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Experiences of Plantation and Large-Scale Farming in 20th Century Africa

Peter Gibbon

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PETER GIBBON
Senior researcher , DIIS
pgi@diis.dk

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Danish Institute for International Studies, DIIS
Strandgade 56, DK-1401 Copenhagen, Denmark
Ph: +45 32 69 87 87
Fax: +45 32 69 87 00
E-mail: diis@diis.dk
Web: www.diis.dk

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ABSTRACT

The paper's background is a revival of the historically dominant narrative on the large-scale and plantation farming (LSF and PF) in Africa, in reaction to the contemporary phenomenon of 'land grabbing'. The historical antecedents of this narrative are examined and its central contentions – that features including low productivity and limited employment generation normally, if not intrinsically characterize LSF and PF – are problematized. This is undertaken on the basis of comprehensive reviews of the historical and contemporary literatures on African LSF and PF farming and labour control systems.

INTRODUCTION

In the wake of commodity price rises from 2004, and against the local background of governments' increasingly welcoming attitude to investors, the last few years have seen a rising interest in acquisition of land in Sub-Saharan Africa for plantation farming (PF) and large-scale farming (LSF). To date only small numbers of new ventures have taken off, but many more are likely to do so and as a result there will be a significant expansion in the area of Sub-Saharan African land under PF and LSF. In this context there has been a revival of policy debates that have been largely dormant for many years. Most contributions to this debate are broadly negative in their assessments of what a large expansion of PF and LSF will entail (cf. e.g., World Bank 2010). In line with the dominant view in earlier discussions, PF and LSF are seen as basically entailing land under-utilization, low productivity crop production, limited employment generation and low quality jobs – not to mention dispossession of pastoralists and smallholders.

This paper does not deal at all with the issue of dispossession ('land grabbing'). It does however trace the intellectual and political background of the other components of the dominant view referred to above, and asks whether what is known as PF and LSF in 20th century Africa supports the prognosis that it offers. It does so on the basis of examining the extent to which it is valid to make generalizations about trends in the 20th century PF and LSF farming and labour systems, and to the extent it is, what these tell us.

The paper proceeds in five main sections. The first provides a quantitative overview of the development of PF and LSF crop production in 20th century Sub-Saharan Africa. Taken together, crop production in these sectors remained more or less the same in terms of share of cultivated land area occupied from 1914 through to 2000. But there was a continuous reduction over time in the number of crops cultivated as well as, in general, an increase in the share of higher value crops. The second section traces the origin of current narratives about PF and LSF to certain economic arguments concerning PF and LSF originally dating from the 19th century and subject to reconstruction/renewal from the 1960s. These provided a shifting intellectual foundation for the policy perspective on agricultural scale in colonial and later 'developing' countries dominant throughout – namely a presumption in favour of small-scale farming (SSF). The third section examines the development of PF and LSF farming systems, mainly in terms of issues of capital and labour intensity. Although recognizing the low share of LSF land under cultivation, this draws attention to a minor revolution in capital intensity of grain production in the three decades following World War II, and to a later – although also more geographically circumscribed – phase of simultaneous capital and labour intensification, associated with the dissemination of fruit, vegetable and cut flower production. The fourth section examines the development of labour systems, in terms of labour stabilization, work organization and labour control questions. Here there appears to have been a common cycle across most PF and LSF in Africa, whereby labour stabilization and labour market integration for large-scale agriculture became established facts across the continent between 1950 and 1980. Up to the 1990s this was associated with considerable change in how labour was supervised, and with somewhat less change in how it was deployed and incentivized. The fifth section concludes.

A few parameters need making explicit of how these issues are treated in what follows. One concerns definitions: PF is understood here as a type of land ownership and use involving mainly foreign investors producing tropical crops mainly or wholly for export, with hired labour. LSF is understood as a type of land ownership and use involving mainly local citizens producing temperate and/or semi-tropical crops partly or mainly for the domestic market, with mainly hired labour. These definitions are indicative rather than exhaustive. Inevitably – and perhaps increasingly – some enterprises fall between them. Deliberately, no cut-off points in terms of size of holding or number of hired labourers are referred to.

Another parameter concerns limitations. It is important to note that the paper only considers PF and LSF *crop production*. This is mainly because there is little written on PF and LSF livestock production, despite the dominant share of LSF land use that it accounts for. Data in the tables likewise refers only to crop production. It also only considers *privately owned* PF and LSF. Publicly owned PF has existed in a number of countries, particularly in 1945-50 and again in the two decades after African independence. While there are a lot of similarities with private PF and LSF, the additional issues raised by public ownership blur rather than sharpen understanding. Data in Table 1 reflect this restriction.

Finally, the paper is based almost entirely on secondary sources and only in a handful of instances on either agricultural census or survey data. This reflects the current preliminary stage of the author's research. As will become clear, coverage of the sector in secondary sources is highly uneven not only across issues but also periods and countries. Outside Southern Africa the contemporary period is particularly thinly covered. The paper inevitably reflects this too. In summary, the paper's status is that of a starting point for investigation rather than a summary of results.

AN OVERVIEW OF THE SECTOR'S DEVELOPMENT IN THE 20TH CENTURY

Efforts to quantitatively trace the development over time of the PF and LSF crop production in Sub-Saharan Africa are complicated by the issues touched on in this paper's introduction. Sources use inconsistent definitions of LSF,[1] of crop area (including different definitions of 'under cultivation') and – to an even greater extent – of employment.[2] In terms of coverage, data or estimates based on secondary sources are available for PF and LSF crop areas for only about a quarter of the countries in Sub-Saharan, whatever period within the 20th century is considered. Estimates for employment are available for a smaller number still. Those countries for which data or estimates are available are almost certainly those where PF or LSF has been most important, but there are a number of countries (particularly in west Africa) known to have (had) PF, but where information is sparse or non-existent.[3] Moreover, even for those countries where data or estimates are available, often these cover only production of one or two principal export crops. A further problem is validity. Certain

[1] An extreme case is Malawi, where some holdings classified as 'estates' are as small as 10 ha.

[2] The author has used figures for 'permanent' labour where these are available (usually the period since 1990 only). Where they are not, he has used those for 'regular' labour. Where these are also not available, he has used those for male labour. And (only) where these also are unavailable, he has used those for registered labourers.

[3] For example, Gabon (cf Fieldhouse 1978), Sierra Leone (cf Pim 1946), Gambia (cf Dinham and Hines 1983) and Senegal (cf Dinham and Hines 1983).

of the numbers in Table 1 below, particularly the aggregates for Africa provided for each period, fall more into the category of 'guesstimate' rather than estimate.[4]

Daviron (2010) proposes an alternative approach to that used here, using indirect data (on exports of known plantation crops) for 1913. This has not been followed here for three reasons. The main one is that, with the proliferation of smallholder outgrower schemes after 1960 for crops such as sugar, tea and tobacco, it does not make sense to use such an approach in the post-independence period. The other is that, if one considers not only PF but also LSF – as this paper does – the main crop cultivated historically in terms of area has been maize, which was not primarily produced for export. Thirdly, data for exports prior to 1913 commonly subsumed products that were collected rather than cultivated in 'concession' areas as well as those grown on plantations.[5]

With these caveats, Table 1 and this section endeavour to trace some general trends. An initial observation here, notwithstanding the issue of coverage, is PF's and LSF's consistently uneven distribution over the continent. PF and LSF are absent from large parts of the continent, notably the Sahel and land-locked Africa south of the Sahel - with the exception of Congo and the inland settler economies of southern Africa (Southern Rhodesia/Zimbabwe, Northern Rhodesia/Zambia and Nyasaland/Malawi). PF predominantly occurs in countries with seaboards, especially west African ones, and within these in regions with easy access to ports. Conversely, in those countries where it is found, LSF – and to a lesser extent PF – often dominates both the agricultural land area and national employment. This is true of Southern Rhodesia/Zimbabwe, South Africa, Liberia and São Tomé and is perhaps becoming true of Sudan and Malawi.

A second point is that, while data on employment is too sparse to make meaningful comparisons over time, the share of Sub-Saharan Africa's cultivated area under PF/LSF appears to have remained broadly constant for almost a century up to 2004. Although the period prior to World War I is commonly considered the golden age of PF in Africa, and the inter-war period saw a decisive turn in colonial economic policy in favour of small-scale farming (SSF), between 1920 and 1960 the area under PF/LSF crop production increased in line with the cultivated area generally. As Table 1 shows, this was mostly the result of the expansion of the LSF crop area in Kenya, Southern Rhodesia and South Africa. After 1960, the substantial contraction in the LSF crop area in Kenya, Zimbabwe and South Africa is more than compensated for by the growth of the LSF crop area in Sudan and, to a lesser extent, Malawi. Thus in the first decade of the 21st century, as in the early 1960s (and 1920), the share of Sub-Saharan Africa's cultivated area under PF/LSF is roughly between 5 and 7.5 percent.[6]

A third point, although this is not visible from Table 1, concerns narrowing of the range of crops produced. The period 1900-1920 saw plantation production of cocoa, coffee, spices, copra, cotton and tobacco on a substantial scale. Cotton continued as a LSF crop in Southern Rhodesia/Zimbabwe and South Africa and tobacco as one in Southern Rhodesia/Zimbabwe and Nyasaland/Malawi, but otherwise SSF came to dominate production of all these crops by around 1960.

