and being discouraged (Schmidt, 2012). However, this was not always the case for the city of Maputo, the capital of Mozambique.

During the post-independence period, IUA occupied a prominent role in Maputo's urban planning; however, urban planners seem to have shifted their attention away from it in the last four decades. In the case of Infulene Valley, this disregard coincides with a decrease in available agricultural land, despite the growing number of households relying on it for their livelihoods. This paper examines ways in which the city has been imagined during each era, the causes and drivers of the policies, and how the policies were implemented, in order to understand how urban planning accounts for IUA and trace consequences of the policies on food production and consumption as and access to land and water for IUA.

The concern motivating our research is the future of farmers – and IUA – in Maputo, given what we observe as a failure of urban planners in Maputo to acknowledge the intrinsic value and significance of IUA within the city's urban fabric. We are concerned that this not only poses a risk of exclusion for numerous urbanites but also overlooks Infulene Valley's potential opportunities for the entire city, especially considering the middle class's reliance on food imports from South Africa, as was proven by the supply disruptions caused by the COVID-19 pandemic in early 2020 (FAO, 2020). The paper documents the significance of IUA – more particularly in Infulene Valley – within Maputo's urban development over four eras spanning more than six decades in order to enrich the debate on how African cities are planned and studied, but doing so in a way that is inclusive and respectful of the realities of those who inhabit the cities.

The next section outlines the methodology used to gather the data necessary to respond to the question of how planning policies in Maputo have evolved since 1960 and what were the implications of their implementation on IUA in Infulene Valley that city dwellers depend on it. This is followed by examining the relationship between urban planning and IUA in four distinct urban development eras. To conclude, we present our findings and reflections.

Methodology

Through an in-depth analysis of the case of Infulene Valley, we set out to trace how IUA has figured over four development eras spanning over six decades, from 1960 to 2020. To select the historical events included in our chronicle, we examine how each event reveals the relationship between the city and IUA, as well as the changes experienced in this relationship over time.

Our data collection methods for documenting the history of IUA in the city and understanding the city's development policies vary for each era. For the late colonial era, we relied on in-depth interviews and scientific works of Professors Paul Jenkins and Bridget O'Laughlin. From 1975 to 1992, we analysed scientific literature, newspaper articles, laws, and policy agreements from the Mozambican government and international donors like the

World Bank. The data for the period between 1992 and 2017 were collected through semistructured interviews with former and current water and municipal authorities, primarily associated with the National Water Directorate of Mozambique. We also analysed policy documents such as laws, regulations, project reports, and investment plans. This historical analysis is complemented by empirical evidence gathered through three fieldwork periods to Infulene Valley from 2017 to 2020, using ethnography and qualitative research methods. Our research community¹ consists of 10 household heads (6 female and 4 male) from four farmers' associations: Augusto Chirute, Primeiro de Maio, Sombra das Enxadas, and 25 de Setembro. These associations were chosen based on their location and their unique relationship with water shaped by the infrastructure in their respective areas, which influences the sources, quantity, availability, and quality of water, leading to diverse irrigation practices.

Grounding the research: the case of Infulene Valley

Infulene Valley is situated within the urban boundaries of the Kamubukwana District, and IUA farmers in Infulene Valley are reorganized into associations. Specifically, within the Kamubukwana District, there are 15 associations that are affiliated with the National Union of Peasant Associations (UNAC). As of 2012, it was estimated that around 13,000 smallholder farmers operated within the encompassing green zones, which include the coastal plain – Costa do Sol – Infulene Valley, and the adjacent Mahotas Valley (FAO, 2003; Figure 1). The primary focus of these farmers lies in the cultivation of vegetables destined for city markets, albeit with some portion allocated for self-consumption. The average land size of individual farms, *machambas*, stands at approximately 0.3 hectares (FAO, 2003). Notably, the predominant crops cultivated in Infulene are lettuce and Portuguese cabbage (*couve*). The farmers independently construct their irrigation canals and use gates made from waste materials to create reservoirs, regulating the water flow. They draw water from nearby springs, the Infulene River, and even the discharge of the wastewater treatment plant (WWTP), employing cans or pumps for field irrigation.

Infulene Valley is renowned for its fertile soil and convenient access to water, rendering it particularly conducive to intensive vegetable production (FAO, 2003). The valley encompasses a 15-km stretch along the Infulene River, extending from the Incomati River bed down to Maputo Bay. Due to gravity, water naturally flows towards Infulene Valley, making it the optimal discharge point for Maputo's rainwater drainage system and the WWTP, which receives approximately 3% of the city's domestic effluents, along with privately transported sludge from peri-urban settlements, while the remaining waste is directly released into Maputo Bay (Spaliviero & Daude, 2008). Since its construction in the 1980s the WWTP was key in shifting Infulene's production towards irrigated agriculture and its management has constantly shaped access, allocation, and control of land and water for farming in the south of the valley.

