

# The plantation paradigm: colonial agronomy, African farmers, and the global cocoa boom, 1870s–1940s\*

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## Abstract

*This article investigates the powerful normative role of plantation-oriented agricultural practices in what was arguably the premier indigenous crop revolution of the colonial era: the West African cocoa boom. It traces the links between the extraordinary growth of cocoa production in the region – above all in the Gold Coast – and the longer experience of cocoa estates in other parts of the world, in particular the Caribbean, which served as a key reference point for the expanding global cocoa frontier in the late nineteenth and early twentieth centuries. In spite of the manifest competitive success of African farmers' extensive agricultural practices during this period, most outside observers retained a strong partiality towards intensive production techniques under centralized European management. This article emphasizes the role played by the transcontinental exchange of ideas in sustaining the cultural authority of such cultivation techniques long after their commercial viability came into question.*

**Keywords** agriculture, cocoa, environment, knowledge, plantation

One of the recurring themes in the history of plantations is the perennial cycle of boom and bust. Whether the crop is sugar, tobacco, or cotton, the basic pattern is often the same: an initial frenzy of clearing and planting is followed by either a precipitous collapse of production or a gradual process of creeping decline before eventually ending in soil exhaustion, abandonment, and relocation elsewhere. Of all the many crops that have been grown on plantations, none are more prone to cyclical extremes than cocoa.<sup>1</sup> There is a whole host of factors that cause such volatility. Economic and political changes are of course crucial, including shifts in trade policy, the vagaries of import markets, and, most

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\* I would like to thank the British Academy for generously supporting the research upon which this article is based, as well as Francesca Carnevali, Matthew Hilton, and Tom McCaskie for their helpful comments on an earlier draft. In addition, the two anonymous reviewers as well as the journal editors deserve a special word of thanks for the exceptionally constructive comments they provided.

1 The essential study is François Ruf, *Booms et crises du cacao: les vertiges de l'or brun*, Paris: Karthala, 1995.

fundamentally, the availability of cheap (often coerced) labour, all of which were profoundly transformed over the course of the nineteenth century with the liberalization of trade and the suppression of slavery. Ecological changes were often equally important, ranging from soil erosion and long-term fertility loss to pests and diseases, all of which also shifted over the course of the nineteenth century as fresh forestland grew scarcer in certain regions and as the thickening networks of global trade allowed diseases to circulate farther and faster than ever before.<sup>2</sup>

Over many years, planters developed a broad repertoire of solutions to cope with these problems. Among the most time-honoured were the abandonment of tired soils for freshly cleared forest, the introduction of different crops to spread risk, and the mechanization of simple tasks to reduce labour costs. By the late nineteenth century, modern science promised a major expansion of this toolkit. As agronomists in Europe and North America achieved record yield increases, tropical botanists were likewise shifting their attention away from discovery and classification towards the improvement and ‘acclimatization’ of known crops.<sup>3</sup> The rapid advances on both fronts led to a growing faith in the capacity of science to ensure the profitability of agricultural enterprises even in relatively unfamiliar environments. After all, if medical and metallurgical breakthroughs could furnish ‘tools of empire’ capable of conquering entire civilizations, then surely agronomists could overcome the challenges facing agricultural estates – as indeed they were already doing in the cases of sugar and rubber.<sup>4</sup> As a result, around the turn of the century the modern plantation involving outside capital and the latest agronomic expertise was widely seen as the most effective vehicle for developing the ‘underused’ lands of the tropics and increasing the supply of sought-after crops for world markets. As the director of Ceylon’s royal botanical gardens put it in 1904, ‘Two or three large planting enterprises will do more to open up and enrich the country than thousands of villagers can do.’<sup>5</sup>

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- 2 See, generally, Philip D. Curtin, *The rise and fall of the plantation complex: essays in Atlantic history*, Cambridge: Cambridge University Press, 1990. On cocoa specifically, see William Gervase Clarence-Smith, *Cocoa and chocolate, 1765–1914*, London: Routledge, 2000; William Gervase Clarence-Smith, ed., *Cocoa pioneer fronts since 1800: the role of smallholders, planters and merchants*, Basingstoke: Macmillan, 1996.
  - 3 Yvon Chatelin and Christophe Bonneuil, eds., *Nature et environnement*, Paris: Orstom Éditions, 1995; Christophe Bonneuil, *Des savants pour l’empire: la structuration des recherches scientifiques coloniales au temps de ‘la mise en valeur des colonies françaises’ 1917–1945*, Paris: ORSTOM, 1991; Michael A. Osborne, *Nature, the exotic, and the science of French colonialism*, Bloomington, IN: Indiana University Press, 1994; Harro Maat, *Science cultivating practice: a history of agricultural science in the Netherlands and its colonies 1863–1986*, Dordrecht: Kluwer, 2001; Stuart McCook, *States of nature: science, agriculture, and environment in the Spanish Caribbean, 1760–1940*, Austin, TX: University of Texas Press, 2002; Detlef Bald and Gerhild Bald, *Das Forschungsinstitut Amani: Wirtschaft und Wissenschaft in der deutschen Kolonialpolitik Ostafrika 1900–1918*, Munich: IFO, 1972; Michael Worboys, ‘Science and British colonial imperialism, 1895–1940’, PhD thesis, University of Sussex, 1979; G. B. Masefield, *A history of the colonial agricultural service*, Oxford: Clarendon, 1972.
  - 4 Daniel Headrick, *The tools of empire: technology and European imperialism in the nineteenth century*, Oxford: Oxford University Press, 1981; idem, *The tentacles of progress: technology transfer in the age of imperialism, 1850–1940*, Oxford: Oxford University Press, 1988, pp. 209–58; J. H. Drabble, *Rubber in Malaya, 1876–1922: the genesis of the industry*, Oxford: Oxford University Press, 1973; Colin Barlow, *The natural rubber industry: its development, technology, and economy in Malaysia*, Oxford: Oxford University Press, 1978; Wim Van der Schoor, ‘Pure science and colonial agriculture: the case of the private Java sugar experimental stations, 1885–1940’, in Chatelin and Bonneuil, *Nature et environnement*, pp. 13–20; J. H. Galloway, ‘Botany in the service of empire: the Barbados cane-breeding program and the revival of the Caribbean sugar industry, 1880s–1930s’, *Annals of the Association of American Geographers*, 86, 4, 1996, pp. 682–706.
  - 5 John C. Willis, *A report upon agriculture in the Federated Malay States*, Kuala Lumpur: FMS Government Printing Press, 1904, p. 90.

The history of the global cocoa boom during this period offers a vivid illustration of how this was *not* always the case. In the event, the modern plantation – by which I mean a large agricultural production complex employing outside capital and technology and concentrating on the intensive production of a single crop for export – proved a relatively inefficient means of cocoa production. Instead, the huge increase in output during this period came overwhelmingly from an expansion of smallholder-style production – by which I mean land-extensive and mixed-cropping techniques commonly employed by smallholders but practised on farms of varying scales – above all in the humid forest belt of West Africa. So rapid was the expansion in the Gold Coast that it was widely viewed by contemporaries as the most dramatic example of indigenous cash-cropping initiative in the entire tropical world, furnishing conclusive proof of the wisdom of Britain’s pro-peasant ‘West African lands policy’ and leaving little or no room for the handful of plantations there that were soon overpowered by the success of their African neighbours.<sup>6</sup>

At the same time, however, the case of cocoa also highlights the remarkable persistence of plantation models and their associated cultivation methods long after their relative inefficiency for bulk production was plainly apparent. Despite mounting evidence to the contrary, the majority of planters and colonial officials stubbornly clung to a belief in the technical supremacy of intensive production techniques under centralized European management.<sup>7</sup> At one level this no doubt reflected the disproportional power of planters in areas where they were well entrenched, where lands were considered too ‘vacant’ or local populations too ‘idle’ to build new export industries. Sheer force of habit likewise played an important role, given the long experience of European-run plantations growing a host of tropical crops. One might also attribute it to the greater ability of state administrators to ‘see’, control, and generate revenue from large, concentrated estates than from scattered smallholdings.<sup>8</sup>

Yet, as important as these factors were, part of the explanation must also be sought in the realm of culture and ideas, above all in the powerful ideological devotion to plantation agriculture and the methods associated with it. Throughout much of the tropical world, and especially in Europe’s colonies, plantations were much more than commercial enterprises; they were also incarnations of European agronomic knowledge and symbols of European power. During the age of ‘social evolutionism’ both the superiority and universal validity of this knowledge were taken for granted, and indeed formed the chief justification for the colonial presence in much of the tropical world.<sup>9</sup> Although the conspicuous success of

6 See the remarks in Fritz Klopstock, *Kakao: Wandlungen in der Erzeugung und der Verwendung des Kakaos nach dem Weltkrieg*, Leipzig: Bibliographisches Institut, 1937, p. vii; also Auguste Chevalier, *La situation agricole de l’ouest africain: enquête*, Domfront: Senen, 1906, p. 21.