[4] So too do those on area for South Africa in 1900-20 and the 1960s.

[5] This certainly applied to palm oil and rubber.

[6] FAOSTAT estimates the total cultivated area in Sub-Saharan Africa in 1961-1963 at around 150 m ha; for the early 2000s its estimate is around 210 m ha.

Table 1. The extent of LSF and PF crop production in Africa (,000 ha. and ,000 workers), ca. 1960 and most recent information

Country	*1900-20*		*1960s*		*Latest available*	
	Area (employment)	*Year (source)*	*Area (employment)*	*Year (source)*	*Area (employment)*	*Year (source)*
Angola	11 (11, slaves)	1903-11 (Clarence-Smith 1979)	n/k		n/k	
Belgian Congo/ DRC	350 α (n/k)	1920 (Fieldhouse 1978)	58 + 350 α (41.6)	1959 (Fieldhouse 1978)	n/k	
Cameroon	75 (n/k)	1913 (est. based on Cooper 1996)	40 (25 permanent)	1960s (Koning 1995)	40 (18 permanent)β	1990 (Koning 1995, Graham & Floering 1984)
Côte d'Ivoire	75 (n/k)	1913 (est. based on Cooper 1996)	n/k		75 (n/k)	2002 (USDA 2002)
Ethiopia	0		5 (n/k)	1970 (Cohen 1975)	1 (15 permanent)γ	2007 (Melese & Helmsing 2010)
Fernando Po/ Equatorial Guinea	11 (n/k)	1909 (Sundiata 1996)	n/k		n/k	
Gold Coast/ Ghana	10 (n/k)	1920 (Pim 1946)	150 (n/k)	1970 (Shepherd 1981)	n/k	
Guinea	50 (n/k)	1913 (est. based on Cooper 1996)	n/k		n/k	
Kenya	n/k (71)	1923 (Mosley 1983)	615 (252)	1960 (Brown 1968)	535 (>95)δ	area 1980 (Gvt of Kenya 1982); empl. ca. 2000 δ
Liberia	0		87 (n/k)	1960 (Voll 1980)	110 (53)	1990 (Africa South of the Sahara 2004)
Nigeria	n/k		14 (6)ε	1959 (Fieldhouse 1978)	n/k	
Northern Rhodesia/ Zambia	n/k		n/k		n/k (7 permanent)η	2004 (Barrientos et al. 2005); 2009 (Richardson 2010)
Nyasaland/ Malawi	n/k		26 (n/k)	1962 (Mkandawire 1999)	360 (157)	area 1997 (Mkandawire 1999); empl. 1981 (Pryor & Chipeta 1990)

Table 1. (Continued)

Country	*1900-20*		*1960s*		*Latest available*	
	Area (employment)	*Year (source)*	*Area (employment)*	*Year (source)*	*Area (employment)*	*Year (source)*
Portuguese East Africa/Mozambique	n/k (36) ζ	1908 (Vail & White 1980)	25 (n/k)ζ	1965 (Vail & White 1980)	n/k	
Rwanda	n/k		n/k		3 (n/k) θ	2010 (Huggins 2011, 35)
São Tomé & Principe	n/k (40, incl. slaves)	1908 (Clarence-Smith 1990)	n/k		n/k	
Southern Rhodesia/ Zimbabwe	75 (58)	1914 (area, Palmer 1977a), 1921 (labour, Phimister 1988)	450 (216)	1965 (Dunlop 1971)	100 (n/k)	2009 (est. based on Scoones et al. 2010)
South Africa	2665 (341 males)	1918 (area, est. based on Morris 1976), 1925 (labour, Morris 1976)	6500 (756 'regular')	1960 (est. based on Wilson 1971)	4682š (378 'full time')	area 2007 (Stats South Africa 2010); empl. 2007 (Stats South Africa 2010)
Sudan	0		504 (86 'half yearly')	area 1960 (O'Brien 1980); empl. 1960 based on Simpson (1981)	5880 (n/k)	2005 (Mustafa 2006)
Tanganyika/Tanzania	n/k (140 registered)	1912 (Iliffe 1979)	260 (75)τ	1956-7 (Guillebaud 1958)	63 (n/k)τ	1986 (Hartemink 1995)
Uganda	14 (n/k)	1920 (van Zwanenburg & King 1975)	n/k		0.2 (6)υ	2005 (World Bank 2006)
Zanzibar/Tanzania	25 (n/k)	1916 (Cooper 1980)	24 (n/k)	1940s (Cooper 1980)	clove plantations broken up and redistributed	
Estimated totals	<5000		8-12000		10-15000	

General notes: N workers denotes all workers except where stated. Areas for Kenya, Southern Rhodesia and South Africa denote estimated cultivated areas.

Key: n/k: not known; α refers to Unilever (HCB) plantations only. '350' denotes area of additional concession for collection of natural fruit; β excludes plantations owned by United Brands referred to in Dinham & Hines (1983); γ data refers to cut flowers only; δ cut flowers, fresh vegetables and pineapple only for employment. Sources: pineapple – Jaffee 1992; cut flowers and fresh vegetables – Humphrey et al. 2004; ε excludes Dunlop rubber plantation; ζ refers to Sena Sugar Co. only; η refers to cut flowers and fresh vegetables in 2004 plus sugar in 2009; θ refers to sugar only; š this figure is based on aggregating the total LSF area under all crops in South Africa. It may therefore overstate the crop area as more than one crop may be grown on the same area during a calendar year, depending on season; τ refers to sisal only; υ refers to cut flowers only.

More recently, a similar process occurred in respect of maize, sugar and tea. Maize became predominantly a smallholder crop in Kenya after 1960 and in Zimbabwe after 1980, although LSFs continued to grow it. In South Africa after 1980 it remained the most important crop in terms of area, but its share fell steeply from close to 60 percent of the cultivated area to around 43 percent in 2001. The fall in the overall size of the LSF cultivated area in South Africa over the last three decades is almost entirely accounted for by the decline in maize production following deregulation.[7]

A fourth point concerns the increasing importance since the 1970s of higher value crops, occupying relatively small physical areas but contributing more to exports and even employment than traditional plantation crops. The principal crops in question for eastern African countries (and for Zimbabwe up to the land invasions) are cut flowers and fresh vegetables, while for South Africa they are citrus, grapes and cut flowers. An interesting dimension of this development in Kenya, at least in the fresh vegetable subsector, is that Kenyan Asians and Africans account for a large share of investment (Jaffee 1992).

In terms of post-2004 changes, a World Bank (2010, xiv) publication estimates that no less than 32 m ha in Sub-Saharan Africa was "subject to investor expressions of interest" during 2004-10. The same publication lists five African countries where 'land acquisitions' over this period exceeded 0.75 m ha – Nigeria (0.79 m), Ethiopia (1.19 m), Liberia (1.60 m), Mozambique (2.67 m) and Sudan (3.97 m). Subsequent to this survey and that by Cotula et al. (2009), which it confirms, press reports have noted negotiations of a rash of palm oil concessions. The location of these (west Africa) and their individual scales recall the 1900-1914 period. The Malaysian company Sime Darby has obtained a concession of 220,000 ha in Liberia and is said to be negotiating another of 300,000 ha in Cameroon; the Indonesian company Golden Agri has obtained 220,000 ha in Liberia; the Singaporean company Olam has obtained 300,000 ha in Gabon, and the UK company Equatorial Palm Oil has obtained 169,000 ha in Liberia (*Financial Times* 17 August 2010 and 27 February 2011).

The total amount of land referred to by the World Bank is more than double that already under PF/LSF crop production in Africa. However, it is unlikely that more than a small part of it will be developed. According to the World Bank (2010) no more than 20 percent of 1,075 "ventures" in the five African countries listed had "started any production" by mid-2010, let alone occupied a significant part of their concessions. The history of PF and LSF in Africa (and elsewhere) is littered with non-realised projects,[8] and the scale of the area subject to investor interest may simply express how easy it is to obtain concessions in certain African countries. Nonetheless, it would be excessively cautious to dismiss the developments described as of little account. Even if only 20 percent of the total area of agreed projects eventually reaches production, the impact would be to increase the current size of the PF/LSF crop area in Africa by around 50 percent.

[7] A classic PF crop that has seen a downward trend has been sisal, although this relates primarily to demand and prices rather than to a shift to SSF production.

[8] This applies particularly to some countries listed by the World Bank. See Hammar (2010) on failed concessions for ex-South African and ex-Zimbabwean LSFs in Mozambique in the 1990s and early 2000s, respectively.

