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Long-term trends in income inequality: Winners and losers of economic change in Ghana, 1891–1960

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ABSTRACT

This paper contributes to a growing literature on long-term trends and drivers of pre-industrial inequality by providing new stylized facts on the evolution of income inequality in Ghana from 1891 to 1960. Using newly constructed social tables, we estimate the Gini coefficient for seven consecutive decades at a time in which the adoption and expansion of cocoa cultivation transformed the Ghanaian economy. Income inequality was already high in 1891, prior to the spread of cocoa cultivation, and it remained stable for four decades. Following a small decline in the early 1930s, inequality increased, reaching its highest level at the end of the colonial era. The expansion of cocoa cultivation and increasing cocoa incomes contributed to persistent high inequality levels until the 1930s. By contrast, the increase in inequality from 1930 to 1960 was largely due to the rising incomes of government employees, skilled workers, and commercial workers.

1. Introduction

The adoption of the United Nations' 2030 sustainable development goals has drawn considerable attention to income inequality in Africa – a continent that is highly unequal, but also heterogeneous, with varying levels of income inequality across countries (Odusola et al., 2017). Yet, partly due to the scarcity of data, our understanding of long-term trends in inequality and how it differed across time and space is rather limited. This paper contributes to understanding the origins and drivers of income inequality in Ghana between 1891 and 1960, using social tables.

Colonial Ghana exemplified the “cash crop revolution” of late-nineteenth- and early-twentieth-century tropical Africa (Austin, 2014: 1035). Exports of cocoa expanded rapidly, mainly through African initiative, and cocoa production has dominated the economy ever since. A generally accepted view in the literature is that in such ‘peasant’ economies, where factors of production remained in the hands of Africans, inequality was lower than in settler and concessionaire economies, where many of the factors of production were expropriated by settlers (Bowden et al., 2008). There is, however, a much wider literature that discusses how both wealth and income inequality between colonized peoples developed in response to both pre-colonial and colonial factors.

For pre-colonial Ghana, one strand of the literature suggests that the society was egalitarian and that economic changes associated with the introduction and subsequent expansion of cocoa production (and to some extent mining in the south) during the colonial period resulted in growing differentiation among Ghanaians in general and among cocoa farmers in particular. This caused social and regional inequality to grow over time (Rhodie, 1968: 105; Kay and Hymer, 1972: 5–8; Howard, 1978: 193–206; Beckman, 1976: 156; Gunnarsson, 1978: 48, 109–10; Plange, 1979; Konings, 1986: 75–78; Van Hear, 1982: 98–109; Brukum, 1998).

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In contrast, Hill (1963a) and Austin (2005, 2013) argue that there were marked inequalities even prior to the advent of cocoa cultivation, both between different groups in society and between regions. It was those who accumulated dependent labor and capital during the pre-cocoa era, and those who earned profits from trade in palm produce and rubber, who had capital to invest and therefore took the lead in cocoa cultivation (Hill, 1963a: 203 and 1963b: 163–67, 210; Arhin, 1970: 369, 371–72 and 1972: 41–43 and 1979: 14–15; 1980; Dumett, 1971: 95–6; Austin, 1996: 27). Additionally, Austin (2013: 8–9) argues that there is very little evidence of increasing polarization within the cocoa sector, and therefore of increasing inequality due to the sector's growth, at least until the third planting boom in the early years of the twenty-first century. Finally, the country's longstanding north/south divide in terms of economic development preceded the adoption of cocoa cultivation, contrary to what earlier authors had assumed (Austin, 2005: 11, 59).

We contribute to the literature on inequality in Africa in general, and Ghana in particular, in three ways. First, we provide the first attempt to quantify the evolution of inequality for the whole economy in colonial Ghana. Second, we explore the drivers of inequality trends, and establish how the importance of individual factors change over time. Third, by combining these two contributions, we add a new perspective to the debate on the role of cocoa in influencing inequality trends in Ghana. We use social tables to chart changes in occupational structure and incomes, estimate income shares, and calculate Gini coefficients for the whole Ghanaian economy between 1891 and 1960. Social tables are an especially useful method for determining the income distribution in societies for which information on individual wages and occupations are scarce (Milanovic, 2016). In the absence of economy-wide surveys and fiscal data for much of the period we consider, social tables present the best source of information about income distribution.

We find that income inequality as measured by the Gini coefficient was 0.40 in 1891 prior to the spread of cocoa cultivation. Inequality remained fairly stable until it declined marginally during the global Great Depression in the early 1930s. During the second half of the colonial period, income inequality increased, reaching its highest level of 0.52 in 1960. The share of total income of the top ten percent income earners increased at the expense of the bottom 40 percent, who saw their income share nearly halved.

Previous studies based on cross-country analysis have identified ethnic fractionalization, uneven factor endowments, institutional and policy differences, and globalization as causes of income inequality in sub-Saharan Africa (Milanovic, 2003; Andersson and McKay, 2004; Odusola et al., 2017). However, these factors do not satisfactorily explain within-country income differences and causal mechanisms are unclear (Van de Walle, 2009). From the inequality literature, we explore three other factors that might have influenced the inequality trends we observe. First, following (Kuznets, 1955) argument that structural change in the economy explains changes in inequality, we analyze how shifts in Ghana's occupational structure affected income inequality. Second, we consider the effect of top incomes earned by European government officials on overall inequality. Third, we explore the role of the expanding cocoa sector on income inequality given the differing views in the existing literature about how the cash-crop boom affected inequality trends. In the final section, we compare income and occupational developments between northern and southern Ghana to understand how the regional divide developed after the introduction of cocoa in the south.

Even though the economy experienced sectoral changes, moving away from agriculture toward formal wage employment, the overall size of such employment shifts alone remained too small to affect inequality levels. However, the rapidly increasing incomes earned by government employees and skilled and commercial workers did lead to increasing income inequality after the 1930s. Second, we find no effect of rising top incomes on the level of inequality. Despite large income differences between the top and the rest, the share of total incomes earned at the top remained too small to affect the overall Gini. Third, our results suggest that the cocoa sector directly affected both the level and trend of income inequality, especially before the 1930s, by providing an increasing number of farmers access to rising cocoa incomes. As a result, inequality for the whole economy was higher during the first decades of the twentieth century but increased less compared to income inequality for everyone engaged outside the cocoa sector. After the 1930s, the effect of the cocoa sector on inequality declined. In the final decade of the colonial era, inequality was mostly driven by rising incomes for government employees. The role of the cocoa sector in determining inequality trends was not due to increasing polarization as, for example, Rhodie (1968: 105), Kay and Hymer (1972: 5–8), and Gunnarsson (1978: 48) argue. Rather, the sector's contribution resulted from a combination of expanding production (especially before the 1930s) and rising cocoa prices, which led to increasing cocoa incomes in the decades that followed. The expanding export sector enabled an increasing number of farmers to earn higher incomes, moving out of the less profitable food farming sector. Therefore, the increase in inequality went hand in hand with economic expansion.

Regarding the north/south divide, we find that there has always been a marked difference in income and occupational structure between the two regions. This supports the argument by Austin (2005: 11, 59) that the historical roots of the divide preceded the adoption of cocoa. However, in line with Van Hear (1982: 98–109), we find that these differences grew after the introduction and rapid expansion of cocoa farming. Subsistence levels were consistently lower in the north and rose less, the share of people living at subsistence was much larger and declined less, and occupational differentiation was limited as the north had a much smaller formal economy and hosted fewer government officials. The ecology of the north did not allow for cocoa farming and the trickle-down effects of rising welfare levels due to rising cocoa incomes in the south were restricted mostly to the limited remittances that agricultural laborers working on cocoa farms sent home.

Our findings are consistent with Atkinson (2015), who uses income tax data to study the distribution of income in former British West Africa. For Ghana, his analysis spans the late colonial period from 1943, when income taxation was introduced, to 1959, and covers a small minority of the population.¹ Atkinson (2015), however, finds that at independence in 1957, incomes were more unequally distributed in Ghana than in other British colonies, challenging earlier assumptions that colonial Ghana was relatively

¹ For example, in 1958 only 10,000 individuals paid personal income tax (Aboagye and Hillbom, 2020).

equal (see for example Killick, 2010: 88–91). The use of social tables enables us to extend our knowledge of measurable inequality levels as far back as the late nineteenth century. This method also allows us to cover a wider population and to interrogate some commonly held views on the evolution of income inequality in colonial Ghana. Overall, the paper points to the need to bridge the chronological divide in historical epochs and to move beyond the export sector to understand trends and drivers of inequality in former colonies.

2. Methods, social classes, and data

To analyze how income inequality has evolved in Ghana over the long run, and to examine the drivers of trends, we constructed seven social tables, one for every census year between 1891 and 1960. A social table entails dividing the population of a society or country into various more or less homogenous groups according to occupation and/or income – so-called social classes. For each social class, the number of individuals or households must be determined, together with the average income for that group. Population and income shares can be calculated to establish the distribution of income across the population, summarized, for example, by the Gini coefficient.

The social tables method has been applied to improve our understanding of the roots of inequality in societies across the globe (Bigsten, 1986; Alvarez-Nogal and Prados de la Escosura, 2007; Lopez Jerez, 2014; Alfani and Ryckbosch, 2016; Bolt and Hillbom, 2016; Alfani and Tadei, 2019). However, two limitations need to be kept in mind. First, as social tables use average incomes per social class, the method ignores within-class inequality. Therefore, overall inequality might be underestimated. Second, social tables do not take into account overlapping incomes between the social classes, which may cause both over- and under-estimations of inequality (Milanovic et al., 2011; Bolt and Hillbom, 2016). In an effort to address within-group inequality, we design income bands and calculate within-class inequality to assess the magnitude of any underestimation.²

The basis for all social tables is information on population, occupations, and incomes. Unfortunately, colonial population censuses in Africa are generally perceived to be of relatively poor quality. African colonial bureaucracies were severely constrained financially, and counting people, especially in the often sparsely populated rural areas, was problematic (Gendreau, 1993; Tabutin et al., 2004; Manning, 2010; Frankema and Jerven, 2014). For Ghana, for example, Austin (2005) reports that the 1911 census might have excluded up to 700,000 people in a population of about 1.5 million people. Fortunately, Frankema and Jerven (2014) provide modified population counts for Ghana for all available colonial census years, based on available colonial census estimates, additional secondary literature, and census reviews. Table 1 provides a comparison of the original population counts as given by the censuses with the modified estimates from Frankema and Jerven (2014). The undercount was substantial for the years prior to 1931. In 1911 and 1921 the census missed roughly a quarter of the population, and around 15 percent in 1901; in 1891, more than half of the population went uncounted.

Table 1
Population estimates for Ghana, 1891–1960.

Year	Census	Frankema and Jerven (2014)	Difference (census undercount)
1960	6727,608	6727,608	–
1948	4494,890	4610,000	115,110
1931	3161,335	3227,000	65,665
1921	2297,395	2528,000	230,605
1911	1504,005	2000,000	495,995
1901	1549,000	1800,000	251,000
1891	764,000	1650,000	886,000

Sources: Official censuses, 1891–1960; Frankema and Jerven (2014: 921, Table 8).

Even though we do not use the official censuses for our population estimates, the census reports are very useful for our construction of social tables as they contain information on the distribution of the population across industries and regions. We therefore use the original shares of regional population sizes from the censuses to redistribute the updated population estimates over the various regions, and we use the sectoral distribution of economic activity from the censuses to place people into different social classes. Although the problem of undercounting may affect the sectoral distribution of the population, wage earners were generally well accounted for in the censuses. In addition, we use secondary sources for our occupational distributions (see for example Kay and Hymer, 1972: 316–17).

The early censuses only contain information on the number of people engaged in wage labor per industry; later censuses also include information on semi-commercial and commercial farming, petty trading, and fishery. The difference between the total population and those recorded in the census as engaged in economic activity (including cash crop production, fishing, and petty trade) are assumed to be engaged in informal farming and subsistence activities. This means that, for example, non-working adults such as the unemployed are placed in the subsistence group. Using the updated (and higher) total population estimates described above, in combination with the census records on economic activity, leads to an increase in the number of subsistence farmers and semi-commercial food farmers compared to the original census population figures. This might affect our measurements of overall inequality

² This remains under the strict assumption that incomes do not overlap, so that everyone in the lower group earns less than everyone in the higher group.

and the level of poverty, especially when subsistence levels are relatively low compared to incomes earned in the formal economy. We use the labor force as the basis for our estimates, in line with previous studies (see for example Bolt and Hillbom, 2016; Alfani and Tadei, 2019).³ Finally, we capture people where they live at the time the census was taken. This means, for example, that migrants from the Northern Territories who have moved south to find employment are recorded in the southern regions even though they might later return home with their incomes.⁴

3. Social classes and data

3.1. The formal economy: wage-earners

Wage earners are the easiest group to identify, as they are consistently recorded in official government publications. Around nine percent of the population in 1891⁵ was engaged in wage-earning employment, which increased to about 16 percent in 1931, and 33 percent in 1960. We distinguish between African and European government employees, skilled workers, mining employees, commercial workers, domestic workers, and agricultural and unskilled laborers. The largest wage-earning occupational classes during our period are unskilled workers and agricultural laborers. Jointly, they make up two-thirds of the wage-earning share of the population. It is only in 1960 that skilled workers begin to account for a substantial group of wage earners, making up nearly ten percent of the population. All other wage-earning occupational groups remain small and never constitute more than two percent of the population during the colonial period.