7 First highlighted for Ghana by R. H. Green and S. H. Hymer, ‘Cocoa in the Gold Coast: a study in the relations between African farmers and agricultural experts’, *Journal of Economic History*, 26, 3, 1966, pp. 299–319; further elaborated by Gareth Austin, ‘Mode of production or mode of cultivation: explaining the failure of European cocoa planters in competition with African farmers in colonial Ghana’, in Clarence-Smith, *Cocoa pioneer fronts*, pp. 154–75.

8 James C. Scott, *Seeing like a state: how certain schemes to improve the human condition have failed*, New Haven, CT: Yale University Press, 1998.

9 Michael Adas, *Machines as the measure of men: science, technology, and ideologies of Western dominance*, Ithaca, NY: Cornell, 1989.

African cocoa farmers threatened to undermine this conviction – not to mention many European-owned cocoa estates – the plantation paradigm nonetheless retained much of its cultural authority as a model of agronomic progress that could be applied to virtually any tropical crop as a means of maximizing efficiency.

This article will briefly explore some of the ‘lessons’ of plantation cocoa and how they were applied to the indigenous planting boom in colonial West Africa. In so doing it seeks to place the rise of West African cocoa into a broader set of contexts and comparisons than is generally provided in the vast literature on the subject.<sup>10</sup> After surveying the expansion of the global cocoa industry it will discuss some of the main issues facing planters during the late nineteenth and early twentieth centuries, above all in the Caribbean region, whose well-established estates and relatively longstanding agricultural departments served as an important reference point for the expanding cocoa frontiers in other parts of the world.<sup>11</sup> It will then consider how the experience and knowledge generated there shaped thinking about the dramatic growth of cocoa cultivation in West Africa and in particular the need to ‘improve’ local farming techniques on the basis of modern agronomic principles.

## The rise of the global cocoa industry

Cocoa, like all major tropical crops, has a number of specific characteristics that influence not only where it can grow but also the manner and scale of its production. As an understorey tree indigenous to the upper Amazon basin and Orinoco, its essential conditions are continual warmth and a regular supply of moisture. It grows best where rainfall is between 1,500 and 2,000 mm per year and where diurnal temperature fluctuations are between about 18°C and 32°C. Although it dislikes prolonged or intense dry seasons, brief periods of low rainfall are advantageous for the purpose of drying harvested beans. It strongly prefers locations sheltered from strong winds and is sensitive to waterlogged soils. Some degree of shade is often beneficial, as are deep, well-drained clay loam soils, but neither is indispensable depending on local conditions. In biological terms, huge areas of tropical lowland forest below about 600 metres are therefore suitable for cocoa, which greatly facilitated its transfer around the globe.<sup>12</sup>

In commercial terms, the most important characteristic of cocoa is that it requires several years between planting and first harvest. This basic attribute – which it shares with coffee and rubber – has two important effects: first, it engenders a relative inelasticity of supply; second, it tends to encourage more long-term and individualized land tenure arrangements, in the form either of outright land title or of ownership of the crop itself. Another crucial feature is that cocoa can be profitably grown on vastly different scales of operation. Unlike cotton or sugar, neither its cultivation nor processing affords any meaningful economies of scale. This characteristic, combined with the relative ease of planting, has made it an archetypal smallholder crop.

10 For inroads, see Clarence-Smith, *Cocoa and chocolate*; Benjamin Acquah, *Cocoa development in West Africa: the early period with particular reference to Ghana*, Oxford: Ghana University Press, 1999.

11 Masfield, *Colonial agricultural service*, pp. 31–2.

12 Allen Young, *The chocolate tree: a natural history of cacao*, Washington, DC: Smithsonian, 1994, pp. 2–3.

But if cocoa is one of the easiest export crops to establish it is also one of the hardest to maintain over the long term. Despite a productive life-span of the plants of anywhere from twenty to eighty years, cocoa production in any given region has always been marked by particularly volatile swings. For one thing, it is quite prone to pests, disease, and wind damage. Moreover, the fact that pests and disease are generally worse on second-growth lands means that replanting is almost never economically feasible so long as there is new forest land available. This need to tap the ‘forest rent’ has long made cocoa frontiers highly mobile. And, to turn the relationship around, in areas with suitable climate and available forest, no other cultivar has proved a more profitable vehicle for exploiting forest capital than cocoa.<sup>13</sup>

Although cocoa had long been used for various purposes in pre-Columbian societies and was first brought to Europe in the early sixteenth century, its elevation into a major tropical commodity came mainly in the nineteenth century with the reduction of import duties on New World goods and with a string of confectionary innovations that transformed the dominant mode of consumption from a drink to a solid. The real breakthrough began around the 1880s as the expansion of global transport and rising purchasing power in Europe converted chocolate from a luxury article into an item of mass consumption.<sup>14</sup> As more people developed a taste for it, cocoa production rose rapidly to meet demand. World exports first surpassed 40,000 tons in 1885 and increased exponentially thereafter, reaching 95,000 tons in 1900, 280,000 in 1914, 500,000 in the 1920s, and surpassing 700,000 tons in the later 1930s. From 1900 to 1920 production increased roughly fourfold while prices sank by around two-thirds. By far the largest import market was continental Europe, which accounted for 58% of the cocoa trade from 1909 to 1913, with the UK taking a further 12% (26% went to the US). In the late 1930s, Europeans consumed an average of 331,000 tons of cocoa per year, over half of world production; it was not until the onset of the Second World War that US imports surpassed those in Europe.<sup>15</sup>

This explosive growth of trade and consumption was inextricably linked to a shift in the geographic centre of production. As the cocoa boom began in the 1880s, the crop was still overwhelmingly centred on the historic heartlands of Central and South America and parts of the Caribbean. Shortly after the turn of the century, however, the coastal belt of West Africa – above all the Gold Coast, but also Nigeria and to a lesser extent the Ivory Coast – eclipsed Latin America as the heart of the world cocoa industry, accounting for around two-thirds of global production by the 1930s.

In turn, this shift of geographic focus was also related to changes in the product itself. Cocoa (*Theobroma cacao*) is a remarkably variable species divided into three main varieties. *Criollo* types, grown mainly in Latin America, are highly prized for flavour but often suffer from low yields and disease; this combination of fussiness and superior price made *criollo*

13 Ruf, *Booms et crises*, pp. 91–159.

14 Sophie D. Coe and Michael D. Coe, *The true history of chocolate*, London: Thames & Hudson, 1996, pp. 203–35, 241–51.

15 Vernon D. Wickizer, *Coffee, tea and cocoa: an economic and political analysis*, London: Stanford University Press, 1951, pp. 264, 484–5; Joseph Grunwald and Philip Musgrove, *Natural resources in Latin American development*, Baltimore, MD: Johns Hopkins Press, 1970, pp. 332, 336; Clarence-Smith, *Cocoa and chocolate*, pp. 238–9.

particularly attractive to well-capitalized planters whose higher overheads could only be justified by the premium prices it could fetch. *Forastero* types – which include the *amelonado* variety that dominated in West Africa – produce a lower quality of cocoa but are more productive and more resistant to disease. Many hybrids were also developed over the years, commonly dubbed *trinitarios* after their origin on Trinidad, though most require constant maintenance and generally do not breed true. The different types of beans produced by these varieties are not regarded as the same commodity, but are broadly categorized into flavour versus bulk beans, which broadly corresponds to a distinction between *criollo* and *forastero* (allowing for considerable overlap in quality and price). From the late nineteenth century onwards, the evolution of chocolate from luxury article to mass consumer good generally reflected a rise in the proportion of bulk beans. Since this market was increasingly dominated by African farmers, the eclipse of the noble *criollo* varieties partly reflected a decline in the proportion of cocoa grown on centralized plantations.<sup>16</sup>

In certain ways, then, the ‘democratization’ of cocoa consumption at one end of the commodity chain was mirrored in the eclipse of large-scale latifundia by small- and medium-sized farmers at the other. Yet this shift was neither immediate nor absolute, and in many areas the chief result of the cocoa boom was the proliferation of cocoa plantations characterized by centralized organization and intensive modes of cultivation.<sup>17</sup> This remained the case to varying degrees in the oldest producer regions in Latin America, and was particularly evident wherever the more demanding *criollo* varieties were grown. It was also common in equatorial Africa and parts of Southeast Asia. It was least evident in the British colonies of West Africa, the cocoa world’s new centre of gravity, where control over land distribution was left largely in the hands of indigenous elites. Yet by and large administrators throughout most of Europe’s colonial empires tended to place their faith in large estates to develop agricultural exports. And even where official policy was to promote indigenous cultivation, as in Nigeria and the Gold Coast, agricultural officials often tried to convert farmers from their supposedly archaic methods to more capital- or labour-intensive techniques.