ECONOMIC PERSPECTIVES AND POLICY NARRATIVES ON PF/LSF IN AFRICA

Four distinct economic or political economy perspectives on PF and/or LSF can be identified – one of which has two variants.[9] All involve comparisons between PF/LSF on the one hand and SSF on the other. Two of these perspectives date back to the era of classical political economy, while the other two are of 20th century vintage. All have shaped economic policies in Africa in relation to PF/LSF, albeit usually in specific combinations, rather than alone. This section first summarizes the perspectives in their rough chronological order of appearance, then turns to the economic policy narratives that marshalled them as scientific evidence. The condensed account offered here overlaps with the important contribution of Cowen and Shenton (1996), especially in highlighting the influence of Mill and of the Indian experience. However, it also departs from these authors by downplaying the role of the political doctrine of 'trusteeship' and (relatedly) of Fabian socialist thinking.

Economies of scale and technical superiority (1780 – the present)

The perspective that LSF is superior to SSF on grounds of technology and economies of scale dates from Arthur Young (1741-1820) and J.R. McCulloch (1789-1864). Both saw the English model, which combined hereditary landed property with LSF by tenants holding long leases, as both natural and the most productive possible. Hereditary landed property and long leases provided those possessing them with incentives to 'improve' (invest), while at the same time leasing out estate land only in large parcels meant that their proprietors could reap the scale benefits of draft animals, machinery and scientific agronomy, as well as organize workers according to a scientific division of labour. The English system of LSF was compared with SSF by (pre-revolutionary) French sharecroppers and Irish and Scottish 'cottiers' – peasants holding half a hectare or less on annual leases. The latter systems allowed their occupants to survive, in the absence of plant health problems, but provided no incentives for improvement and allowed no economies of scale. Thus they were bywords for misery (see Dewey 1974 for a summary).

Most British economists since McCulloch have subscribed to the critique of this view, which will be discussed in a moment. Nevertheless the Young-McCulloch position had its British advocates. Its core argument was repeated by the first half of the 20th century's standard textbook on tropical agronomy (Willis 1909, 179-90, 200-16[10]) and in the 1940s in international discussions on the optimal production organisation for palm oil. In Germany and the Netherlands the view enjoyed general hegemony. For example, it was incorporated by A.D.A. de Kat Angelino (1931) as a cornerstone of his definitive statement of a Dutch colonial development model, written at the request of his Minister of the Colonies – who also financed its translation into English and French.

[9] Actually more than four perspectives exist. For example, the discussion here does not include Marxist perspectives on LSF. These are well-covered in Bernstein (2010).

[10] J.C. Willis was Director of the Royal Botanical Garden at Kew, which was the institutional reference for agricultural extension services in British Africa until World War II. His book was reprinted twice. While he shared the assumption of PF's economic superiority, Willis's main argument in its favour was technical. Moreover, he did not entirely reject SSF as a basis for cultivating some export crops.

By the end of the 20th century most advocates of the PF or LSF model had modified their economic arguments away from claims concerning the unique investment incentive attaching to LS property. Arguments about economies of scale were maintained, but these were no longer presented as intrinsic. Rather, as will be noted below in relation to the Inverse Relation argument, they referred to scale economies 'transmitted' from processing operations for crops such as sisal, palm oil, sugar, rubber and tea (see also Tiffen and Mortimore 1990, 27). The core of the PF/LSF case became, as it had been from the outset for Willis, a technical one, with technical superiority now defined in terms of both scientific production techniques (propensity to utilize improved crop varieties, farming methods and plant health interventions, Courtenay 1980, 180-83) and scientific management ("the expert direction and training of its workforce by use of a technology of detailed routine working and supervision", Graham and Floering 1984, 15-16).

An interesting footnote to this perspective is its persistent link to Malthusian doctrines of population. Young and McCulloch referred to a race between agricultural productivity and population growth, in a context where Irish peasants in particular were held to combine low propensity to 'improve' with high propensity to procreate. Likewise, later claims for the technical superiority of PF/LSF in Africa have cited an urgent need for 'something to be done' in relation to food security, against a background of abnormal population growth (cf. Collier 2008).

Economic inefficiency and political instability (1830-70)

Soon after it was unveiled, Richard Jones and W.T. Thornton attacked this first perspective along economic lines. In his *Principles of Political Economy* (1848) John Stuart Mill consolidated these critiques and added a political dimension to them. In each case, the example of Ireland – and to a lesser extent, India – was used to reverse Young and McCulloch's conclusions.

According to Jones and Thornton the Irish experience showed that, in agriculture, the propensity to 'improve' related not to landed property or scale, but to security of tenure on the one hand and the presence of functioning markets on the other. Where, as in Ireland, there was no security of tenure or functioning labour market, landlords could make more money from taking advantage of SSF competition for land to continuously raise rents, than from 'improving'. At the same time there was no incentive for SSFs to invest – since they could not be sure they could continue a tenancy from one year to another, nor expect a Ricardian rent,[11] nor use profit to buy land from a landlord. In contrast to the Irish and French sharecropping cases of Young and McCulloch, Thornton cited examples from Switzerland, the Netherlands and parts of Scandinavia where SSFs not hampered by intolerable financial burdens were able to exhibit higher levels of unit investment than LSFs.[12] Thornton also claimed a link between recognition of peasant property rights, spontaneous land consolidation, improved productivity and stabilisation of population growth (for a summary, see Dewey 1974).

[11] Ricardo's theory states that rent for agricultural land is mainly determined by the natural fertility of soil. Ricardo himself accepted that Ireland was an exception to his theory, which he explained as a result of normal tenurial relations being confounded by the 'racial' behaviour of landlords (Collison Black 1953).

[12] Thornton was the first to insist that 'labour-based', in addition to capital-based, improvements be counted as investments.

Mill completed this critique by arguing that LSF enjoyed no natural economies of scale. There were few agricultural machines whose use was economical only for LSFs – and these could be also used economically by SSFs through cooperative ownership. Moreover a peasant household of average size could achieve a level of internal specialization corresponding to the optimal division of agricultural labour (Dewey 1974). Equally importantly, Mill added to the critique of landed property by claiming that, in the absence of market controls, it led inevitably both to an inefficient pattern of resource allocation and to political instability. The latter case was illustrated in relation to both Ireland and Cornwallis' failed 'Permanent Settlement' of 1800 in Bengal. Here, in an attempt to politically consolidate British rule, title to land was invested in a class of non-cultivating functionaries (*zamindars*), in exchange for a fixed land tax. Like their Irish counterparts, the *zamindars* then proceeded to live by collecting rents from insecure cultivators, who responded through continuous revolts and rebellions. Mill's conclusion was that economic and political presumptions should favour peasant proprietorship, if necessary supported through cooperatives (Collison Black 1968).

Racial rents (1940 – present)

The experience of the settler economies (Kenya, Southern Rhodesia and South Africa) provoked a new economic perspective on PF/LSF, interpreting it as a political rather than economic phenomenon, aimed at institutionalizing white racial domination in rural parts of these countries by providing white LSFs with rents. Institutionalization proceeded first through forcibly establishing a white physical presence, then by stabilising white agricultural incomes, and finally by supporting these incomes at levels equivalent to (white) urban ones (Wilson 1971). According to the initial version of this perspective (Hancock 1941; Wilson 1971; Palmer 1977a,b; Bundy 1979) the first two stages of institutionalization both involved undermining the conditions of black SSF. All three entailed subsidising white LSF, initially through cheapening access to land, then through discriminatory labour, output and credit market interventions.[13]

That LSF in the settler economies should not be primarily understood as an economic phenomenon was supported by arguments about LSF under-capitalisation and high attrition rates in the period prior to implementation of the main rent-providing output and credit market interventions. Phimister (1988, 127-29) for example states that the average level of capital commanded by colonists in Southern Rhodesia up to and including 1924 was only GBP 357 per capita, and that 401 of the 1,158 land title holders in 1913 relinquished their titles by 1921. A large proportion of those who remained were wiped out in the first years of the Great Depression. In the tobacco-growing Marandellas area of Southern Rhodesia, 40 percent of the 1928 white LSF population had left by 1932 (Hodder-Williams 1983, 129). Similar evidence has been adduced in relation to Kenya, South Africa and the more peripheral countries of white settlement.[14] According to advocates of this view, even after output and credit market

[13] On land alienation, see van Zwanenberg and King 1975 (Kenya); Phimister 1988 (Southern Rhodesia) and Francis and Williams 1993 (South Africa); on labour market interventions see Cowen 1989 on Kenya, Loewenson 1992 on Southern Rhodesia and Morris 1976 on South Africa; on output market interventions see Mosley 1983 on Kenya and Southern Rhodesia and Wilson 1971 on South Africa; on credit market interventions see references to output markets.

[14] Cf. for example Palmer 1985a on attrition rates amongst white LSFs in Nyasaland in the same period.

interventions kicked in following World War II, LSF in the settler economies was barely profitable. Hodder-Williams (187) for example states that in 1946 50 percent of LSFs in the Marandellas had net incomes of GBP 425 or less, while 25 percent earned GBP 191 or less.

