LONG-TERM LAND INEQUALITY AND POST-COLONIAL LAND REFORM IN EGYPT (1896-2020)

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Abstract

The Middle East is among the most unequal regions in the world today, yet little is known about the long-term dynamics of inequality in the region. This paper presents detailed and newly digitized estimates of land inequality in Egypt from 1896 to 2020, drawing on comprehensive records of private agricultural land ownership. This unique dataset enables a systematic analysis of the evolution of land distribution over more than a century and sheds light on the historical forces and redistributive policies that shaped it. To the best of my knowledge, no similarly long-run and granular series on land inequality exists for any other country or land reform context. The results reveal an extreme concentration of land in the early 20$^{\text{th}}$ century, with the top 1% of landowners controlling over 42% of privately owned agricultural land on the eve of Egypt's 1952 agrarian reform. Subsequent redistribution efforts reduced this figure to 27% by 1980. During the same period, the share held by the next 9% of landowners increased modestly, from 32% to 35%. The most notable gains were achieved by middle landowners (owners of 1 to 5 feddans), whose share increased from 20% to 30%. In contrast, the reform had limited impact on the landless and smallest landowners: the bottom 50% saw only a marginal increase in their land share, from 6% to 8%.

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"What about the poor? Don't they deserve a share in this world too?!
Their share is only in the afterlife, but they also want a small share in this world,
and they're willing to give up part of their share in heaven for it."

— Gamal Abdel Nasser, President of Egypt (1956–1970)
(Excerpt from a public speech)

1 Introduction

Examining the dynamics of wealth distribution reveals the institutional structures that shape a country's evolution of inequality. It highlights the historical forces driving the shifts in wealth inequality and helps trace its origins, which in turn influence economic growth and development (Sokoloff and Engerman, 2000; Acemoglu et al., 2001). The study of long-term wealth inequality has been a central focus of scholars (Piketty et al., 2006; Saez and Zucman, 2016; Garbinti et al., 2021; Cummins, 2021; Albers et al., 2022), particularly in efforts to uncover the mechanisms behind wealth concentration and the persistence of inequality. Among wealth assets, land plays a crucial role in explaining the underlying political and social inequalities. It has long been at the center of studies on the development of rural societies, given its impact on economic growth, development, and political stability (Deininger and Squire, 1998; Galor et al., 2009; Frankema, 2010). However, there is limited evidence on the forces that perpetuate inequality in the Middle East, a region marked by recent political upheavals and recognized as one of the most unequal in the world (Alvaredo et al., 2019). This lack of historical perspective leaves a significant gap in understanding the long-term dynamics of inequality in the region and the underlying factors that shape its trajectory.

In this paper, I estimate long-term agricultural land inequality in Egypt from 1896 to 2020, covering key historical periods: the colonial era under British protectorate until 1923, the constitutional monarchy under nominal independence until the 1952 military *coup*, and the republican era under successive presidents Nasser, Sadat, and Mubarak. By analyzing this extended timeline, I examine how shifting political regimes and institutional frameworks have shaped land inequality. Furthermore, this paper evaluates the redistributive impact of the 1952 agrarian reform and incorporates the landless population into the inequality estimates, providing a more comprehensive historical perspective on wealth distribution in rural society.

To shed light on the historical evolution of land inequality in Egypt, I use a new data source

on private agricultural land ownership distribution, produced by the Ministry of Finance in Egypt in the format of land tabulations[1]. I complement this distribution with data on the landless population, which I collected from Agricultural and Population censuses. Then, I apply the Generalized Pareto Interpolation Method (Blanchet et al., 2022) to reconstruct the full distribution of land ownership at the percentile level, first for landowners only, and then for the entire population, including the landless.

This approach enables me to analyze trends in land inequality by examining the evolution of land shares across different groups, such as the top 1%, the bottom 90%, and the next 9% in between. This methodology has previously been applied in studies on historical income and wealth inequalities (Saez and Zucman, 2016; Garbinti et al., 2018, 2021) and land inequality (Bauluz et al., 2020). By using a more detailed distributional approach, I can analyze the dynamics of land inequality and assess the impact of various policies on land distribution over extended periods.

The estimates reveal high levels of land inequality in Egypt at the beginning of the 20th century. With the rise of large landowners during the 19th century, the top 1% landowners in Egypt owned 45% of the total private agricultural land in 1900. 25% of the top 1% were foreigners, 17% were religious endowments ("*Waqfs*") primarily managed by elites, and 58% were private Egyptian landowners. Later, as the nationalization movement started in 1923, foreigners started exiting Egypt, leaving behind a strong class of Egyptian large landowners sustaining the high levels of inequality. The share of land owned by the top 1% remained high at 42% in 1950; however, land ownership was even more concentrated within this group. The top 0.5% and the top 0.1% held approximately 39% and 25% of the land in 1910, respectively, but these shares decreased slightly to 36% and 22% by 1950.

The 1952 agrarian reform substantially reduced the land share of the top 1%, decreasing from 42% to 27% by 1980. The share of the next 9% rose slightly from 32% to 35%. The main winners were the next 40% (owners of 1 to 5 feddans [2]), whose land share rose from 20% to 30%. In contrast, the reform had limited effects on the landless population and the smallest landowners. The bottom 50% experienced only a modest increase in land share, rising from 6% to 8%.

[1]These tabulations are derived from land tax return records (*Mukallafat*), which are compiled by the Ministry of Finance. The ministry aggregates the data based on different land size categories, allowing me to determine, for each land bracket, the number of landowners and the amount of land they own.

[2]Feddan is a unit of measure known in Egypt and Syria and 1 feddan is equivalent to 0.42 ha.

This paper contributes to the literature on historical inequalities, a field that has received significant attention through studies on long-term wealth inequality in various countries. Notable examples include research by Saez and Zucman (2016) in the United States, Garbinti et al. (2021) in France, Cummins (2021) in England, and Albers et al. (2022) in Germany. While many studies have explored long-term trends in wealth inequality in western nations, research on the Middle East remains comparatively limited. Alvaredo et al. (2019) and Assouad (2023) analyzed income inequality in the Middle East using contemporary household income surveys. To address data limitations, they also incorporated Forbes rich lists in an attempt to top-correct income distributions and estimate the average wealth in Arab countries. However, these approaches face significant constraints due to under-reporting of household surveys, inconsistency of wealth reported in Forbes, and the absence of comprehensive fiscal data, making it difficult to fully capture the extent and evolution of inequality in the region.

The Middle East presents unique challenges for inequality research, particularly due to the lack of systematic and consistent historical data. This paper addresses these challenges by leveraging newly digitized data on land ownership in Egypt to reconstruct a long-term series of land inequality, offering new insights into the historical trajectory of wealth concentration in the region.

Existing studies on long-term land inequality (Deininger and Squire, 1998; Deinlinger and Binswanger, 1999; Galor et al., 2009; Frankema, 2010) have primarily relied on land Gini coefficients derived from agricultural censuses as a measure of inequality. However, this approach presents several limitations. First, land Gini alone fails to capture key shifts at both the top and bottom of the distribution, overlooking crucial changes in land concentration dynamics (Erickson and Vollrath, 2004; Bauluz et al., 2020). Second, agricultural censuses treat land as a unit of production (farmland) rather than an owned asset, which can obscure its role in wealth concentration and inequality. Alternative approaches, such as survey data (Bauluz et al., 2020), attempt to correct for these shortcomings but suffer from under-reporting at the top of the distribution, ultimately underestimating inequality levels. Moreover, previous studies do not account for the landless population, excluding a significant portion of the rural workforce from inequality assessments.

This paper contributes to this literature by overcoming these limitations through the use of novel data on land ownership and the explicit incorporation of the landless population into inequality measurements. This approach allows for a more comprehensive historical analysis

of land inequality in Egypt, contributing to a deeper understanding of institutional factors behind inequality shifts. By examining the entire distribution, from the landless to the largest landowners, this study provides the first historical reconstruction of land inequality with high precision for a single country, covering both pre- and post-land reform periods.

Second, this paper contributes to the literature on land reforms, a topic with extensive yet mixed findings. One segment of this literature focuses on the political consequences of land reform, such as clientelism (Casaburi et al., 2021; Bardhan and Mookherjee, 2010) and political instability (Dell, 2012; Finkel et al., 2015; Albertus et al., 2016; Domenech and Herreros, 2017; Albertus, 2020). Another segment examines the socioeconomic effects of land reform, including poverty reduction, agricultural productivity, and long-term development (Besley and Burgess, 2000; Finley et al., 2020; İşcan, 2018; Albertus et al., 2020; Alesina et al., 2020; Galán, 2024). While these studies provide important insights into the long-term consequences of redistribution policies, they often overlook the implementation process and its direct impact on inequality itself. This paper addresses this gap by examining how Egypt's 1952 agrarian reform reshaped landownership and inequality. Few studies have analyzed this question directly. Bardhan et al. (2014) found a reduction in land inequality after land reforms in West Bengal, India, while Finley et al. (2020) and Galli and Rönnbäck (2021) observed an increase in inequality after reforms in France and Sierra Leone during the 19th century. These mixed findings suggest that the effectiveness of redistributive land policies is heavily dependent on the political context and the implementation process. By examining the Egyptian case, this study contributes to understanding how land reforms implemented in a postcolonial setting interact with institutional structures to shape long-term inequality trends.

Finally, this paper contributes to the work of historians who have examined land concentration in Egypt (Amer, 1958; Baer, 1962; Abbas and El-Dessouki, 1973; Barakat, 1977). These studies primarily focused on the pre-1952 period, documenting the concentration of land among Egyptian elites using anecdotal evidence. However, there has been no systematic continuation of this work for the post-1952 period, particularly following the implementation of agrarian reform. This study complements and expands on these historical accounts by providing a long-term perspective on land inequality, bridging the gap between pre- and post-reform land distribution dynamics. In addition, it contributes to the broader understanding of postcolonial reforms in Egypt, such as those examined by Saleh (2016). Building on these studies, this paper offers a long-term view of institutional shifts in Egypt and highlights the evolution of regimes and their

effect on inequality.

The remainder of this paper is organized as follows. Section 2 provides a historical background on the legal and institutional framework in Egypt and the 1952 agrarian reform. Section 3 presents the data and methodology. Sections 4 and 5 present the results and the discussion.

2 Historical Context: Legal and Institutional Framework

2.1 History of land ownership

As Kenneth M. Cuno (1992) observes, "stratification was an ancient and deeply rooted characteristic of rural society."[3] This statement highlights the long-standing nature of inequality in Egypt's agrarian economy, where "land was held individually and unequally distributed among the peasantry before the rise of Muhammad Ali (1805-1848)."[4] However, the specific structure of inequality that persisted throughout the 19th and early 20th centuries was not merely a continuation of premodern patterns; rather, it was a direct product of the land policies implemented under Muhammad Ali.

In 1813, Muhammad Ali abolished the *iltizam* system[5], replacing it with a centralized system of land tax collection. Small plots of land (3-5 feddans) were distributed equally among peasants, who were required to pay a land tax in exchange for usufruct rights. Meanwhile, large estates were granted to high Turkish officials, the Royal Family, and religious scholars "*'ulama*" and Village headmen "*Sheikhs*".