## The modern cocoa plantation: practices and problems in global perspective

Of course, cocoa plantations were no more a single entity than the numerous varieties of cocoa itself. They came in a range of different shapes and sizes, adapted a variety of methods to diverse ecological and social conditions, and employed different commercial and agricultural strategies in an attempt to maximize the profits they could coax out of the soil. Without getting bogged down in definitions, it is important to recognize that the label ‘plantation’ was itself used quite broadly. Reporting on his fact-finding mission to Central and South America, the German botanist Paul Preuss was struck by the broad continuum of

16 Clarence-Smith, *Cocoa and chocolate*, pp. 176–80.

17 And frequently by coerced labour as well, as the slavery scandals of the 1900s attest: see Lowell J. Satre, *Chocolate on trial: slavery, politics, and the ethics of business*, Athens, OH: Ohio University Press, 2005; Catherine Higgs, *Chocolate islands: cocoa, slavery, and colonial Africa*, Athens, OH: Ohio University Press, 2012.

cocoa farms, ranging from the ‘well-tended gardens’ of Suriname, through the large plantations on Trinidad, to the ‘forests and occasionally even thickets’ of cocoa in Ecuador.<sup>18</sup> Nor were the conditions on plantations static. Methods of planting and maintenance were shaped by innovations such as fungicides and artificial fertilizers, as well as by price trends and shifting labour laws. But despite all their differences, cocoa plantations throughout the tropics faced similar types of problems during this period. Over time, the increasingly global exchange of information between the thickening network of research stations and botanical gardens created a set of semi-standardized and expert-endorsed practices that were reflected in plantation operations in many different parts of the world.

The Caribbean is arguably the best place to get a sense of these commonalities and differences. During the late nineteenth century, most would-be cocoa planters searching for the state of the art tended to look there (including Preuss, who was commissioned by the German Colonial Economic Committee to make recommendations for the development of the cocoa industry in Cameroon). Although the region had long been a focal point of global cocoa production, the rapid expansion of cultivation in certain territories meant that it was home to many of the world’s newest plantations. In addition, the divergent climatic and soil conditions in the area meant that there was a range of different models on display.

Trinidad was by far the largest cocoa producer in the Caribbean, ranking third in the world behind Ecuador and Brazil by the turn of the century. Although small amounts had been grown here since the mid seventeenth century, nearly all of its quarter million acres of cocoa came in a flurry of planting after the 1860s, much of it initially undertaken by smallholders but increasingly centred on larger estates.<sup>19</sup> Planting and maintenance methods broadly reflected – and subsequently influenced – those in many other areas. Standard practice was roughly as follows. First, all vegetation was cut down and burned, apart from any commercially valuable wood. After digging drainage ditches, seeds were sown at stake at wide intervals of anywhere from 12 by 12 feet to 16 by 16 feet, depending on the quality of the soil (the richer the soil, the greater the distance, as faster growth required more space to prevent overcrowding). Spacing at such wide intervals necessitated a considerable amount of weeding, especially before the canopy thickened and shaded the ground underneath. After six or seven years the trees began to bear, and reached full production at anywhere from ten to fifteen years. Broadly speaking, this method of planting involved a wholesale elimination of the original forest ecosystem; little if any of the previous cover was left. But since cocoa had evolved as an under-storey tree, many of the practices on Trinidad’s cocoa estates effectively mimicked the ecological services – moisture retention, shade, wind protection – otherwise provided by the original forest cover. Windbreaks were regarded as vital, especially wherever cocoa groves were exposed to hurricanes or tropical storms. Shade was also important for guarding against drought, avoiding high soil temperatures, and reducing erosion. For young saplings, temporary shade was generally provided by cassava, chillies, or pigeon peas, which also delivered an income before the trees began to yield. For mature

18 Paul Preuss, *Expedition nach Central- und Südamerika*, Berlin: Kolonial-Wirtschaftliches Komitee, 1901, pp. 239–40.

19 E. R. Moll, *Cacao in Trinidad and Tobago*, n.p., 1960, p. 2; Kathleen Phillips Lewis, ‘The Trinidad cocoa industry and the struggle for crown land during the nineteenth century’, in Clarence-Smith, *Cocoa pioneer fronts*, pp. 45–64.

groves the issue of shade was more controversial, for while protection from the full glare of the sun tends to extend the trees' productive life span and reduces the risk of drought, it also slows growth and limits yields.

For decades, the question of shade on cocoa estates was a source of considerable disagreement among planters and botanists, for the balance of advantages and disadvantages varied from one locality to another. At the time, most agronomists recommended some degree of permanent shade for cocoa plantings to maintain moisture and reduce soil temperatures.<sup>20</sup> On Trinidad it was widely deemed indispensable, given that average rainfall was relatively low for cocoa (approximately 1,700 mm) and the risk of seasonal drought relatively high. During the late nineteenth century many Trinidadian estates planted one shade tree for every two cocoa trees, placing them at most around 12 metres apart. For outside observers this seemed excessive, and the debate eventually prompted a four-year experiment by the Trinidad Department of Agriculture that ultimately recommended partial shade.<sup>21</sup> But this still left the question of which species were best suited to the task. Over the years a variety of shade trees were tried, most of them producing a catch crop – for example, bread fruit, mango, rubber, and kapok. None, however, compared with the evergreen *Erythrina* species or immortal tree, in Spanish often called '*madre del cacao*'. Despite the fact that it bears no fruit and the wood is not valuable, the immortal is easy to propagate, forms a good canopy that retains humidity, and, best of all, often sheds some of its foliage just as the cocoa crop ripens, thereby letting the sun in at the very moment when it is most beneficial.<sup>22</sup> On Trinidad they were so prevalent that, as one contemporary remarked, an unsuspecting visitor might be forgiven for asking 'Is this an Immortel plantation?'<sup>23</sup> At base, this strong emphasis on shade trees reflected a strategic decision to simulate certain forest conditions as the basis for the cocoa growing environment.

If Trinidad occupied one end of the spectrum, the other was represented by nearby Grenada, the second largest island producer in the Caribbean, whose estates were famed for their almost complete *lack* of permanent shade. One reason for the disparity was the island's high and relatively consistent rainfall (2,000–3,000 mm), which made moisture retention far less problematic than on Trinidad. Other reasons were its highly suitable clay soils and a ready supply of cheap labour. Together, these factors allowed Grenadan planters to adopt a remarkably intensive form of cultivation. Trees were planted at intervals as close as 8 by 8 feet, drains were dug, and the ground was clean-weeded until the cocoa canopy closed and shaded the soil. Closure of the canopy did not take long, for compared to their slow but steady counterparts on Trinidad – which reached full production after at least ten years – Grenada's open-sun cocoa trees produced their first full harvest in only half the time and achieved roughly double the yields at maturity. This was, of course, a major advantage, but

20 E.g. Auguste Chevalier, *Le cacaoyer dans l'ouest Africain*, Paris: Challamel, 1908, pp. 116–17; Henri Jumelle, *Le cacaoyer: sa culture et son exploitation dans tous les pays de production*, Paris: Challamel, 1900, pp. 77–80; Ministère des Colonies, *Manuel pratique de la culture du caféier et du cacaoyer au Congo belge*, Brussels: Van Campenhout, 1908, pp. 76–8; Arthur W. Knapp, *Cocoa and chocolate: their history from plantation to consumer*, London: Chapman and Hall, 1920, pp. 36–40.

21 Knapp, *Cocoa and chocolate*, p. 40.

22 Jumelle, *Le cacaoyer*, pp. 79–80.

23 Knapp, *Cocoa and chocolate*, pp. 34–7, quote p. 37; Preuss, *Expedition*, pp. 181–4.



the flip side was that Grenada's cocoa groves tended to live fast and die young. Full sun not only wore out the trees more quickly; it also 'exploited the soil thoroughly in quick time' through a combination of high growth rates, high yields, and greater exposure of soil to the sun.<sup>24</sup> Whereas Trinidad's estates generally sought to minimize the loss of fertility through heavy shade or the occasional planting of ground cover, on Grenada the density of plantings and the lack of cover required a more proactive regime of weeding, pruning, forking, and manuring to maintain fertility.<sup>25</sup> Although the open-sun system was notably labour-intensive, before the slump in cocoa prices in the early 1920s the costs were justified both by higher yields and by the lower risk of fungal diseases such as witches' broom (a fungus endemic to the Amazon basin), which tended to be more problematic in shadier growing conditions.<sup>26</sup> By the 1910s the tendency to maximize yield per acre on Grenada was also reinforced by a growing shortage of land.<sup>27</sup>

Overall, the full-sun system was well tailored to the particular ecological and social conditions on Grenada, and demonstrated that there was no single answer to the fundamental question of shade versus none. Yet the employment of such intensive methods was due as much to deep-seated cultural preferences as to the physical conditions of the island. Undoubtedly, many Grenada estates were highly profitable until the 1920s. But contemporaries extolled them as much for their appearance *per se* as for anything else. In many eyes their thorough mastery of the estate environment – where 'the ground may be kept so tidy and free from weeds that they have the appearance of gardens' – embodied agricultural modernity itself.<sup>28</sup> Compared to the local peasant groves, whose owners were 'addicted to a life of tropical indolence' and 'often do no more than chop out the weeds and harvest the crop', Grenada's meticulous estates stood both as paragons of agronomic virtue and as reassuring symbols of a presumed cultural superiority.<sup>29</sup>

But however aesthetically pleasing they may have been, even the most orderly plantation environments were no match for adverse ecological conditions. A vivid illustration could be found in nearby Suriname, which possessed not only one of the world's most capital-intensive cocoa industries but also one of the least profitable. Located mainly in the alluvial valleys of the Suriname and Commewijne rivers, Suriname's cocoa estates boasted a reputation for tidiness and precision that surpassed even the neatest estates of Grenada.<sup>30</sup> After the forest had been cleared and expensive drainage works dug, *forastero* seeds were planted at wide intervals of 4–6 metres, and the soil was hoed and covered with straw to suppress weeds and retain moisture. Initial shade was provided by bananas, mature shade by *Erythrina* varieties as on Trinidad.<sup>31</sup> Once established, most operated a particularly

24 Preuss, *Expedition*, p. 187; C. Y. Shephard, *Report on the economics of peasant agriculture in the Gold Coast*, Accra: Government Printer, 1936, pp. 2–4.