Chronicle: farming and the city in Maputo over four distinct developmental eras

In this section we document the practice of IUA in Maputo throughout four distinct developmental eras: the late colonial regime, the post-independence socialist state, and the early and late neoliberal eras.

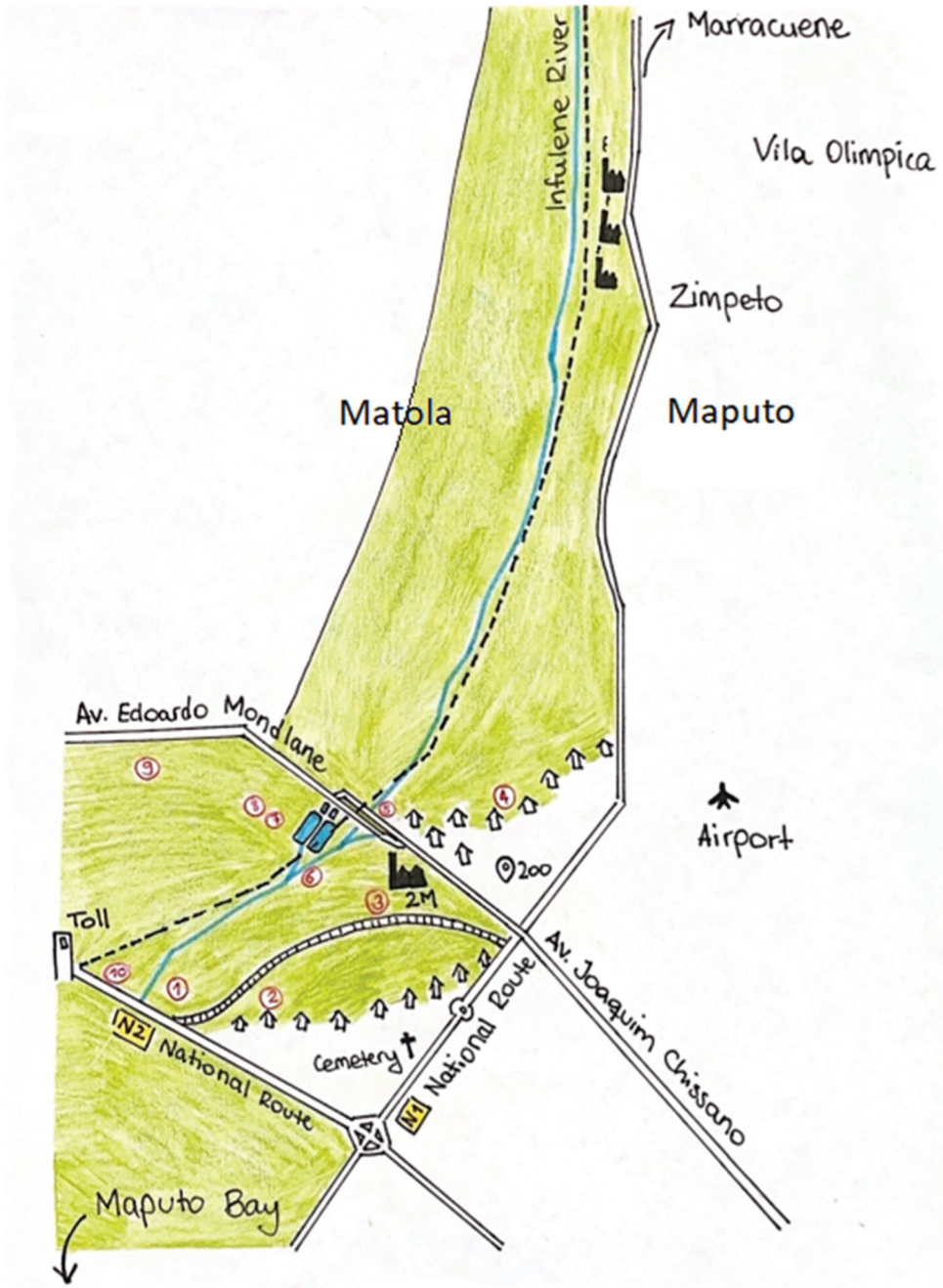


Figure 1. Map of Infulene Valley based on the main researcher's drawing in her field journal during her first stay in Maputo in 2017. Own source.