Ib'adiya lands were tax-exempt uncultivated agricultural lands granted to Turkish officials for the purpose of agricultural expansion. *Jiflik* lands, on the other hand, were allocated to Muhammad Ali and the royal family, representing the largest share of large landholdings (Baer, 1962). Later, tax arrears "*'uhda*"[6] were often redistributed to state officials and, in some cases, to the royal family, transferring tax liabilities to new landowners (Baer, 1962, p. 13)[7]. These policies favored the Turkish elites and the royal family, while the peasants remained burdened

[3] Cuno (1992), p. 4.
[4] Cuno (1992), p. 3.
[5] The *iltizam* system, introduced in the 16th century during Ottoman rule in Egypt, was a tax farming system in which *multazims* (tax farmers) controlled agricultural land, collected taxes and surpluses from peasants, and maintained authority over labor.
[6] Land abandoned by peasants due to heavy taxation and an inability to meet tax obligations.
[7] There were other plots of land that were also granted like "*usiyea*" for the previous *multazims*, deserts land to Bedouins. They are not considered as large as the one granted to the royal family or the state officials, but larger than peasants' plots. (Amer, 1958, p. 67-68)

with heavy taxes[8] and limited usufruct rights (Barakat, 1977).

The 1858 *Sai'd* Law marked a pivotal step in establishing private land ownership, granting landholders the right to inherit, sell, and mortgage land. However, full ownership rights were restricted and reforms primarily benefited wealthier farmers. Further measures, such as the *Muqabla* Law (1871), allowed individuals to pay taxes in advance as an exchange for permanent ownership, leading to the consolidation of large estates. With the British occupation starting 1881, the path towards private land ownership rights was speed up, so that by 1891, all agricultural land in Egypt were granted private ownership rights.

2.2 *Waqf* System

The *waqf* system (religious endowments) played a significant role in perpetuating land inequality in Egypt by allowing elites to protect large estates from inheritance fragmentation. A *waqf* is a property endowed for charitable purposes or beneficiaries in perpetuity and can be classified into two types: public *waqfs*, which support communal projects such as schools or mosques, and private *waqfs*, which primarily benefit the endower's family. In 1950, *waqfs* accounted for 11% of private agricultural land in Egypt, of which 75% were private *waqfs*, and only 25% were public [9].

Although *waqfs* were abolished by Muhammad Ali, they were restored by his dynasty. In 1849, Khedive Abbas Helmi I restored individuals' rights to establish *waqfs*. The decree of the khedive declared that the prohibition of endowments violated individual freedoms under Sharia law. Subsequently, the *Muqabla* Law (1871) allowed landowners to endow their land for public or charitable purposes with the permission of the khedive. These legal developments reinforced the *waqf* system as a tool to preserve large estates (Baer, 1962).

2.3 Foreigners Ownership

The establishment of mixed courts in 1876 increased foreign investment in Egypt's agricultural sector. These courts provided legal frameworks that allowed foreigners to purchase land in Egypt and not fall under local jurisdiction. Foreigner land ownership doubled between 1890 and 1900 to occupy 10% private agricultural land, despite representing only 2% of the landowners [10].

[8] A land tax for large estates was later introduced in 1854, known as "*'ushuriya*", but it was levied at lower rates than the "*Kharaj*" tax, which peasants had to pay in exchange for usufruct rights (Baer, 1962). This tax differentiation remained in place until 1896.

[9] My Own estimations from the 1951 Statistical Yearbook

[10] My own estimations based on the 1910 Statistical Yearbook

Foreign investors, predominantly Greeks, Italians, French, English, and Ottomans [11], established numerous land companies, particularly during the 1880s and 1890s, with the peak of the sale of state uncultivated land ("*Amiriya*") and royal estates ("*Dayera Soneya*"). These companies specialized in reclaiming uncultivated or fallow land and reselling it for a profit. Such initiatives were closely related to large-scale irrigation projects, including the construction of the Aswan Dam (1902), which increased the value of cultivable land and attracted further investments (Baer, 1962).

By the mid-20th century, efforts by nationalists to gain increased control over the economy resulted in the implementation of significant reforms designed to reduce foreign influence. Starting by 1919's revolution that demanded Egypt's independence from British occupation and got a nominal independence [12], the 1937 Montreux Convention abolished the mixed courts system, and the 1947 Company Law mandated majority Egyptian ownership in corporate boards. These measures were part of broader Egyptianization policies intended to reduce foreign influence over land and economic resources.

2.4 Land Redistribution and the 1952 Agrarian Reform

The 1952 *coup d'état* in Egypt was a crucial turning point in the country's history, ending the monarchy and leading to substantial socio-political changes with the establishment of the republic in 1953. Founded by the Free Officers, a military group, the coup was driven by general dissatisfaction with corruption in the monarchy, remained British presence in the economy, and political rule, along with concerns of the rise of rural inequality. The Free Officers took opportunity to overthrow the monarchy and consolidate their control over the state.

Upon taking power, the military group identified land reform as a fundamental element of their plan to address rural poverty and inequality. On 11 September 1952, Law 178 was enacted, initiating Egypt's first agrarian land reform. It was used as a means to solidify the political authority of the new regime by diminishing the control of large landowners, who had traditionally played a dominant role in Egypt's economic and political landscape.

[11] In the population census of 1907, foreigners represented 5% of total population.

[12] The British remained in control of the Suez Canal and acted as Egyptian protectorate with a control over Egyptian army, but seized direct control over Egyptian political affairs.

2.4.1 Land Ceilings and Redistribution

The primary objective of the agrarian reform was to expropriate large estates and redistribute them to small landowners. Implemented in three phases between 1952 and 1969, the reform progressively reduced land ceilings from 200 feddans (84 ha) in 1952, to 100 feddans (42 ha) in 1961, and finally to 50 feddans (21 ha) in 1969. Land exceeding these ceilings was expropriated by the state and redistributed, prioritizing existing tenants and farmers that cultivated the land, then larger families, and economically disadvantaged residents within the same village.

However, the reform excluded the landless population, restricting beneficiaries to those who own less than five feddans. Compensation schemes and allowances for additional land ownership for larger families were criticized for favoring former landowners. Certain properties, such as fallow land and estates used by agricultural companies, were also exempt.

The affected landowners were compensated at a rate equivalent to ten times the rental value of the land or seven times its assessed taxable value, paid in 30-year government bonds bearing 3% interest. Although this rate was considered reasonable by the reform designers, it was significantly below the market value of land, particularly in densely populated regions (Warriner, 1953). This disparity was a major point of dispute, as landowners argued that compensation undervalued their property. In contrast, land owned by the royal family was confiscated without compensation.

Beneficiaries of the redistributed land were required to purchase it from the state, with an additional 15% fee to cover redistribution expenses. Sales of redistributed land were restricted until the land was fully paid for. The land ceiling system remained in place until 1978, when economic liberalization under President Sadat effectively ended it.

2.4.2 Other Reforms

The agrarian reform included measures to stabilize tenancy relationships and limit exploitation. Rent caps were set at seven times the basic land tax, and laws passed throughout the 1950s extended protections, including automatic lease renewals and mechanisms for clearing rent arrears. By 1966, tenancy contracts became effectively permanent unless dissolved voluntarily. Tenancy laws remained in place until 1992.

The nationalization of *waqf* lands further aims at dismantling large estates shielded by religious endowments. Law 152 (1957) brought public *waqf* lands under state control, while Law 44 (1962) extended this to private *waqf* lands. Furthermore, Law 15 (1963) prohibited

foreign ownership of agricultural land, reflecting nationalist policies under Nasser. These lands were under the control of the agrarian reform committee that took charge of its redistribution.

3 Data and Methodology

This study examines the long-term evolution of agricultural land inequality in rural Egypt from 1896 to 2020, using newly digitized data on the distribution of private agricultural land ownership and the agricultural population. The analysis focuses on measuring land inequality through three distinct scenarios, accounting for both landowners and the landless population. Scenario 1 examines inequality exclusively among landowners, while Scenarios 2 and 3 progressively incorporate the landless population, including permanent wage earners and family workers, to provide a comprehensive view of land inequality.

3.1 Data

3.1.1 Private Agricultural land ownership Distribution

To study the evolution of the land ownership distribution, this paper digitized unique data on private agricultural land ownership tabulations in rural Egypt from 1896 to 2020 (Figure 1), obtained from the Statistical Yearbooks (1896-1961) and the Reports on Agricultural Land Ownership (1970-2020). This data set includes detailed information on the number of landowners, the total private agricultural land area owned, and the breakdown of land ownership in various land brackets. It is available annually and at both the national and sub-national levels, offering a rare opportunity to analyze land inequality from an ownership perspective.

The tabulations originate from land tax returns collected at the village level by the land registry ("*Mukallafat*") and aggregated by the Ministry of Finance. These returns classify landowners into brackets based on the size of their ownership, such as less than 1 feddan (0.42 ha), 1 to 5 feddans (0.42 to 2.1 ha), 5 to 50 feddans (2.1 ha to 21 ha), and more than 50 feddans (more than 21 ha). From 1939 onward, additional breakdowns for larger ownership were introduced, including brackets for properties exceeding 100 feddans (42 ha), 200 feddans, and up to 2000 feddans [13].

This data also includes land ownership distribution by nationality (Egyptians, Foreigners

[13]The larger brackets are broken into smaller brackets as observed in Figure 1. For simplification purposes and for long-term analysis, I focus on the evolution of large land groups.

[14]) and property type (e.g. "*Waqfs*", or religious endowments) until 1959. To complement this, I incorporated data on state agricultural land to construct the total cultivable land area and analyze the share of land owned privately.

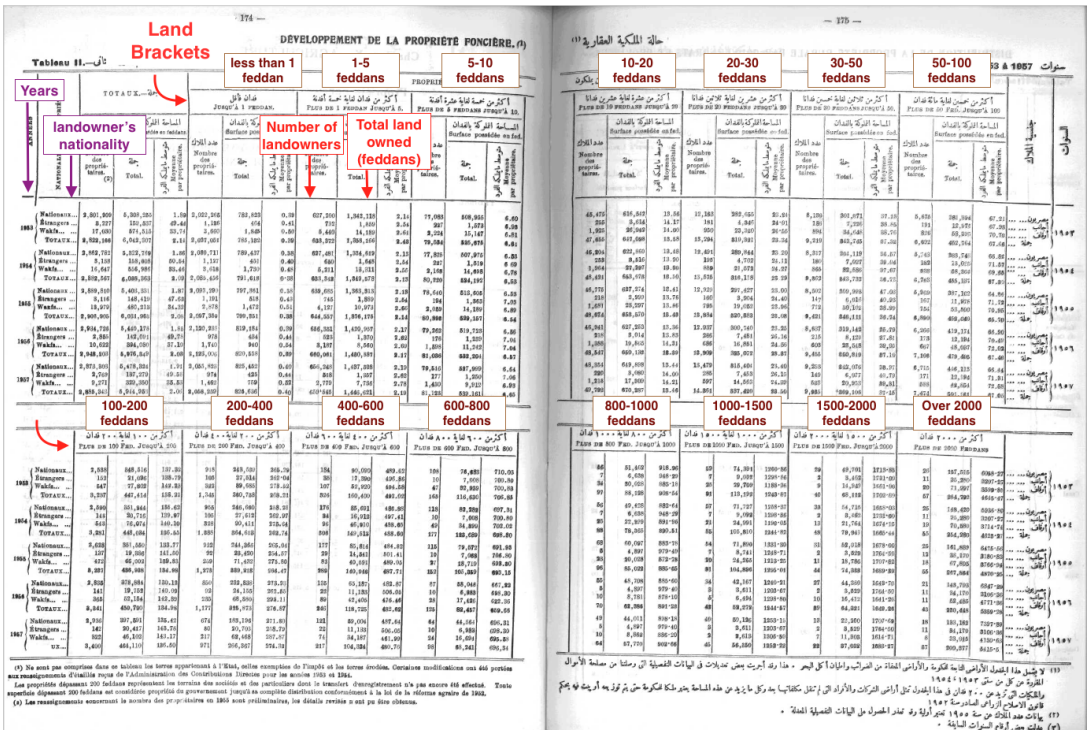

Figure 1: Land Ownership Tabulation from the Statistical Yearbook of 1959.