25 Harley P. Milstead, 'Cacao industry of Grenada', *Economic Geography*, 16, 2, April 1940, p. 199.

26 Wickizer, *Coffee, tea and cocoa*, pp. 297–8.

27 Milstead, 'Cacao industry', pp. 202–3.

28 Knapp, *Cocoa and chocolate*, p. 30.

29 Milstead, 'Cacao industry', p. 199.

30 Preuss, *Expedition*, pp. 168–9, 239–40; Clarence-Smith, *Cocoa and chocolate*, pp. 154–5.

31 E. J. Bartelink, *Handleiding voor kakao-planters*, Amsterdam: de Bussy, 1885, pp. 18–19, 20–3.

thorough regime of weeding and pruning that was – though it was not known at the time – almost certainly counterproductive insofar as it suppressed the breeding of pollinating midges crucial to the productivity of cocoa groves.<sup>32</sup> The reward for all this work was a catastrophic outbreak of witches' broom, which quickly overwhelmed the moist monocultures of Suriname's cocoa plantations after 1895. Agronomists in the colony were stumped: no amount of carbolic acid, radical pruning, or dousing with Bordeaux mixture (a blend of copper sulphate and lime used since the 1880s as a fungicide for vineyards) could do more than slow the inexorable advance of the disease, which covered the colony by 1903 and had effectively killed its cocoa industry by the 1920s.<sup>33</sup>

Although Suriname was an extreme example, pests and pathogens were a perennial problem in most cocoa-producing areas, and were generally exacerbated by the (relatively) uniform character of plantation environments. A few examples must suffice by way of illustration. On Ceylon, where cocoa was introduced in the late nineteenth century in response to the devastation of coffee production by the *Hemileia vastatrix* fungus,<sup>34</sup> the fledgling industry was ravaged by an outbreak of cacao canker (*Phytophthora faberi*, a bark fungus) that spread like wildfire through its monocultural stands and infected 98% of the trees in the colony by 1902. Although it was eventually contained by the first large-scale spraying of fungicides anywhere in the tropics, confidence in the future of cocoa never fully recovered among the planter community.<sup>35</sup> On São Tomé, Africa's leading producer for most of the nineteenth century, excessive forest clearance and a shift to full-sun techniques around the turn of the century contributed to a massive outbreak of thrips (a juice-sucking insect pest that is especially problematic in drier conditions) that nearly wiped out the crop during the First World War.<sup>36</sup> On the well-capitalized and carefully managed German cocoa estates around Mount Cameroon, the heavy losses to brown pod (a common fungal disease in cocoa stands) in the 1900s did not – as was erroneously asserted at first – result from cross-infection from indigenous cocoa plantings but rather from a combination of uniform stands and excessive shade in the relatively wet conditions.<sup>37</sup> The disease problems on Western Samoa, by far the leading cocoa producer in the South Pacific, were particularly distinctive given its fragile island ecosystem. Here, the piles of rotting shells and prunings left under the cocoa trees not only encouraged the spread of brown pod but also furnished an ideal breeding ground for the Indian rhinoceros beetle, itself a recent bio-invader without natural enemies on the island, whose exploding population threatened to wreck the island's all-important coconut industry (though was eventually biologically controlled with an insect

32 Young, *Chocolate tree*, pp. 167–71.

33 Wickizer, *Coffee, tea and cocoa*, p. 297; Clarence-Smith, *Cocoa and chocolate*, pp. 155, 183–4; Bartelink, *Handleiding*, 32–3.

34 See Stuart McCook, 'Global rust belt: *Hemileia vastatrix* and the ecological integration of world coffee production since 1850', *Journal of Global History*, 1, 2, 2006, pp. 177–95.

35 G. B. Masfield, *A short history of agriculture in the British colonies*, Oxford: Clarendon, 1950, p. 117.

36 Leonard J. Schwarz, *Cocoa in the Cameroons under French mandate and in Fernando Po*, Washington, DC: Government Printing Office, 1933, pp. 10, 47; Clarence-Smith, *Cocoa and chocolate*, pp. 185–6; Ruf, *Booms et crises*, p. 120.

37 Paul Preuss, 'Über Pflanzenschädlinge in Kamerun', *Der Tropenpflanzer*, 7, 8, August 1903, p. 361; Friedrich Zacher, *Die wichtigsten Krankheiten und Schädlinge der tropischen Kulturpflanzen und ihre Bekämpfung*, Hamburg: Thaden, 1914, p. 80.

fungus, *Metarhizium anisopliae*, that kills its larvae).<sup>38</sup> Although the list could be continued, it would only belabour the point that pests and pathogens continually threatened to destabilize the already unstable ecologies of the cocoa plantations.

Throughout the *fin-de-siècle* cocoa world, estates represented an attempt to mobilize the natural capital of the lowland forests through the imposition of a uniform and purportedly ‘scientific’ system of cultivation under a central regime of management. Like plantations growing almost any other tropical crop, nearly all reflected one of three basic scenarios: first, where European planters had a vast reservoir of landless labourers and ex-slaves at their disposal (as in much of the Caribbean); second, where they could readily import copious amounts of cheap foreign labour (most evident in Southeast Asia); and third, where they enjoyed systematic privileges in the alienation of land, which itself facilitated the mobilization of indigenous labour (as in much of sub-Saharan Africa).<sup>39</sup> Where none of these circumstances prevailed, as in British West Africa, cocoa plantations stood little chance of success. To say the very least, African farmers more than made up for their absence.

## The West African cocoa boom

The rise of the Gold Coast into the world’s dominant cocoa producer is widely seen as one of the most dramatic commodity booms in the history of tropical agriculture. Although cocoa exports only began in 1891, within just two decades they had reached 40,000 tons, making the colony the world’s largest producer. Growth thereafter was meteoric: exports exceeded 200,000 tons in 1923 and 300,000 in the mid 1930s.<sup>40</sup> Although few observers at the turn of the century thought that Africans would grow a crop that took so long to pay, by the 1920s the Gold Coast cocoa industry was the envy of the colonial world. As a French commentator remarked in 1924, ‘Forget the proverb that there is nothing new under the sun – or at least cite cocoa in the Gold Coast as an exception. In the history of the world there has certainly never been such rapid development of an entire economic sector launched by the local inhabitants.’<sup>41</sup>

The origins of the industry reach back to around the middle of the nineteenth century when a group of Basel missionaries distributed cocoa seeds among Christian villagers. But it was only in the 1880s, after seeds were brought from Fernando Po to Accra (probably by a plantation worker), that cocoa really caught on. The earliest planting began around this time in the Eastern Province and opened a cocoa frontier that raced westward and northward over the following decades. The first wave of planters were largely merchants and commercial farmers from south of the forest belt who migrated into the sparsely populated forests of Akim Abuakwa in the extreme south-east of the colony.<sup>42</sup> Most were a far cry from

38 K. Friederichs, ‘Bericht über den staatlichen Pflanzenschutzdienst in Deutsch-Samoa 1912–1914’, *Der Tropenpflanzer: Beiheft*, 18, 1918, pp. 257–66, 283–4; C. E. Ertling, ‘Die Aussichten der Kakaokultur auf Samoa’, *Der Tropenpflanzer*, 7, 2, February 1903, pp. 79–82; F. Reinicke, ‘Gefährdung der Kakaokultur auf Samoa’, *Der Tropenpflanzer*, 6, 12, December 1902, pp. 632–5.

39 See I. C. Greaves, *Modern production among backward peoples*, London: Allen & Unwin, 1935, p. 215.

40 Austin, ‘Mode of production’, p. 154.

41 *Revue générale de botanique*, 36, 1924, p. 190, cited in Ruf, *Booms et crises*, p. 177.