Farming in the late colonial city: racial segregation and farming in Lourenço Marques, 1960–1974

The colonial planning of the city was based on the principle of racial segregation (Biza et al., 2021; Jenkins, 2013) and created a dual pattern of organization of the urban space and of access to public services (Biza et al., 2021; Rusca et al., 2018). This was reflected in IUA as urban planning marginalized indigenous Africans in their claim for agricultural land, leading to a differentiation among kinds of agricultural production. Privileges of private property rights in Infulene Valley were granted to Portuguese settlers, and sometimes Chinese and Indian market gardeners, enabling them to engage in commercial agriculture and to own orchards, gardens, and weekend residences. In contrast, indigenous African farmers and their subsistence agriculture were marginalized and pushed to the rural-peripheral areas ‘*outside, off the city limits*’ (interview 200229_0021 2020; Jenkins, 2000b; O’Laughlin, 1996).

According to Professor Jenkins, farming in the low-lying regions, including Infulene Valley, pre-dates the arrival of Portuguese traders. Back then, Mozambican nationals and indigenous communities had access to diverse land types suitable for different crops, encompassing dry land and irrigated cultivation. The lower areas, such as Infulene Valley and the coastal plain, were primarily utilized for water-fed crops. Due to variations in water levels and seasonal conditions, multiple plots were often necessary to accommodate these people’s farming practices (interview 200229_0021 2020). However, during the late colonial period, the few indigenous African farmers who were able to secure rental agreements for modest plots in these areas typically did so in areas with low-quality soil. The majority, mostly women, were relegated to produce in neighbouring rural districts subjected to long commutes (O’Laughlin, 1996).

In the 1960s, Lourenço Marques underwent substantial population growth due to changes in foreign investment laws (Jenkins, 2000a, 2000b). It became a ‘migrant city’, with its population nearly doubling between 1940 and 1960. Labour and migration played pivotal roles in shaping urbanization and class structures in Mozambique during this period; for instance, the higher density of residential accommodation in the formal city inhabited by European settlers was targeted with the development of apartment blocks contrasting with the growing densification of the unplanned urban periphery through the subdivision of plots to accommodate several African working families. Lourenço Marques, strategically located near South Africa’s mines and serving as the political, cultural, and economic hub for a small settler community, maintained a delicate racial equilibrium, ensuring that the black population did not outnumber the white population by more than a 2:1 ratio (O’Laughlin, 1996).

Throughout much of its history, black people were migrant aliens in the city, mainly young men recruited as servants or for heavy manual labour in the port, railways or sanitation services. (Antonio Rita-Ferreira quoted in O’Laughlin, 1996, p. 4)

Racial segregation in urban planning was also reflected in terms of food production and consumption in the city (O’Laughlin, 1996). Biza et al. (2021) shed light at how in Lourenço Marques, similar to other African colonial cities in the 20th century, health, sanitation, and hydraulic infrastructure (Rusca et al., 2018) were used to enact

administrative distinctions ‘between the city (Cidade) and suburbs (Suburbios) as zones for European versus indigenous people’ (Biza et al., 2021, p. 13).

The city’s first Master Plan (1972) aimed to distribute population densities and allocate open spaces by creating distinct zones. However, its implementation faced limitations due to its emphasis ‘on building control for the formal city, ignoring that for the faster growing informal city’ (Jenkins, 2000b, p. 208). Additionally, the escalating war for independence further constrained the plan’s execution. Neglecting the informal city perpetuated unequal access to urban agricultural land. This situation persisted until Mozambique gained independence in 1975, which was preceded by the exodus of Portuguese settlers a year earlier, when the city came to a standstill, with municipal agencies left vacant, construction projects abandoned, and houses and farms left deserted (Jenkins, 2000a; O’Laughlin, 1996). Only then did some indigenous African families have an opportunity to access abandoned farms and plots in what would later become Maputo’s green zones.