Note: This table provides a detailed breakdown of private agricultural land by land brackets, ranging from less than 1 feddan to over 2000 feddans. Each bracket includes the number of landowners and the total amount of land owned (in feddans). The data covers the years 1953 to 1957 and is disaggregated by Egyptians, Foreigners, and *Waqfs*. **Source:** Statistical Yearbook of 1959. (1 feddan = 0.42 hectares)

3.1.2 Agricultural Population and Landless Workers

Recognizing a critical limitation in land inequality studies (Erickson and Vollrath, 2004; Bauluz et al., 2020), this article includes the landless population - those who work in agriculture but do not own land - in the analysis. Data on the agricultural population were digitized from Egypt's agricultural censuses (1929, 1939, 1950, 1961, 1981, 1991, 2000, and 2010) and complemented by population censuses (1897, 1907, and 1917). These sources categorize agricultural workers into permanent and temporary workers.

Permanent workers are further classified into:

- **Family workers**: Those who work on land owned by their families and are unpaid.
- **Wage earners**: Non-family workers paid for their labor on the land of others.

[14]Foreigners, according to the definition expalined by Abbas and El-Dessouki (1973) are either Egyptians with double nationality or non-Egyptians.

This paper treats permanent wage earners as the core landless population because they lack ownership opportunities. Temporary workers, whose agricultural participation is primarily supplementary, are excluded to maintain focus on permanent agricultural workers. It also excludes workers below the age of 15 years to focus primarily on working-age population aged 15 years and above. More details on adjustments of agricultural workforce are provided in Appendix B.

3.2 Methodology

To analyze private agricultural land inequality, the generalized Pareto interpolation method (Blanchet et al., 2022) is applied to land ownership tabulations. Following Bauluz et al. (2020), I measure land shares owned by the bottom 90%, next 9%, and the top 1% of the landowners. The bottom 90% is further divided into the bottom 50% (smallest landowners) and the next 40% (those between the bottom 50% and the top 10%). These measurements are conducted in three scenarios:

3.2.1 Scenario 1: Within-Landowners Inequality

This scenario examines inequality exclusively among landowners, excluding the landless population. It reflects the distribution of agricultural land among those who own it and is the basis for comparison.

3.2.2 Scenario 2: Landless Population as Wage Earners

In this scenario, individuals who are 15 years and older and permanently working in agriculture as wage earners are included as a landless population. They are treated as landowners with zero land, capturing the inequality between landowners and those who rely entirely on wage labor. This scenario is preferred because wage earners lack ownership opportunities and are more economically vulnerable than family workers, who may inherit land.

3.2.3 Scenario 3: The total permanent agricultural workforce

The final scenario incorporates both wage earners and family agricultural workers (15 years and older) as a landless population. This approach provides a comprehensive view of land inequality, including all permanent agricultural workers. However, the potential of family workers to inherit

land makes their economic position distinct from those of wage earners, necessitating their separate inclusion.

Incorporating the landless population addresses a significant gap in the traditional literature on land inequality. By examining the inclusion of different worker groups, this methodology reveals how inequality measures change when the broader agricultural population is considered. Although scenario 2 is the most relevant to understand the situation of landless individuals, scenario 3 highlights the broader impact of land distribution policies on the entire agricultural workforce.

3.3 Agricultural Crops

I have also digitized data on crop area and production for the main crops in Egypt from the 19th to the 21st century, to see how the different land policies affected the yield of crops. The main crops on which I focus are cotton, wheat, maize, sorghum, and rice. The data is at the national level and was collected from Statistical Yearbooks and the International Historical Statistics and was complemented with data from FAO starting 1961. All units for crop production were converted to tons, and for crop area, it was converted from feddans to hectares (ha).

4 Results

4.1 Cultivable Land in Egypt

The growth of cultivable land in Egypt in the last 120 years has been limited and heavily dependent on irrigation. In the late 19th century, Egypt's total cultivable land was 2.7 million hectares. Between 1896 and 1930, this area grew by 30%, reaching 3.1 million hectares due to improvements in irrigation, most notably the construction of the Aswan Dam in 1907 and the sale of uncultivated state land. However, from 1930 to 1980, growth stagnated and the total cultivable land only began to increase again to 4 million acres by 2020 (Figure A.1). This recent expansion has been mainly driven by the reclamation of desert areas, particularly around both sides of the Nile Delta and, to a lesser extent, in the Nile Valley.

As shown in Figure 2, private agricultural land consistently represented 75% to 80% of total cultivable land, while public agricultural land remained relatively stable at 20% to 25%. A notable shift occurred after the Free Officers took power in 1952. The proportion of private agricultural land began to decline, dropping from 80% to 75% in 1975, largely due to urban

expansion and the conversion of agricultural land into urban areas.

The implementation of the 1952 agrarian land reforms reshaped the distribution of agricultural land ownership. The first agrarian reform law of 1952 limited individual land ownership to 200 feddans (84 hectares). Subsequent laws in 1961 and 1969 further reduced the maximum land ownership to 100 feddans (42 hectares) and 50 feddans (21 hectares), respectively. On average, the 1952 law mobilized approximately 20,000 hectares annually, while the 1961 law increased this to around 40,000 hectares. Redistribution peaked in the 1960s, but the final law of 1969, which lowered the ceiling to 50 feddans, contributed only modestly to further redistribution (Figure A.2).

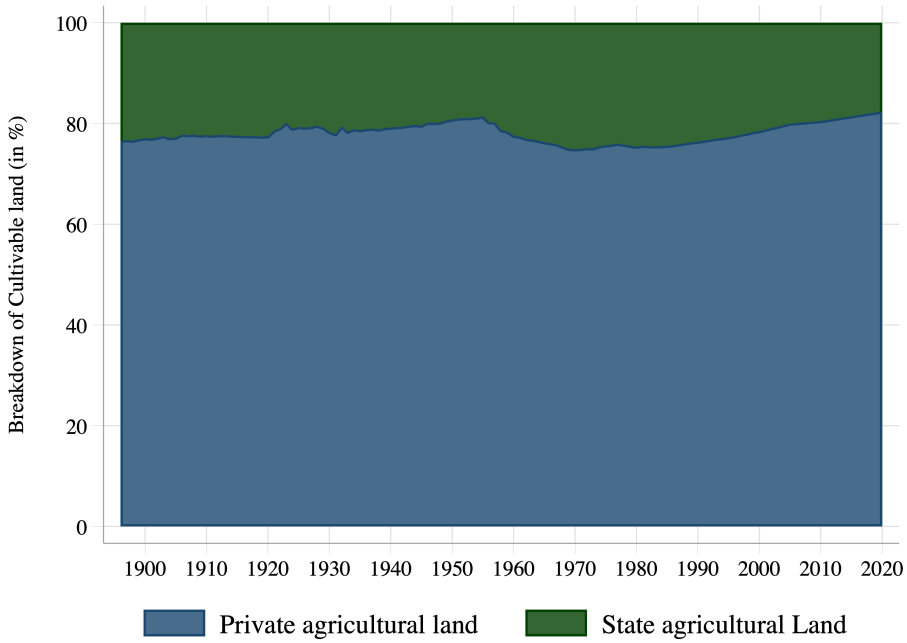

Figure 2: Decomposition of Total Cultivable Land into Private and Public Ownership in Egypt (1896-2020).

Note: This figure illustrates the evolution of total cultivable land in Egypt, expressed as percentages of private and public ownership, from 1896 to 2020. **Source:** Statistical Yearbooks and Reports on Agricultural Land Ownership.

4.2 Evolution of the Egyptian Population and Agricultural Workforce

As shown in Figure 3, the total national population of Egypt grew dramatically between 1900 and 2020, increasing from approximately 10 million to nearly 100 million. The rural population followed a similar trajectory, maintaining a relatively stable share of around 80-90% of the total national population until the mid-20th century. This stability began to shift in the latter half of the 20th century, as rural-urban migration accelerated due to industrialization and urban

expansion. The rural population (15 years and older) followed a similar trend, representing approximately 50% of the national population. This population represents the workforce of the rural economy and serves as a reference point for studying the evolution of the agricultural population relative to the rural population above age 15.

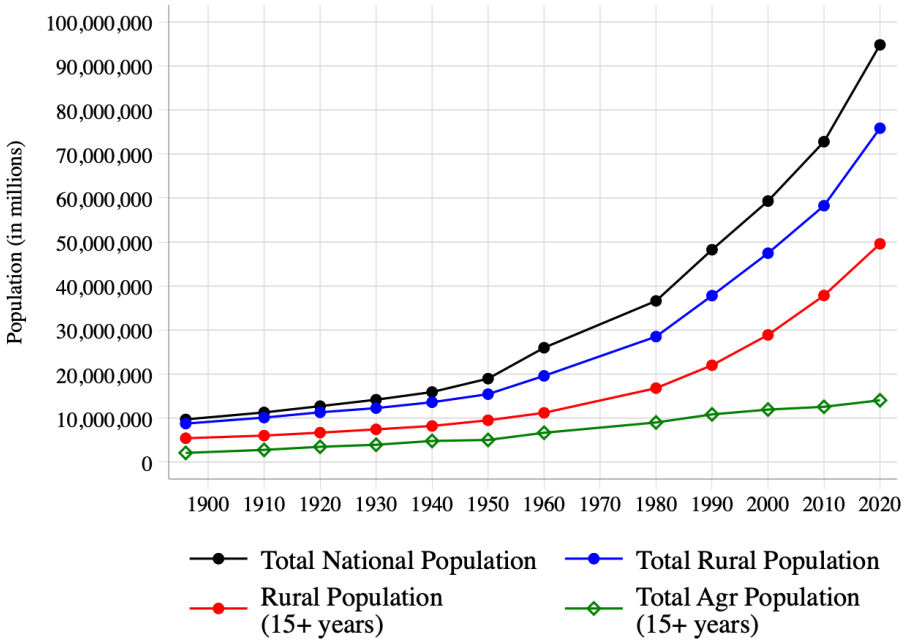

Figure 3: The Evolution of Population in Egypt (1897-2020).

Note: This figure illustrates the evolution of Egypt's population from 1897 to 2020, including the total national population, the total rural population, the rural population aged 15 and above, and the agricultural population aged 15 and above. **Source:** Data derived from Population and Agricultural Censuses, Statistical Yearbooks, and Reports on Agricultural Land Ownership.