42 The classic study is Polly Hill, *The migrant cocoa-farmers of southern Ghana: a study in rural capitalism*, 2nd edn, Oxford: James Currey, 1997.

the stereotypical ‘smallholder peasant’ planting a few acres near his village, and are better described as agricultural entrepreneurs or even ‘rural capitalists’. It was these pioneers who accounted for most Gold Coast cocoa exports before the First World War, making it the biggest exporter in the world by 1911.<sup>43</sup>

As the frontier moved into other regions, above all Asante, acreage and production rose even faster. Although migrant farmers played a role here too, the fact that outsiders had to pay substantial rents and that Asante commoners retained ownership over the trees they planted meant that smallholders were somewhat more prevalent than in the Akwapim boom.<sup>44</sup> Everywhere, however, the dynamic of growth was crucially promoted by transportation improvements. Prior to the spread of railways, the first of which were constructed in the 1890s to service the gold mines, most cocoa was moved to market by means of head-porterage. Whereas cocoa growers in the Americas and on São Tomé had long relied on mules, donkeys, and horses to carry their crop to port, the tsetse problem on the West African mainland precluded the use of draught animals there. It therefore took the expansion of railways and especially lorries from the 1920s onwards to clear this transport bottleneck, which goes some way towards explaining both the relatively late and the exceptionally explosive growth of cocoa in the Gold Coast.<sup>45</sup> At the end of the First World War the estimated cocoa acreage was around 450 square miles (288,000 acres or 1,165 square kilometres); by the later 1920s it was estimated that over one million acres of the Gold Coast were planted in cocoa.<sup>46</sup> By 1930 the colony dwarfed all other producers: its output of 243,000 metric tonnes accounted for over 40% of world production (588,000 metric tonnes), and was nearly three times that of its nearest rival, Brazil (92,000 metric tonnes). This represented one of the largest intercontinental plant transfers anywhere in the world: in the mid 1930s there were an estimated 700 million cocoa trees in the Gold Coast, mostly of the *amelonado* variety.<sup>47</sup>

Throughout the entire colonial era, cocoa growing in the Gold Coast was notably land-extensive: that is, increases in production came from the enlargement of the area under cultivation rather than by raising yields on existing acreage. In this respect the nature of the planting boom closely reflected the existing ecological and social conditions on the cocoa frontier. Given the abundance of land and the relative scarcity of labour and outside capital, extensive planting strategies made sound commercial sense as they essentially sought to maximize the exploitation of the ‘forest rent’. They also meshed well with existing land-use practices. Indeed, for all the commercial and social innovations that underpinned the cocoa revolution in the Gold Coast (the foundation of commercial syndicates, collective land purchases based on kinship groups, new forms of wage labour and sharecropping),<sup>48</sup> one of the primary reasons for its extraordinary speed was that it built

43 *Ibid.*, pp. 15–17.

44 On land rights in Asante, see Gareth Austin, *Labour, land and capital in Ghana: from slavery to free labour in Asante, 1807–1956*, Rochester, NY: University of Rochester Press, 2005, pp. 258–76.

45 Leonard J. Schwarz, *Cocoa in West Africa*, Washington, DC: Government Printing Office, 1928, p. 17.

46 N. C. McLeod, *Address on forestry in connection with the cocoa industry of the Gold Coast*, Accra: Government Press, 1920, p. 5; Schwarz, *Cocoa in West Africa*, p. 1.

47 Shephard, *Report on the economics*, p. 9. The Gold Coast production figures here include output from British Togo, though this was marginal: Wickizer, *Coffee, tea and cocoa*, p. 483.

48 See, generally, Hill, *Migrant cocoa-farmers*.

upon rather than overturned established patterns of ‘forest fallow’ cultivation long practised in the region.

In this system, farmers cleared and burned a patch of forest and grew a sequence of crops – often yams, vegetables, and maize followed by cassava or plantains – for three to five years before abandoning it to secondary forest, returning at intervals of ideally fifteen or twenty years once the land had regained its fertility. Integrating cocoa into this routine was fairly straightforward. Clearing and planting proceeded much as before, the primary difference being that cocoa was planted along with the first season’s crops, usually at close intervals of as little as 6 or 7 feet. Cocoa saplings then grew alongside the food crops, which not only suppressed weeds but also provided beneficial shade. It was an ingenious innovation to traditional cultivation methods, which essentially amounted to selecting an exotic plant as the successor species once farmers left their plots to lie fallow. When this happened, the three- to five-year head start acquired by the cocoa saplings enabled them to out-compete other successor species, especially once the canopy closed and shaded the ground underneath. A further benefit of this system was that it provided food for most of the period before the cocoa trees came to bear, thus avoiding one of the major start-up costs. Combined with the use of family labour, which was supplemented by wage contracts and various sharecropping arrangements, the folding of cocoa into the existing system of land use enabled indigenous planters to establish a cocoa farm at a fraction of the cost of European-owned estates. Once the trees came into production, harvesting conveniently took place during the main dry season starting in November, at the nadir of annual demand for agricultural labour.<sup>49</sup> Even after the harvest, the beans required little processing beyond fermentation for several days, which farmers achieved by enclosing piles of beans in banana leaves, followed by drying in the sun.<sup>50</sup>

All in all, this was an extraordinarily efficient system for exploiting the natural capital of the forest. Yet few British administrators initially believed that indigenous farmers would respond so quickly and effectively to market stimuli. It is sometimes misunderstood that, unlike the situation in Nigeria where European plantations were expressly forbidden, the decision to privilege African farmers in the Gold Coast was as much a consequence as a cause of the cocoa boom. Like their counterparts elsewhere, from the Congo to the Ivory Coast, administrators initially favoured estates and only gradually changed their minds out of fear of political unrest and out of the recognition that African cocoa farming greatly benefited both government revenues and European business interests.<sup>51</sup> From the 1890s through to the interwar period the

49 This paragraph is based on Shephard, *Report on the economics*, pp. 2–3; O. T. Faulkner and J. R. Mackie, *West African agriculture*, Cambridge: Cambridge University Press, 1933, pp. 106–8; Austin, *Labour*, pp. 60–79.

50 Faulkner and Mackie, *West African agriculture*, pp. 110–11.

51 See esp. Austin, *Labour*, pp. 253–8; Sara S. Berry, *Cocoa, custom, and socio-economic change in rural western Nigeria*, Oxford: Clarendon, 1975; Hubert Frechou, ‘Les plantations européennes en Côte d’Ivoire’, *Cahiers d’Outre-Mer*, 8, 29, January 1955, pp. 56–83; Jean-Pierre Chauveau and Eric Léonard, ‘Côte d’Ivoire’s pioneer fronts: historical and political determinants of the spread of cocoa cultivation’, in Clarence-Smith, *Cocoa pioneer fronts*, pp. 176–94; Catherine Coquery-Vidrovitch, *Le Congo au temps des grandes compagnies concessionnaires 1898–1930*, Paris: Mouton & Co., 1972, pp. 470–3; William Gervase Clarence-Smith, ‘Plantation versus smallholder production of cocoa: the legacy of the German period in Cameroon’, in Peter Geschiere and Piet Konings, eds., *Itinéraires d’accumulation au Cameroun*, Paris: Karthala, 1993, pp. 187–216.

southern Gold Coast was home to a dispersed string of plantations ranging in size from 150 acres to over 25,000 acres. It quickly became clear, however, that they could hardly compete with the extraordinary efficiency of the indigenous planting regime. Cadbury's, one of the colony's major cocoa buyers, ran its own 'model estate', though it never produced more than a fraction of the firm's purchases and, like a similar venture launched by the Lever Brothers, collapsed in the 1930s. The Agriculture Department's own model cocoa farm at Kpeve in British Togoland (initially established by the German colonial government) could only operate at a huge loss despite its technical sophistication. After a distinctly unimpressive record, the last European plantation finally gave up the ghost in the early 1940s.<sup>52</sup>

The reasons for the parlous performance of the estates were both economic and ecological. The most obvious problem was that of high costs, which have most commonly been attributed to the need to pay wages instead of relying on family labour. As Gareth Austin has shown, however, it was not so much the payment of wages *per se* that distinguished estates from indigenous farms (many of which also resorted to hiring outside labour for planting and maintenance), but rather the higher labour requirements demanded by their intensive cultivation techniques.<sup>53</sup> The conventional practice of planting in rows, heavy weeding, and pruning required a lot of work. So, too, did the method of regularly transferring beans between special fermentation boxes and drying them on racks or in ovens, none of which appreciably improved quality over the standard practices of West African farmers.<sup>54</sup> In the absence of cheap labour, such techniques made little commercial sense. And in the absence of government backing for some form of coercive labour recruitment in the Gold Coast, there was little prospect of acquiring enough cheap labour. Even if intensive cultivation methods were capable of raising yields – a questionable point in itself – they would not necessarily have been more efficient in view of the extra costs incurred.