Most income estimates for formal employment were obtained from colonial blue books, colonial censuses, and various government reports. We assume that especially the unskilled laborers working in cities, on farms, as domestic servants, or in mines, did not work for wages for the entirety of the year, and that they also engaged in subsistence farming. Information on mining contracts indicate that mine laborers work for wages nine months per year on average, and spend the remainder on their farms growing their own foods (Crisp, 2017). We therefore assume nine months of wage incomes for all unskilled laborers, and add the monetary value of subsistence income to estimate their total annual income.

3.2. The formal economy: cocoa farmers

The second cluster in the formal economy that we identify are commercial cash crop farmers engaged in the expanding cocoa sector (Hill, 1963a, 1963b). We place cocoa farmers within the formal economy because incomes were earned from sales on the formal agricultural market. Censuses from 1931 onwards record the number of cocoa farmers, indicating that employment in the sector increased from close to 220,000 people, or 11 percent of the population, to more than 312,000 (8.5 percent of the population) in 1960. Before 1931, we rely on secondary sources to estimate the number of cocoa farmers (see Appendix I).

There is ample historical evidence that the distribution of production capacity between different groups of farmers was unequal (Hill, 1956: 84–91; Konings, 1986: 76; Austin, 2013: 5–6). Especially prior to 1930, there are scant comprehensive statistics on the exact farm size distribution.⁶ In his detailed discussion of inequality within the cocoa sector, Austin (2013) finds no robust evidence that indicates major trends toward a more unequal distribution of production.⁷ We therefore opt for determining the distribution of total output among different groups of farmers based on the first national comprehensive study of inequality among cocoa farmers, which was done for the crop year 1963/64 (Beckman, 1970). We follow Hill (1956: 1, 84) and focus on farm size in terms of output rather than land size. Based on the survey, we distinguish between four broad groups of cocoa farmers, as indicated in Table 2. We keep the share of the farmer groups and their output share constant over time. As a robustness check we re-construct our social tables using the distribution of output among cocoa farmers for the years of the different regional surveys done between 1925 and 1963/64 (see Appendix III). However, this hardly affects the main results.

Table 2

Farm sizes and levels of output in the cocoa sector, 1963/64.

Farmer groups	Category	% farmers	% output
Small-scale cocoa farmers	less than 20 loads	38	7
Medium-scale cocoa farmers	20–100 loads	47	39
Large-scale cocoa farmers	100–200 loads	10	23
Elite cocoa farmers	more than 200 loads	5	31

Source: Authors' summary of Beckman (1970), reproduced in Konings (1986: 76).

³ The labor force is defined as the share of the population over 15 years of age. As we lack information on the number of elderly and unemployed they are included in our labour force, but given that most adults were economically active in one way or form, the share of non-working adults was most likely very small and the effect on our inequality estimates therefore limited.

⁴ Detailed surveys of remittances indicate that the amount of income sent or taken home by migrant laborers is very limited, amounting to a pound per year per migrant, on average (Raeburn, 1950:29, Table 6).

⁵ See Appendix III for an overview.

⁶ See Appendix III for the main arguments.

⁷ Cost of Cocoa Production, 1930–37, C808/2/75, p.2., Accra, Ghana National Archives.

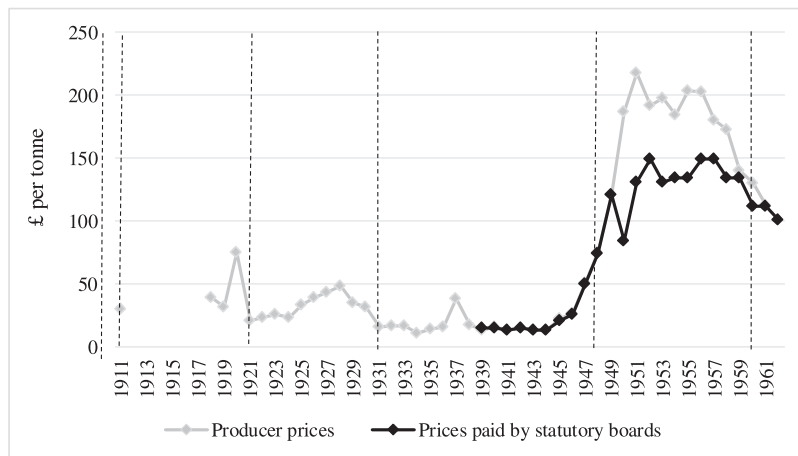


Fig. 1. Cocoa prices, 1911–1961, and social table years, £ per ton

Note: Producer prices are prices obtainable at the open market. Statutory board prices are fixed by the Cocoa Marketing Board.

Sources: Producer prices, [Frimpong-Ansah \(1991: 57/89\)](#); marketing board prices, [Killick \(1966: 370, Table 15.3\)](#).

To estimate cocoa incomes, we start from total recorded cocoa exports, as a proxy for total production. We then redistribute the total recorded cocoa exports over the different groups of farmers based on their share of total output, as indicated in [Table 2](#), for each social table year. Finally, by multiplying production of cocoa for each class of cocoa farmers with the prevailing producer prices for cocoa for that year, we arrive at the average incomes derived from cocoa per class of cocoa farmers. We repeat this procedure for each social table year.

The procedure outlined above generates gross incomes for cocoa farmers. There were of course costs involved in the production of cocoa, including interest on capital, rent for non-native farmers, and other costs for farm implements such as cutlasses, hoes, pruning knives, pickers, and drying racks. The most important factor, however, was labor. [Cardinal \(1931: 86\)](#), based on a farm in Ashanti, estimates that the monetary cost for establishing a plantation in 1931 was approximately £9 per acre. However, for small- and medium-scale farmers, most of this cost represented their own working time and not capital outlays.⁸ Once a plantation was established, labor costs represented nearly the entire cost of production during the colonial era ([Austin, 2005: 87](#); [Beckett, 1944: 47](#)). Indeed, cocoa surveys carried out during the mid-1950s in Ashanti and Oda-Swedru-Asamankese indicate that costs beyond payment to labor constitute less than one percent of revenues obtained from cocoa sales (Office of the Government Statistician, 1958:62, Table 22); 1960:54, Table 21). Deducting these costs does not alter our income or inequality estimations. Labor costs are included in the social tables under incomes for agricultural laborers.⁹

Producer prices were substantially affected by the establishment of statutory boards which controlled cocoa purchasing from farmers from 1939 onward ([Alence, 2001](#)). From 1949 on, the prices paid by the Cocoa Marketing Board were substantially lower than market prices (see [Fig. 1](#)). Therefore, we use the price paid by the statutory board to calculate cocoa incomes for 1960.

3.3. The informal economy: fishermen and petty traders

The final cluster of social classes are groups engaged in the informal sector, working as petty traders, fishermen, semi-commercial food farmers, and in subsistence agriculture. Most of these groups are not (reliably) accounted for in the censuses prior to 1948, and therefore we complement the official sources with secondary sources and in-depth studies of certain sectors (see for example [Szczeszewski, 1965: 18–20](#); [Kay and Hymer, 1972: 316–17](#)). The groups that are recorded in the official censuses for most of the period are fishermen and petty traders. Fishermen constituted an important class, especially in the earlier years of the colonial period and in the coastal regions, but their number was limited throughout the period under study. According to the census, there were 16,500 fishermen in 1891, representing about 2.5 percent of the population. The number of fishermen increased over the years to around 56,600 in 1960, or 1.5 percent of the population.

Incomes for fishermen were not consistently reported. Fortunately, the census for 1911 gives an income estimate for that year based on the average amount of fish caught, and the prevailing market price for the most common fish (Gold Coast Colony, n.d.). For 1941, Lawson provides an income estimate based on the same information ([Lawson, 1968: 93](#)). As both estimates indicate the yearly income at around £40, we extrapolate these estimates to obtain incomes for fishermen throughout the colonial period.

Petty traders, including hawkers and peddlers, were mostly engaged in local small-scale trading of food, traditional straw and leather artifacts, and other consumer goods. All censuses provide at least a rough estimate of their numbers. Our calculations indicate

⁸ See Appendix III for details.

⁹ See Appendix I for details.

that the share of petty traders in the total population fluctuates between 1.6 and 8.7 percent, but the absolute number of petty traders increases drastically, especially after 1948. Between 1891 and 1948 the group nearly doubled in size, from 35,000 to nearly 70,000. Between 1948 and 1960 the number increased five times, reaching 324,000 petty traders.

To estimate incomes for petty traders, we combine a few direct observations on their average incomes from the colonial official statistics with calculations based on information from household surveys. For 1911, we have direct estimates from the 1911 census report for petty traders' weekly incomes (Gold Coast Colony, n.d.:37). For 1931, we obtain income estimates from Cardinall by using his estimates of trading profits from imports, exports, and inland trading, and divide this by the total number of petty traders (Cardinall, 1931: 120). For 1960, we rely on average incomes from several household surveys (Neustadt and Omaboe, 1959: 67–70; Office of the Government Statistician, 1960). We extrapolate these estimates to obtain incomes for petty traders for the other years.

3.4. *The informal economy: semi-commercial farmers and those living at subsistence level*

During the period under study, a large majority of the population lived in rural areas and were engaged in agriculture. A substantial share of those farmers were able to produce above subsistence level and sell the extra produce on local markets to supplement their incomes. We classify this group as semi-commercial food farmers. We obtain the size of this group from the censuses in 1891, 1948, and 1960. For the years in between, we use estimates provided by Kay and Hymer (1972: 316).

To calculate the incomes of food farmers we collected data on food crops cultivated per region, average farm acreage, yields, production, and prevailing market prices (Cardinall, 1931; Lynn, 1937; Birmingham et al., 1966; Nyanteng, 1978).¹⁰ Due to the different vegetation types in the country, farming practices varied across regions as farmers cultivated different crops. An average semi-commercial food farmer had about two-and-one-third farms of slightly less than three acres each (Birmingham et al., 1966). From average gross production per farm, we deduct waste and losses and the seed ratio for each crop. We multiply the resultant 'net' production by the prevailing average market price for each crop, the sum of which represents food farmers' income per farm. This sum is multiplied by the average number of farms held by a farmer in each region to obtain farmers' total income. As farms typically engaged the whole family, we divide total farmers' income by two to arrive at the income per adult worker.

The last group in our social table is also the largest: the subsistence group. This class comprised subsistence farmers, the unemployed, those who had not started work in a definite occupation, old men and women who had retired, those who were incapacitated, and those whose occupations were unclassified. A large majority of the subsistence group lived in rural areas outside the realm of the colonial government, and where they tried to make a living from their small farms. We obtain estimates about the size of this group by deducting all those accounted for in other activities from the total population or the labor force. Throughout the period of our study, the subsistence group constitutes between 37 and 60 percent of the population.

Finally, to estimate the earnings of the subsistence class, we collect all available direct estimates of subsistence incomes from secondary sources and colonial records.¹¹ We compare these to both the level of subsistence income derived from the bare bones consumption basket taken from the real wage literature (Allen, 2001, 2015; Frankema and van Waijenburg, 2012) and to the monetary value of food production at cocoa farms for various years (Office of Government Statistician, 1958, 1960). The direct estimates of the level of subsistence incomes and the value of food produced on cocoa farms give roughly similar results, which are substantially higher than estimates from the consumption basket approach. Given that the ecology generally allowed for decent agricultural production and large-scale famines were scarce, we opt for direct estimates of subsistence income when available (1891–1911, 1931), and for the barebones subsistence basket when direct estimates are not available (1921, 1948, and 1960).¹²

4. Social tables: winners and losers of economic change

As discussed earlier, the broader literature on inequality has looked at occupational structures and wages, and their effects on inequality trends. Meanwhile, the debates on inequality and differentiation in Ghana have focused on changes in the rural economy in general and the cocoa expansion in particular. We address both strands of the literature in our analysis. We begin by analyzing the evolution of incomes among the different social classes in Ghana, starting with the top earners, followed by other income earners in the formal economy. We end with workers in the informal sector. Charting income developments enables us to analyze their effects on inequality trends over time. The discussion in this section is largely based on Table 3, which summarizes our population shares and annual incomes per class.

4.1. *The formal economy: government elites*

The highest income earners were, unsurprisingly, the very small group of European government employees. This group increased from 361 in 1901 to about 800 in 1960, but never made up more than half a percent of the population. They earned on average £200 per annum in 1891, which is 12 times the average African income of £16 in that year. The annual incomes of European government employees continued to increase and in 1960 they averaged more than £1900, or 25 times that of Africans. Meanwhile, the total

¹⁰ See Appendix I for details.

¹¹ For an overview of subsistence levels, see Appendix I.

¹² For details, see Appendix I, Table A5. Food incomes from cocoa farms are only available for the mid-1950s and 1960. As we have no social table for the 1950s, and the bare bones basket gives a similar income estimate for 1960 as the monetary value of the food produced, we opt for the bare bones basket in order to be consistent with 1948.

Table 3
Social tables, 1891–1960.