Moving to the agricultural population (15 years and older) in absolute terms, as shown in Figure 4, the total number of agricultural workers grew steadily from 1900 to 1950, driven by the expansion of the rural population and the importance of agriculture in the economy. During this period, most of the agricultural workforce groups increased in size: temporary agricultural workers, family agricultural workers, and agricultural landowners all grew steadily, while wage-earning permanent agricultural workers remained relatively stable. By 1950, agricultural landowners represented the largest group in absolute terms, followed closely by temporary workers. Wage earners and family workers made up smaller but steady shares of the workforce during this period.

In relative terms, the share of the total agricultural population within the rural population (15 years and older) also increased significantly during the first half of the 20th century, as illustrated in Figure 5. In 1900, the agricultural population represented 40% of the rural pop-

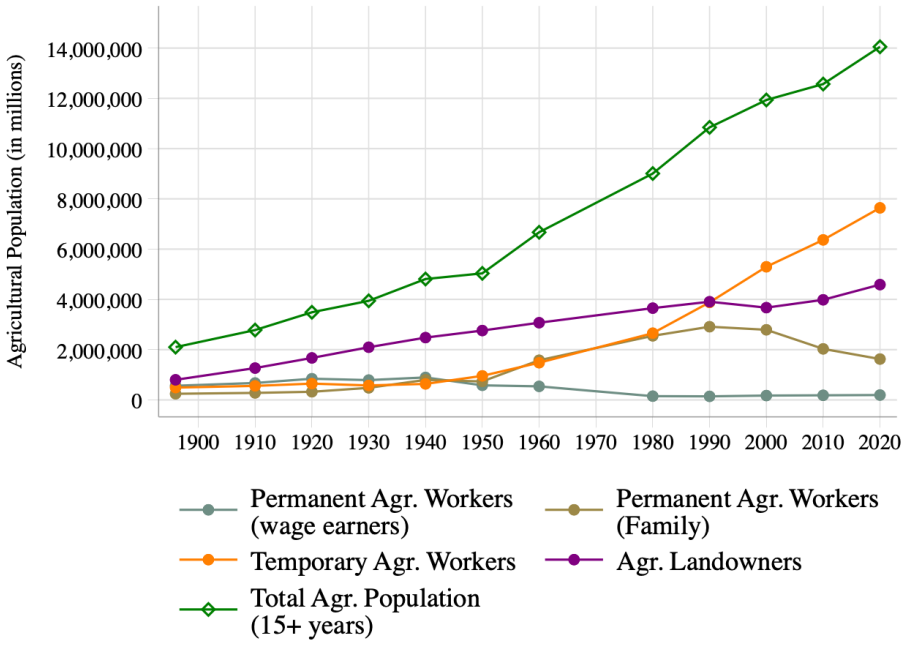

Figure 4: The Evolution of the Agricultural Population (15+ years) in Egypt (1897-2020).

Note: This figure illustrates the evolution of Egypt's agricultural population (15+ years) from 1897 to 2020, broken down into permanent workers (wage earners), family workers, temporary workers, and landowners. **Source:** Data derived from Population and Agricultural Censuses, Statistical Yearbooks, and Reports on Agricultural Land Ownership.

ulation above the age of 15. This share increased to 50% by 1920 and peaked at 60% by 1940, emphasizing the importance of agriculture to Egypt's rural economy during this period. Within this composition, agricultural landowners saw their share increase from 15% in 1900 to 30% in 1940, reflecting the consolidation of land ownership. Permanent wage earners maintained a stable share of around 10%, while family agricultural workers grew from 5% to 10%. Temporary workers, however, remained relatively stable at approximately 8-10% during this time.

After 1950, significant shifts began to emerge in both absolute and relative terms of the agricultural population due to the impact of land reforms and broader economic restructuring. As shown in Figure 4, the total agricultural population continued to grow, driven by sharp increases in the number of temporary workers, family agricultural workers, and agricultural landowners. Temporary workers experienced rapid growth following the 1952 agrarian reforms, becoming the largest category of the workforce by 2000. Family agricultural workers also expanded their share significantly during the early post-reform decades, peaking at 15% of the rural population in 1960, before beginning a steady decline to 4% by 2020.

In contrast, permanent wage-earner agricultural workers followed a consistent downward trajectory after 1950. Their numbers and relative share declined sharply, from 10% of the rural

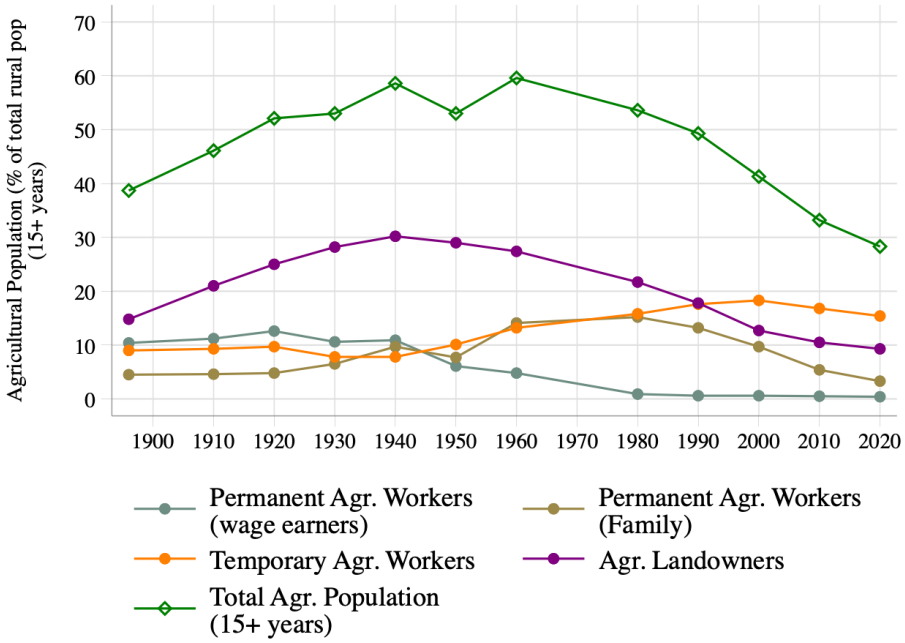

Figure 5: Decomposition of the Agricultural Population as a Percentage of the Total Rural Working-Age Population in Egypt (1896-2020).

Note: This figure shows the composition of the agricultural population as a percentage of the total rural population aged 15 years and above. The decomposition includes Permanent Agricultural Workers (wage earners), Family Permanent Agricultural Workers, Temporary Agricultural Workers, and Agricultural Landowners. The population figures align with the working-age definition aged 15 years and above. **Source:** Population Censuses, Agricultural Censuses, Statistical Yearbooks, and Reports on Land Ownership.

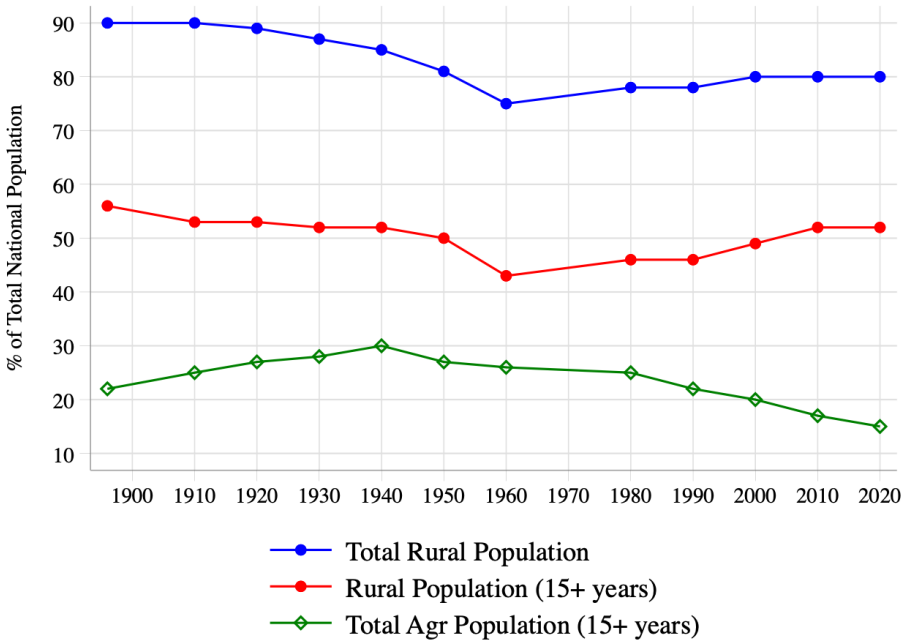

Figure 6: The Evolution of Rural and Agricultural Populations as a Percentage of Total National Population in Egypt (1896–2020).

Note: This figure illustrates the evolution of rural and agricultural populations in Egypt as a percentage of the total national population from 1900 to 2020. The breakdown includes the total rural population (blue), rural population aged 15 years and above (red), and agricultural population aged 15 years and above (green). **Source:** Population Censuses, Agricultural Censuses, Statistical Yearbooks, and Reports on Land Ownership.

population in 1940 to only 1% in 2020. This trend reflects a structural shift away from permanent employment in agriculture and the increasing reliance on flexible and seasonal labor provided by temporary workers. By 2020, temporary workers had become the dominant category, accounting for 18% of the rural population, reflecting the growing precarity of agricultural employment.

Finally, Figures 5 and 6 place these agricultural trends in the larger context of the national population. In 1900, agricultural workers represented more than 20% of the total national population and 40% of the rural population above the age of 15. By 1940, these shares reached their peak at 30% and 60%, respectively. However, by 2020, the share of the agricultural population had decreased dramatically to less than 15% of the national population and less than 30% of the rural population. This substantial decline reflects Egypt's transition from an agrarian economy to one increasingly dominated by services and industry. Urbanization, mechanization, and economic liberalization further marginalized agriculture within the economy, leading to significant changes in the structure of the rural workforce.

4.3 Within-Landowners Land-area Inequality

The colonial period under British direct rule (1881–1923) was marked by extreme land inequality. In 1900, the top 10% of agricultural landowners controlled 70% of private agricultural land (Figure 8), leaving the bottom 90% with only 30% (Figure 7). By World War I, the share of the top 10% increased to 75%, while the bottom 90% decreased to 25%. These shares remained stable until the *coup d'état* by the military group in 1952, where we see the top 10% land share decrease to 60% and the bottom 90% increase to 40%. However, land ownership was unevenly distributed and more concentrated within the top 10%, especially within the top 1%, representing owners of over 50 feddans. Hence, the need to decompose the top 10% and the bottom 90% into smaller land groups to understand the extent of inequality.

4.3.1 Impact on Top Landowner Groups

A closer analysis reveals that the share of the top 1% of landowners increased by 17% between 1900 and 1918, rising from 40% to 47% of private agricultural land. This share remained relatively stable between 45% and 47% until a significant decline in 1947, when it fell to 42% (Figure 7). The top 1% represents landowners with more than 50 feddans. In 1950, landowners with more than 50 feddans represented just 0.4% of the total landowners, but controlled 28%

of the total cultivable land. Within this group, estates above 100 and 200 feddans, representing 0.2% and 0.07% of landowners, owned 22% and 16% of total cultivable land, respectively (Figure A.3a).