In the 1970s a new variant of this perspective emerged. According to this, while the link between LSF development and the political project of white domination entailed that some LSF in these countries could not be considered a strictly economic phenomenon, it did not entail that LSF generally owed its existence solely to rents. Two arguments are deployed by adherents of this variant (Dunlop 1971; Mosley 1983; Phimister 1988; Vink and Kirsten 2000). The first is that there was always a segment of LSF that was efficient and profitable, independent of policy interventions (at least after land alienation). Mosley (176-78) for example shows that the average yields reported for white LSFs in Kenya and Southern Rhodesia up to 1960 – which were quite high in international terms (see section on Farming Systems, below) – concealed a high level of internal differentiation, with a minority of high volume-high yield producers and a majority of low volume-low yield ones.

The second argument is that most policy interventions in the countries concerned, particularly those in the credit and output markets, were never aimed at providing rent to the LSF sector generally. Actually they were targeted at smaller, less viable white LSFs. Mosley (179-81) notes here that in the 1930s the Kenya Land Bank set loan limits too low to be of relevance to larger LSFs, while the public maize marketing system distributed sales quotas to white farmers in inverse relation to their output. Similarly in Southern Rhodesia in the 1950s producer prices for LSF maize were set administratively on the basis of a 'cost plus' formula, where the production cost component was derived from surveys with samples biased in favour of smaller LSFs (Dunlop 1971, 34). Policies involving politically distributed sales quotas, biased in favour of smaller LSFs, were also widely applied in South Africa (Vink and Kirsten 2000). After World War II, this was usually linked to designation of LSF cooperatives, with 'white egalitarian' purchasing policies, as sole or dominant buying agents for public marketing boards.[15]

Although not explicitly constructed as a reply to this approach, Morris's (1976) contribution to the history of labour market interventions in South Africa is worth considering, since it casts doubt on the second argument. Morris shows that the main measures enacted, especially from the 1930s to the 1950s, were aimed at consolidating the emergence of 'progressive' (i.e., fully capitalist) farming, at the direct expense of the smaller and less competitive LSFs whose labour supply relied most on non-labour market mechanisms such as share tenancies and labour rent tenancies. Hence even if smaller LSFs were favoured by some policies, others penalized them.[16]

An inverse scale-productivity relation (1960 – present)

Comparisons of the efficiency of PF/LSF and SSF revived internationally in the 1950s and 60s, in the context of publication of the first Indian Farm Management Surveys and the Inter-American Committee for Agricul-

[15] See for example Dunlop 1971, 39 on the role of the LSF cooperative in the Southern Rhodesia tobacco sector.

[16] Although livestock farming is outside the paper's empirical scope, it may be noted that Beinart (2001, 36-45) makes a similar point about the nature of some policy interventions in this area.

tural Development's reports on seven Latin American countries (Lipton 2009). Both pointed to SSFs' generally higher output per unit. The explanation favoured at this time referred to the abundance of labour relative to the shortage of capital in developing countries, and more specifically to the 'dualism' of developing country labour markets, with SSF identified with family as opposed to wage labour (cf. Sen 1966; Mabro 1971). Given that, in agriculture, returns to labour diminish as more labour is applied, those hiring in wage labour (LSFs) will cease to do so at the point where the marginal value of output equals the market wage. But because of labour market segregation and a lower effective price of labour, family members will continue to work on the SSF even after the net benefit from marginal output fall below its value in wage terms.[17]

Two studies published between 1979 and 1985 (Berry and Cline 1979; Cornia 1985) provided the most comprehensive LSF-SSF empirical comparisons to date. Both claimed to provide clear evidence across Asia, Latin America and Africa, and – in the case of Berry and Cline – time periods for what the authors called the 'Inverse Relation' (IR) between farm size and agricultural productivity in developing countries. These studies argued that SSF's lower effective labour price allowed cultivation of higher proportions of land within holdings, and investment in more labour per unit of cultivated land. The authors complemented this argument with one concerning capital market imperfections. According to this, since LSF operations enjoyed cheaper access to capital they over-substituted capital for labour, thus reducing their relative productivity further.

[17] This argument recalls Kautsky's (1988) thesis of the theoretically limitless nature of peasant self-exploitation.

A majority of subsequent contributions on developing countries, up to and including Lipton (2009), have supported the IR proposition (e.g., Netting 1993; Ellis 1993; Deininger and Feder 1998; Griffen et al. 2002). From Feder (1985) on, a further explanation for the IR is deployed, which thereafter comes to displace that of dual labour markets. This is that SSFs' higher productivity results from a superior capacity to supervise labour. This leads SSFs to select more optimal factor combinations (more labour, capital only in a form of labour-based improvements, and less purchased or hired inputs).

Lipton's (2009, 72-73) own gloss on this argument introduces the language of transaction cost economics, according to which there are systematic differences in the "transaction costs per unit (TCU) of output" between SSFs and LSFs in developing countries. Normally, SSFs have lower TCUs associated with labour recruitment and supervision, farm capital established by on-farm labour, and disposal of output (since most of this is used to pay family members in kind). This makes it profitable for SSFs to use more labour and more inputs that directly complement labour per unit than LSFs. SSFs' lower supervisory TCUs (following Feder and others) are further reinforced by the fact that SSF family members are residual claimants to profit and thus have greater incentive for effort than hired labour.

The criticisms raised against the IR fall into two main groups. One set is primarily methodological. As for example Dyer (2004) points out, the classic contributions did not control for crop mix or – more importantly – for differences in agro-ecological conditions in their estimations of productivity. Thus, an IR may simply reflect a probability that areas of good soil fertility and water availability will be more heavily settled than areas lacking these characteristics. The other

group is primarily empirical. As is pointed out by Sender and Johnston (2004), the handful of studies from Africa for example, subsequent to Berry and Cline and Cornia, do not provide robust or unambiguous support for the IR.[18]

Sender and Johnston (2004) go on to claim that the inability of a number of World Bank-financed studies on Zimbabwe and South Africa immediately after majority rule to confirm the IR in these countries has led to reformulation of the argument in its favour in a near-tautological form. In this, the IR is said to exist in all developing countries, except where SSF has been politically suppressed, and/or rents supplied to LSFs.

Sender and Johnston (2004) advance the rudiments of a counter-argument against necessarily lower TCUs for SSFs in respect of labour. This refers to 'institutional arrangements' through which LSFs may 'reduce the bargaining power of workers, facilitate supervision and increase (worker) incentives' – including increasing use of less protected/more vulnerable categories of workers; and paternalism. The other component of the 'lower TCU' argument, identifying SSF with family labour, may equally repay critical attention. Work in Zimbabwean communal areas in the early 1980s found that around 30 percent of households sampled hired agricultural labour (Truscott 1985). Recent work on northern Tanzania finds that 43 percent of SSFs surveyed there hire in labour during the main agricultural season (Mueller 2011). The present author's data from a cocoa area in Uganda indicates that here a substantially larger proportion does.[19]

World Bank (2010), although in general subscribing to the IR, complements Sender and Johnston's argument by providing a further list of circumstances under which it may not apply. These include the cultivation of crops that require industrial post-harvest treatment or processing immediately after harvesting, in which case economies of scale in processing may be transmitted to production;[20] participation in global supply chains where buyers demand sophisticated standards entailing high fixed costs such as traceability, or sophisticated logistical systems to which both high fixed costs and economies of scale apply; and utilization of advanced technologies such as remote sensing which can substitute for or even improve on the imputed 'local knowledge' advantages of SSFs.

Policy narratives

Of the different narratives or doctrines guiding international policy toward PF and LSF in Africa over the last 50-100 years, one has largely dominated. This will be considered here in detail, followed by brief reviews of two subordinate doctrines.

The (evolving) ICS doctrine

20th century British colonial policy regarding land and agricultural production was dominated by what can be called the 'Indian Civil Service' (ICS) doctrine. The domination of this doctrine persists today, although, as will

[18] The main references are Hunt (1984) and Livingston (1986) using Kenyan data from the late 1960s and early 1970s; Pearson et al. (1981) using Nigerian data from the 1970s; Barrett (1993) on Madagascar; Sahn and Arulpragsam (1993) on Malawi; Adesina and Djato (1996) on Côte d'Ivoire and Dorward (1999) on Malawi. Of these, only Hunt and Livingston provide clear support for the IR while Dorward supports its rejection.

[19] About half of the bottom SSF farm size tercile in the Uganda sample hired in labour. In the top tercile, around 80 percent did. A probit regression shows a statistically significant relation between SSF gross crop income and volume of hired labour, controlling for a range of other factors. For details of the calculations contact the author.