		1891			1901			1911			1921			Annual income (£)
		Population	Pop.share	Annual income (£)	Population	Pop.share	Annual income (£)	Population	Pop.share	Annual income (£)	Population	Pop.share		
Wage workers	European government officials	308	0.0%	200	361	0.1%	250	619	0.1%	371	995	0.1%	562	
	Government (admin, executive)	792	0.1%	80	927	0.1%	85	1085	0.1%	85	1526	0.1%	110	
	Government (other)	1500	0.2%	32	1400	0.2%	39	11,550	1.1%	39	16,240	0.6%	57	
	Skilled laborers	3091	0.5%	32	3710	0.6%	32	3832	0.3%	43	10,851	0.4%	68	
	Commercial workers	4795	0.7%	32	10,794	1.6%	32	11,700	1.1%	25	9661	0.4%	68	
	Domestic services	2795	0.4%	28	7665	1.2%	28	2539	0.2%	31	3569	0.1%	56	
	Mine workers	2499	0.4%	23	17,000	2.6%	23	18,300	1.7%	25	11,300	0.4%	27	
	Unskilled laborers	25,023	3.8%	19	29,306	4.4%	17	34,603	3.1%	24	48,518	1.9%	33	
	Agricultural laborers	17,203	2.6%	11	20,148	3.0%	11	134,264	12.2%	14	206,177	8.2%	20	
	Elite cocoa farmers	3267	0.5%	249	4478	0.7%	168	6713	0.6%	182	10,309	0.4%	190	
Cocoa farmers	Large-scale cocoa farmers	6533	1.0%	51	8955	1.4%	78	13,426	1.2%	108	20,618	0.8%	138	
	Medium-scale cocoa farmers	30,706	4.6%	31	42,090	6.4%	41	63,104	5.7%	55	96,903	3.8%	72	
	Small-scale cocoa farmers	24,827	3.7%	31	34,031	5.1%	41	51,020	4.6%	50	78,347	3.1%	63	
Informal sector	Fishermen	16,593	2.5%	36	5930	0.9%	37	6221	0.6%	38	9502	0.4%	38	
	Food farmers	88,202	13.3%	31	89,054	13.5%	41	176,551	16.1%	48	306,686	24.6%	61	
	Petty traders	35,313	5.3%	13	27,101	4.1%	16	29,375	2.7%	23	41,505	1.6%	29	
	Subsistence group	400,740	60.3%	7	359,159	54.2%	7	534,693	48.6%	10	660,106	53.0%	10	
	Total labor force	664,188			662,109			1099,595			1532,813			
Social tables, 1891–1960 (continued)														
		1931			1948			1960						Annual income (£)
		Population	Pop. share	Annual income (£)	Population	Pop. share	Annual income (£)	Population	Pop. share	Annual income (£)	Population	Pop. share		
Wage workers	European government officials	949	0.0%	788	493	0.0%	849	788	0.0%	1908				
	Government (admin, executive)	6120	0.3%	131	11,741	0.4%	276	44,550	1.2%	408				
	Government (other)	8775	0.5%	62	20,873	0.8%	174	63,460	1.7%	317				
	Skilled laborers	38,295	2.0%	51	56,629	2.2%	104	366,290	9.8%	185				
	Commercial workers	13,296	0.7%	66	30,633	1.2%	121	47,600	1.3%	238				
	Domestic services	16,430	0.8%	50	10,410	0.4%	51	39,100	1.0%	69				
	Mine workers	14,107	0.7%	22	30,632	1.2%	71	48,430	1.3%	137				
	Unskilled laborers	67,449	3.5%	26	94,060	3.6%	42	117,360	3.1%	85				
	Agricultural laborers	136,224	7.0%	12	210,898	8.0%	24	484,530	13.0%	44				
	Elite cocoa farmers	10,941	0.6%	148	10,698	0.4%	472	18,534	0.5%	673				
Cocoa farmers	Large-scale cocoa farmers	21,882	1.1%	90	21,397	0.8%	181	38,519	1.0%	250				
	Medium-scale cocoa farmers	102,847	5.3%	38	100,565	3.8%	99	144,018	3.9%	157				
	Small-scale cocoa farmers	83,153	4.3%	27	81,308	3.1%	51	111,529	3.0%	87				
Informal sector	Fishermen	8429	0.4%	39	43,500	1.7%	41	56,610	1.5%	42				
	Food farmers	571,427	29.4%	23	745,137	28.4%	37	446,396	12.0%	67				
	Petty traders	57,120	2.9%	36	68,181	2.6%	55	323,900	8.7%	78				
	Subsistence group	788,918	40.5%	7	1,089,310	41.5%	9	1,378,729	37.0%	14				
	Total labor force	1946,361			2,626,465			3,730,343						

Note: The complete data is available at Open-ICPSR (see [Aboagye and Bolt, 2021](https://doi.org/10.3886/E141401V1); <https://doi.org/10.3886/E141401V1>).

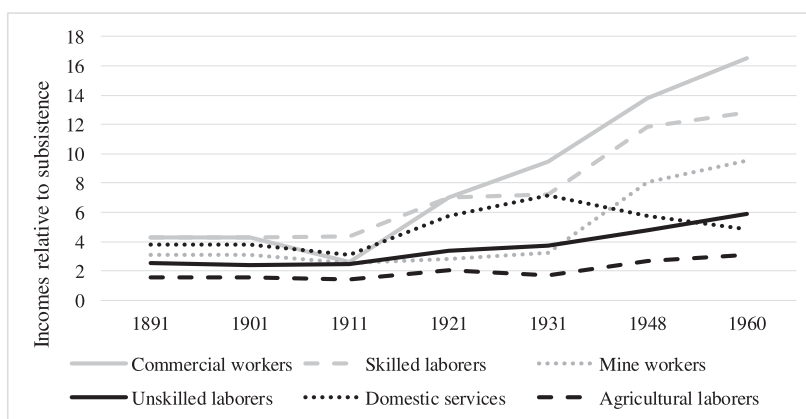


Fig. 2. Evolution of incomes in the private sector relative to subsistence incomes, 1891–1960
Sources: Table 3; Appendix I; Gold Coast Colony (1891–1939); Van Hear (1982: 130, 198); Konings (1986: 97).

number of African government administrators grew from around 800 in 1891 to over 44,500 in 1960. These administrators also earned relatively high incomes throughout the period. In 1891, their annual incomes averaged £80, and increased to more than £400 by 1960. African administrators earned on average more than five times the African average income throughout the period. Together with European government officials, African administrative and executive government officials consistently belonged to the top one percent income earners, a group that received between four and 14 percent of total incomes earned between 1891 and 1960.

4.2. The formal economy: private sector employment and incomes

The private sector expanded substantially between 1891 and 1960. Initially only about nine percent of the population was employed in the private sector, but this increased to 33 percent in 1960. During the first decades of the twentieth century, incomes remained fairly low and stagnant at between two and four times the level of subsistence incomes across different occupations (see Table 3 and Fig. 2). Starting in 1931, however, there was a general improvement in incomes. Wages for skilled workers, commercial workers, and miners rose to much higher absolute levels than those of unskilled workers in both urban and rural settings, but the skill premium – the ratio between wages for skilled and commercial workers and wages for unskilled urban workers – remained roughly constant at 2.5 throughout the period. This indicates a continued substantial dispersion in private sector incomes.¹³

Mining companies in the south of Ghana offered low wages for labor in the initial years of mine development (Crisp, 2017: 16). After the 1930s, there was a 70 percent increase in the price of gold on the world market, which led to a spectacular revival in the mining industry. The income of mine laborers increased substantially, from £22 in 1931 to £137 in 1960 in nominal terms, or from four times the subsistence income in 1931 to ten times the subsistence income in 1960. The strengthening of mining capital coincided with growing class consciousness and a rise in collective action among the labor force which expanded rapidly from 14,000 men in 1930–31 to around 50,000 in 1960.

Among waged workers, the most rapid growth was in those engaged in agriculture, most of whom found employment in the expanding cocoa sector. While initially cocoa farmers' demand for labor was limited, it increased over time. A migrant-labor system emerged around 1908, which channeled workers from the drier and more remote savanna of the north to the main cocoa producing areas (Van Hear, 1982: 41–53; Austin, 2005: 59; 316–20). Agricultural laborers' incomes slowly increased throughout the colonial period, except for 1931, when the global crisis affected the whole economy. Agricultural incomes were only about half the level of unskilled urban laborers' incomes during the initial years of colonial rule, and the gap increased over time due to modest wage increases for the agricultural workers.

4.3. The formal economy: the cocoa farmers

The major economic change during the period under study was the adoption and diffusion of cocoa cultivation (Austin, 2005: 236–37). From the late nineteenth century, cocoa cultivation spread rapidly in the forest zone of southern Ghana in areas where the soil quality was favorable. While Ghana exported no cocoa beans in 1892, nineteen years later it had become the world's largest exporter at 40,000 tons a year (Austin, 2014: 1035). Export volumes continued to increase and in both 1936 and 1960, Ghana exported over 300,000 tons of cocoa (Fig. 3).

¹³ Frankema and Van Waijenburg (2012: 903) find similar skill premiums for Accra, except for the 1920s and 1930s, when they find a skill premium of 3.01 and 3.55, respectively. Comparing their underlying data to ours, we find very similar wage premiums for all years except 1921 (Frankema and Van Waijenburg indicate a premium of 2.7 where we find 2.2) and 1931 (where they find a premium of 3.8 and we of 2.6). Hence, part of the difference is that we look at specific years, while Frankema and Van Waijenburg average over decades.

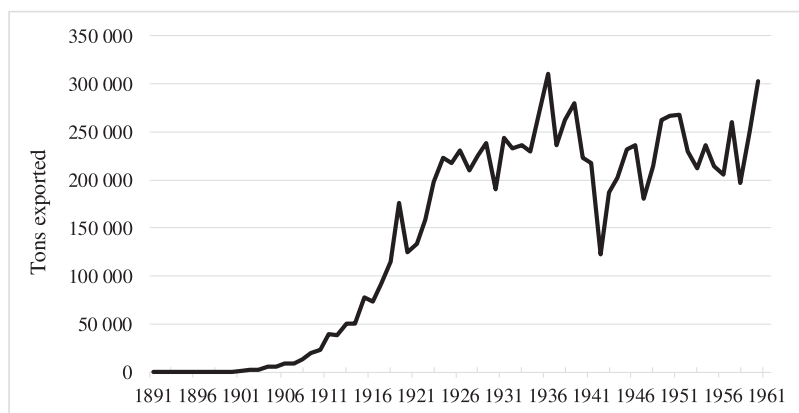


Fig. 3. Total cocoa exports, 1891–1960

Sources: Hill (1963b: 177); Kay and Hymer (1972: 336–37, Table 21b).

This cash crop revolution had a major impact on the colonial economy and society in Ghana. Around 1910, more than 130,000 Africans were growing cocoa on their farms; at that time, there were probably as many farm laborers as farmers (Hill, 1963b: 17). The sector continued to attract more laborers and farmers throughout the colonial period, although growth slowed down during the Great Depression in the early 1930s. In 1960, close to 800,000 people earned their incomes from working in the cocoa sector, which represented about 26 percent of the total population.

Overall, the rapid development of the cocoa sector offered opportunities for many to share in cocoa wealth and raised the standard of material welfare. Incomes, however, were not equally distributed. Fig. 4 shows a significant gap in incomes between the richest cocoa farmers (defined as elite and large-scale farmers) and the rest. After 1930, the gap widened as most of the cocoa income accrued to the elite cocoa farmers who owned vast farms and harvested a few hundred loads per annum (Austin, 2013; Hill, 1956). These rural ‘cocoa elites,’ constituting less than half a percent of the population, were initially mostly pioneering Akwapim farmers, as well as Krobo, Shai, and Ga migrant farmers from the Eastern province (Hill, 1963a: 203). Soon after, the rural elite in Ashanti entered cocoa production as well.

In 1891, incomes for the elite in the then-Gold Coast Colony – derived from the export of palm oil and rubber – were substantial (Wilks, 1975, 1993; Latorre, 1978; Kea, 1982). During the transition away from palm produce and rubber toward cocoa as the main source of income, the African rural elite’s average income fell from £249 in 1891 to £168 in 1901. Yet even this decreased sum was still eight times the average African income for that year.¹⁴

By 1911, when cocoa production had also spread to Ashanti and Ghana had become the world’s largest cocoa producer, most of the country’s cocoa was still grown by the elite farmers who had accumulated capital from the oil-palm trade in the Eastern province (Hill, 1963b: 17). Increasingly however, a new group of large cocoa farmers emerged. Early on, both groups – the old elite farmers and the new large-scale farmers – had sufficient resources to invest in planting cocoa trees. They took advantage of relatively high initial prices of cocoa and earned a large share of the country’s total incomes (Hill, 1963b: 15, 38–53, 164–67; Austin, 1997: xix; Dumett, 1971: 95–96; Arhin, 1970: 369; Austin, 1994, 1996: 27, 2005: 181–94, 215). In 1911, the elite farmers’ average income had risen to £182 per annum while the large-scale farmers earned £108 per annum in nominal terms. Meanwhile, access to land was both easy and cheap during the early decades of cocoa expansion, especially in Ashanti (Austin, 2005: 259–70, 325, and 327). This led to a rapid increase in the number of small- and medium-scale cocoa farmers after 1911 and prevented the concentration of farm ownership (Austin, 1993: 127–30)

Fig. 4 shows why cocoa farming was so attractive; small-scale farmers could earn substantially higher incomes than those in the subsistence group through most of the period. Importantly, the majority of cocoa farmers were well off compared to the majority of the African populace (Table 4). Especially between 1931 and 1948, incomes diverged, while average income also nearly doubled. Our findings are in line with the broad consensus that the expansion of the cocoa sector led to substantial welfare increases for cocoa farmers (Cox-George, 1973: 151–56; Rimmer, 1992: 30; Austin, 2005; Frankema and Van Waijenburg, 2012). After 1948 incomes converged again, mainly due to rapidly rising private and government wages and the lower government-regulated prices paid to cocoa farmers from the 1950s onwards.