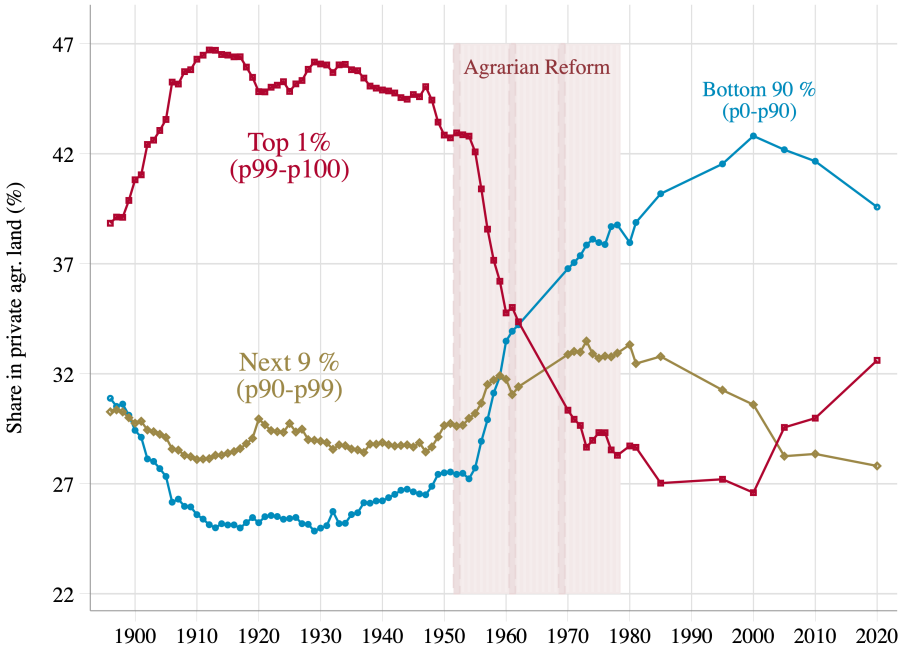

Figure 7: Evolution of the Top 1%, Next 9%, and Bottom 90% Private Agricultural Land Shares (1896-2020).

Note: This figure illustrates the evolution of private agricultural land shares among the top 1%, next 9%, and bottom 90% in Egypt from 1896 to 2020, based on Scenario 1 (Within-Landowners Inequality). **Source:** Own estimations.

Foreigners played an important role in shaping land ownership distribution in the early twentieth century. In 1900, foreigners owned approximately 10% of private agricultural land but represented only 2% of landowners. Between 1900 and 1918, foreigners made up about 25% –27% of the top 1% landowners, highlighting their disproportionate presence among the largest landowners (Figure 9). However, the 1919 Revolution, driven by demands for independence from British occupation and widespread resentment toward foreign economic dominance, created an increasingly hostile environment for foreign investors. Following the revolution, their share of agricultural land began to slowly decline, dropping from 21% to 15% by 1937, and to just 5% by 1950.

Waqfs also played an important role in land concentration, controlling 12% of the total cultivable land at the beginning of the twentieth century. *Waqfs* maintained their position, accounting for 17% of the top 1% of landowners until the 1952 agrarian reform, which confiscated their holdings.

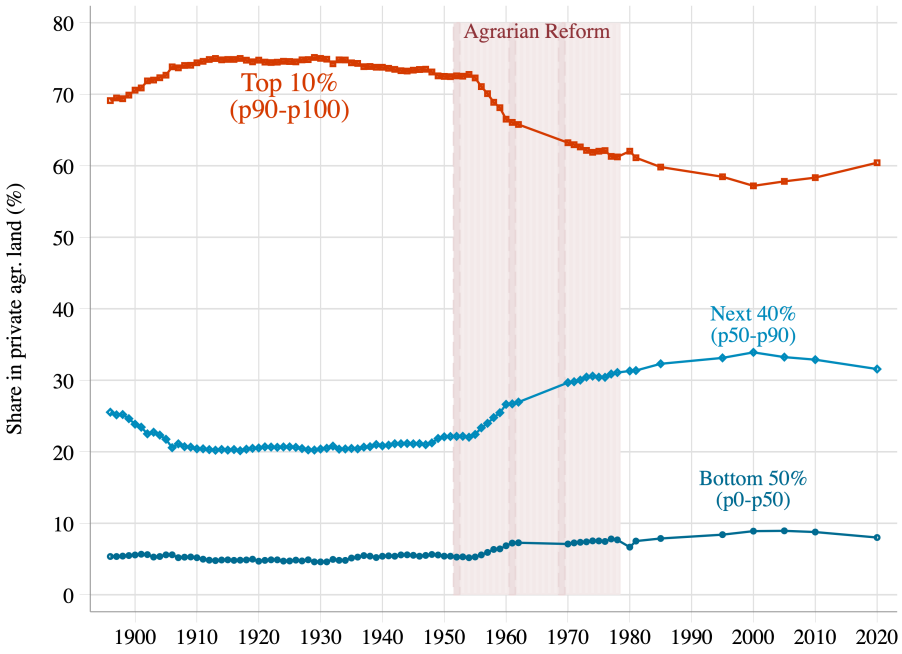

Figure 8: Evolution of the Top 10%, Next 40%, and Bottom 50% Private Agricultural Land Shares (1896-2020).

Note: This figure illustrates the evolution of private agricultural land shares among the top 10%, next 40%, and bottom 50% in Egypt from 1896 to 2020, based on Scenario 1 (Within-Landowners Inequality). **Source:** Own estimations.

The 1952 agrarian reform and subsequent laws in 1961 and 1969 significantly impacted the top 1% of landowners, whose share of private agricultural land decreased from 42% in 1952 to 35% in 1961, following the first ceiling of 200 feddans (84 hectares). This share also dropped to 30% after the ceiling reduction to 100 feddans (42 hectares) in 1961 and 50 feddans (21 hectares) in 1969. Although the reforms successfully reduced land concentration, the top 1% share stabilized at 27% until 2000. Then it rose again to 32% in the twentieth century, following the lifting of tenancy reforms in 1992 and the extension of agricultural land into the desert. In general, the agrarian reform reduced the share of the top 1% by 30% during its 17 years of implementation.

4.3.2 Impact on Small and Medium Landowner Groups

Before the agrarian reforms of the 1950s and 1960s, the land inequalities in Egypt were significant. Small landowners (owning less than 5 feddans) represented 94% of the landowner population in 1950, but controlled less than 30% of private agricultural land. In contrast, medium landowners (owners of 5 to 50 feddans) controlled between 24% and 25% of private agricultural land before 1952, although they accounted for only 5% of the landowners (Figure

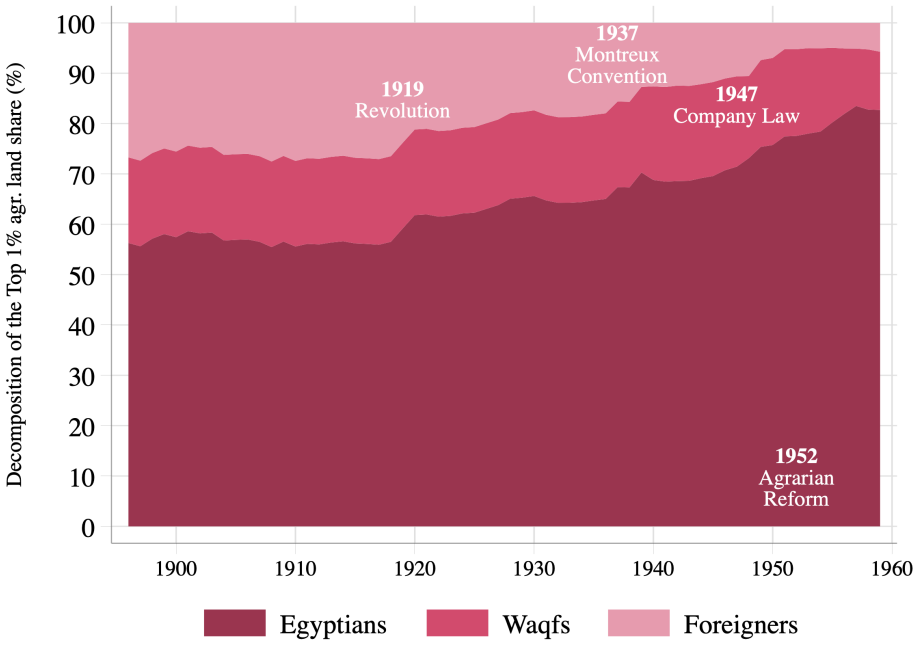

Figure 9: Decomposition of the Top 1% Private Agricultural Land Share by Nationality of Landowner and Type of Property (1896-1959).

Note: This figure illustrates the decomposition of the top 1% private agricultural land share in Egypt between 1896 and 1959. It distinguishes landownership by foreign nationals and properties classified as *Waqf*. **Source:** Own estimations.

A.3a). Only by analyzing the distribution within the bottom 99% of landowners can we fully understand the evolution of land inequality in Egypt.

A closer look at the bottom 99% reveals significant inequalities that showed little improvement in their shares over time. Within this group, the next 9% (medium-sized landowners with between 5 and 50 feddans) held 30% of private agricultural land in 1900 (Figure 7), while the next 40% (small landowners with 1 to 5 feddans) held 24%, and the bottom 50% (landowners with less than 1 feddan) held only 6% (Figure 8). By 1918, these shares had decreased to 28%, 20%, and 5%, reflecting the increasing fragmentation of land among smaller land groups. Between 1924 and 1952, when the top 1% of landowners consistently controlled approximately 45% of private agricultural land, the next 9% owned 30%, the next 40% controlled 22%, and the bottom 50% only owned 5%.

The agrarian reforms following the 1952 revolution initiated a redistribution of agricultural land, benefited the next 9% and the bottom 90% the most. The next 9% experienced modest gains, with their share increasing from 30% to 33%, while the bottom 90% saw a more substantial rise from 27% in 1952 to 42% in the mid-20th century. Within the bottom 90%, the next 40% (small landowners with 1 to 5 feddans) took the most significant benefits, with their share rising

from 20% in 1952 to 30% in the 1970s. This group directly benefited from the redistribution of large estates, as they represented farmers and tenants who had previously worked on those estates. In contrast, the bottom 50% (landowners with less than 1 feddan) saw only marginal improvements, with their share increasing from 5% to 8%.

These limited gains highlight that the agrarian reforms mainly focused on empowering smallholders (less than 5 feddans) who already owned farms, increasing their ownership up to 5 feddans. Although the reforms succeeded in reducing the share of land controlled by the top 1%, the benefits of redistribution were more substantial for farmers who already owned land and few landless households. In addition, the reforms did not address the landless population, leaving the most vulnerable groups with little or no benefit from the changes.

4.4 Land-area Inequality Including Landless Population

The inclusion of the landless population in the land ownership distribution fundamentally reshapes the observed patterns of land inequality. Adding the landless population alters the share of land areas between all ownership groups, offering a broader perspective on inequality. In Scenario 1, inequality is measured exclusively among landowners (within-landowners). Scenario 2 includes wage-earning agricultural workers without land (Figure 11). For an analysis that includes family agricultural workers, see the appendix B.3.