[20] This argument is attributed to Binswanger and Rosenzweig (1985).

be seen, a succession of modifications to it has occurred since the 1940s. The doctrine is given the title 'ICS' here since it derives from that instituted in British India in the second half of the 19th century, following the critique of Cornwallis's reform in Bengal. It was shaped personally by Jones, Thornton and Mill, who were all either officials in the East India Company or its successor, the ICS, or were employed to train its leadership. Its central feature was the presumption against LS property in land and in favour of peasant proprietorship, on the basis of the arguments referred to earlier. A precondition of the ICS doctrine unfolding in Africa was the hegemony of the ICS in the British colonial service, due not least to the tendency for leading administrators or advisors in Africa to be drawn from the ICS's ranks.

An important moment in the ICS doctrine's dissemination in British Africa was the West Africa Land Commission of 1914-18, appointed to decide what tenurial system Britain should endorse in the region. Although the detailed recommendations of the Commission were never implemented, its rejection of freehold concessions to PF was accepted, while its justification for doing so was to become implanted in the 'official mind'. This repeated Mill's link between the economic inefficiency of LS property and the latter's potential for political destabilization. Not only land alienation, but also hired labour and labour migration was presented as threatening the indirect rule system (Hopkins 1973, passim; Phillips 1989, 72-76, 97-100).[21]

Developments in the west African cocoa sector were also used to justify institutionalization of the ICS doctrine. SSF production overtook PF production of cocoa in the Gold Coast during 1900-08. This – and related price considerations[22] – encouraged the British Cotton Growing Association and Cadbury Bros, who were then operating plantations in Nigeria and the Gold Coast, respectively, to subsequently source these crops overwhelmingly from SSFs (Phillips 1989, 70). Daviron (2010) notes the dissemination of the Gold Coast peasant cocoa story in international scientific journals from 1909, and partly attributes the fading lure of PF also in French colonial circles at this time to reflection upon it.[23]

Lever Bros (the forerunner of Unilever) was not convinced that SSF production could compete against PF over the long term in the case of oil palm, and pressed ahead with demands for large plantations in British West Africa. Refused land for this purpose, it diverted its investment to the Belgian Congo (Phillips 1989, ch. 5; Fieldhouse, 501-02). It was to be another 35 years before the Belgians also adopted a version of the ICS doctrine.[24]

Consideration of the pros and cons of PF/LSF and SSF revived in British Africa immediately before and during World War II, in the context of debate in business, sci-

[21] Hired migrant labour was also held to lead to a series of 'problems of population'. For a classic British statement see Ardener et al., 1960. Daviron 2010 mentions a similar discussion in France.

[22] George Cadbury is quoted by Phillips (1989) to the effect that "self-employed Africans were willing to work longer and for lower returns than day labourers". Cadbury Bros's reluctance to rely on PF was reinforced by popular boycotts of chocolate and cocoa from cocoa plantations on São Tomé, following exposure of labour conditions there in 1908 (Clarence-Smith, 1990).

[23] PF/LSF's low priority in French Africa was reaffirmed in 1944 at the Free French Brazzaville conference, held to determine post-war colonial policy. PF/LSF "received virtually no support…The colons (settlers, PG) were reviled for their inefficiency and greed and for putting officials in the position of slave traders" (Cooper 1996, 180).

[24] According to Clarence-Smith (1983) policy in the Belgian Congo only moved decisively in a pro-SSF direction after 1945. The process in Portuguese colonies was slower and also inconsistent between colonies.

entific (the British Association) and government (the West Africa Commission) circles of whether SSF-based palm oil production for export in west Africa remained viable, given its apparent out-competition by Dutch-owned plantations in Asia. This issue, and de Kat Angelino's related promulgation of a distinct Dutch development doctrine (see above) is referred to in William (Lord) Hailey's (1938) *African Survey*, sponsored by the Colonial Office, and – in more detail – in Sir Alan Pim's (1946) definitive restatement of British colonial agricultural policy, sponsored by Chatham House.

Pim was a scion of the ICS who acted as a roving Colonial Office economic advisor in Africa,[25] and he reaffirmed the classic ICS position – with one twist. He granted that Asian palm oil plantations now used scientific methods of seed selection and plant health treatment, and in this respect were technically superior to SSF. But there was no reason why 'peasant producers' should not also benefit from technical advances, provided that they were organized in ways facilitating their 'scientific assistance'. Two such ways were outlined: 'better organisation' with assistance from public institutions; and/or organization as outgrowers for plantations (Pim 1946, 141-42).

Clad mainly in the guise of resettlement schemes – based on subdivision of settler land and/or consolidation of peasant holdings,[26] using farm plans, model budgets and target incomes, and often linked to PF 'nucleus estates' and processing facilities – these proposals were to become the main agricultural development strategies of the late colonial and initial post-independence periods in Africa (Gaitskell 1959 ch. 25; Phillips 1965; Rendell 1976, 275-78). As former British officials disseminated the now revised doctrine in international organizations, 'Integrated Rural Development' (IRD) planning proliferated along these lines (Hodge 2010). The World Bank alone sponsored more than 70 IRD projects and programmes in independent black Africa between the late 1960s and the 1980s.

Arguably it is still this doctrine, in a form where the role of 'better organising' smallholders is performed entirely by private LSF/PF, that underlies donor support to what Gibbon et al. (2010) refer to as 'third generation' (or post-liberalisation) outgrower schemes in Africa. While the old conditions of land titling and consolidation are dropped, assistance is provided for SSFs to produce for export on a sub-contracting basis for stand-alone export companies who provide services, or through service-providing LSFs that are also exporters. Creating more schemes of this type is currently proposed by the World Bank (2010) as its alternative to the granting of new land concessions exclusively for LSF/PF in Africa.

Eliminating PF/LSF through land reform

Whereas J.S. Mill actively advocated a comprehensive redistribution of landed property to SSFs, not only in Ireland and India but also mainland Britain, in Africa the ICS doctrine was mainly used to contain demands to further expand PF/LSF where land tenure systems were contested, rather than to dismantle it. Even in independent black Africa the only instance prior to Zimbabwe in 2000, where PF/LSF was subject to a forced redistribution, was in Zanzibar, following the revolution of 1964.[27]

[25] Later he was amongst the founders of the Oxford Committee for Famine Relief (Oxfam).

[26] Based on individual surveying and titling.

[27] No studies of this process seem to have been published.

When land reform first appeared in policy narratives concerning Africa, this was in relation to LSF in Kenya and Zimbabwe (cf. Hunt 1984; Livingston 1986; Weiner et al. 1985; Roth 1990). Later, it resurfaced in South Africa immediately after majority rule (cf. Deininger and Binswanger 1995). The narrative combined the initial version of the racial rents perspective on PF/LSF with the IR perspective: Redistribution of LSF land in favour of SSFs would eliminate racial rents, restore the viability of black SSF and thus increase agricultural productivity. The reforms proposed within this narrative were quite radical. In the Zimbabwean case for example, Roth (1990) floated the idea of redistribution – by a method not much specified – of 50 percent of all LSFs, plus 50 percent of all land deemed to be 'underutilised' on remaining LSFs.

Some of this narrative's main proponents were employees of the World Bank. But, in the event, their parent institution espoused policies falling well short of it. In Zimbabwe the World Bank's (1995) official position favoured taxation of agricultural land, liberalization of the land market by permitting voluntary subdivision of LSFs, and assistance to an increased number of resettlement schemes. Thus, in practice, the land reform policy narrative became absorbed in the revised version of the ICS doctrine. Conversely, when land redistribution eventually occurred in Zimbabwe through the invasions of 2000, government justified it not in economic terms, but in terms of the citizenship of farm owners and workers[28] (Rutherford 2001b; Hammar and Raftopoulos 2003). Notwithstanding this, some recent contributions to the literature (e.g., Scoones et al. 2010) have sought retrospectively to absorb the experience into a more orthodox land reform narrative.

[28] 'British' or 'Boer' farm owners, 'Malawian' or 'Mozambican' farm workers.

'Structural adjustment' of LSF

While the analytical difference between the two variants of the racial rents perspective is one of emphasis, in practice they became linked to markedly different narratives of reform. The second version of the racial rents perspective, associated initially with Dunlop and Mosley, was absorbed into a policy narrative that linked up with the classical case *for* PF/LSF – that is, technical efficiency and economies of scale. This policy narrative took the form of a call for the 'structural adjustment' of LSF in the settler economies. Full liberalization of land and output markets would allow separation of the efficient from the inefficient, rent-dependent component of LSF – thereby realizing the sector's underlying economic advantages.

This narrative gained ground amongst agricultural economists in South Africa from the early 1980s and formed the discursive basis for the reforms of the South African agricultural sector of the late 1980s and mid-90s. Prior to majority rule in 1994, therefore, South African LSF was in a process of reform. Subsidies and opportunities for rent were severely reduced, resulting in shakeout of large numbers of producers (cf. de Klerk 1993; Bernstein 1996; van Zyl et al. 2001; Vink and Kirsten 2000). Indeed, following this shock it took more than a decade for the sector's aggregate profitability to be restored. On the other hand, implementation of these changes blunted the edge of land reform narratives, since rent seeking was visibly in retreat. Agricultural policy in South Africa following majority rule mainly concerned putting the final touches to this process.