Farming and the socialist post-independence city: turning a hungry city into a productive centre, 1975–1987

With the city’s renaming to Maputo, signifying a break from its colonial legacy, the newly established FRELIMO government prioritized the enhancement of the agricultural sector and the development of reliable water infrastructure. These were crucial components of their national project, which aimed to foster a socialist economy and cultivate a sense of national identity (Hofmann, 2013; Rusca et al., 2018). FRELIMO’s vision for the city placed labour, whether in urban farming or factories, at the heart of urban life, striving to attain self-sufficiency within a cooperative model (República Popular de Moçambique, 1979a; Tempo, 1979; Voz da Revolução, 1979). Cities were seen by the revolutionaries as colonial remnants (Jenkins, 2000), and concerns were raised about their ability to ensure their own food security (República Popular de Moçambique, 1979a). Consequently, urban farming not only became a fundamental aspect of people’s right to inhabit the city but also played a pivotal role in Maputo’s urban planning and food provisioning strategies through the establishment of the green zones (República Popular de Moçambique, 1979a; Tempo, 1979; Voz da Revolução, 1979). They and the farmers cooperatives became central in how the city was imagined during this period (República Popular de Moçambique, 1979a), and farming evolved and adapted in response to both war-induced migration and the requirements of international donors for supporting water interventions.

The National Meeting for Cities and *Bairros Comunais* (community neighbourhoods) shows the escalating importance of the green zones within the post-independence city. Participants emphasized the need for a comprehensive plan to develop and establish the green zones, with a particular focus on increasing horticultural and small animal production under a state-promoted, cooperative or family-based model in support and control of the private production (República Popular de Moçambique, 1979c). In response, the green zones were created by law and agricultural cooperatives were organized. As a result, the abandoned commercial farms, with their well-developed irrigation systems, were restructured into state-owned farms or collective *machambas*, primarily producing rice and other grains. About 200 Maputo-based cooperatives used to be gathered in the

General Union of Cooperatives – UGC – which was supported by the government and international donors for empowering farmers economically and politically. The cooperatives provided access to land and capital to farmers and the agricultural products were distributed through food stamps, which were introduced to ensure the city's food security (O'Laughlin, 1996).

Bairros Comunais were envisioned to be 'the highest form of organization for the cities' population'. By implementing collective structures under the control of a local political structure, urban planning aimed to achieve self-sustainability for urban populations across various essential aspects, including labour, food production and supply, education, health, security, and housing (República Popular de Moçambique, 1979a). At its core, it sought to transform the city into a productive and socially valuable entity by dismantling colonial structures and mentalities and fostering the adoption of the state's vision by the people (República Popular de Moçambique, 1979a; Tempo, 1979). Cities concentrated most of the country's industries and the working class, especially due to the high degree of immigration from rural areas.

Maputo served as a safe haven during the armed conflicts that ravaged rural Mozambique after its independence. Additionally, it had to accommodate those who had been excluded by the Portuguese urban project. It is estimated that up to 200,000 settler residents fled Maputo right after independence, contrasting with its population increase by 97% by 1980, reaching a total of 755,000 inhabitants (Jenkins, 2000a). In the research conducted by Graham et al. (1991), it was found that within their sample of peri-urban areas, a significant proportion (98%) comprised families that were either entirely (32%) or partially (66%) composed of migrants residing in Maputo. The civil war (1975–1992) stood as the primary driver for this wave of migration (Graham et al., 1991). Even today, most of Infulene's farmers we spoke to are migrants from Inhambane who settled in Maputo after fleeing the war.

Amidst escalating hostilities during the war, in 1983 the government implemented a policy known as *Operação Produção*, which involved issuing residence and work cards to urban residents engaged in the industrial sector or affiliated with farmers' cooperatives. This policy, guided by the motto 'only those who work there have the right to live in Maputo or any other city', led to the forced relocation of hundreds of 'unproductive' individuals to the northern Mozambican provinces of Niassa and Cabo Delgado in 1983 (Fernando, 2019; O'Laughlin, 1996). *Operação Produção* reflected FRELIMO's imaginary of the city, where productivity was fundamental, and challenged the perceived parasitic nature of the urban middle class (Jenkins, 2000a). By granting the right to the city, this policy solidified urban farming, particularly within farmers' cooperatives, as a central component of urban life. To address this and mass migration, the state intervened by nationalizing abandoned and rented housing units or land and allocating them to working families (Jenkins, 2000b) – similar to what happened to the farms and plots left behind by the Portuguese.

In addition, during the years after independence and the early 1980s, Maputo faced challenges such as floods disruptions in the food supply, and food scarcity, further accentuating the urgency of enhancing the city's capacity to feed itself. The government responded by establishing '*Lojas do Povo*' (people's stores), and through the regulation of prices for essential commodities such as 'rice, maize, sugar oil, soap and other basic staples' (O'Laughlin, 1996). In 1981, the New Provisioning System was implemented,

leading to the transfer of control over the *Lojas do Povo* to private traders or consumer cooperatives. This transition brought about monthly urban food rationing measures, inadvertently giving rise to a clandestine food market known as the ‘*candongá*’. This parallel market enabled the accumulation of private capital and had the unintended consequence of undermining domestic food production while further exacerbating Maputo’s reliance on international food assistance (Famine Early Warning System Network [FEWS NET], 2003; O’Laughlin, 1996).