This remeasurement highlights a key insight: If newly added landless individuals represent the same proportion of the population as landowners, they would collectively constitute the entire bottom 50% of the distribution. This highlights how including the landless alters our perception of inequality by stressing the concentration of land within a small group of the population.

4.4.1 Bottom 50%

As shown in Figure 10, in Scenario 1 (within-landowners), the bottom 50% of the landowners had a stable share of around 5%-6% of agricultural land between 1900 and 1950. However, when the landless population is included in Scenario 2, their share falls to 1%-4%. This reflects the addition of a large group of landless workers, particularly permanent wage-earning agricultural workers, who accounted for a significant share of the rural population. The decline in permanent agricultural workers between 1940 and 1950 mirrors the converging trend in the shares of the bottom 50% land area between Scenarios 1 and 2. Land reforms implemented in the 1950s and

1960s had a notable redistributive effect: the bottom 50% saw their share rise from 3% in 1950 to 6% in 1961 and 7.5% in 1980 in Scenario 2. These improvements reflect the impact of reforms on this vulnerable group.

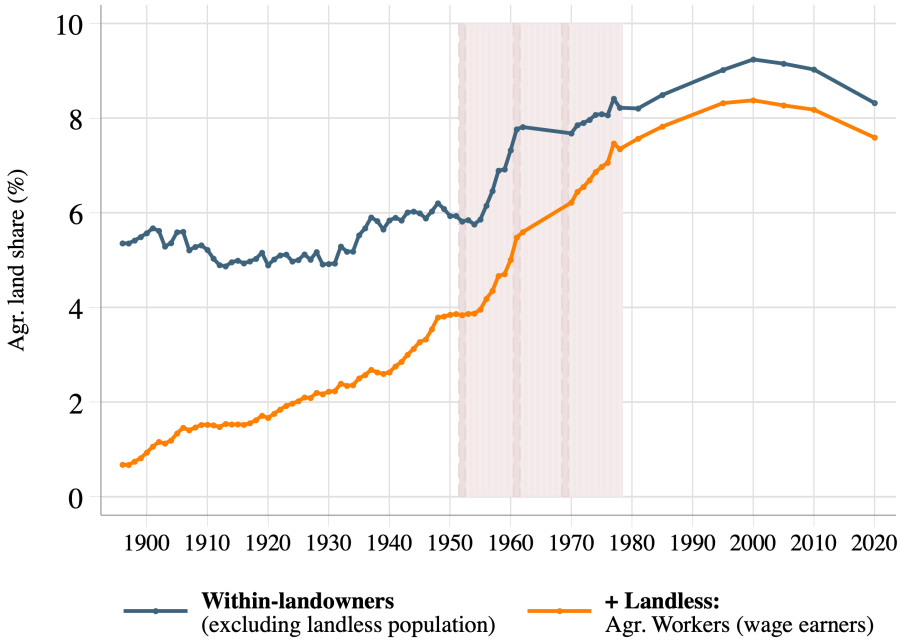

Figure 10: Agricultural Land-Area Shares of the Bottom 50% in Egypt, Including and Excluding the Landless Population (1896-2020).

Note: This figure shows agricultural land-area shares for the Bottom 50% (p0p50) in Egypt from 1896 to 2020, with and without the inclusion of the landless population over the age of 15. Blue represents landowners only, and Orange includes wage-earning landless workers. Temporary workers are excluded. **Source:** Own estimations.

4.4.2 Next 40%

The next 40% shows steady growth in Scenario 1, particularly after the 1952 agrarian reform, with their share increasing from 20% in 1950 to 30% in 1980 (Figure 11). When the landless are included in Scenario 2, the next 40% absorbs small landowners from the bottom 50%, particularly those who previously owned less than 1 feddan. This downward effect redistributes land ownership between groups. In Scenario 2, the next 40% shows slow growth before the 1952 reform, increasing from 19% in 1910 to 21% in 1950. After the reform, their share converges toward Scenario 1, reaching 30% by 2020.

4.4.3 Next 9%

The next 9% experiences growth in its share of land area in both scenarios during the reform years. In Scenario 2, this increase is driven by the upward mobility of landowners from the

next 40% to the next 9%, reflecting the effects of land redistribution and the inclusion of the landless population. The reforms facilitated the movement of smaller landowners into higher land brackets. However, after 1990, the growth of the next 9% slows due to the decline of permanent agricultural workers and their transformation into temporary workers, reducing their overall share of the rural population.

4.4.4 Top Groups (10%, 1%, 0.5%, and 0.1%)

The top landowner groups exhibit significant trends across both scenarios, particularly in the context of land reforms. Before the reforms, the top 10% controlled over 70% of agricultural land in Scenario 1. This share declined following the reforms of the 1950s, stabilizing around 60% post-1980. The declines were even more significant for the top 1%, 0.5%, and 0.1%, highlighting the substantial land concentration that existed prior to the reform and the redistributive effect on the largest land groups.

Including the landless population in Scenario 2 initially increased the relative share of land held by the top groups, as the addition of landless workers without land skewed the distribution upward, widening the gap between the top and bottom land groups. Starting in the 1950s and continuing through the 1980s, the alignment of Scenarios 1 and 2 reflects a mechanical reduction in measured inequality. This alignment is primarily driven by the fact that permanent agricultural workers are the only landless group captured in the distribution.

At the same time, the reforms also led to the creation of a growing group of temporary workers who are excluded from land ownership measurements. Many of these temporary workers were formerly permanent workers before the reforms and lost access to stable employment and ownership opportunities. As a result, while the alignment of Scenarios 1 and 2 reflects a decline in measured inequality, this reduction does not account for the instability introduced by the transition from permanent to temporary agricultural work.

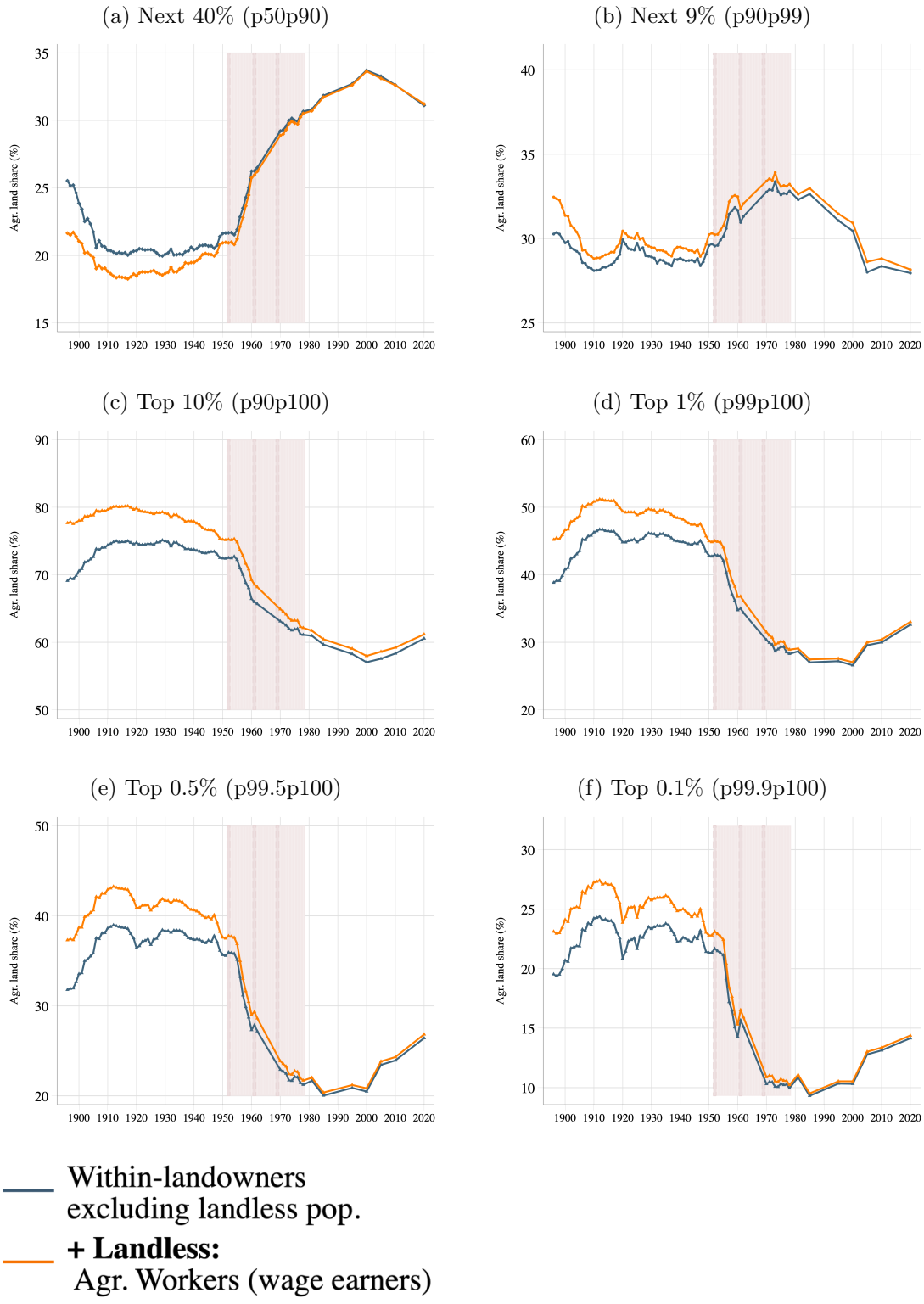

Figure 11: Land-area inequality excluding and including the landless population.

Note: This figure illustrates land-area shares in Egypt (1896-2020), comparing distributions with and without the landless population (aged 15+). Blue bars represent landowners only, and orange includes wage-earning landless workers. Temporary workers are excluded. **Source:** Own estimations.

5 Discussion

5.1 Pre-Colonial and Colonial Roots of Land Inequality

The origins of land inequality in Egypt are deeply embedded in pre-colonial power structures and institutional arrangements, which were later reinforced and reshaped by colonial policies. As Frankema (2010) argues, pre-colonial institutions often played a more significant role than geographical factors or initial factor endowments in determining the trajectory of land distribution. Muhammad Ali's economic reforms, while aimed at modernizing Egypt's economy, exacerbated these inequalities by concentrating land ownership in the hands of landed elites. His policies of allocating tax-exempt uncultivated land to Turkish officials and fertile land to royal family members, interconnected with heavy taxation on peasant landholdings, firmly established power of the elite. By 1844, large estates controlled by these privileged groups represented 53% of cultivable land, leaving only 47% to be cultivated by peasants (Saleh, 2024).

The American Civil War (1861-1865) and the resulting Egyptian cotton boom exacerbated existing inequalities. Cotton, a critical cash crop for export to English textile factories, became central to the Egyptian economy. Large landowners, including members of the royal family, who had the necessary capital to invest, intensified cotton cultivation. Improved irrigation systems, initiated under Muhammad Ali and later expanded during colonial rule, facilitated this expansion and disproportionately benefited large estates (Amer, 1958; Owen, 1999).

These historical developments align with the broader argument of Frankema (2010) that colonial powers often built on existing institutional frameworks and adapted them rather than creating entirely new systems, perpetuating preexisting inequalities. Hartnett and Saleh (2023) similarly emphasize how colonial administrations selectively empowered elites to serve imperial interests, particularly prioritizing cotton production and political stability. In Egypt, this approach involved the reshaping of political institutions, such as the parliament, to favor landed elites, ensuring their alignment with colonial objectives.