Despite their apparent shortcomings, however, these standard plantation practices remained at the heart of the Gold Coast Agriculture Department's efforts to increase production. In essence, the Department's planting recommendations boiled down to several main points: neat planting at wide intervals to maximize yields, clean-weeding, pruning, and intensive treatment of disease. For the most part, Gold Coast farmers ignored all of this.<sup>55</sup> Although their method of close and fairly random spacing resulted in relatively spindly trees that appeared as 'rather a shock to anyone from the American side',<sup>56</sup> it in fact achieved higher yields per hectare for the *amelonado* strains they were planting, especially on poorer soils. An additional advantage of close spacing was that the canopy closed quickly, usually within four years, which not only suppressed weeds but also hindered attack by capsid insects (a sucking insect common in the coastal belt of West Africa), the main pest in the colony until the late 1930s. The indigenous method for treating capsid-infected areas

52 Roger J. Southall, 'Cadbury on the Gold Coast, 1907–1938: the dilemma of the "model firm" in a colonial economy', PhD thesis, University of Birmingham, 1975, pp. 76–87; Green and Hymer, 'Cocoa in the Gold Coast', p. 310; Austin, 'Mode of production', pp. 157–9.

53 See, generally, Austin, 'Mode of production'.

54 Klopstock, *Kakao*, pp. 9–10; Faulkner and Mackie, *West African agriculture*, pp. 110–11; Austin, 'Mode of production', p. 168.

55 Austin, 'Mode of production', pp. 164–8.

56 Wickizer, *Coffee, tea and cocoa*, p. 291.

also proved remarkably effective despite initial ridicule by officials. Instead of taking the more invasive measures advocated by the Agriculture Department, farmers left affected areas to lie fallow for three years, after which they had usually recovered and needed only to be cleared of undergrowth. As for the problem of black pod fungus, they similarly ignored Department advice to remove all infected pods and bury or burn them, which subsequent studies revealed to be useless.<sup>57</sup> Indeed, recommendations to cut out the diseased parts of trees often made matters worse since the opening of the canopy encouraged capsid infestation.<sup>58</sup>

This is not to say that agricultural officials were wholly dismissive of African practices or that their prescriptions were always wrong, as the struggle against ‘swollen shoot’ disease in the 1940s and 1950s was to prove. And it certainly is not to suggest that African farmers were hesitant to capitalize on outside agronomic innovations that suited them, as the adoption of cocoa itself readily attests. The point is rather that the advantages enjoyed by indigenous farmers over foreign-owned plantations were not only economic but also rested on a sound understanding of local environments and growing conditions that were profitably adapted to the new opportunities presented by cocoa.

## Farmers, scientists, and the lessons of the plantation

To a large extent, then, the success of the indigenous cocoa boom came in spite of rather than because of government efforts to encourage production. In what many regarded as the most spectacular case of cash crop expansion in the colonial world, the input of agricultural experts was conspicuous by its absence. Looking back from the vantage point of 1957, the year of Ghanaian independence, the noted botanist Duncan Hector Urquhart told the international Cocoa Conference in London: ‘I would like to remind the scientists present that the world cocoa industry was very largely developed without their aid. The great cocoa industry in West Africa was developed by the skill of the farmer. That skill – you might call it the simple skill of the simple man – was great skill.’<sup>59</sup>

Urquhart was hardly the first to recognize this. Indeed, there had long been a range of views among European observers about the ‘plantation paradigm’ in general as well as the value of indigenous knowledge, which growing numbers had come to admire by the interwar years.<sup>60</sup> The cocoa boom in West Africa was in many respects the epitome of an ‘indigenous agricultural revolution’,<sup>61</sup> a classic illustration of the value of local knowledge and the wisdom of leaving farming to farmers. Moreover, it was not an isolated development but was

57 Faulkner and Mackie, *West African agriculture*, pp. 107–8; Green and Hymer, ‘Cocoa in the Gold Coast’, pp. 308–9.

58 Masfield, *Short history*, pp. 120–1.

59 Quoted in Emma Robertson, *Chocolate, women and empire: a social and cultural history*, Manchester: Manchester University Press, 2009, p. 84.

60 For heterodox views, see Chevalier, *La situation agricole*, p. 5; Faulkner and Mackie, *West African agriculture*; L. D. Stamp, ‘Land utilization and soil erosion in Nigeria’, *Geographical Review*, 28, 1938, pp. 32–45. More generally, see Helen Tilley, *Africa as a living laboratory: empire, development, and the problem of scientific knowledge, 1870–1950*, Chicago, IL: University of Chicago Press, 2011, pp. 128–59.

61 Paul Richards, *Indigenous agricultural revolution: ecology and food production in West Africa*, Boulder, CO: Westview, 1985.

part of a broader trend of smallholder success within the wider global cocoa economy, particularly with the fall in prices in the 1930s. During the Depression even a number of estate managers began to experiment with more extensive methods, driven largely by the need to reduce costs but also partly by a growing realization that in most respects they better mimicked the natural conditions of a forest. By the mid 1930s this recognition led some agronomists to argue that ‘of all plantation crops cacao is the most sensitive to environment and is least adapted to being grown under plantation conditions’.<sup>62</sup> Ecologically, land-extensive techniques proved remarkably effective; both economically and politically, indigenous cultivation was less risky and more profitable for colonial administrations than a policy of privileging European estates.

But if the assumed superiority of intensive cultivation practices was no longer as certain as before, it nonetheless remained a dominant article of faith among most European observers. How did such a conviction persist amid the triumph of African-grown cocoa? In order to maintain the inflated confidence placed in ‘modern agriculture’ it was first of all necessary to explain away the success of indigenous farmers. Generally speaking this happened in two different ways. One was to give a large share of the credit to the colonial administration for what was almost entirely the result of indigenous initiative. ‘In the Gold Coast the “indolent” native has created a new industry entirely native owned, and in thirty years the Gold Coast has outstripped all the areas of the world in quantity of produce’, one observer conceded in the 1920s, before perpetuating the conventional myth that ‘this could not have happened without the strenuous efforts of the Department of Agriculture’.<sup>63</sup> Though perhaps unwittingly, French critics of the forced labour regime in neighbouring Ivory Coast partially reinforced this myth with their argument that the future of the cocoa industry lay not in mandatory cultivation or privileging European farms – many of which, it might be noted, were lambasted by French agronomists for their amateurism and poor-quality product<sup>64</sup> – but rather in ‘the method of educating and persuading the native, a method which the English in the Gold Coast have deployed so brilliantly’.<sup>65</sup>

Of course, not all officials were fooled by this pretence. None other than Hugh Clifford, the Gold Coast governor between 1912 and 1919, opposed Agriculture Department proposals to mandate changes to African cultivation methods, noting that ‘native’ agricultural interests ‘are capable of a rapidity of expansion and a progressive increase of output that beggar every record of the past, and are altogether unparalleled in all the long history of European agricultural enterprise in the tropics’.<sup>66</sup> But Clifford’s views were not universally shared, particularly among many experts who focused more narrowly on agronomic issues rather than commodity trade and who were often blind to the logic of indigenous farming methods. This by no means pertained only to colonial agronomists, as

62 Sir Arthur W. Hill, *Cacao research*, December 1935, quoted in Klopstock, *Kakao*, p. 5.

63 Knapp, *Cocoa and chocolate*, pp. 94–6.

64 E.g. L. Renodier, ‘Le cacaoyer en Côte d’Ivoire’, *L’Agronomie Coloniale*, 18, 142, October 1929, pp. 304–10.

65 Chevalier, *La situation agricole*, p. 21.

66 Quoted in Greaves, *Modern production*, pp. 209–10.



the strikingly erroneous conclusions of a visitor from the US Department of Agriculture clearly attest:

It is quite certain that the native could not have accomplished this tremendous work had he not been guided and assisted. ... The native, of course, must be given credit for introducing the crop, but its rapid development must be credited to those branches of the Government which planned and established the present transport system and to the agricultural department for supplying planting stock and demonstrating sound methods of cocoa culture and preparation.<sup>67</sup>

The second line of argument was more plausible and ultimately more important: namely the idea that indigenous methods were not sustainable. During the 1930s, as the first signs of local land scarcity emerged, many officials insisted on redoubling efforts to intensify cultivation through the application of agronomic science. Without it, so the argument went, cocoa ran the risk of becoming the long-term ecological victim of its own short-term economic success. Given the proven productive capacity of African cultivation methods, the stated aim was not to suppress them entirely but rather to ‘improve’ them in the interests of raising yields and preventing pests and disease. The problem, however, was a remarkable lack of knowledge about these techniques and how they related to both the plant and local growing conditions. Before the founding of the West African Cocoa Research Institute at Tafo in Asante in 1937, governments carried out almost no systematic research on cocoa. In the Gold Coast, the assorted experiment stations were of little use since they were largely – and tellingly – geared towards supporting estate agriculture and ‘cultivated in a manner which bears little relation to native methods’.<sup>68</sup> The situation was similar in the Ivory Coast and Nigeria. Indeed, when studies were carried out in Nigeria on seed selection in the 1930s they were financed not by the government but by the Ibadan Native Administration.<sup>69</sup> Against this backdrop it is easy to understand why local farmers ignored most department recommendations.