FARMING SYSTEMS

Capital and labour intensity in the settler economies

The literature on LSF and PF farming systems in Africa mainly deals with LSF systems in the (former) 'settler economies', particularly Kenya, Southern Rhodesia/Zimbabwe and South Africa. Here, as noted, the dominant critical perspective identified widespread problems of under-capitalisation. Farms covered huge areas, most of which were left uncultivated, while the small part that was cultivated was mono-cropped with a food crop in a labour intensive, low-yield system (cf. Hancock 1941; Pim 1946; Palmer 1977a,b). This stereotype certainly captures some aspects of one type of LSF system in these countries, at least up to 1945. But it captures neither all the main aspects of this type of system, nor variant types, nor later changes. The extent of variations and changes will be briefly considered in this section by discussing in turn the issues of farm size, share of cultivated land in total farm area, share of land under maize and other grains, capital intensity of crop production, and labour intensity.

In terms of LSF scale, there was a steady decline in all three countries from the early part of the 20th century up to the 1960s, as LS farmer settlement became denser (for example, through schemes to settle white ex-servicemen on the land) without a corresponding increase in the total area of alienated land. Whereas around World War I the average size of holding in each country was over 2,000 ha, this had fallen by 1960 to around 1,200 ha in Southern Rhodesia and to 800 ha in Kenya and South Africa.[29] Although by 1980 the average LSF size continued to fall in Kenya (to 748 ha, Government of Kenya 1982), in Southern Rhodesia and South Africa it was to increase again over the same period, to around 1,600 ha and 1,200 ha, respectively.[30] Since 1990 data on average LSF size is available only for Zimbabwe, and then only for that decade itself. In South Africa, no data on the total LSF area has been published for some decades. But indirect evidence suggests substantial further concentration in farm size there since 1990, as the number of 'commercial farming' units fell from just over 60,000 in the early 1990s (Stats South Africa 2002, 7) to just under 40,000 in 2007 (Stats South Africa 2010).

Because of the absence of data on total LSF area, information on the proportion of LSF land under crops is also not available in the case of South Africa. Data on Kenya and Southern Rhodesia/Zimbabwe is available, but difficult to use for comparative purposes due to variations over time and place in the definitions of 'cultivation' applied.[31] Including fallows and improved pastures, but excluding land planted with sisal, sugar and wattle, in 1960 about 14 percent of the Kenyan LSF area was cultivated,[32] probably about 8 percent in Southern Rhodesia (Brown 1968, 44; Dunlop 1971, 9) and probably around 6 percent in South Africa (Beinart 2001, 206). These proportions had increased from levels below 5 percent in 1945 – almost certainly as a result of greater mechanization (see below).

[29] Palmer 1977a and Phimister 1988, 126 on Southern Rhodesia; van Zwanenberg and King 1975, 36 and Brown 1968 on Kenya; Beinart 2001, 207 on South Africa.

[30] von Blankenburg 1994, 15-20 on Southern Rhodesia/Zimbabwe; Marcus 1989, 7 on South Africa.

[31] Some of these include only land under crops in a given year, while others also include fallow land included in rotations and improved pastures. A further problem is that land under PF may be included in the LS farm area.

[32] Note that the data in Table 1 includes estimates of the areas under sugar and sisal in these countries.

In all three settler economies the proportion of the LSF area under crops and permanent pasture continued to increase until the 1980s. Using the same definition as applied a moment ago, in Kenya it reached 16.3 percent by 1980 (Government of Kenya 1982). In Southern Rhodesia/Zimbabwe and South Africa the cultivated area continued to expand until the end of the 1980s, although thereafter it was to contract sharply (von Blankenburg 1994,15-20; Vink and Kirsten 2000). In Zimbabwe it was below 5 percent of the LSF area again by 1990. The share of the LSF area under crop production has almost certainly continued to fall in South Africa since the 1990s, probably to around 4 percent today. These developments suggest that since 1980 the 'big picture' of LSF in the settler economies has become one of capital de-intensification. However, as will be seen, this picture does not apply to crop production considered in isolation.

Maize was the backbone of LSF crop production in all three countries until 1945. For thirty years after 1945 it continued to account for the largest single share crop area in Southern Rhodesia (von Blankenburg 1994, 15-20) and South Africa – resting on introduction of hybrid varieties and mechanization (McCann 2005, 141). But in Kenya a process of LSF diversification to other crops including winter wheat, coffee and tea was strengthening already in the 1950s (Brown 1968, 59). Diversification out of maize would also characterize Southern Rhodesia and South Africa from the mid-1970s. The turn away from maize, in this case mainly but not only towards livestock, was to be most marked in South Africa, where the planted area on LSFs contracted steadily from 4.8 m ha in 1974-76 (FAO-STAT, based on South African Maize Board data) to 3.9 m ha in 1985-89, 3.6 m ha in 1990-94 and 3.1 m ha in 1995-99 (Breintenbach and Féynes 2000; South African Grain Information Service).

At least until the land invasions of 2000, diversification out of maize in Southern Rhodesia was mainly into tropical and semi-tropical non-grain crops, led by tobacco but also including cotton and soya, although there also were significant expansions in other grains and in horticultural products (von Blankenburg1994). In Kenya, the estate coffee area remained constant after independence, while the estate tea area increased in the 1970s before becoming subject to a government ceiling.[33] But beginning in the 1980s there was rapid growth of LSF fresh vegetable and cut flower production for export. The impacts of this growth have been mainly in terms of export values and employment rather than in land use, however. Even today the area under production of these crops represents only a fraction of the remaining Kenyan LSF area – almost certainly no more than 12,500-17,500 ha.[34]

In the context of the retreat of maize in South Africa, increases in the areas under deciduous fruit, vegetables and grapes have been recorded, but this mainly has continued to be in Western Cape, where these crops were already well established (Vink and Kirsten). Moreover, the share of 'horticulture' in national gross commercial farm income has hardly changed since the early

[33] The Kenyan estate coffee area remained at around 29,000 ha from 1960. Tea increased from 20,000 to 27,000 ha before the ceiling was imposed (Government of Kenya 1982). See Swainson (1980, 254 and 264) on the ceiling.

[34] The Kenya Flower Council estimates the total LSF area under cut flowers as 2,500 ha; no data directly reporting the LSF area under fresh vegetables is available. Based on the employment figure reported in Humphrey et al. (2004) and the labour density figure stated by Mausch et al. (2006) this area is somewhere between 10,000 and 15,000 ha.

Table 2. Yields, capital and labour intensity, LSF in Kenya, Southern Rhodesia/Zimbabwe, South Africa and Sudan, 1930-1994

		1930/4	*1935/9*	*1940/4*	*1945/9*	*1950/4*	*1955/9*	*1960/4*	*1965/9*	*1970/4*	*1975/9*	*1980/4*	*1985/9*	*1990/4*
Maize	Kenya	1591.0	1770.2		1120.4	1165.2	1299.7	1680.6	2891.4*					
	SR/Zim	1319.0	1341.7	1341.7	1159.8	1364.5		3024.6					4080.0	5366.0
	SAfrica	773.2			773.2	798.3		1106.7		1651.1		1614.8	2020.0	2040.0
Wheat	Kenya				784.3	1210.0	1030.7	1299.7	1300.0*	1546.6*		1177.6		
	SR/Zim												5190.0	6480.0
	SAfrica					453.6		535.2		734.8		1025.1	1360.0	1600.0
Tobacco	SR/Zim	213.3	233.1	261.1	264.2	272.7	358.2	496.4					2100.0	2985.0
Sorghum	Sudan									814.0	759.2			471.4†
Tractors per farm	Kenya					1.3		1.8		1.81	1.88	1.84		
	SR/Zim				0.1	0.9			2.32					4.9
	SAfrica	0.04				0.4		1.2				4.6		
Labour per tractor	Kenya					41.7		39.4						
	SR/Zim				283.6	33.2	23.4		13.4					11.9
	SAfrica	90.3				13.3		6.9				2.7		
Labour per ha cultivated land	Kenya				0.34			0.41	0.08*					
	SR/Zim				0.64		0.52		0.43				0.47	0.37
	SAfrica						(0.02)	0.12 (0.01)						0.08**

Notes: For purposes of comparison, South African maize yield data refers to white maize only. Bracketed data on labour per ha refers to maize only. Non-bracketed data refers to LSF production generally.

Key: * 'African owned' LSFs, Trans Nzoia district only, 1967-70 (maize and labour), 1968-9 and 1970-71 (wheat); † data for 1990-99; ** data for 2007.
Notes: All yields data is in kg./ha; data on Sudanese sorghum yields refers to Gedaref only. Calculations involving reference to labour are based on data on permanently employed labour, or male labour where information on permanent labour is not available.