Colonial rule further exacerbated land inequality through policies that prioritized imperial interests. Following Egypt's bankruptcy in 1876, the liberalization of investments facilitated the sale of uncultivated state land and royal estates. These measures enabled foreign investors and wealthy Egyptians to dominate the land market. The findings illustrate this dynamic: By 1900, foreign investors controlled 10% of private agricultural land, while they represented only 2% of landowners. In 1918, they reached their peak influence as 27% of the top 1% of

landowners. These policies, linked to the shift toward private land ownership, continued to uphold inequality. Land auctions and sales disproportionately allowed large landowners, village headmen, and merchants to accumulate additional agricultural land (Baer, 1962; Barakat, 1977). This shift is reflected in the findings during the colonial period, when the share of agricultural land owned by the top 1% increased by 17%, from 40% in 1900, to 47% by World War I.

Waqfs, played a critical role in maintaining land concentration and protecting elite estates from land fragmentation. By circumventing inheritance laws, *waqfs* allowed elite families to preserve their vast landholdings, perpetuating inequality. The findings highlight how the largest *waqf* estates, often controlled by the top 1% of landowners, date back to the late 19th century (Baer, 1962).

Despite growing parliamentary debates in the 1940s criticizing *waqfs* for inefficiency and inequity, substantive reforms were resisted until the 1952 agrarian reforms. These endowments ensured that elite families retained their dominance over land, delaying efforts to redistribute resources or address structural inequality. The persistence of *waqfs* contributed to the concentration of land ownership, with the top 1% maintaining a disproportionately large share of private agricultural land well into the mid-20th century.

Although nationalist reforms, such as the 1937 Montreux Convention and the 1947 Company Law, reduced foreign ownership to 15% by 1937 and 5% by 1950 within the top 1%, land concentration among Egyptian elites remained high. By 1952, the top 1% of landowners still controlled 42% of private agricultural land, demonstrating how this hindered economic development and increased rural poverty.

5.2 Broader Implications of the 1952 Agrarian Reform

The 1952 agrarian reform marked a significant moment in Egypt's socio-economic history, particularly in addressing land inequality. The reform succeeded in reducing the dominance of the top 1% of landowners, whose share of agricultural land decreased from 42% to 27%, while the next 40% saw their share increase from 20% to 30%. These shifts highlight the political success of the reform in reshaping the rural power structure and addressing the inequality that had characterized Egypt's agrarian society under the old regime. However, despite these gains, the reform fell short in its redistribution efforts, leaving the smallest landowners and landless laborers, the most vulnerable groups, largely excluded from its benefits.

Redistribution efforts were constrained by the limited amount of expropriated land. Laws

passed in 1961 and 1969 sought to expand redistribution by lowering the maximum allowable land ownership, but only 16% of the land was redistributed, which was insufficient for smallholders and landless and could only marginally improve access to land for a select group of smallholders. Although small farmers benefited significantly from reforms, particularly those with holdings of 1 to 5 feddans, stagnation of land holdings less than 1 feddan demonstrated the limited reach of redistribution policies (Figure A.3b).

A key unintended consequence of the reform was the exacerbation of land fragmentation. Inheritance laws, particularly for the smallest estates, led to the continuous subdivision of land among heirs. Over time, this process made many plots economically infeasible, further embedding rural poverty (Adams, 1985). Smallholders increasingly relied on family labor to work these fragmented holdings, yet the irregularity of agricultural work left many laborers inactive outside of the harvest season. These laborers, often members of landless households, were forced to seek employment outside their villages, contributing to patterns of seasonal migration and rural underemployment (Toth, 1999).

The political success of the reform in deconstructing the power of large absentee landowners also created a new rural middle class, which emerged as the dominant group in the agricultural landscape of Egypt (Waterbury, 1983). However, this shift in power did little to improve the conditions of landless laborers, who constituted the majority of the rural population. The lack of strategic policies to support this group meant that they remained marginalized, with few opportunities for social or economic mobility. The absence of comprehensive plans to integrate landless workers into the agricultural economy highlighted the narrow focus of the reform on redistribution without addressing broader structural challenges.

In addition, the state's tight control over the agricultural sector hindered innovation and productivity. Compulsory crop rotations and fixed quotas limited farmers' ability to diversify their production or adopt new techniques. As a result, while the reforms initially boosted yields in the short term, productivity gains stagnated over time. By prioritizing state control over market-driven improvements, the government missed opportunities to modernize Egypt's agricultural sector, leaving it vulnerable to stagnation and inefficiencies (Boeckx, 1971; Adams, 1985; Waterbury, 1983).

During the Sadat era, many of the socialist policies of the Nasserist period were rolled back as the economy was liberalized. Although foreign investment increased in some sectors, the agricultural sector remained largely neglected. Rural poverty saw some decline due to the

remittances of Egyptian migrants who worked abroad, but inequality persisted, and the lack of sustained investment in agriculture left the sector underdeveloped (Adams, 1985). The agrarian reforms, while politically transformative, ultimately did not provide long-term economic benefits or equitable development to the majority of the rural population in Egypt. This highlights the need to combine redistribution with strategies that tackle structural inequalities, promote innovation, and guarantee the participation of underrepresented groups.

6 Conclusion

This paper provides a detailed examination of the evolution of land inequality in Egypt, emphasizing the roles of landless agricultural workers and the transformative impact of the 1952 agrarian reforms. By analyzing inequality both within landowners and with the inclusion of the landless population, the study highlights the multidimensional nature of land inequality in rural Egypt.

The analysis reveals that including the landless population in measures of land inequality reshapes the distribution across all landholding groups. Wage-earner landless workers, when incorporated into the distribution, significantly reduce the relative share of the bottom 50% landowners, particularly before the reforms. This underscores the stark inequalities faced by this group, which had limited access to land and few prospects of ownership.

At the same time, the reforms profoundly affected land inequality among landowners. The top 10%, and especially the top 1%, experienced significant reductions in their share of land area, reflecting the redistribution of large estates to smaller landholders. The next 40% emerged as a key beneficiary of these reforms, gaining considerable land shares and consolidating their position within the rural economy. However, the reforms had a limited impact on the bottom 50% of landowners, whose small land shares underscore persistent challenges in addressing rural poverty.

In summary, the study underscores the dual importance of addressing inequality within landowners and among the larger agricultural population. Although agrarian reforms made significant progress in reducing concentration among the top landowner groups, more comprehensive strategies are needed to address the inequalities faced by landless and smallest landowners. Future research should further investigate the interaction between land reforms, labor dynamics, and rural livelihoods to develop targeted solutions to reduce inequality and promote sustainable

development in agrarian economies.

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Appendix

A Supplementary Figures and Tables

A.1 Agricultural Land in Egypt

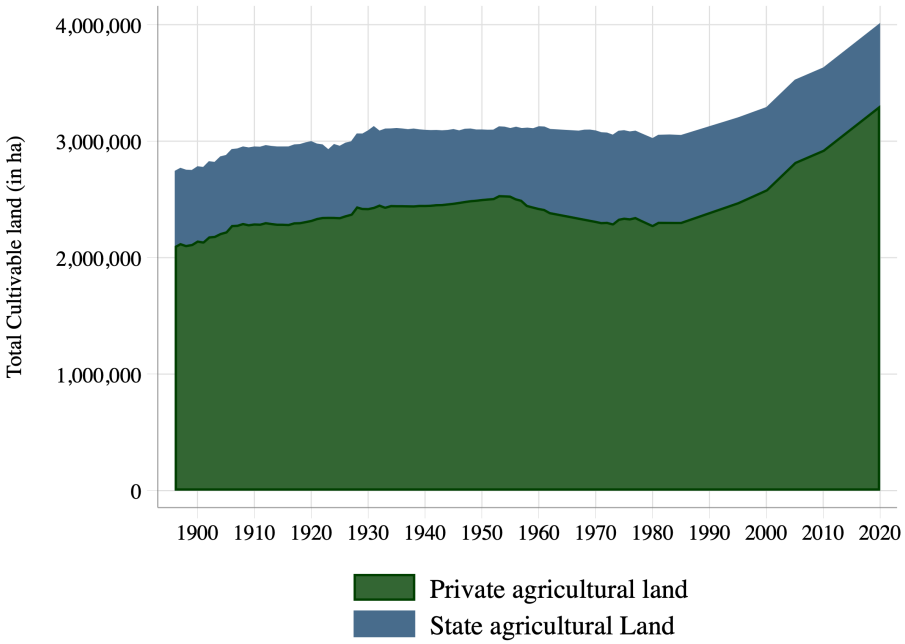


Figure A.1: The breakdown of total cultivable land into private and public lands (1896-2020).

Note: This figure illustrates the evolution of total cultivable land area (in hectares) in Egypt from 1896 to 2020, categorized into private and public ownership. **Source:** Statistical Yearbooks and Reports on Agricultural Land Ownership.