There are two exceptions to the general trend of cocoa farmers’ increasing incomes. During the global crisis of the early 1930s, incomes for all cocoa farmers decreased substantially due to very low export prices. For all except the small-scale farmers, this decline was only temporary. Incomes quickly bounced back to a higher level than before the crisis. After 1948, incomes continued to increase but at a more gradual rate, due to slower price increases resulting from the marketing board’s interference. Second, small-scale farmers’ incomes never recovered to pre-crisis levels and actually declined between 1948 and 1960, which explains the widening income gaps between cocoa farmers post-1930.

¹⁴ Calculated as the sum of total income earned by Africans divided by the total African population.

Table 4
Incomes of cocoa farmers relative to the average African income, 1891–1960.

	1891	1901	1911	1921	1931	1948	1960
Elite cocoa farmers	15	8	7	6	7	13	9
Large-scale cocoa farmers	3	4	4	4	4	5	3
Medium-scale cocoa farmers	2	2	2	2	2	3	2
Small-scale cocoa farmers	2	2	2	2	1	1	1

Sources: Table 3; Appendix I.

Note: This is calculated as the sum of total income earned by Africans divided by the total African population.

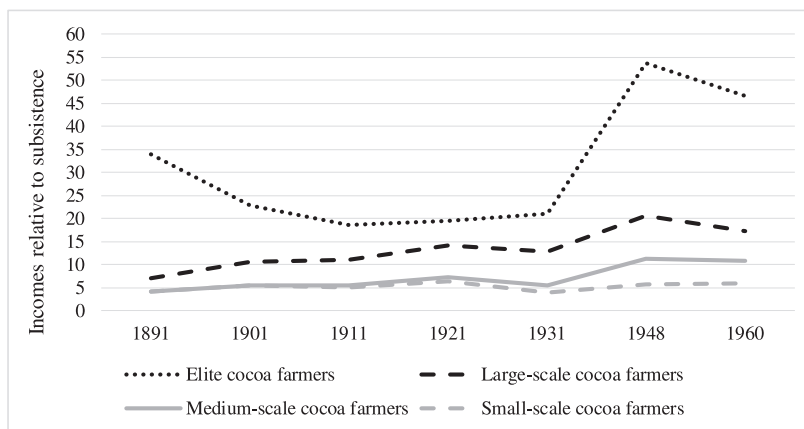


Fig. 4. Evolution of cocoa farmers' incomes relative to subsistence incomes, 1891–1960

Sources: Table 3; Appendix I. Producer prices, Frimpong-Ansah (1991: 57/89); marketing board prices, Killick (1966: 370, Table 15.3).

4.4. The informal sector

Within the informal sector, only petty traders gained substantially, as this groups income rose from less than two times the subsistence level of income to over five times that level. The increase in population and urbanization, in combination with overall increases in incomes, stimulated demand for the goods offered by petty traders (Arhin, 1979; Grier, 1992). This resulted in both substantial increases in petty traders' average incomes, which more than tripled between 1891 and 1960, and a significant increase in the number of petty traders. In 1891, there were roughly 35,000 petty traders recorded, which grew to over 300,000 in 1960 (Table 3). Petty traders' incomes were comparable to those of unskilled urban laborers throughout the period.

In contrast, while both fishermen and food farmers saw nominal incomes improve, their relative incomes did not improve between 1891 and 1960 despite substantial fluctuations resulting from fluctuations in food prices (see Table 2 and Fig. 5). Food farmers' incomes were especially hard hit by the Great Depression. However, they saw their incomes bounce back fairly rapidly after the 1930s, mirroring the general increase in incomes and prices in the economy during those years. While incomes remained relatively constant, the group of food farmers increased in size more than five times, to over 400,000 farmers, catering for increasing food demands from a rapidly growing population. Outside of subsistence activities, incomes earned within the informal economy were at least similar, if not higher, than those earned by unskilled urban laborers. It was not until the rapid rise in wages after the 1930s that urban laborers' earnings surpassed the incomes of those in the informal sector, except for petty traders. However, due to differences in prices between the city and rural areas (where most of those in the informal sector resided) the income divide probably overstates welfare differences (De Haas, 2021).

Overall, incomes for all social groups except for small-scale cocoa farmers, food farmers, and fishermen, increased between 1891 and 1960. Initially incomes rose slowly, but after the 1930s the gains were substantial. However, despite the rise in incomes, some gained much more than others. Fig. 6 shows cumulative income shares between 1891 and 1960. The top 10 percent earned between 28 and 31 percent of total income between 1891 and 1931. Their income share increased to 39 percent in 1948, after which it fell to 35 percent in 1960. The large increase through 1948 came at the expense especially of the poorest 40 percent of the population, which saw their income share decline from roughly 18 percent of total incomes in 1891 to 8 percent in 1960. The middle 40–90 percent of the population received a relative stable portion of total incomes throughout the period, roughly 55 percent. In the following section, we explore what these developments imply for inequality trends.

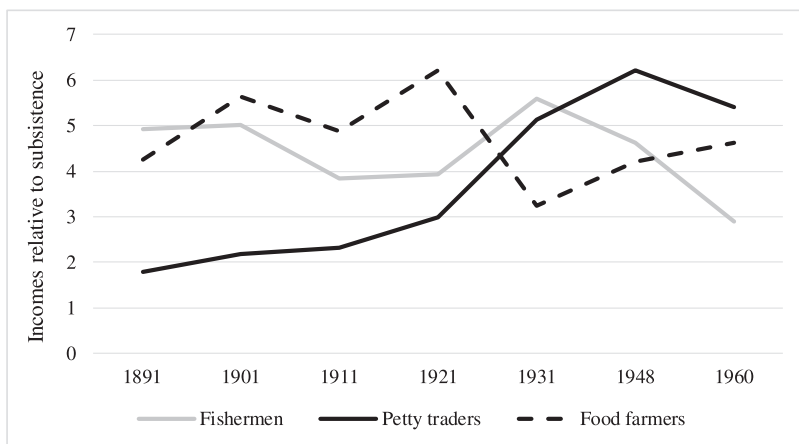
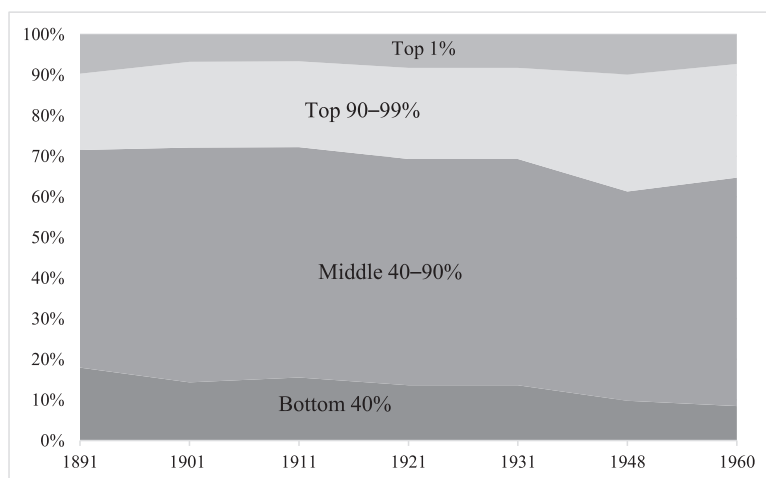


Fig. 5. Evolution of incomes in the informal sector relative to subsistence incomes, 1891–1960

Sources: Table 3; Appendix I. Income estimates based on Lawson (1968: 93) and Cardinall (1931); food prices from colonial blue books, census reports, and reports on the colonial provinces.



Income shares in Ghana, 1891–1960

Source: Estimates are based on Table 3.

Fig. 6. Income shares in Ghana, 1891–1960

Source: Estimates are based on Table 3.

5. Measuring and explaining inequality over time

A standard measure used to summarize the distribution of incomes over different classes is the Gini coefficient. We calculate Gini coefficients for all social table years between 1891 and 1960. This allows us to chart changes in income distribution over time. Fig. 7 shows our income Gini coefficients. In 1891, the Gini stands at 0.40, after which it remains roughly constant until a small dip in 1931 due to the Great Depression and the resulting fall in prices. After 1931, inequality rapidly rises, resulting in a Gini over 0.52 in 1960. However, calculating Gini coefficients with the social tables method, using average incomes per social group, ignores within-group inequality and therefore might underestimate inequality overall. As a robustness check we therefore designed income bands around the average incomes of the various social classes, while still assuming that incomes of different groups do not overlap. This enables us to account for at least a share of within-group inequality, following Milanovic et al. (2011: 257). Accounting for this within-group inequality raises inequality on average by four percentage points throughout the period (Fig. 7).

To put our Gini estimates in a broader perspective, we compare our Gini estimates with those available for other African countries and pre-industrial societies. The earliest available Gini estimates are for Kenya, Botswana, and Uganda. In 1914, Kenya records a Gini of 0.39, rising to 0.42 in 1921 and to 0.50 in 1960. Botswana records a Gini of 0.25 in 1921, rising to 0.47 in 1956. For Uganda, the Gini is at 0.33 in 1925, rising to 0.43 in 1935 and to 0.42 in 1957 (Bigsten, 1986; Bolt and Hillbom, 2016; De Haas, 2021; Hillbom et al., 2021). In comparison with these countries, Ghana clearly starts out with relatively high inequality. Inequality

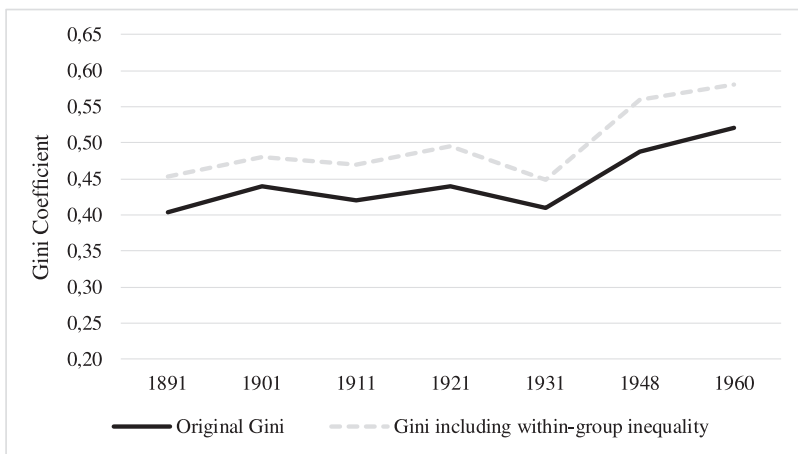


Fig. 7. Income Gini coefficients (1891–1960)
Source: Authors’ estimates.

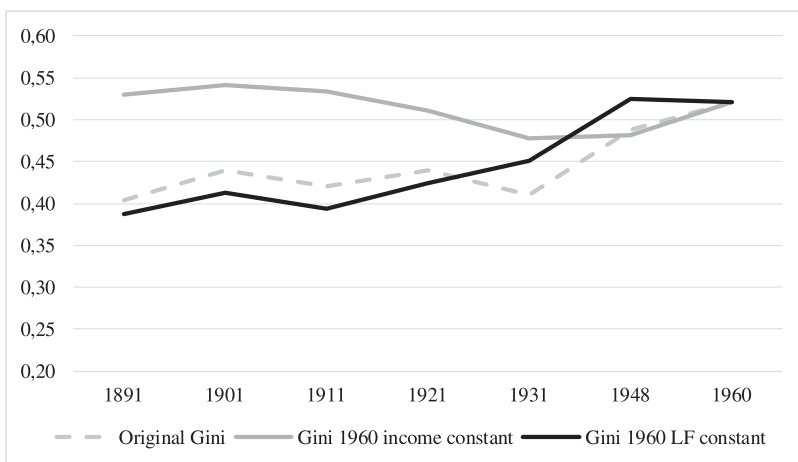


Fig. 8. Trends in inequality keeping labor force constant and income constant.

remained comparatively high at the end of the colonial era. Further, relative to other preindustrial societies, inequality in Ghana was high in 1891. In 1872, Brazil’s Gini was 0.39; similar Ginis were recorded for Peru (0.41 in 1876), Java (0.39 in 1880), China (0.24 in 1880), and Japan (0.40 in 1886) (Milanovic et al., 2011: 263). Below we explore the different dimensions of inequality, and examine how changes in occupational structure, top incomes, and an expanding cocoa sector affect Ghana’s Gini coefficient.

5.1. Changes in occupational structure

While Ghana’s economy started to diversify during the colonial period, the movement of labor to non-agricultural sectors remained limited (see also Table 3). In 1960, only 10 percent of the population was engaged in formal wage labor.¹⁵ If instead one defines the modern sector more broadly, including cash crop farmers, then the fraction of the population engaged in modern, highly productive sectors reaches 17 percent.¹⁶ We explore how this moderate sectoral change affects the levels of inequality by recalculating our Gini coefficients in two ways. First, we hold incomes constant at the 1960 level and only let occupational shares change over time. Second, we keep the occupational shares constant at the 1960 level and let incomes change over time. Fig. 8 shows that when we keep incomes constant at the 1960 level, inequality prior to 1948 is much higher than the original estimates, and it remains more or less constant

¹⁵ Another five percent moved out of agriculture toward petty trading. However, such informal service activities are generally perceived to be of low productivity. At the same time, average incomes earned were similar to those of unskilled laborers. In the analysis we take into account all employment shifts, including changes between formal and informal sectors.

¹⁶ This includes all government and private sector employment.

at the 1948 level. Alternatively, when we keep the occupational structure constant at the 1960 level, the trend in inequality is very similar to the original estimates, except for 1931 and 1948, when it becomes substantially higher.