But the case for ‘improving’ indigenous methods was about more than just production. It also reflected the emergence of a more ecological way of thinking during the interwar period, which generated a different set of concerns about the wider implications of large-scale cocoa planting.<sup>70</sup> One source of anxiety was the relationship between long-term yields and the effects of widespread forest clearance. Ever since the 1910s the threat of erosion had been on the increase as planting moved beyond the most suitable areas onto more marginal, sloping land. Notably, this was a concern shared by African observers: the Omanhene (paramount chief) of Eastern Akim passed a bye-law in 1915 prohibiting all farming and felling of trees on the hills of his territory.<sup>71</sup>

Somewhat more controversial were desiccationist-inspired fears that continued forest clearance would create more arid conditions that might ultimately threaten the cocoa

67 Schwarz, *Cocoa in West Africa*, pp. 3–4.

68 Shephard, *Report on the economics*, p. 7; see also H. C. Sampson and E. M. Crowther, *The West African commission 1938–1939: technical reports*, London: Waterlow, 1943, pp. 39–40.

69 Albert Viton, *Cacao: tendances actuelles de la production, des prix et de la consommation*, Rome: FAO, 1957, p. 12.

70 See, more generally, Tilley, *Africa*, pp. 115–68.

71 McLeod, *Address on forestry*, p. 4.

industry itself. Conventional wisdom at the time was that a region with less than 25% forest cover was too dry for cocoa.<sup>72</sup> With this in mind, the lack of permanent shade on most African cocoa farms was regarded as a major problem since large shade trees maintain rainfall much better than land that has been totally cleared. The scarcity of windbreaks exacerbated the situation, given the seasonal threat from dry harmattan winds blowing southward from the Sahara. At the same time, the absence of large shade and windbreak trees was also blamed for mounting flood problems, since smaller cocoa trees were unable to absorb all of the water from heavy rains.<sup>73</sup> In areas where the bush had been largely cleared for cocoa it was reported that ‘the distribution of rainfall has been altered to such an extent that in some cases farms now suffer from drought while in others the soil is water-logged’.<sup>74</sup> In 1920 foresters recommended leaving thirty of the largest trees per acre as ‘standards’ to maintain humidity and to reseed areas after cocoa had been abandoned.<sup>75</sup> The fact that such suggestions were often coloured by prejudice against ‘improvident’ indigenous farming methods and were rarely adopted in practice does not mean that they were entirely misplaced. By the 1930s there was mounting evidence of damage from arid winds on mature farms, which many plausibly attributed to the progressive clearing of surrounding forests that had initially provided adequate shelter.<sup>76</sup>

Another central concern was that the breakneck speed of expansion raised the prospect of regional land shortages. As a British forester rhetorically asked Gold Coast officials in 1920: ‘Now how long do you think this country, still rich in forests could, without permanent injury, stand the drain of 450 square miles of forest cut down every twenty years to make room for cocoa, if the natives continued their happy-go-lucky style of clearing forests?’<sup>77</sup> Not long, was the standard answer. Others similarly cautioned that if nothing were done ‘it is obvious that the coming generation will see the destruction of the remaining forests’.<sup>78</sup> We now know that such catastrophist warnings were exaggerated; in fact, agricultural officials in the mid 1930s recognized that the current cocoa area of approximately 1,600 square miles, though vast, still represented only around 15% of recent clearing in the Gold Coast as a whole.<sup>79</sup> Nonetheless, in certain regions there was reason to be concerned. By the 1930s most suitable land in the Eastern Province was already under cocoa, and from 1938 to 1946 the Asante Confederacy Council banned all new cocoa

72 A. Harold Unwin, *West African forests and forestry*, London: T. Fisher Unwin Ltd., 1920, p. 492; Knapp, *Cocoa and chocolate*, p. 78.

73 Klopstock, *Kakao*, p. 57.

74 Schwarz, *Cocoa in West Africa*, p. 2.

75 McLeod, *Address on forestry*, p. 5.

76 See the dire warnings in F. A. Stockdale, *Report by Mr. F. A. Stockdale on his visit to Nigeria, Gold Coast and Sierra Leone, October 1935–February 1936*, London: Colonial Office, 1936, pp. 99–100; also Shephard, *Report on the economics*, pp. 2, 16–20; R. S. Troup, *Colonial forest administration*, Oxford: Oxford University Press, 1940, p. 59.

77 McLeod, *Address on forestry*, pp. 5, 8.

78 H. W. Moor, ‘Forestry and its application to the Gold Coast’, *Journal of the Gold Coast Agricultural and Commercial Society*, 3, 2, 1924, p. 82, quoted in James Fairhead and Melissa Leach, *Reframing deforestation: global analyses and local realities*, London: Routledge, 1998, p. 68.

79 Shephard, *Report on the economics*, p. 6; Fairhead and Leach, *Reframing deforestation*, pp. 68–9 and *passim*.

planting in the territory for fear of a decline in staple food production.<sup>80</sup> More broadly, the impact on food supplies added to the sense of unease about the pell-mell rush into the forests, particularly in the ‘monoculture landscape’ of the main cocoa districts.<sup>81</sup>

All the signs pointed to the need to raise cocoa yields without further forest clearance. As Frank Stockdale (a leading figure in the Colonial Advisory Council for Agriculture and Animal Health) expressly concluded from a trip to the Gold Coast in 1935–36, ‘If ... the total export is to be maintained there is little doubt that the time is rapidly approaching when more intensive cultivation will be necessary.’<sup>82</sup> Ever since the 1920s yields had begun to decline in the oldest cocoa districts as trees aged and soils became depleted. Hitherto, the losses had been more than compensated by further clearance elsewhere. But, as Stockdale and others argued, since continual expansion into new forest was unsustainable in the long term, farmers would have to begin pruning and thinning older stands, replanting shade trees and windbreaks, applying mulches or manures and providing better drainage. In short, they would need to abandon the land-extensive methods that had turned West Africa into the centre of world cocoa production and cultivate instead along more intensive ‘scientific’ lines.

Such recommendations partly reflected chauvinistic assumptions about the benefits that modern agronomy could bestow upon colonial farmers. However, another important reason for their persistence was that they drew on long experience of cocoa cycles in older regions of production, above all in the Caribbean colonies, which for British agronomists had long served as the key reference point for measuring how the West African industry was performing and how it might develop in the future. Trinidad and Grenada were not only longstanding producers but had also been far more thoroughly researched (especially after the Imperial College of Tropical Agriculture was established on Trinidad in 1924). By the 1930s, yields on plantations there had begun to decline sharply, partly owing to the spread of witches’ broom disease (which infected over half of the cocoa acreage on Trinidad by 1932) but more importantly as a result of the rising average age of the cocoa trees.<sup>83</sup> Planting had essentially ceased on Trinidad after 1921 as prices stagnated and suitable land became less abundant. Detailed examinations of individual estates showed that yields had peaked at around fifteen to twenty-five years of age, declining at a more or less steady rate depending mainly on soil quality.<sup>84</sup>

When Cecil Shephard, the agronomist who had conducted these studies, was dispatched from the Imperial College of Tropical Agriculture in 1935 to make recommendations for improving cultivation in the Gold Coast, average yields there were estimated at around 500–600 lbs per acre – similar to Grenada’s intensively cultivated estates and around twice as high as on Trinidad, whose farms were mostly well beyond their peak. At first glance one might read this as nothing more than another instance of agricultural officials stubbornly believing in the superiority of intensive methods despite evidence to

80 Though the ban was widely evaded: see Austin, *Labour*, pp. 50, 350, 437, 445; Stockdale, *Report by Mr. F. A. Stockdale*, p. 7.