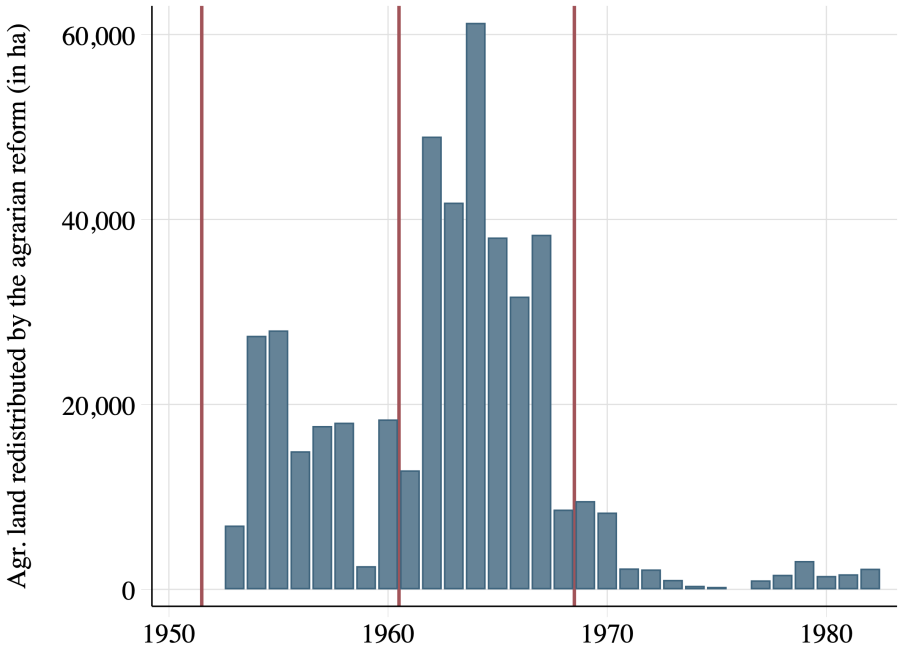
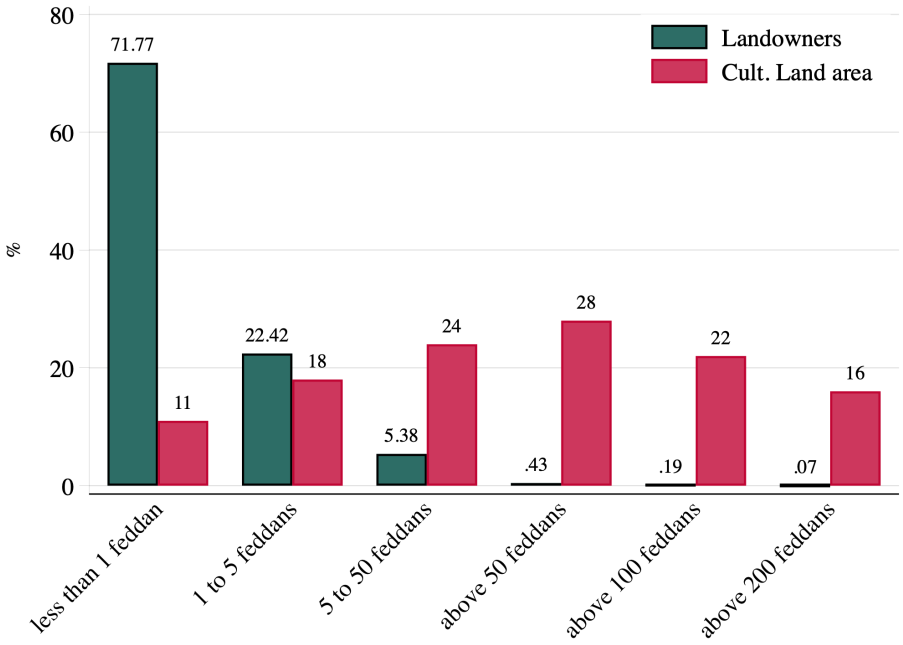
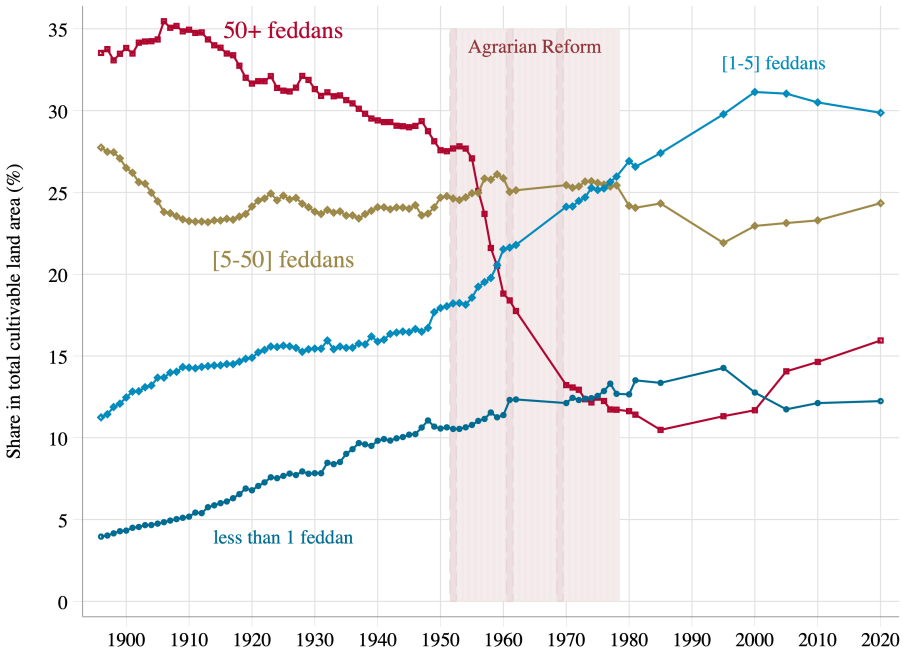


Figure A.2: Agricultural land area redistributed to beneficiaries of the agrarian reform (1952-1982).

Note: This figure depicts the amount of agricultural land area (in hectares) redistributed to beneficiaries during the agrarian reform period (1952-1982). The redistribution followed the implementation of land ceiling laws, which reduced maximum land ownership allowed. **Source:** Statistical Yearbooks and Reports on Agricultural Land Ownership.



(a) The share of land area and landowners by land brackets in 1950.



(b) Evolution of the main land groups: Less than 1 feddan, 1 to 5, 5 to 50, and above 50 feddans (1896-2020).

Note: These figures provide insights into the distribution of land area and landowners by brackets in 1950 (Figure A.3a) and the long-term evolution of the main land groups in Egypt from 1896 to 2020 (Figure A.3b). **Source:** Data derived from land ownership tabulations in Statistical Yearbooks and Reports on Agricultural Land Ownership.

B Landless Population

B.1 Temporary population

In the absence of direct census data, assumptions were made to extrapolate the share of temporary agricultural workers backward before 1960. It was assumed that their share remained relatively constant over time, except for 1950, where historical evidence suggests an increase in temporary workers. This increase appears to coincide with a decline in both permanent workers and family permanent workers during that period. These adjustments reflect historical labor trends and aim to provide a more accurate representation of the agricultural workforce composition in the mid-20th century, despite data limitations.

B.2 Adjusting Agricultural Workforce Data for Child Labor Bias

To account for the overestimation of agricultural workers due to the inclusion of individuals under the age of 15 years in historical agricultural censuses, adjustments were applied to the workforce data. The 1939 Agricultural Census indicated that a significant proportion of permanent and temporary workers were under 15, leading to reductions of 45-47% for these groups in pre-1950 data. For post-1950 estimates, the 1980 Agricultural Census showed a decline in child labor prevalence, and corrections were applied accordingly. For example, permanent workers were adjusted downward by 10%, while temporary workers saw reductions of up to 30% in later years to reflect evolving labor practices.

Where direct census data was unavailable, assumptions were made based on historical trends and labor patterns. For example, adjustments in 1960 reflected intermediate declines in child labor, with permanent household workers reduced by 38% and temporary workers by 20%. These adjustments ensured that the workforce data excluded non-working-age individuals, providing a more accurate representation of the agricultural population over time.

B.3 Land Inequality Including Family Workers as Landless Population

Including family agricultural workers in the land ownership distribution (Scenario 3) further expands the perspective on inequality. In this scenario, family agricultural workers—who typically occupy the lower segments of the rural population—significantly shift the distribution of land ownership shares, particularly for the bottom 50%. Initially, this group's inclusion reduces

the bottom 50% share to nearly 0%-1% in the early decades, as family workers make up a large share of the rural population but lack access to land.

Between 1940 and 1950, the share of the bottom 50% rises as the proportion of family workers in the rural population declines. However, after the 1952 agrarian reform, the increasing presence of family workers in rural areas causes their share to fall again. Improvements in the bottom 50% land share become evident only after 2000, reflecting a gradual decline in the proportion of family workers within the rural population.

For the next 40% and higher groups (next 9%, top 10%, and above), Scenario 3 reveals slower growth compared to Scenario 2 due to the redistribution effects of family workers. The next 40% sees marginal increases in land share as small landowners with family ties are absorbed into this group. For the top groups (10%, 1%, 0.5%, and 0.1%), Scenario 3 suggests slower reductions in inequality compared to Scenario 2, as family workers' ties to land inheritance dilute the redistributive impacts of the reform.

Overall, Scenario 3 provides additional insights into how the inclusion of family workers modifies inequality trends, but its broader implications are discussed in the main analysis.

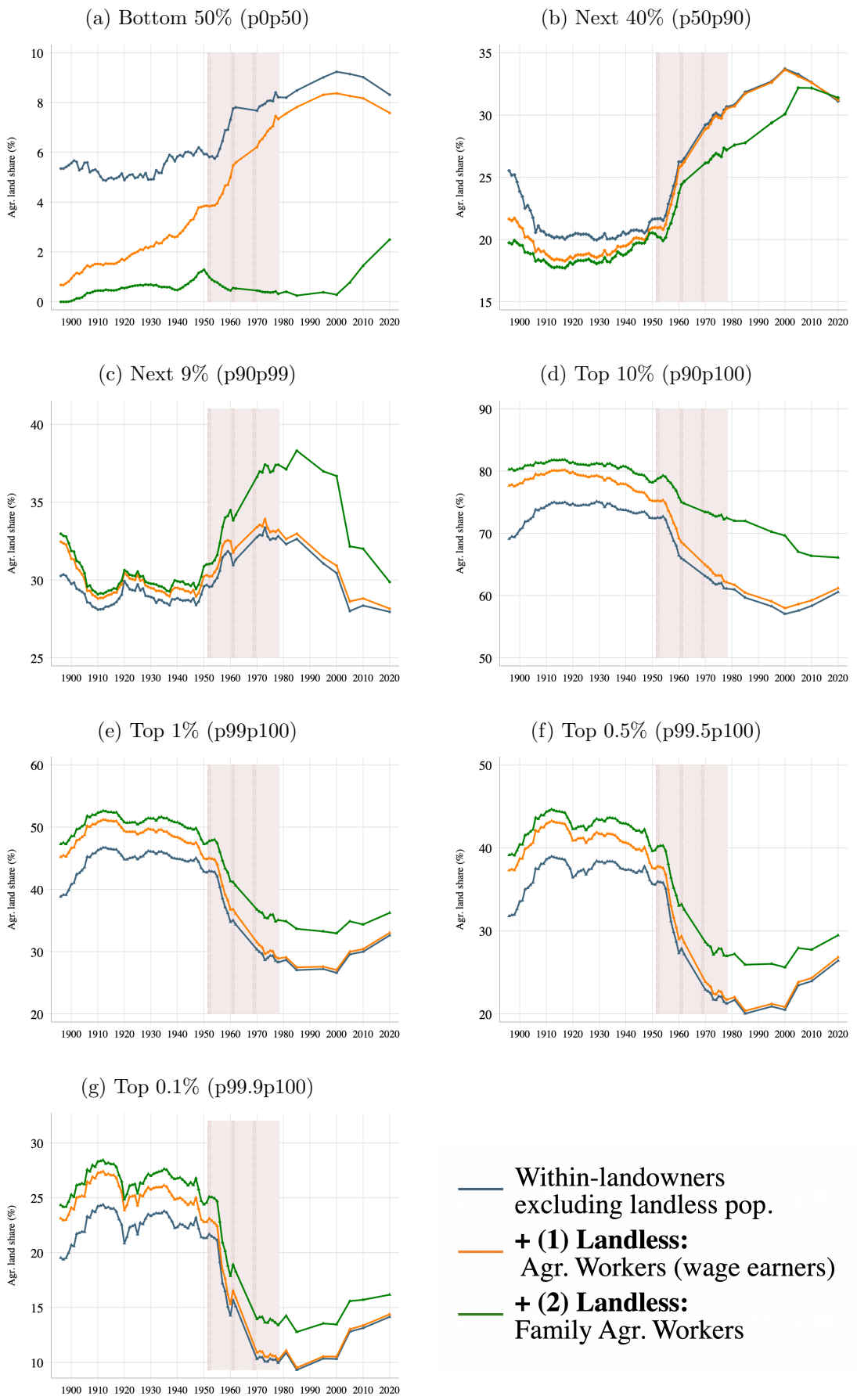


Figure B.4: Land-area inequality excluding and including the landless population.

Note: This figure illustrates land-area shares in Egypt (1896-2020), comparing distributions with and without the landless population (aged 15+). Blue bars represent landowners only, orange includes wage-earning landless workers, and green adds family agricultural workers. Temporary workers are excluded. **Source:** Own estimations.