Sources: (a) yields: Brown 1968, 58; Mosley 1983; Government of Kenya 1972, 1977, 1980 and 1982; Palmer 1977a, 92; Dunlop 1971, 44; von Blankenburg 1994, 58; Vink and Kirsten 2000.; Breitenbach and Fényes 2000; South African Grain Information Service; O'Brien 1980, 100; Simpson 1981, 210; Mustafa 2006, 33; (b) farm numbers and cultivated land areas: van Zwanenburg and King 1975, 45; Brown 1968, 44; Dunlop 1971; Palmer 1977a; Phimister 1988; von Blankenburg 1994, 15-20; Wilson 1971; Morris 1976; Marcus 1989; Beinart 2001; (c) tractor numbers: Mosley 1983, 184; Brown 1968, 59; Wilson 1971, 152; Dunlop 1971, 18; Beinart 2001, 207; von Blankenburg 1994, 52; (d) labour numbers: Mosley 1983, 184; Brown 1968, 54; Dunlop 1971, 19; Rutherford 2001a, 43-46; Morris 1976; Wilson 1971; Budlander 1984; Beinart 2001; Marcus 1989, 37; de Klerk 1984; Stats South Africa 2010.

1990s (at ca. 22-23 percent, Stats South Africa 2006). Since the South African winter wheat area has fallen even faster than that for maize[35] it is probable that, where grains have been replaced by other crops, this has been mainly by oilseeds and possibly fodder crops. The commercial farm area under soya and sunflowers combined is reported to have increased from around 0.7 m ha (2006) to around 1.05 m ha in 2011 (Government of South Africa 2006, 2011).

The overall trend in terms of crop specialization from 1945 to 1975 was thus one of some diversification of the overall crop mix within an overall pattern of a large increase in grain production. Since 1975 it has been one of substantial contraction in grains partly compensated for by growth in tobacco and cotton (Zimbabwe), horticultural crops (all three settler economies) and, to a limited extent, oilseeds in South Africa. Although the share of total output exported has increased over time, this shift is not co-terminus with one from domestic to export crops. All three countries exported grains, especially from 1945 to 1960 (albeit sometimes at a loss[36]), while significant shares of South African deciduous fruit and grape production were for the domestic market.

Generalizations concerning the overall capital and labour intensity of LSF crop production in the settler economies are problematic, not to say of possibly limited value, given the patchy evidence and the large differences between the requirements of different favoured crops. For this reason the discussion that follows will continue to focus mainly on maize, with brief comparisons with other crops.

The capital intensity of maize production was low in all three countries prior to 1945, when public agricultural credit provision took off (Mosley 1983; Wilson 1971). Nonetheless, pre-World War II maize yields in Kenya and Southern Rhodesia were remarkably high – according to Mosley (175) at similar levels to those in Australia and the US. This presumably reflected natural soil fertility, as yields in South Africa – even when crops were subject to relatively intensive cultivation – were substantially lower.[37] When it did become available after World War II, public agricultural credit was sometimes at low or negative real interest rates and was accompanied by tax breaks and subsidies for fertilizer, fuel and water. These provisions continued to underwrite farm capitalization into the 1970s in Southern Rhodesia and into the 1980s (at least) in Kenya and South Africa (Mosley 1983; Phimister 1988, 227; de Klerk 1993; van Zyl et al. 2001).

Initially, increased capital intensity in maize production mainly took the form of replacement of oxen by tractors. This change became general in the late 1940s in Kenya and in the early 1950s in Southern Rhodesia and South Africa (cf. Table 2). In Southern Rhodesia capital intensity sharply increased further in the first half of the 1960s, in the form of adoption of (publicly bred) hybrid maize varieties and increased application of synthetic fertilizers. The key event here was the release of locally bred SR 52 hybrid maize in 1960, which worked well with nitrogen fertilizer. SR 52 was adopted for 93 percent of all plantings on Southern

[35] Between 1985-89 and 1995-99, for example, it fell from an average of 1.9 m ha to an average of 1.2 m ha (Breitenbach and Fényes 2000, South African Grain Information Service). In 2006 the winter wheat area was only 0.6 m ha. (Stats South Africa 2010).

[36] A part of the maize exports from South Africa and Southern Rhodesia were however clearly remunerative. These were to the British industrial starch and distilling market. McCann (2005, 115) traces the introduction in the 1920s of South Africa's national system of maize standards and grading to the requirements of this market.

Rhodesian LSFs by 1967, while fertilizer application rose from 269 kg/ha in 1956 to 405.2 kg/ha in 1965. A spectacular increase in maize yields resulted, which continued through into the 1980s (see Table 2) and allowed Southern Rhodesian yields to almost recover parity with contemporary American ones (McCann 2005, 123-54; Dunlop 1971, 17). LSF synthetic fertilizer consumption also increased substantially in Kenya up to the mid-1970s, when data ceased to be available. Here, application increased from an average of 85.6 kg/ha during 1965-67 to 241.7 kg/ha in 1973-74 (Government of Kenya 1969, 1977).

By contrast, capital intensification in maize production in South Africa up to the 1980s seemingly continued to be mainly confined to diffusion of tractors, and from the 1970s, some combine harvesters (Beinart 2001, 207). No 'breakthrough' hybrid maize variety especially designed for local conditions was bred, and while synthetic fertilizer use did increase, this was from a very low base. Fertilizer application on maize in western Transvaal in 1982 had increased by 400 percent over that in 1966, but still stood at only 100 kg/ha (de Klerk 1984). Moreover, fallows seem less likely to be observed in South Africa than the other settler economies (cf. Murray 1992 on Orange Free State). Maize (and winter wheat) yields did increase, but at nothing like the same extent or at the same rate as in Southern Rhodesia or even Kenya.

Capturing the overall capital intensity of LSF crop production in the settler economies is difficult, as little data on investment in particular is available. Repeat survey data from 1967/68 to 1970/71 for 54 (black) African-owned LSFs in Trans Nzoia, Kenya[38] – whose maize and wheat yields were well above the national averages for South Africa during the same period (cf. Table 2) – reports an average capital investment level of GBP 13,000 – a figure that the authors of the survey report considered 'worrying low' (Government of Kenya 1972).

More recent data is available only for South Africa. The 2007 Census of Commercial Agriculture (Stats South Africa 2010) reports the 'market value of farm assets' for the country's ca. 40,000 LSFs. The average unit market value of farm assets including land was 4.49 m Rand (USD 658,000). Discounting the market value of farmland, average unit assets were worth 1.96 m Rand (USD 287,000), varying between 1.52 m Rand (USD 223,000) in the maize-growing Free State and 2.96 m Rand (USD 432,000) in the Western Cape, the centre of South African fruit and horticulture. No direct comparison of this data with that from Trans Nzoia cited above is possible, even if the latter is updated to 2007 prices taking account of inflation. This is partly because it is unclear whether the Kenyan average figure includes the purchase price of the farms in question, partly because it is also unclear which national or international inflation index should be used in calculating the 2007 value of this investment,[39] and partly be-

[37] Murray (1997) gives an average maize yield of 1,001 kg/ha for 1928 in Bethal (eastern Transvaal), where use of synthetic fertilizer was most widespread in South Africa. For eastern Transvaal generally it was 687 kg/ha.

[38] At independence in 1963 there were 480 white-owned LSFs in Trans Nzoia district. By 1970 270 of these had been purchased by black Africans, 72 remained under white ownership, 40 had been taken over by public corporations and 100 had been redistributed to SSFs in resettlement schemes. As average LSF size remained around the same over this period (at ca. 525 ha) no process of LSF concentration occurred. However, black-owned LSFs were smaller on average (at 386 ha) than LSFs generally in Trans Nzoia (Government of Kenya 1972). The new owners were typically drawn from the circle around Jomo Kenyatta, Kenya's first President. They included politicians in his KANU party, senior civil servants and a few businessmen. Their ownership was mostly absentee, although a large majority employed professional farm managers.

[39] Using the UK Consumer Price Inflation Index for example, the 2007 value of a 1970 investment of GBP 13,000 would be GBP 145,000 or 1.98 m Rand (http://www.measuringworth.com/ppoweruk/).

cause the South African data reports market values as opposed to actual investment at historical cost. Nonetheless, it appears that average unit capital investment in LSF maize farms remained low, absolutely and in relation to average unit capital investment in LSF fruit and horticulture farms.

There is insufficient labour intensity-related data on maize production across different settler economies and time periods to offer generalizations in this area. All that is clear is that the dissemination of tractors in the late 1950s and early 1960s was associated with a radical reduction in the labour intensity of maize production in South Africa (cf. Table 2). Otherwise, the differences in labour intensity between countries and periods reported in Table 2 primarily reflect locational and temporal differences in the crop composition of production, rather than differences in efficiency. This relates to the fact, already alluded to, that in all the settler economies LSF agriculture embraced not only grains but also sub-sectors with much higher average levels of both capital and labour intensity.