81 Klopstock, *Kakao*, p. 41.

82 Stockdale, *Report by Mr. F. A. Stockdale*, p. 96.

83 Moll, *Cacao*, p. 3.

84 C. Y. Shephard, *The cacao industry of Trinidad: some economic aspects: series III–IV*, Port-of-Spain: Government Printer, 1937, pp. 31, 70–2.

the contrary.<sup>85</sup> Undoubtedly such assumptions played a role, but the picture nonetheless changed once age was factored in. Records suggested that yields on Trinidad were slightly higher than in the Gold Coast at a comparable age, and on Grenada appreciably higher. Although the Gold Coast as a whole was still a young producer, the first decreases in the oldest cocoa areas of the Eastern District were already following the familiar pattern of boom, decline, and eventual relocation that had already been seen in the Caribbean – indeed the pattern here was comparatively rapid as some farms were being abandoned after only twenty years.<sup>86</sup>

There was something ironic about Caribbean plantations (of all things) serving as a source of inspiration for developing a more stable and sustainable form of agricultural production in the well-established agrarian societies of West Africa. At one level it is difficult to avoid the jaundiced conclusion that this was little more than an exercise in shifting the criteria of success, a new-fangled means of asserting the agro-scientific superiority of plantation methods over the smallholder-style practices used on indigenous farms once the latter had clearly won the battle for commercial efficiency in West Africa. Nonetheless, there was good reason to assume that yields would eventually drop in West Africa in the absence of either continued forest clearance or a shift towards more intensive cultivation techniques. Since the former was not a long-term answer, officials focused their attention on the latter, looking above all to developments on Trinidad for ideas. By the 1930s the Trinidad Department of Agriculture had undertaken substantial trials on replanting, on the development of high-yielding varieties, on pruning, on draining, and on fertilizer application, all of which managed to achieve considerable yield increases for ageing stands on test plots.<sup>87</sup>

Such promising results – all the more attractive for resonating with pre-existing suppositions about the ability of agricultural science to improve indigenous practices – quickly prompted recommendations that West African cocoa-producing regions should adopt these remedial measures since Trinidad had once boasted yields like theirs too.<sup>88</sup> But beyond the controlled conditions on the test plots, which could be managed much more carefully than was practical for commercial stands, there was precious little scope for introducing them, as the Agriculture Department's own research clearly suggested. A seminal study of a single cocoa farm in the Eastern District (Koransang) carried out in the later 1930s showed that, although concerted action by farmers and agriculture officials could make replantation work, there was little realistic prospect of success on a larger scale.<sup>89</sup> In fact, over the following years a similar conclusion was reached on Trinidad itself, where – despite the provision of a special subsidy scheme for rehabilitation, the allocation of hundreds of thousands of selected seedlings, and even the large-scale distribution of new high-yielding clones after 1945 – only 10% of cocoa was grown on replanted land in the late 1950s.<sup>90</sup>

85 As do Green and Hymer, 'Cocoa in the Gold Coast', pp. 308–9.

86 Shephard, *Report on the economics*, p. 5.

87 Moll, *Cacao*, pp. 4–5.

88 Shephard, *Cacao industry*, p. 72.

89 W. H. Beckett, *Koransang: a Gold Coast cocoa farm*, Accra: Government Printer, 1945, reprinted as Part 1 of idem, *Koransang 1904–1970*, Legon: University of Ghana Institute of Statistical, Social and Economic Research, 1972.

90 Moll, *Cacao*, pp. 4–6.

The difficulties stemmed in large part from ecological factors: whereas older forest suppresses the number of quick-growing successor species, few of whose seeds are around at first clearing, they are more numerous on previously cleared land and therefore compete more intensively with cocoa seedlings, especially on depleted soils.<sup>91</sup> But the underlying reason was economic. Given the costs of rehabilitation, missed income while saplings matured, and the significant fertility and disease drawbacks of planting on previously cultivated land, it generally remained more lucrative to clear fresh forest than to replant existing farms. Where fresh forest was in short supply, it was usually more profitable to switch to other crops than to compete against farmers clearing new cocoa pioneer fronts elsewhere in the world where woodland was still abundant. Once again, the perennial cycle of boom and decline was set to repeat itself. And once again, agricultural science was capable of raising yields but not necessarily profits.<sup>92</sup>

## Conclusion

In short, the exploitation of the ‘forest rent’ remained (and to some extent still remains<sup>93</sup>) the single most important factor in the economics of cocoa cultivation. As long as forested land was available – and especially wherever a ready supply of cheap wage labour was not – the overall cost structure strongly favoured the land-extensive techniques that prevailed among African farmers. Refusal to abandon these methods at the behest of colonial officials did not represent an oft-alleged ‘peasant conservatism’ but rather an eminently rational weighing-up of the factors of production and the various alternatives at one’s disposal, as well as a sound knowledge of local growing conditions.<sup>94</sup> As an agrarian historian might well expect, the cultivation practices employed by African cocoa growers clearly reflected the prevailing economic and ecological circumstances of the region in question: namely a shortage of labour and capital, a relative abundance of woodland, and, eventually – as the forest rent was depleted – a transition to other crops such as maize, cassava, or pineapple, which grew better on previously cleared land.

By contrast, the powerful European bias towards intensive modes of cultivation was based as much on cultural as on material factors. Or, to put it more precisely, cultural predilections strongly influenced perceptions of the material basis of the African cocoa industry as well as the proposed solutions for ensuring its long-term viability. Colonial officials in West Africa, as elsewhere, were part of a broader imperial project that sought to boost agricultural production and trade. As such, they continually fretted about issues such as long-term productivity, labour availability, and product quality. By the interwar period some were also increasingly concerned about the wider ecological – and ultimately economic – implications of cocoa cultivation on such a large scale. Eventually, some of the Agriculture Department’s recommendations for intensive maintenance proved correct: namely in the

91 Ruf, *Booms et crises*, pp. 94–5.

92 See, more generally, William Gervase Clarence-Smith and François Ruf, ‘Cocoa pioneer fronts: the historical determinants’, in Clarence-Smith, *Cocoa pioneer fronts*, pp. 1–2, 14–15.

93 François Ruf, ‘The myth of complex agroforests: the case of Ghana’, *Human Ecology*, 39, 2011, pp. 373–88.

94 As clearly recognized by some contemporaries: see e.g. Faulkner and Mackie, *West African agriculture*, p. 7.

highly unpopular policy of ‘cutting out’ diseased trees as a means of halting the spread of swollen shoot virus that threatened to cripple the industry after first being identified in the Eastern District in the late 1930s.<sup>95</sup>

What is most striking, however, is the extent to which understandings of these material factors were shaped by the cultural attachment to intensive methods of cultivation. Cocoa plantations – despite their widespread commercial failure in West Africa, their dwindling share of world production by the 1930s, and even their negligible ability (or need) to deploy sophisticated machinery – retained much of their cultural authority as models of organization and paradigmatic repositories of ‘scientific’ agricultural techniques. This was not only, or even primarily, a reflection of the economic interests of planters or the professional interests of agricultural officials, important though these factors undoubtedly were. It was also, as this article has sought to show, underpinned by the increasingly transcontinental flow of agronomic knowledge and information in the late nineteenth and early twentieth centuries, above all from the longstanding plantation economies of the Caribbean.

These wider contexts and connections help to explain why assumptions about the supremacy of intensive cultivation practices retained such a powerful grip on colonial agricultural policies amid the spectacular indigenous cocoa revolution of British West Africa. Indeed, the fact that the models migrating from the western hemisphere resonated with the explicitly racialized and social-evolutionist technological hierarchies that structured colonial society made them all the more likely to serve as a platform for a misguided agronomic paternalism. ‘West Indian cocoa producers are either Europeans, or of European extraction, or are sufficiently intelligent to accept European methods’, declared the Gold Coast Director of Agriculture, W. S. D. Tudhope, in 1916:

The producers of cocoa in this colony and Ashanti are natives in a most elementary state of civilization whose sole aim, as yet, appears to be the attainment of a maximum amount of money with a minimum expenditure of energy, however uneconomical the system, and whose lack of foresight for the future welfare of the industry – and consequently of themselves – has not yet been compensated by adequate legislative measures.<sup>96</sup>

As this statement suggests, the persistence of the ‘plantation paradigm’ ultimately mirrored the wider ideological underpinnings of the entire colonial enterprise, whose key claim to legitimacy was to spread the benefits of superior European knowledge to other parts of world, to conquer tropical nature, and to develop its resources for all to enjoy. The vehicles that most administrations looked to for achieving this – the network of experiment stations, model farms, and modern plantations – served both as signs of European power and as means of exerting it. In this context, the fact that West African cultivators actually proved more adept at growing cocoa was in certain ways profoundly subversive. While on the one

95 Hill, *Migrant cocoa-farmers*, pp. 23–4; Gold Coast, *Report on the department of agriculture 1944–5*, Accra: Government Printer, 1945, pp. 4–5; *Report on the department of agriculture 1945–6*, Accra: Government Printer, 1946, pp. 4–5; *Report on the department of agriculture 1951–2*, Accra: Government Printer, 1952, p. 5.

96 Gold Coast, *Sessional paper*, 2, 1916–1917, Accra, 1916, quoted in Green and Hymer, ‘Cocoa in the Gold Coast’, p. 312.

hand it clearly accorded with Western assumptions about the universality of *Homo economicus*, and was indeed taken by many as emphatic confirmation of the ‘rational peasant’ as an agent for colonial development, on the other hand it plainly contravened the fundamental faith in the innate superiority of European methods and technical expertise.

For many decades, however, this conviction was simply too strong to be overpowered by mere fact. Throughout the colonial era, the lessons drawn from plantation-style agriculture were widely regarded as self-evident improvements on indigenous cultivation methods, with little examination of whether they actually worked better, let alone whether they paid better. Although it took some time for agronomists to learn it, the real lesson of colonial cocoa was that farmers generally understood local ecological and social peculiarities better than those scientists who were only interested in applying global principles imported from elsewhere, and that the particular practices that give rise to a successful farming industry must therefore be understood before they can be improved.

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