The civil war also forced FRELIMO to finally turn its attention to developing urban infrastructures, especially in Maputo, as most of the country’s rural territories were controlled by rebel forces (Rusca et al., 2018). The large rural water projects initially prioritized by FRELIMO – such as the Cabora Bassa Dam – became targets prompting the government to redirect its attention to improving the city’s water supply (Rusca et al., 2018). That is how the construction of a drainage system and the WWTP in Infulene became a priority for the central government. Despite being focused on enhancing urban sanitation, this intervention brought opportunities for IUA in terms of availability and quality of land in the green zones, as well as in terms of flows of water. Prior to the construction of the main drainage ditch, Chinese farmers engaged in profitable horticulture. However, the development of the Ruta Nacional and toll facilities elevated the terrain, leading to the ingress of saltwater and restrictions on the outflow of water from the Infulene River (interviews 181023_0026 2018, 181027_0027 2018). This turned Infulene’s southern tip into a swamp. The conclusion of the works on Maputo’s drainage system in 1986 left fertile ground behind and the cleansing of the valley allowed irrigated horticultural production to expand into recovered land (interview 181121_0036 2018). These interventions were accompanied by the building of an irrigation system (interview 181027_0027 2018), which has since vanished.

The government’s strategies to ensure urban access to food and promote its production, alongside the construction of WWTP and the reclamation of swampy plots to create fertile land, contributed to the emergence of farmers’ cooperatives in the southern tip of the valley. One notable example of this is the establishment of Sombra das Enxadas in 1983 as part of the UGC under the promotion of the Italian cooperation (interview 181121_0036 2018). While detailed documentation on these projects, including hydraulic initiatives and support for social production organization, is limited, the significance of the Italian cooperation for the development of green zones cannot be understated (interviews 181121_0036 2018, 200229_0021 2020; Malauene, 2002). For newcomers to Maputo, particularly women, becoming a member of the cooperatives offered a sense of security and guaranteed access to agricultural land (O’Laughlin, 1996). Through their increasing political and economic influence, farmers’ cooperatives acquired significant portions of land in the green zones for commercially IUA and even obtained land registry rights (O’Laughlin, 1996).

The early neoliberal city (1988–1999): deepening of urban hunger and reliance on urban farming

The implementation of the Structural Adjustment Programme in Mozambique marked a shift to a neoliberal era, characterized by price liberalization and currency devaluation. These policy changes influenced IUA in Infulene Valley, as farmers transitioned to

commercial agriculture, selecting more profitable crops and expanding vegetable production. This economic transformation, in conjunction with FRELIMO's shift to a bureaucratic hierarchical model, encouraged the prevailing on-farm economy. Marked by the disappearance of cooperatives and the consolidation of land ownership among a select few who hired workers, this production model pushed historical land cultivators – particularly female cooperative members – aside (O'Laughlin, 1996; Sheldon, 1999; interview 200729_022 2020). Additionally, the devaluation of the local currency – Metical – prompted an exodus of public servants, weakening the municipal government. This situation justified the World Bank's promotion of the local reform and decentralization processes, which sometimes clashed with previous urban planning efforts and partly explain the neglect of Infulene's irrigation system. The valley now finds itself in a jurisdictional grey area between Maputo and Matola. Furthermore, the publication of the New Land Law in 1997, with its vague treatment of urban lands, contributed to the current speculation and emergence of an illegal land market.

Mozambique's adherence to the World Bank and the International Monetary Fund in 1984, together with the economic challenges resulting from war and declining production, and the demands of international creditors set the stage for the implementation of the Program for Economic Rehabilitation (PRE) in 1987, which aimed to transition Mozambique to a market-based economy, dismantling socialist structures (Castel-Branco, 1995; Kariisa, 1999; Malauene, 2002; Meque, 2013; O'Laughlin, 1996; Tschirley et al., 1996). The PRE initially showed positive economic indicators, as well as an increase in food availability for Maputo's residents, albeit at higher prices. However, as the economy stepped into the 1990s it stagnated. The industrial and fishing sectors declined, and purchasing power decreased (Castel-Branco, 1995), accompanied by a devaluation of the Metical, which hindered the importation of goods and production inputs, reduced the salaries and increased unemployment even further (interview 200229_0021 2020). At the same time, South Africa restricted the migration of Mozambican mining workers which exacerbated the unemployment rate in Maputo (Roth et al., 1995). The increase in urban hunger, urban unemployment, and the overall precarity of urban life (FEWS NET, 2003) intensified the competition for agricultural land in Infulene Valley (interview 181024_0027 2018).