Thus, prior to 1948, changes in incomes clearly played a more important role in determining the inequality trend than changes in occupational structures alone. Leading up to 1960, it was a joint effect of shifts in the sectoral composition of employment and increases in the incomes of top earners that affected the level of inequality. Hence, the total number of people finding employment in more productive sectors was too small to make occupational change in itself affect inequality. Instead, it was rapidly rising incomes in the productive sectors that caused the increase in inequality.

5.2. Top incomes

Even though the Gini tends to be most sensitive to changes in the center of the distribution, top income groups are capable of significantly affecting overall inequality (Atkinson, 2007) – especially when the very top group is very small, their incomes are well reported, and the share of total income they earn is substantial (Alvaredo, 2011: 274). In the case of Ghana, the top incomes during the colonial period were clearly earned by the European government elite. Therefore, we analyze the effect of the European elite on the overall inequality estimates. We do so by comparing the difference in Gini coefficients when we include or exclude the European top incomes. Contrary to what Atkinson (2007) indicates, we find no real effect in the level of inequality when we exclude Europeans from our social tables (Table 5).¹⁷ Even though European government employees earned between one (1891) and 25 (1960) times the average African income, they accounted for a very small portion of the population, and therefore of total incomes. Further, our European social class includes both high- and low-income earners. Therefore, European incomes are closer to the country's average and so have a limited impact on inequality.

Table 5
Inequality with and without Europeans included, 1891–1960.

Years	Original Gini	Gini excluding Europeans
1891	0.40	0.40
1901	0.44	0.44
1911	0.42	0.42
1921	0.44	0.44
1931	0.41	0.40
1948	0.49	0.49
1960	0.52	0.52

Source: authors' calculations based on Table 3 and Appendix I.

5.3. The expanding cocoa sector

Within the literature on the drivers of inequality in Ghana, the cocoa sector has received much attention. As discussed above, some scholars suggest a positive correlation between the expansion of cocoa production and inequality, while others question whether it played much of a role in increasing income disparities. We assess the effect of the expanding cocoa sector on income inequality by comparing inequality levels including all occupational groups with inequality levels excluding cocoa farmers.

Fig. 9 shows that excluding cocoa farmers from the social tables lowers inequality on average by 4 percentage points, except in 1960. This suggests that despite the absence of increasing polarization in terms of production capacity, the expanding cocoa sector increased inequality. Therefore, our results support the argument that the expansion of cocoa production gave rise to a process of differentiation in incomes between Ghanaians generally, and cocoa producers in particular (Rhodie, 1968: 105; Kay and Hymer, 1972: 5–8; Hopkins, 1973: 238–39; Beckman, 1976: 156; Gunnarsson, 1978: 48, 109–10; Howard 1978: 193–206; Konings, 1986: 75–78). However, in contrast to a simplified polarization story, we argue that the process changed in nature over time. Initially, the rise in income inequality is the result of the cocoa sector's expansion in terms of the number of farmers and total exports, but after the 1930s, it is due to increasing prices driving up cocoa incomes.

Our results indicate that the cocoa export sector, by providing an increasing share of the population the opportunity to earn substantially more than subsistence incomes, reflected expanding earning opportunities (Austin, 2005; 2013). A growing share of the population took advantage of these opportunities, which led increasing incomes to go hand in hand with rising levels of inequality. Results for Botswana, where the colonial economy centered on an African-dominated cattle export sector, show similar mechanisms (Bolt and Hillbom, 2016).

¹⁷ All differences in the table except for 1931 are due to third-decimal rounding discrepancies (for example 0.374 versus 0.375 for the total population Gini coefficients in 1891). Only the difference in the labor force Ginis for 1931 is an actual one percent difference when we compare the population with and without Europeans.

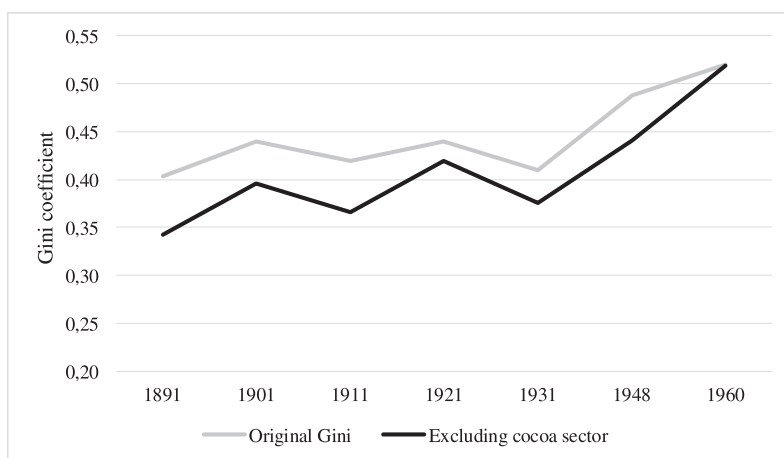


Fig. 9. Inequality trends including and excluding the cocoa sector, 1901–1960
Source: Authors' estimates.

5.4. The north/south divide

Lastly, we turn to the north/south divide, as it is one of the factors affecting inequality in Ghana that features prominently in contemporary development literature (Odusola et al., 2017: 30; Aryeetey et al., 2009). Scholars have divergent views on the origins of this divide. Some argue that the north/south divide has roots in the structure of the colonial economy and has changed little since then (Aryeetey et al., 2009). Relatedly, some have suggested that the advent of cocoa cultivation and mining in the southern areas of Ghana resulted in inequality between the savanna north and the mostly forest-zone south (Plange, 1979; Brukum, 1998; Van Hear, 1982: 98–109). In contrast, Austin (2005; 2013) has argued that Ghana's longstanding north/south divide in terms of economic development preceded the adoption of cocoa cultivation. In the nineteenth century the savanna north, with its relatively poor soil quality and unfavorable climate, was a major source of slave labor for the elites of the forest-zone, who had near-monopoly control over the “broad forest rent” which included all commercially-valuable natural resources. Therefore, the north/south divide represents the long-term uneven distribution of endowments between the regions (Austin 2005: 11; 59). In this section, we compare the level of income and diversity in occupational structures for the two regions to analyze differences in levels and trends.

As regional income and price information is very scarce, a direct comparison of incomes between the northern and southern population over time is difficult. However, there are estimates of subsistence incomes available for both the beginning and the end of the period under study. Szereszewski (1965) provides estimates of subsistence income for the Gold Coast Colony, Ashanti, and the Northern Territories between 1891 and 1911. Initially, the monetary costs of subsistence are estimated to be 3d per capita per day in the south and 2d in the north. In 1911, incomes had risen to 4d and 2.7d respectively. Further, for 1961/62, Birmingham et al. (1966:111) estimated that the average value of total food consumption in the southern regions was 215 s. per 12 weeks, and 84 s. in the Northern Territories.

When comparing agricultural production and incomes of food farmers between different regions, it is clear that due to differences in vegetation types and farming practices, the crops cultivated across the country varied. Farmers in the northern savanna areas mostly cultivated guinea corn, millet, yams, and groundnuts. In the forest areas cassava, cocoyams, plantains, and maize were instead the main food crops (Wills, 1962; Birmingham et al., 1966). We find that food farmers' incomes¹⁸ in the Northern Territories were generally substantially below the national average between 1911 and 1960, even when using national prices.¹⁹

Looking at occupational structures, we find that the share of population engaged in subsistence activities in the Northern Territories was higher than in the southern regions. There were no significant income-earning opportunities besides subsistence agriculture, although the area had prospects for the development of some commercial commodities such as cotton and shea nuts (Sutton, 1989). Instead, people from the north moved south in search of employment and found it mostly in the expanding cocoa sector. Thereby, the cocoa sector affected the north of the country indirectly, via demand for agricultural labor and the remittances that laborers send home (Van Hear, 1982: 41–53; Austin, 2005: 59; 316–20; Moradi et al., 2013). However, detailed surveys of remittances indicate that the amount of income sent or taken home by migrant laborers was limited, on average £1 per year per migrant in 1948; the annual cash income of agricultural laborers amounted to £15 per year (Raeburn, 1950:29, Table 6).

Further, the number of skilled workers, commercial workers, and especially government employees was much lower in the north than in the south. In 1960, five percent of European government officials were working in the north, and eight percent of the African

¹⁸ For details on how we estimated food farmers' incomes see Section 2 and Appendix I.

¹⁹ Regional prices are not available.

government officials. Moreover, the introduction of western and professional education to the Northern Territories was belated, and all clerical and skilled work was done by people from the south, who often had to be induced to travel by field allowances (Ladouceur, 1979: 59).

The cumulative effect of these circumstances was the slow development of a monetary economy in the north. Throughout the early 1900s, and in some areas into the 1940s, cowries were the major currency, while only some silver coins, copper, and brass rods were in circulation. Buying and selling was therefore done only in small amounts (Sutton, 1989: 640). This points to the cocoa expansion and the uneven development of wages and incomes for off-farm workers throughout the colonial period as the key forces that reinforced pre-existing differences between the north and south in Ghana.

Conclusion

This article contributes to our understanding of the evolution and drivers of income inequality in colonial Ghana by constructing social tables and estimating Gini coefficients for seven consecutive decades from 1891 to 1960. During this time, Ghana represented an example of a cash-crop revolution mainly driven by African peasant farmers. It therefore constitutes an interesting case for examining how Africans employed their factors of production and exploited opportunities provided by economic changes during the colonial era for their own welfare, and how these changes in economic structure affected the distribution of incomes over the long run.

We establish six new stylized facts. First, inequality was substantial prior to the adoption of cocoa cultivation, remained stable in subsequent decades until it fell during the years of the Great Depression in the early 1930s, and increased again in the last decades of the colonial period. Second, the main winners were earners in the top ten percent of the distribution, who saw their share of total income increase at the expense of the poorest half of society. Third, although the economy experienced substantial sectoral change, the size of the employment shifts alone were not large enough to affect the aggregate estimates. Fourth, despite the rapid income increase for the European elite and the widening income gap between them and the rest of society, these changes did not cause inequality to increase, as the elite remained too small relative to the total population. Fifth, the expanding cocoa sector increased the overall level of income inequality by, on average, four percentage points. Rising cocoa production before the 1930s allowed an increasing number of farmers to access higher cash crop incomes. Between 1930 and 1948, rapidly rising cocoa prices resulted in fast-increasing incomes that caused overall inequality to increase. During the final decade of this study, increasing wages for both government and skilled employees were the main factors driving the increase in inequality. Finally, the substantial initial differences in incomes and occupational structures between the north and south widened even further with the adoption and expansion of cocoa farming.

Our findings suggest that understanding the evolution of inequality trends in colonial sub-Saharan Africa requires bridging the historical divide between pre-colonial and colonial periods, as well as the adoption of cash crops. This “chronological dead zone” (McCaskie 1986: 19) in time inspires the narrative that African societies were egalitarian at the start of colonialism and only became severely unequal at the end. Yet we find that at least in the case of Ghana, income and wealth differences were marked before the advent of colonial rule and cocoa cultivation, and only declined in the second half of the twentieth century. As we have shown, in colonial Ghana cash cropping became the mechanism by which existing inequalities between different sections of the population and regions manifested themselves. This also implies that to understand the drivers of inequality in colonial sub-Saharan Africa, we need to move beyond analyzing dynamics in the export sector alone.

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Appendices

In these appendices we provide the details for the data used and calculations made in the construction of our social tables.

Appendix I: Incomes

As indicated in the main text, we obtained wages for those employed in the formal sectors from colonial blue books, censuses, an annual report, a labor report, and secondary sources. We assume that especially the unskilled laborers engage in bi-employment; while working for wages for some months, they also engage in subsistence farming. Laborers working in the mines are assumed to be employed for nine months of the year, and for the remainder of the year work on their farms growing their own food. Therefore, their incomes comprise of nine months' mining wages and the monetary value of subsistence income (for a full explanation of subsistence incomes, see below). Similarly, general unskilled laborers are also assumed to work for wages for part of the year, and work on their own farms for the remainder. We assume the average employment contract for unskilled labor was nine months, similar to the mining

contracts (Sutton, 1983; Konings, 1986). Thus, the total annual urban income for unskilled laborers consists of nine months of cash income and the subsistence income. Agricultural laborers are assumed to grow their own foodstuffs as well, so we add subsistence income to their annual wage income.

For people earning incomes outside formal waged employment, we have no direct wage or income observations from the colonial blue books. In the remainder of this section, we will provide details on how we arrived at incomes for the various social groups outside of the formal sector.

Cocoa farmers: We estimated cocoa farmers' incomes based on total cocoa exports and prevailing producer prices for cocoa. First, we distributed total exports across all cocoa farmers. There is ample historical evidence that the distribution of production capacity between different groups of farmers was unequal (Hill, 1956: 84–91; Konings, 1986: 76; Austin, 2013: 5–6). However, even though there are a number of available surveys on the distribution of farming assets and income increases from the 1930s onward, there is little consistent evidence on exact farm sizes, and few comparative statistics available over time (Austin, 2013: 6). At the same time, there is little evidence to suggest that there were major trends toward polarization of production capacity (Austin, 2013).

Therefore, we opted to determine the distribution of total output among different groups of farmers based on the first national comprehensive study of inequality among cocoa-farmers, which was done for the crop year 1963/64 (Beckman, 1970). Based on this survey, we distinguish between elite farmers, large-scale farmers, medium-scale farmers, and small-scale farmers. The distribution of total exports over the different categories of farmers is also obtained from the 1963/64 survey and is given in Table 2.