Based on the accounts of all four of our male interviewees of how they accessed their first *machambas*, men were compelled to challenge the prejudice of farming being an activity of the female domain by offering their workforce on the plots as waged workers; this later allowed them to join the associations. This shift in gender balance was largely enabled by the fact that the liberalization of prices allowed the parcellation of the collective *machambas* into individual plots and the respective increase in the number of farmers (Malauene, 2002; Sheldon, 1999; Tschirley et al., 1996). Farmers were now able to replace rice for lettuce and Portuguese cabbage, which allowed an increase in the volume of vegetable production and commercialization in the green zones. Even when land ownership was not allowed, its parcellation allowed for it to become a private asset.

For Infulene Valley, this meant a shift from a cooperative model to one of commercial agriculture on individual plots and organized in farmers' associations. 'Cooperatives were weakened by reduction of credit subsidies and heightening competition in land and produce markets' (O'Laughlin, 1996). The shift towards an associative model changed how people accessed plots, and who benefited from farm activities: 'gradually, however,

much irrigated commercial land was taken over by those with political or economic power needed to obtain land registry' (O'Laughlin, 1996, p. 13). Consequently, there was a concentration of landownership in fewer hands and a corresponding increase in the employment of young male waged workers on these plots (interview 200729_022 2020). Membership in an association no longer automatically conferred the right to the city, further exacerbating the precariousness of women-headed households in urban life.

The changes brought about by the liberalization of prices coincided with a shift in FRELIMO's political narrative towards a bureaucratic hierarchical model (Grest, 1994; O'Laughlin, 1996), creating a distinct tension in defining who qualifies as a farmer in Maputo's green zones. The directive was unequivocal: land belongs to those capable of working it. This capability was interpreted as the capacity to invest in the land, and those who counted on it were mostly men affiliated with the Party with the financial and political power to boost production (interview 200729_022 2020). The change in the perception of who has the right to land reflects the emerging class interests within FRELIMO.

The devaluation of the Metical impacted urban farming by decreasing public administration salaries and prompting the exodus of experts from ministries and water management (interview 200729_022 2020). The neglect of water infrastructure and the lack of transparency in resource allocation by the central government further contributed to the perception of institutional weaknesses at the municipal level during the 1990s (Grest, 1994). This justified the implementation of a 'comprehensive World Bank driven programme of local reform' (Grest, 1994). Funded in the principle of subsidiarity, it aimed to assist the central government in tackling the rapid deterioration of urban infrastructure and services, to create employment and strengthen local institutions (World Bank, 2009). Concurrently, the decentralization process was implemented to tackle the limited legal, administrative, financial, and political autonomy of local governments (World Bank, 2009) and it reflected the donor's prioritization of formal urban water management diverging from FRELIMO's previous agro-industrial development model. This shift led to the neglect of Infulene's food production and its respective irrigation system by urban planners. However, these reforms and their respective urban infrastructure development projects had other direct implications for Infulene. For instance, during our interviews, one farmer mentioned receiving a relatively large plot in the land allocated to the Sombra das Enxadas cooperative as a result of her family's involvement in the construction of Avenida Joaquim Chissano in 1999 (interview 181212_0040 2018). In contrast, the neighbouring cooperative, Augusto Chirute, experienced worsening flooding issues due to the elevation of the highway, exceeding the capacity of the existing gates designed in the 1980s (interview 181031_0031 2018). Furthermore, an engineer from the National Water Directorate explained that the construction of the highway also contributed to increased soil salinity downstream from the wastewater treatment plant (interview 181027_0027 2018).

Parallel to these changes in urban planning, the new land law was published in 1979 (Republic of Mozambique, 1979). According to Jenkins, land remained nationalized 'due to a strong antiprivatisation lobby from the peasant sector' (2020). This means that 'the state [is] responsible for land allocation and management on behalf of the Mozambican people' (interview 200229_0021 2020). The allocation of urban land is technically the responsibility of municipal governments, as it is intended to

generate income through titling, property registration, and ongoing valuation processes (interview 200229_0021 2020). However, in practice, an illegal market emerged where land ‘increasingly became commoditized, albeit illegally’ and is allocated by local control structures (Jenkins, 2013). Tensions emerged because the land law does not address urban land directly (Jenkins, 2013; Shannon et al., 2020). Furthermore, the new land law acknowledges the rights to land use that result from 10 years of occupation in good faith, but it also introduces a requirement for planning in the urban territory before any land titles can be issued (Jenkins, 2013), which continues to pose challenges to land tenure security in Infulene Valley.