For the years 1891–1911 we also include incomes derived from rubber and palm production for the elite cocoa farmers. From the blue books we obtain the total value of produce for both crops and divide that equally across all elite cocoa farmers, as it was the rural elites that were engaged in the production of these valuable crops (Hill, 1963; Austin, 2005).

We keep the share of the different categories of farmers (share of farmers) and their output share constant. As a robustness check we collected all available regional surveys on the distribution of output among different categories of cocoa farmers between 1925 and 1963 and used that information both to distinguish between smaller and larger-scale farms and for the distribution of output between the different groups.²⁰ To derive incomes for cocoa farmers, in the final step we multiply the production per group of farmers with the prevailing retail price of cocoa to estimate average cocoa incomes for the different farmer categories.

Fishermen: The 1911 census notes that fishermen made about £3 to £5 a month when fish were in season; at other times their earnings would amount to 6d or 1 s. per day. Further, the census noted that the important fishing season was from July to October, and the small season from January after the harmattan, to the beginning of the rainy season in May. To arrive at a yearly income, we added the incomes earned during the fishing season with incomes earned outside the season. From the lower and upper incomes given for the fishing seasons, we calculated the log average earnings per month, placing more weight on the lower incomes to avoid overestimation. We multiplied these monthly incomes by nine months (the combined duration of both fishing seasons). To this, we added the log average of daily incomes earned for all days outside the fishing season (November, December, and June). Summing both incomes, we arrived at £37.6 per annum in 1911.

Lawson (1968: 93) provides a direct income estimate for fishermen for 1941 based on the average amount of fish caught, and the prevailing market price for the most common fish. She estimates that fishermen earned on average £41 per annum. We interpolate the series based on linear growth rates between 1911 and 1941 to obtain fishermen incomes for 1921 and 1931. We extrapolate forwards with the growth rate from 1911 to 1941 to obtain income estimates for 1948 and 1960. We extrapolate backwards from 1911 with the same growth rates to obtain income estimates for the years 1901 and 1891.

Petty traders: To obtain incomes for petty traders, we relied on a combination of direct income estimates, rough estimates, and extrapolation between the various years to fill in the gaps. For 1948 and 1960, we are able to calculate separate petty traders' incomes for the Eastern province, Ashanti, and British Togoland. For 1911, we obtained direct estimates from the 1911 census report for petty traders' weekly income. For 1931, we derived petty traders' income from Cardinall (1931) by using his estimates of trading profits of imports and exports, and inland trading and divided this by the total number of petty traders in 1931. For 1960, we relied on average petty traders' incomes from household surveys conducted in Akuse, British Togoland (1954), Kumasi, Ashanti (1955), and the Oda-Swedru-Asamankese area, Eastern province (1955–56) (Office of the Government Statistician, 1955, 1956, 1958). For other regions and the country as a whole, we use the unweighted average of these incomes as the income for petty traders.

Using the linear growth rate between the petty traders' income for 1931 and the regional estimates for the mid-1950s, we calculate regional and national petty traders' income for 1948. Using the same growth rate, we extrapolate our mid-1950s estimate to obtain income estimates for 1960. Interpolating between the income estimate for 1931 and 1911, again using linear growth rates, gives us income estimates for 1921. Using the growth rate between 1931 and 1911, we extrapolate the 1911 income estimate backwards to obtain income estimates for petty traders in the years 1901 and 1891.

Semi-commercial food farmers: The agricultural sector, particularly the organization of food farming, remained the “Great Unknown” of Ghana's economy (Birmingham et al., 1966: 215). To calculate the incomes of food farmers, therefore, we had to rely on several sources to obtain data on food crops cultivated, farm acreages, yields, production, and prevailing market prices.

Farm sizes

Data on the average farm size of the peasant in each of the regions was derived from the 1963 agricultural census, which surveyed 2510 farms across the country. According to the census, the average farmer owned 2.34 farms, and each farm was slightly less than three acres. These estimates are not far off from earlier ones by Cardinall (1931) and Lynn (1937) for the Northern Territories. Total

²⁰ For exact details, see the discussion of each individual social table in Appendix II.

farm sizes averaged 4.28 acres in the more congested areas of the Northern Territories and 5.51 acres in areas where there was less population pressure (Cardinall, 1931: 105). In North Mamprusi, the average area cultivated per man was found to be 2.49 acres (Lynn, 1937: 19). Due to the lack of data for earlier periods and given that the 1963 agricultural census provides a regional breakdown of average farm sizes, we use these figures throughout the period studied (Table A1)

Table A1
Size of peasant holdings, 1963.

Region	Average number of acres per farm	Average number of farms per holding
Western	3.8	2.92
Central	1.9	2.43
Accra	1.0	1.2
Eastern	1.6	2.34
Volta	1.5	2.13
Ashanti	3.3	2.63
Brong-Ahafo	2.7	2.61
Northern	4.4	1.61
Upper	3.3	2.05
Average. whole country	2.7	2.34

Note: A holding is defined “as a parcel or parcels of land wholly or partly used for agricultural production for the day-to-day operation of which one man is responsible”. Source: Birmingham et al. (1966: 224).

Crops cultivated

Due to differences in vegetation types, farming practices across the country varied and farmers cultivated different crops as the natural vegetation would allow. Farmers in the savanna areas (mainly the Northern Territories of the Gold Coast) mostly cultivated guinea corn, millet, yams, and groundnuts (Lynn, 1937). In the forest areas, cassava, cocoyams, plantains, and maize were the main food crops (Wills, 1962; Birmingham et al., 1966). Sometimes, different crops were cultivated on the same parcel of land, although the extent of this practice was often exaggerated (Birmingham et al., 1966).

To estimate the share of farm acreage devoted to each of the main food crops, we looked only at the farms which cultivated the main crops in both the savanna and forest areas. We grouped farms together based on the crops they cultivated and estimated the share of farms devoted to each crop. We used this as a proxy for the share of acres under cultivation for each crop. Increasingly, some crops were being cultivated more than others, especially in older cocoa-growing areas. For instance, Austin (2005: 66) notes that in Amansie, cassavas (which grew better on marginal-quality land) became widely adopted both in the diet and on the farm in the 1940s, replacing plantains as the traditional staple food as land availability was reduced. We changed the size of farms devoted to cassavas and plantains to reflect the increased adoption of cassavas from 1948.

We then multiplied the respective shares by the average farm size in each of the provinces to obtain the share of the same farm size that was used for the cultivation of each crop. Since we do not have estimates for earlier periods, we assume these to be constant throughout our study period (Table A2)

Table A2
Share of acres devoted to main food crops.

Northern Territories			Gold Coast Colony, Ashanti, and British Togoland		
Major crops	Number of farms	Shares of farms (%)	Major crops	Number of farms	Share of farms (%)
Groundnuts	54	11	Plantains	167	20
Guinea corn	141	28	Cassavas	386	46
Millet	141	28	Cocoyams	167	20
Yams	174	34	Maize	120	14
Total	510	100	Total	840	100

Source: Authors' estimates based on Birmingham et al. (1966: 219).

Yields and production

We obtained estimates of average yields per acre from several sources. For 1960 we rely on Birmingham et al. (1966) and Nyanteng (1978), for 1948 we use the Report on the Administration of British Togoland, 1948, and for 1931 we obtain our information from Cardinall (1931) and Lynn (1937). As we have no information prior to 1931, we hold the 1931 estimates constant for earlier years.

To arrive at an estimate of net yield per acre, we deducted farm waste and losses from the above estimates, as well as the seed ratio. As the stems of plantains, cocoyams, and cassavas were used for cultivation they required no seed ratio.

Food farmers consumed a large proportion of their own produce and sold any surpluses that might be available. To estimate farmers' income, we calculated the value of own consumption in kind and the value of the surpluses sold at the market by multiplying the total amount consumed and sold by the prevailing average market price for each crop. This sum was then multiplied by the average number of farms held by a farmer (2.3) to obtain total farmers' income. As farms typically engaged the whole household, we divide total farmers' income by two to arrive at the income per adult worker (Tables A3 and A4).

Table A3
Crop yields, lbs per acre.

Crop	Years		
	1963	1950	1931
Groundnuts	419	493	630
Guinea corn	600	515	530
Millet	600	493	525
Yams	6720	6400	8000
Plantains	20,608	8000	8000
Cassavas	6720	5200	8000
Cocoyams	4480	5200	8000
Maize	806	1053	636

Sources: [Cardinall \(1931\)](#); [Lynn \(1937\)](#); The Colonial Office (1949); [Birmingham et al. \(1966\)](#); [Nyanteng \(1978\)](#).

Table A4
Farm waste and losses and seed ratio.

Crop	Waste and losses (%)	Seed ratio (%)
Groundnuts	12	10
Guinea corn	12	10
Millet	12	10
Yams	30	30
Plantains	37	
Cassavas	19	
Cocoyams	24	
Maize	12	10

Sources: [Birmingham et al. \(1966\)](#); [Nyanteng \(1978\)](#); [De Haas \(2017\)](#).

Food prices

We derived food prices for each of our social table years from colonial blue books, census reports, and reports on the colonial provinces. These were mostly urban prices. Following [De Haas \(2017: 617\)](#), we assume that rural food prices were half (50%) of those of urban areas.

Subsistence: The group of people living at subsistence is the largest income group in our social table. Estimating their average income is not straightforward because they encompass many different sub-groups such as subsistence farmers, the unemployed, retired people, and those who were incapacitated. Their incomes were mostly enjoyed in kind, so there is no recorded monetary value for subsistence income. Therefore, we collected all available direct estimates of subsistence incomes available from secondary sources and colonial records. We also collected estimates of the monetary value of own food produced by cocoa farmers from various cocoa surveys done in the 1950s (Office of the Government Statistician, 1958, 1960). Finally, we calculated the value of a bare bones subsistence basket taken from the real wage literature as a proxy for the monetary value of living at subsistence ([Frankema and Waijenburg, 2012](#); [De Haas, 2017](#)).²¹ These different approaches yield different results, as indicated in [Table A5](#) below, where we

²¹ As the ecology of the Gold Coast generally allowed for decent agricultural production and large-scale famines were scarce, we use the updated subsistence basket providing 2,100 calories per person per day from [Allen \(2015: 4–5\)](#). One of the issues with the consumption basket approach is that the majority of available price information in the colonial records reflects price levels in cities, which tended to be more expensive than rural areas. As the vast majority of the population resided in the countryside, the consumption approach in combination with city prices might overstate the cost of subsistence faced by the average Ghanaian. Based on the table, we actually find the opposite (except for 1960), namely that the consumption basket approach seems to underestimate the level of subsistence incomes.

show the level of subsistence income required for half a family, which represents the level of income that everyone in the labor force needed to earn for the whole family to survive.

Table A5

Available estimates of subsistence incomes for workers, £ per annum^a.

	1891	1901	1911	1921	1931	1948	1950s	1960
Southern Ghana (Szereszewski)	8	8	11					
Northern Territory (Szereszewski)	5	5	7					
Bare bones subsistence basket	4	4	4	10	4	9		14
Value of rural living costs (Cardinall)					11			
Value of own food produced on farms (Birmingham)								12
Population-weighted average value foodstuffs, Oda Swedru Asamankese							8	
Population-weighted average value of foodstuffs, Ashanti							7	

^a: This is subsistence income for each worker in the labor force, assuming he or she needs to support half a family.

Sources: Southern Ghana and Northern Territory, Szereszewski (1965: 139); bare bones subsistence basket, following Allen's (2015:4–5) updated basket and family size and using prices from Frankema and Van Waijenburg (2012); value of rural living costs, estimates from Cardinall (1931: 233); value of own food produced on farms, Birmingham (1966: 111); population-weighted average value of food stuffs, Oda-Swedru-Asamankese: authors' calculation based on Office of the Government Statistician (1958: 68–69, Table 22); population-weighted average value of food stuffs, Ashanti, authors' calculation based on Office of the Government Statistician (1960: 54–55, Table 21).

The 1960 value of the subsistence basket is very similar to the value of per capita own food produced on farms as given by Birmingham (1966: 111). Birmingham (1966) further indicates that in addition to the value of own-produced food, rural populations bought additional local foodstuffs with an average value of £6 per capita. As this suggests a much higher level of subsistence than either the subsistence basket or the value of food produced on cocoa farms in the previous decade (see Table A5), we use the value of the subsistence basket to estimate subsistence incomes for 1960.

For 1921 and 1948, we use the subsistence basket as we have no other estimate for the level of subsistence. For 1931, when the world was going through the Great Depression, estimates of subsistence drop, reflecting the economy-wide drop in prices and incomes. However, the direct estimate of Cardinall's report (1931) shows a much smaller decline than the bare bones subsistence basket for 1931. The bare bones basket is based on market prices, which were affected by the global depression, and thus most likely overstate the drop in subsistence income obtained from growing own-food crops. At the same time, the estimates given in Cardinall (1931) seem on the high side for subsistence estimates during slump years. We therefore use the average between as the level of subsistence income for the main results in the paper. For the years 1891–1911 we have both direct estimates for the level of subsistence and estimates for the bare bones basket, where the latter are substantially lower. Given that the Gold Coast's ecology generally allowed for decent agricultural production and large-scale famines were rare, the bare bones consumption basket approach seems to result in subsistence income estimates that are too low. We therefore use the direct estimates for the level of subsistence income as provided by Szereszewski (1966: 139) for the years 1891–1911.

As a robustness check, we recalculate our Gini coefficients using the bare bones consumption basket approach throughout the period. Using the very low subsistence estimates from the bare bones consumption approach drives up inequality substantially for the years 1891–1911 and 1931. The average Gini for the years 1891–1911 is 0.42 when we use our direct subsistence estimates and 0.53 when the bare bones subsistence basket approach is used (Fig. A1).

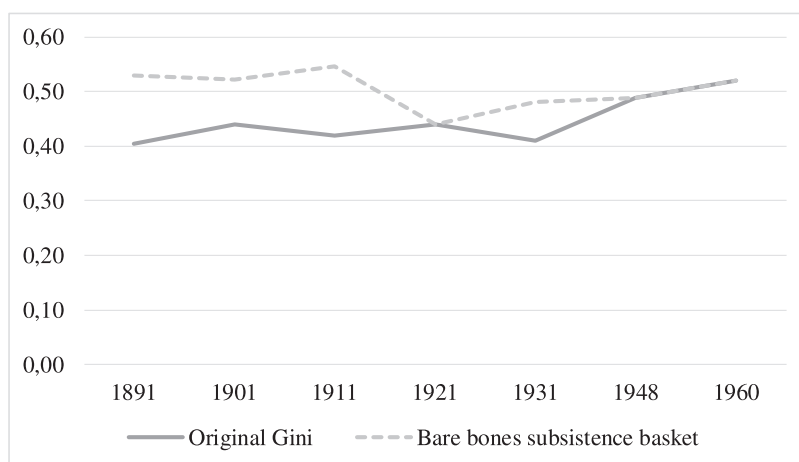


Fig. 1A. Gini coefficients using bare bones basket, 1891–1960

Source: Authors' calculations.

Appendix II: Social tables

We obtained information on the size of each social class for 1960 mostly from the 1960 population census and from the 1960 labor statistics (Census Office, 1962; Central Bureau of Statistics, 1961). While the classification of various occupational groups is based on the census, these were re-categorized to form broad social classes. Our social class of government administrators and executives, for instance, comprised central government officials including workers in the ministries of defense and justice and local government administrators as defined in the 1960 population census. Other government officials included officials providing community services as described in the census. Wholesale and retail traders and workers in banks and other financial institutions made up our social class of commercial workers. Estimates on people engaged in cultivating field crops and foodstuff production and engaged in other kinds of extra subsistence activities were combined to obtain the size of the food crop farmers class. The census numbers on workers in manufacturing, transport, communication, construction, and other similar occupations as described in the census were added to give the size of the class of skilled workers. The number of agricultural laborers was underestimated in the censuses. Austin (2005: 319–20) based on the Report on Cocoa Farming-Families for Ashanti for 1956/57, notes that there was a ratio of nearly 1.9:1 between hired laborers on cocoa farms and cocoa-farm owners. The survey for Oda-Swedru-Asamankese (Office of the Government Statistician, 1958) indicates that the ratio of hired laborers to farmers was 1.39:1. We adopt an average of 1.55:1 for 1960 and 1948 to obtain the number of agricultural wage workers.

The 1948 census identified only four main occupational groups: cultivation of cocoa; artisans, craftsmen, and skilled workmen; shopkeepers, traders, and sellers; unskilled workmen; and a fifth group for miscellaneous occupations. We therefore relied on Kay and Hymer (1972: 316) and some fragmentary information given in the census report for a breakdown of these occupations. The total number of African government officials is taken from Kay and Hymer's classification of persons employed in government administrative and security services. Our social class 'other government officials' is based on their classification of professional and technical workers, which included doctors, teachers, and surveyors. Kay and Hymer indicate that of the total government employees, 64 percent are estimated to be community services providers; we have removed these workers from the original skilled laborers group in the census to create our social class. Regional division of government employees is based on the share in main occupation groups of the 1948 census (Population Census, 1948:370). The number of skilled laborers is taken from Kay and Hymer (1972: 316). Again, we use their share of the population classified as blue collar and others in the transportation and communication sectors to estimate the number of skilled workers in the original census group 'craftsmen and skilled workmen.' Regional division of total skilled workers is based on the regional division of artisans, craftsmen, and skilled workmen reported in the 1948 census.

For petty traders, the census indicates that nearly 67 percent of the female population were petty traders (Population Census, 1948:23). As the original distribution of the four main occupations was based on the male population, the number of female petty traders was added to the official sum. The share of the population engaged in non-petty-trading commerce, based on the summaries for administrative areas and districts given in the census, was then taken out of the derived total to obtain the number of commercial workers (Population Census, 1948: 371–88). The remainder was then taken as the number of petty traders. The regional distribution of petty traders and commercial workers is based on the regional division on shopkeepers, traders, and sellers as given in the census.

For the number of employees working as domestic servants, we combine information from Kay and Hymer (1972: 316) and the 1948 census. The total number of laborers in mines is taken from Kay and Hymer (1972: 415), who record the number of Africans employed in the mines. As we have no information on the regional distribution of mine workers in 1948, we base our distribution on the regional division for 1960. We obtain the number of agricultural laborers from the 1948 population census estimate of wage-earning employees on the cocoa farms. The number of fishermen is also based on information from the 1948 population census (Ibid).

According to the 1948 population census, a majority of the group categorized as 'remainder' were farmers (other than cocoa) (Population Census 1948:20). We add the total number of female farmers to the official figure based on the population census to arrive at the number of food crop farmers for 1948.

For 1931, most of our estimates on social class sizes were derived from the 1931 population census. These include the number of commercial workers, petty traders, domestic servants, fishermen, and miners. Where the number of some occupational groups is not given directly, we rely on secondary sources. For instance, for the number of cocoa farmers, our estimate is based on Van Hear (1982: 122) who indicates that the cocoa sector absorbed one-sixth of the country's labor in the early 1930s.

The number of food crop farmers is taken from Kay and Hymer's (1972: 316) estimate, as are the sizes of our social classes for skilled workers, African government administrators and executives, and other government employees. For agricultural laborers, our estimate is based on the number of people moving from the north to the south to work on cocoa and food farms for wages, as stated in the Northern Territories report for 1933–34 (Gold Coast Colony (1934: 60). Admittedly, assuming that all workers moving south were engaged as agricultural laborers is rather precarious. However, as Sutton (1983: 479) argues, while a few northerners were engaged as traders, most northern laborers went to work on cocoa and food farms.

We combine information from the 1921 census report and Kay and Hymer (1972: 316, 415) to estimate the size of each class for the 1921 social tables. The number of miners, fishermen, government administrators and executives, and other government employees is based on Kay and Hymer. The estimate of the number of cocoa farmers is based on Berg's (1960: 192, cited by Van Hear, 1982: 35) assessment that in the period 1900–10 between 10 and 15 percent of the total population was engaged in the cocoa sector. We use the same share for 1921. For food crop farmers we rely on Kay and Hymer's (1972) share of farmers in the classified population. The number of agricultural laborers is based on the Northern Territories Report for the Year 1924–25. As the number of petty traders

Table A6
Social table, 1960.

1960	No. in class	Population share (%)	Annual income (£)	Welfare ratio	Income share (%)
European government officials	788	0.0%	1908	133	0.5%
Government (admin, executive, etc.)	44,550	1.2%	408	28	6.3%
Government (other)	63,460	1.7%	317	22	6.9%
Total skilled laborers	366,290	9.8%	185	13	23.2%
Commercial workers	47,600	1.3%	238	17	3.9%
Domestic services	39,100	1.0%	69	5	0.9%
Mines	48,430	1.3%	137	10	2.3%
Total unskilled laborers	117,360	3.1%	85	6	3.4%
Agricultural wages	484,530	13.0%	44	3	7.4%
Elite cocoa farmers	18,534	0.5%	673	37	4.3%
Large-scale cocoa farmers	38,519	1.0%	250	15	3.3%
Medium-scale cocoa farmers	144,018	3.9%	157	9	7.7%
Small-scale cocoa farmers	111,529	3.0%	87	6	3.3%
Fishermen	56,610	1.5%	42	3	0.8%
Food farmers	446,396	12.0%	67	5	10.2%
Petty traders	323,900	8.7%	78	5	8.7%
Subsistence group	1378,729	37.0%	14	1	6.8%

Table A7
Social table, 1948.

1948	No. in class	Population share (%)	Annual income (£)	Welfare ratio	Income share (%)
European government officials	493	0.0%	849	97	0.4%
Government (admin, executive, etc.)	11,741	0.4%	276	31	3.4%
Government (other)	20,873	0.8%	174	20	3.9%
Total skilled laborers	56,629	2.2%	104	12	6.2%
Commercial workers	30,633	1.2%	121	14	3.9%
Domestic services	10,410	0.4%	51	6	0.6%
Mines	30,632	1.2%	71	8	2.3%
Total unskilled laborers	94,060	3.6%	42	5	4.2%
Agricultural wages	210,898	8.0%	24	3	5.3%
Elite cocoa farmers	10,698	0.4%	472	54	5.4%
Large-scale cocoa farmers	21,397	0.8%	181	21	4.1%
Medium-scale cocoa farmers	100,565	3.8%	99	11	10.6%
Small-scale cocoa farmers	81,308	3.1%	51	6	4.4%
Fishermen	43,500	1.7%	41	5	1.9%
Food farmers	745,137	28.4%	37	4	29.2%
Petty traders	68,181	2.6%	55	6	4.0%
Subsistence group	1089,310	41.5%	9	1	10.2%

Table A8
Social table, 1931.

1931	No. in class	Population share (%)	Annual income (£)	Welfare ratio	Income share (%)
European government officials	949	0.0%	788	113	1.9%
Government (admin, executive, etc.)	6120	0.3%	131	19	2.0%
Government (other)	8775	0.5%	62	9	1.4%
Total skilled laborers	38,295	2.0%	51	7	4.8%
Commercial workers	13,296	0.7%	66	9	2.2%
Domestic services	16,430	0.8%	50	7	2.1%
Mines	14,107	0.7%	22	3	0.8%
Total unskilled laborers	67,449	3.5%	26	4	4.4%
Agricultural wages	136,224	7.0%	12	2	4.1%
Elite cocoa farmers	10,941	0.6%	148	21	4.0%
Large-scale cocoa farmers	21,882	1.1%	90	13	4.9%
Medium-scale cocoa farmers	102,847	5.3%	38	5	9.8%
Small-scale cocoa farmers	83,153	4.3%	27	4	5.6%
Fishermen	8429	0.4%	39	6	0.8%
Food farmers	571,427	29.4%	23	3	32.3%
Petty traders	57,120	2.9%	36	5	5.1%
Subsistence group	788,918	40.5%	7	1	13.8%

Table A9
Social table, 1921.

1921					
	No. in class	Population share (%)	Annual income (£)	Welfare ratio	Income share (%)
European government officials	995	0.1%	562	58	1.1%
Government (admin, executive, etc.)	1526	0.1%	110	11	0.3%
Government (other)	16,240	1.1%	57	6	1.8%
Total skilled laborers	10,851	0.7%	68	7	1.4%
Commercial workers	9661	0.6%	68	7	1.3%
Domestic services	3569	0.2%	56	6	0.4%
Mines	11,300	0.7%	27	3	0.6%
Total unskilled laborers	48,518	3.2%	33	3	3.1%
Agricultural wages	206,177	13.5%	20	2	7.8%
Elite cocoa farmers	10,309	0.7%	190	19	3.7%
Large-scale cocoa farmers	20,618	1.3%	138	14	5.4%
Medium-scale cocoa farmers	96,903	6.3%	72	7	13.2%
Small-scale cocoa farmers	78,347	5.1%	63	6	9.3%
Fishermen	9502	0.6%	38	4	0.7%
Food farmers	306,686	20.0%	61	6	35.4%
Petty traders	41,505	2.7%	29	3	2.3%
Subsistence group	660,106	43.1%	10	1	12.3%

Table A10
Social table, 1911.

1911					
	No. in class	Population share (%)	Annual income (£)	Welfare ratio	Income share (%)
European government officials	619	0.1%	371	38	0.8%
Government (admin, executive, etc.)	1085	0.1%	85	9	0.3%
Government (other)	11,550	1.1%	39	4	1.6%
Total skilled laborers	3832	0.3%	43	4	0.6%
Commercial workers	18,300	1.7%	25	3	1.7%
Domestic services	2539	0.2%	31	3	0.3%
Mines	11,700	1.1%	25	3	1.1%
Total unskilled laborers	34,603	3.1%	24	2	3.0%
Agricultural wages	134,264	12.2%	14	1	6.7%
Elite cocoa farmers	6713	0.6%	182	19	4.4%
Large-scale cocoa farmers	13,426	1.2%	108	11	5.2%
Medium-scale cocoa farmers	63,104	5.7%	55	6	12.5%
Small-scale cocoa farmers	51,020	4.6%	50	5	9.2%
Fishermen	6221	0.6%	38	4	0.8%
Food farmers	176,551	16.1%	48	5	30.5%
Petty traders	29,375	2.7%	23	2	2.4%
Subsistence group	534,693	48.6%	10	1	18.9%

Table A11
Social table, 1901.

1901					
	No. in class	Population share (%)	Annual income (£)	Welfare ratio	Income share (%)
European government officials	361	0.1%	250	34	0.7%
Government (admin, executive, etc.)	927	0.1%	85	12	0.6%
Government (other)	1400	0.2%	39	5	0.4%
Total skilled laborers	3710	0.6%	32	4	0.9%
Commercial workers	10,794	1.6%	32	4	2.5%
Domestic services	7665	1.2%	28	4	1.6%
Mines	17,000	2.6%	23	3	2.8%
Total unskilled laborers	29,306	4.4%	17	2	3.8%
Agricultural wages	20,148	3.0%	11	2	1.7%
Elite cocoa farmers	4478	0.7%	168	23	5.5%
Large-scale cocoa farmers	8955	1.4%	78	11	5.2%
Medium-scale cocoa farmers	42,090	6.4%	41	6	12.8%
Small-scale cocoa farmers	34,031	5.1%	41	6	10.3%
Fishermen	5930	0.9%	37	5	1.6%
Food farmers	89,054	13.5%	41	6	27.1%
Petty traders	27,101	4.1%	16	2	3.2%
Subsistence group	359,159	54.3%	7	1	19.4%

Table A12
Social table, 1891.