The late neoliberal city (2000–2020): master planning era and the disappearance of food production from the urban imaginary

The World Bank’s involvement in the local reform allowed for the city planning to be increasingly shaped with international donor-supported development and modernity narratives (Jenkins, 2013; interview 200229_0021 2020; Hofmann, 2013; Shannon et al., 2020). Maputo’s Urban Structure Plan (2008), the Metropolitan Area Plan (2010), the Sanitation Master Plan (2017), and their respective legislative packages have not been able to tackle the rapid urbanization processes, land speculation and the emergence of new sources of pollution throughout Infulene’s River bed. Therefore, and despite being officially protected by municipal regulations, Infulene Valley has faced increasing pressure for land for middle-class housing units, the consumption of its products has been discouraged and water interventions have brought potential risks to the farmers in Infulene Valley. Regardless, IUA persists in the area and remains a vital source of livelihood for hundreds of urban families and food security for the city.

In the early 2000s, Mozambique approved a set of master plans aimed at organizing urban territories, as well as urban water infrastructure and drainage. These plans, funded by the World Bank, placed Maputo within what scholars like Shannon et al. (2020) call the ‘new era of global interventionism in African cities’ (p. 733). Although master plans were not new to Mozambique, as they were favoured by the Portuguese colonial regime, previous attempts by the World Bank to introduce such tools for Maputo’s urban planning had been unsuccessful (interview 200229_0021 2020). However, with the consolidation of the local reform and shifting political narratives within FRELIMO, the necessary legal basis and political willingness emerged for their implementation. Consequently, Maputo’s Urban Structure Plan (2008) and the Metropolitan Area Plan (2010) were approved, along with complementary legislation for land use and territorial planning.²

The effectiveness of these tools regulating the expansion of the city’s built environment is debatable, as rapid urbanization still predominantly occurs through informal processes (Jenkins, 2013). The treatment of non-rural agricultural lands in these planning tools is very vague. The expansion of suburban middle-class residential areas and some industrial development, facilitated by new road networks connecting to the city, has fuelled land speculation, understood by those who view the city’s expansion as inevitable (Jenkins, 2013). Agricultural lands, particularly in Boane, Infulene and the coastal plains, have been sold off by farmers for ‘unplanned occupation and unregulated of land at the

local neighbourhood level, including areas reserved for nonresidential uses and areas unsuitable for residential use' (Jenkins, 2013, p. 111) even though the right to those lands beyond being 'informal' is 'historical, back to before independence' (interview 200229_0021 2020).

Until 2013, however, land dedicated to urban agriculture still accounted for 26% of the urban area (Jenkins, 2013). The pressure on land is particularly high in the northern tip of Infulene Valley (District 4 – not studied here), where several families have been resettled since the 1990s. For instance, Zimpeto's Vila Olimpica, an apartment complex built for the 2011 African Olympic Games, was constructed in this district. The units were later allocated as permanent housing for public servants' families. The southern tip of the valley, however, has been less threaded by the urbanization process. Its flood-prone nature makes it less desirable for middle-class housing developments.

Still, Infulene Valley and urban farming managed to get a spot in the urban planning agenda. In 2000, severe floods caused by cyclones and tropical storms led to the worst flood Southern Mozambique had experienced in over 50 years (UNICEF USA, 2000). Maputo's urban flood overwhelmed Infulene's drainage system, causing extensive disruptions in the city and cultivated plots (interviews 181031_0031 2018, 181121_0036 2018). The flood resulted in significant crop losses, and some farmers struggled to rehabilitate their plots, some never recovered the same production conditions as before, and others, mostly female farmers, ended up giving up their land for good (interviews 181031_0031 2018, 181121_0036 2018).

The subsequent years were characterized by a series of natural disasters, culminating in the declaration of a humanitarian crisis in 2003 (FEWS NET, 2003). The city experienced frequent floods, leading to cholera outbreaks and exacerbating urban food insecurity (interview 181121_0036 2018). These challenges, coupled with the fact that pluvial waters from Zimpeto and wastewater from metallurgical and soap factories being discharged into Infulene River, have indirectly brought the valley's food production back into the focus of urban planners. This, together with the underwhelming performance of the WWTP, has raised concerns among district authorities regarding the water quality. As a result, they have taken measures to discourage the consumption of produce from the Infulene Valley (interview 181121_0036 2018).