1891	No. in class	Population share (%)	Annual income (£)	Welfare ratio	Income share (%)
European government officials	308	0.0%	200	27	0.6%
Government (admin, executive, etc.)	792	0.1%	80	11	0.6%
Government (other)	1500	0.2%	32	4	0.4%
Total skilled laborers	3091	0.5%	32	4	0.9%
Commercial workers	4795	0.7%	32	4	1.4%
Domestic services	2795	0.4%	28	4	0.7%
Mines	2499	0.4%	23	3	0.5%
Total unskilled laborers	25,023	3.8%	19	3	4.3%
Agricultural wages	17,203	2.6%	11	2	1.8%
Elite cocoa farmers	3267	0.5%	249	54	7.5%
Large-scale cocoa farmers	6533	1.0%	51	7	3.1%
Medium-scale cocoa farmers	30,706	4.6%	31	4	8.8%
Small-scale cocoa farmers	24,827	3.7%	31	4	7.1%
Fishermen	16,593	2.5%	36	5	5.5%
Food farmers	88,202	13.3%	31	4	25.4%
Petty traders	35,313	5.3%	13	2	4.3%
Subsistence group	400,740	60.3%	7	1	27.1%

and commercial workers in the census report were for only a few towns and hence most likely are grossly underestimated, we use the share of the trading population for 1931 to estimate the sizes of these social classes. The number of agricultural workers is based on Hill (1997: 17), who indicates that there were as many farm laborers as farmers, as early as 1910 or earlier. We apply this ratio for the years 1901–21.

The 1911 population census (Gold Coast Colony, n.d.) gives occupational statistics for a few towns in the Western, Central, and Eastern provinces. Occupational statistics were not collected in the cases of Ashanti and the Northern Territories, as a majority of the male population in these areas were assumed to be mostly farmers, and the women employed mainly in domestic duties (Gold Coast Colony (n.d.: 34). Hence, we had to use estimates from secondary sources and the occupational shares in later years to determine the size of many social classes, especially for Ashanti and the Northern Territories.

The number of miners and skilled workers is taken from Kay and Hymer (1972: 415). The estimate of the number of cocoa farmers is based on Berg's (1960: 192) estimation that 10 to 15 percent of the total population was engaged in the cocoa sector between 1900 and 1910. The number of commercial workers and petty traders is based on the 1921 share of the trading population for Ashanti and the Northern Territories, as we have no reason to suspect that it changed significantly over the period. For food crop farmers, unskilled laborers, and all other social classes, we also use the share of the population for 1921.

The occupational distribution of the Gold Coast Colony as given by the 1901 census was based only on 10 principal towns which were mostly found in the Western, Central and Eastern provinces which made up the 'Colony'. Therefore, we use information from the census and from Kay and Hymer to estimate the respective size of our social classes. The number of African government administrators and executives, other government officials, and miners is based on Kay and Hymer's estimates (1972: 316; 415).

The number of skilled workers, fishermen, and agricultural laborers is taken from the census (Colony of the Gold Coast, 1902: 8). The number of commercial workers and petty traders is based on the share of the trading population in 1911. The estimate of the number of cocoa farmers is based on Berg's (1960: 192) estimation of between 10 and 15 percent of the total population involved in the cocoa sector during this period.

Occupational data for 1891 are given for only 16 towns and for 35,529 persons in the 1891 census (Gold Coast Colony (1892: 133–36). The number of most of our social classes for 1891 is therefore based on Szereszewski's (1965: 18–20) estimates and on the 1891 census. In 1891, there were virtually no cocoa exports from Ghana. Instead, the size of the cocoa farmers social class is calculated using the growth in farmers from 1901 to 11 period. Except the elite farmers who derived incomes from trade in palm oil and rubber, large-scale and small-scale cocoa farmers were the most affluent among the food farmers. Especially in the earlier years, it was customary to plant food crops for several years while cocoa seedlings were still growing (Beckett, 1944; Austin, 2014). Estimates of agricultural laborers are based on the share of the population of agricultural laborers in 1901.

Appendix III: Robustness of cocoa incomes

Distribution of production capacity

Within the rapidly expanding group of cocoa farmers, the distribution of production capacity was unequal from the start, although exact farm sizes remained unknown (Hill, 1956: 84–91; Konings, 1986: 76; Austin, 2013: 5–6). However, even though there are increasing numbers of surveys on the distribution of farming assets and income increases available from the 1930s onward, there is little consistent evidence on exact farm sizes, and there are few comparative statistics available over time (Austin, 2013: 6). Three

factors are especially relevant for the present study.²² First, regional variation was considerable, which makes it very difficult to find the average cocoa farming area from which to generalize. Second, while many farmers had more than one cocoa farm, all of the farms they owned were not necessarily included in surveys. Third, the available estimates are presented using different size bands, which makes combining the estimates to construct time series hazardous (Austin, 2013: 9). We therefore opted to use the first comprehensive national study to distinguish between different groups of farmers (see Section 3). However, to see how this assumption affects our results, we collected regional surveys on the distribution of production capacity for various years covering the period 1925/26 to 1963/64, which we use to distribute total exports over the total number of cocoa farmers to determine how robust our original estimates are.

A 1925/26 survey of cocoa farmers in Asante-Akyem in Ashanti reports that farm sizes varied from less than an acre to over 20 acres. About 45 percent of farmers had farms of less than an acre, 54 percent worked between one and ten acres, and one percent managed an area of more than ten acres to grow their trees (Austin, 2005: 307). Metcalfe (1964: 653) reports on a survey done by the Department of Agriculture on the farms of 1250 Ashanti farmers in the 1930s, which indicated that farm size varied from a fraction of an acre to 27 acres, and that 60 percent of the farmers owned up to one acre. Cardinal (1931: 87) suggests that the size of the average cocoa plantation was “somewhat in the neighbourhood of four acres.” Various regional surveys of cocoa farms during the 1950s indicate that a small group of elite cocoa farmers harvested 270 to 325 loads of 60lbs per year (Austin, 2013: 9). However, the majority of surveyed farms produced much less. About half of the farms produced less than 30 loads, and another 40 percent produced less than 100 loads annually (Office of the Government Statistician (1958, 1960). In 1963, five percent of farmers could be classified as large-scale farmers, producing around 200 loads of 60lbs each. More than half of the farmers produced between 40 and 100 loads of 60lbs, and the remaining small cocoa farmers produced between 10 and 40 loads (Beckman, 1970). We use the available regional distribution of production capacity and apply broad but homogeneous bands of production to distribute output across the farmers. In the next step, we apply this method on a national level to see how sensitive the results are to the different distributions of production capacity.

From Table A14 it is clear that the distribution of cocoa production capacity affects the exact level of incomes, but that variation is rather limited. For the years 1931 and 1925 the surveys allow the distinction between three classes of cocoa farmers: elite and large, medium, and small. When using the survey of 1925 for calculating the cocoa incomes for 1921, the elite/large farmer income is much higher compared to the original incomes used in the main text. This is because this group of farmers only makes up one percent of the population according to the survey, but produces 37 percent of the output. For 1931, the combined income for elite and large-scale farmers is actually close to the average of elite incomes and large-scale farmer incomes used in the main text. The same is true when we use the survey estimates on the distribution of production capacity from the mid-1950s from Hill (1956). Incomes for medium and small-scale farmers are very similar to the ones used in the main text. The surveys of Oda-Swedru-Asamankese and Ashanti from the mid-1950s allow for the distribution of output over the four categories of farmers as used in the main text. Again, incomes using these distributions for small- and medium-scale farmers show very similar income levels compared to the ones used in the main text. The income for large-scale farmers is higher than the estimate used in the main text for Oda-Swedru-Asamankese and a bit lower for Ashanti; the same is true for elite farmers' incomes. But the different levels of income seem within reasonable bounds, and the average of the two is similar to the estimates based on the regional average used in the main text.

Measurement of cocoa incomes

In the main text we apply an indirect method to calculate incomes. First, we distinguish between different groups of farmers with respect to production capacity based on the first comprehensive national study of inequality among cocoa-farmers, which was done for the crop year 1963/64 (Beckman, 1970). Second, we distribute total exports across the different groups of farmers. Finally, we multiply the resulting production level by the prevailing retail price. To check whether this indirect approach of calculating cocoa incomes results in reasonable estimates, we can compare our estimates to detailed production and income estimates from the mid-1950s cocoa surveys of Ashanti and Oda-Swedru-Asamankese (Office of the Government Statistician, 1958, 1960). These surveys provide information on loads sold, number of laborers and others employed, incomes earned from sources other than cocoa, and farming costs for 12–14 income groups. When we compare cocoa incomes earned using our method based on export figures in combination with the distribution of output over groups of farmers, we get fairly close to the level and distribution of net incomes (gross incomes minus farming costs) given in the surveys; see Table A15 below. Yet, our method using retail prices and production is actually calculating gross incomes, and therefore seems to underestimate cocoa incomes, especially at the top of the scale. There are three possible reasons for this. First, the export figures that we use as the base for our calculations might be too low. However, given the importance of cocoa exports to the colonial government, underreporting seems unlikely. Second, the number of cocoa farmers recorded in the census may be too high. Distributing total reported output over an overestimated number of farmers leads to lower incomes for all. Third, the farmers in the areas covered by the survey may not be representative of the average farmer, so the average cocoa income might be lower than indicated for these two regions. As we have no clear indication from our primary and secondary sources or the literature on which of the two (too little exports or too many farmers) might be driving our cocoa income estimates down, we continue with our method for calculating incomes as described above.

Continuing with the method as described above has important implications. First, our method underestimates total gross income earned in the economy. Second, had we included the actual gross incomes of cocoa farmers, we might have underestimated actual

²² Austin (2013) also discusses the fact that with a tree crop it is crucial to distinguish between current output and/or income and the capital value or wealth that the farm represents. While the latter is an important factor determining latent wealth inequality between farmers, this factor seems less relevant when discussing income inequality alone.

Table A13

Farm sizes and levels of output in the cocoa sector.

	1925		1931		Various regions 1954/55		Oda Swedru Asamankese 1955/1956		Ashanti 1956/57		National survey 1963/64	
	% farmers	% output	% farmers	% output	% farmers	% output	% farmers	% output	% farmers	% out-put	% farmers	% output
< 20 loads	67	29	60	2	29	9	48	6	25	4	38	7
100 loads	32	33	20	4	53	49	46	29	53	41	47	39
> 100 loads	1	37	15	39	17	43	5	32	15	24	10	23
> 200 loads			5	55			1	33	7	30	5	31

Source: 1925/26: [Austin \(2005: 307, Table 16.1\)](#). 1931: [Cardinall \(1931\)](#). 1954/55, various regions: [Hill \(1956: 89–90, Tables 16 and 17\)](#). Oda-Swedru-Asamankese, 1955: Office of the Government Statistician (1958: 68–69, Table 22) and (1960: 54–55, Table 21). 1963/64: Beckman (1970) reproduced in [Konings \(1986: 76\)](#). We apply the 1925 estimate to our 1921 social table, the 1931 estimate to our 1931 social table, and the 1950s estimate to our 1960 social table.

Table A14

Cocoa income estimates using regional surveys from Table A13.

	1920s Original estimate paper (1921)	Regional survey estimate (1925)	1930s Original paper estimate (1931)	Regional survey estimate Cardinall (1931)	1950s/1960s Original paper Estimate (1960)	Regional survey estimate Hill (1956)	Regional survey estimate Oda-Swedru- Asamankese (1955/56)	Regional survey estimate Ashanti (1956/57)
Elite/large	190	496	148	231	673		1172	538
Large	138		90	95	250	331	697	244
Medium	72	74	38	28	157	167	135	152
Small	63	66	27	25	87	101	81	85

Sources: See Table A13; authors' calculations using total exports, prevailing retail prices, and the method described in Section 3.

Table A15

Comparison incomes, cocoa farmer surveys, and indirect estimates.

Social group	Category	Oda-Swedru- Asamankese net farming incomes £	Ashanti net farming incomes £	Indirect cocoa incomes using national exports £
Small cocoa farmers	less than 20 loads	59	68	87
Medium cocoa farmers	20–100 loads	185	187	157
Large cocoa farmers	100–200 loads	375	393	250
Elite cocoa farmers	more than 200 loads	753	870	673

Source: Authors' calculations and Office of the Government Statistician (1958, 1960).

inequality. On the other hand, the surveys indicate that except for the very small-scale cocoa growers, about 88 percent of all costs (the difference between gross and net incomes in the survey) are due to payments made to labor. These are incomes that accrue to agricultural laborers and not cocoa farmers. Agricultural laborers and their incomes are accounted for in the social tables. The sum of both kinds of income should be equal to the total income earned in the cocoa sector by the different participants. Further, costs, and especially labor costs, seem specific to the cocoa sector. None of the other sectors defined in our social tables include incomes earned using substantial wage labor (Van Hear, 1982). Therefore, using net cocoa incomes minus labor costs actually much more comparable to the way we calculate average incomes for the other social groups. Given that the level and internal distribution of cocoa incomes is similar to the survey data from the 1950s, we apply this method for calculating cocoa incomes for all other census years.

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