These concerns around food safety and public health contributed to justifying the need to rehabilitate Infulene's WWTP. The implementation of the World Bank's USP began in May 2019 and aims to enhance access to safely managed sanitation services and strengthen municipal sanitation service delivery capacity in Maputo, Tete, and Quelimane. For Infulene Valley, particularly, the programme anticipated the resettlement of approximately 100 farmers to make space for the rehabilitation works of the WWTP. The affected farmers were initially expected to move their production to Marracuene, a rural district located just north of Infulene Valley. However, they were unenthusiastic about doing so due to the long commute, particularly considering their advanced ages. Consequently, the farmers organized themselves and engaged in collective negotiations to secure financial compensation for their lands. While many of them intend to utilize the compensation to acquire land elsewhere in Infulene or in other peri-urban green zones, some are planning to invest in alternative businesses or allocate the funds towards the education of their families (interview 200223_0020 2020). Scholars, including Jenkins, express concern that the purchase of land from farmers could trigger

a cycle of dispossession in Maputo's historical agricultural lands, favouring the middle classes, the formal water network and real-estate enterprises. This potential loss of land is particularly alarming because it directly affects hundreds of farming households who depend on IUA for their livelihoods.

Conclusion

In this paper we examined the shifts and continuities in planning policies and the challenges and opportunities they brought to irrigated urban agriculture (IUA) in different eras of Maputo's urban development. In the late colonial regime, colonialism reconfigured the land claims for agriculture in Maputo Bay by imposing distinct categories for agricultural lands in relation to the city based on segregation where settlers farmed in the city's Infulene Valley while natives outside the city. Following independence and the departure of the Portuguese settlers, urban agricultural lands were reclaimed by natives and migrant Mozambicans fleeing the civil war. Urban farming became an essential element of Mozambique's post-colonial urban imagination through access to urban agricultural lands and it defined who had the right to the city. However, with the shift towards a neoliberal economic model over the past four decades, IUA seems to have received less consideration in Maputo's urban development plans and visions. The current urban plans in Maputo are increasingly influenced by modernist ideals driven by international donors, urban water management, urban sanitation and public health, which overshadow the importance of IUA in Infulene Valley. These developments primarily favour the urban middle class and formal urban planning and water services, often at the expense of peri-urban communities and the informal mechanisms of land and water management.

IUA in Infulene Valley has persisted and remains an inherent feature of the city despite urban planning. However, given its informal nature and its contentious relationship with the water infrastructure on the field, we wonder whether IUA in Maputo is at risk of being planned away from the city, as the case of urban farming in another Mozambican city, Beira, due to modernist imaginary of the city pushed by international donors and urban planning (Shannon et al., 2020), and even in cases where farmers are taken into account in urban planning, farming is seen as an improper use of urban space (Halloran & Magid, 2013).

Urban agriculture's apparent contradiction with urban planning stems from a prevailing narrative of development and modernity perpetuated by the dichotomic narrative of formal planning versus informal settlements, modernization versus underdevelopment, and urban versus rural; which is 'grounded in the rationality of Western modernity and development' (Shannon et al., 2020). The imaginary of the city informed by this dichotomy is problematic for African cities like Maputo, because it ignores the reality of how the city is actually organized and fails to align with the lived experiences of the majority of the city's inhabitants, their daily practices, dwellings, and aspirations.

The development of urban infrastructure in Infulene exacerbated social inequalities by favouring the urban middle class who benefit from the sanitation infrastructure at the cost of excluding IUA practices and farmers from the future of the city. This displacement and potential loss of land for food production are considered collateral damage in the pursuit of the city's public health strategy and development of urban sanitation

services. In this context, we pose a crucial question: Who is the city planned for? This reveals underlying tension between urban farming and the right to the city. The stark dichotomy between modernization and underdevelopment; urban and rural lifestyles; and formal and informal water usage; fails to capture the nuanced nature of agriculture in African cities, and it risks excluding several urban livelihoods and urbanites from the city. Thus, planners and development approaches should acknowledge the city's history and recognize urban farming as an intrinsic feature of Maputo and other African cities, thereby fostering more inclusive urban futures.

Notes

1. Approval to carry out interviews and participant observation in the mentioned community was granted by the chief of the agrarian district on 15 November 2017.
2. None of the previously mentioned policy documents and laws are open access. for an adequate sociospatial analysis and graphics refer to Jenkins (2013).

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Interviews

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