These sub-sectors included tobacco in (pre-land invasion) Zimbabwe, fruits in South Africa and fresh vegetable and cut flowers in Kenya, South Africa and pre-land invasion Zimbabwe. In all these cases there are differences in capital intensity of production with grains, either in terms of establishment or production costs or both. For a few of them, such as cut flowers and grapes, investment requirements in terms of farm infrastructure and/or crop establishment costs are substantial. A hectare of modern (steel and polythene) greenhouse will cost upwards of USD 75,000, without irrigation and other systems and without plant stock – as well as without post-harvest infrastructure. In terms of plant stock, Ewert and du Toit (2005) report 1994 grape farm establishment costs in South Africa as USD 20,600/ha for 'noble cultivars'. While, like grains, annual crops grown in open fields like tobacco and fresh vegetables have relatively insignificant establishment costs, their production costs are nevertheless high. For tobacco in Zimbabwe in 1992 Rutherford (2001a, 70-72) reports annual production costs including labour as USD 4,231/ha. For fresh vegetables in Kenya in 2006, Mausch et al. (2006) report production costs including labour as USD 10,116/ha, while for cut flowers in Ethiopia and Kenya respectively in 2009 Melese and Helmsing (2010) report production costs including labour of around USD 60,000/ha and USD 80,000/ha.[40] These figures compare to Southern African LSF maize production costs towards the end of the 20th century, that were almost certainly below USD 200/ha.

Differences in labour intensity are of course reflected in this variance in capital intensity. Whereas maize production in Southern Africa after the 1960s employed no more than 0.01 workers/ha, the comparable figures for tobacco were 0.35 workers/ha (Rutherford 2001a); for deciduous fruit in Western Cape in 1994 1.0-1.2 permanent workers/ha (Kritzinger and Vorster 1997) and in 2002 0.53 permanents/ha, plus 0.79 'regular workers'/ha (du Toit and Ally 2003);[41] for pineapple production in Eastern Cape in 2004 7.93 permanents/ha (Jespersen 2005); for fresh vegetables in Kenya in 2006 1.7-2.1 permanents/ha (Mausch et al. 2006) and for cut flowers in Kenya in 2004 15-23 workers (in all)/ha[42] (Dolan et al. 2005).

[40] The difference is accounted for mainly by higher Kenyan labour costs.

[41] du Toit and Ally's survey included some grape farms, as well as deciduous fruit ones.

[42] This figure includes workers employed in non-field jobs, including post-harvest operations.

Taken together with the data on capital intensity of crop production already reviewed, this material suggests the following interpretation. Partly in line with the variant of the 'Racial rents' narrative proposed by Mosley and others, LSF crop production in the settler economies was subject to deep stratification. However, this stratification has been more complex than is normally proposed in this narrative. As already suggested, its principal aspect was tied to crop specialization *per se*, rather than in differences in levels of capitalization of maize production – although of course these existed too. On average, maize production attracted large-scale farmers who were capital-poor, and whose use both of capital and labour reflected this. In contrast, tobacco, fruit and horticulture on average attracted farmers who had more capital, and who could thus afford to engage in more technically complex types of farming and employ a higher volume of labour.

At the same time, Table 2 implies that average capital intensity of crop production varied systematically between the settler economies in a geographical sense. There were clearly higher average levels of capital intensity in LSF grain farming throughout most of the 20th century in Southern Rhodesia/Zimbabwe, and to a lesser extent Kenya, than in South Africa. These geographical differences were partly linked to differences in initial levels of capital, but probably also to differences in the types of public support that LSF received. Public intervention in land and labour markets, even when they were supplemented by cheap public credit, seem primarily to have been aimed at compensating for low capital intensity rather than seriously augmenting it. Public agronomic interventions, on the side of seed breeding for local LSF conditions, development of industrial fertilizer production and research and extension, arguably had a bigger impact on capitalization – and up to the 1980s these were more notable in Southern Rhodesia/Zimbabwe and Kenya than in South Africa.[43]

Concluding on the issue of stratification according to crop specialization, evidence suggests that differences between crops in capital and labour intensity increased rather than fell over time. The little evidence that there is suggests that – in contrast to maize – cultivation of tobacco, vegetables, fruit and cut flowers did not become significantly less labour intensive over time prior to the end of the 20th century. Where reductions in labour costs were sought for these crops, this was mainly by methods other than reduction in employment. This relates to the difficulty of applying high levels of mechanization to many of these crops, which in turn relates to issues such as scale of production, how frequently basic operations such as land preparation needs to occur, the sensitivity of soils and crops to mechanical handling and so on. Thus differences between crops in labour intensity tended to increase over time. Probably, differences between crops also increased in terms of capital intensity. This may relate to the increased salience of product differentiation in the value chains in which the more capital intensive crops are traded.

The Sudan sorghum system

LSF crop production systems involving fewer settler farmers and land areas that were a great deal smaller than those considered so far were also established in a number of other Anglophone African countries of white settle-

[43] McCann (2005) argues that Southern Rhodesian agricultural research benefited strongly from the formation of the Rhodesian Federation in 1953, when the research services of Nyasaland and Northern Rhodesia were amalgamated with those of Southern Rhodesia and relocated to Salisbury.

ment, including Northern Rhodesia/Zambia, Nyasaland/Malawi and Tanganyika/Tanzania. However, the literature on these, with the partial exception of Nyasaland/Malawi, almost exclusively considers the pre-independence period. [44] Only Sudan has had a LSF-like crop production system (albeit without the presence of white settler farmers) whose development has been documented into the late 20th century.

This system was initially pioneered by the British during World War II when large blocks of public land in northern Gedaref were planted with sorghum sewn using tractor-drawn wide- level disc harrows mounted with seed drills. Unemployed labourers from urban areas were paid by the authorities to clear land, weed and harvest. The objective was to feed British troops based in the region. After the end of the war, the colonial government continued with the system. But while still undertaking land preparation, they now contracted out cultivation on a sharecropping basis to local operators. The market now was for domestic urban consumption as well as, to a limited extent, for regional exports. This has remained the case subsequently.[45]

State involvement was fully abandoned in 1953, after which the area formerly planted publicly was leased at nominal rents in blocks of 420 ha, mainly to local traders who in turn hired professional farm managers. The area officially allocated steadily increased thereafter, both within Gedaref and beyond, to around 0.4 m ha in 1960, 1.75 m in 1975, 3.8 m ha in 1995 and around 6 m in 2004 (O'Brien 1980; Simpson 1981; Shepherd 1983; Elhiraika 1999; Mustafa 2006). Expansion in the 1960s and 70s relied heavily on World Bank finance. [46] One source puts the total area currently under the system, including areas that have been encroached on unofficially, at 11 m ha (World Bank 2010).

In the original sorghum area the modal farm size continued to be 420 ha, a standardized area chosen by colonial experts since it was considered the maximum that could be operated by a single tractor (Mustafa 2006). In areas opened from the 1960s onwards however, additional land was allocated to lessees with the objective that they should leave half the area fallow each year. In these areas, modal farm sizes of 630 ha were the norm (Shepherd 1983; Elhiraika 1999). However already in the 1970s, individuals both in Gedaref and newer sorghum regions obtained multiple holdings, and consolidated farm units of 8-9,000 ha or more emerged (Simpson 1981, 201).

Mustafa's (2006) study underlines the largely unchanging nature of the LS sorghum farming system in Sudan over the last decades. In the part of Gedaref surveyed, a large majority of farms continue to own only one tractor, fitted with a disc harrow and a seed drill and box. A few own or hire combine harvesters, but these are used only for stationary threshing. In a majority of cases the only other farm equipment is a pick-up used for human and crop transport. Typically, there are no farm buildings other than housing for the farm manager; for most of the year the tractor and pick-up are kept in town by the farm owner. Elhiraika (1999), reporting the results of a 1995 survey of 337 LSFs in a long-established sorghum-growing area

[44] cf. Pim 1946; Palmer 1985a, 1985b; Iliffe 1979; Kydd and Christiansen 1982; Kydd and Hewitt 1986; Pryor and Chipeta 1990.

[45] Although there are also a few large Middle East-owned sorghum estates in contemporary Sudan, producing exclusively for export.

[46] The World Bank financed just under a quarter of the 1970/71-1974/75 Sudanese Five Year Plan, under which an additional 1.13 m ha was opened for LSF (Mustafa 2006).

in Gedaref, estimates the value of average non-land farm assets at USD 34,000.

Sorghum mono-cropping predominates, although sesame may also be grown. Successive public efforts to enforce fallowing have failed. Of Mustafa's sample of 100 LSFs, only 7 percent had left any land fallow in the 2003-04 crop season. No farmer surveyed used fertilizer and only 9 percent used herbicides (administered by a spray attached to the farm tractor) (Mustafa 2006). Land clearance, weeding and harvesting (and often threshing) were , as before, normally carried out by hand by labourers. But on some farms established in the 1960s or 70s, where yields had fallen to very low levels, no hand weeding was conducted and tractors were used to spray herbicide and plough weeds and crop stubble into the soil prior to replanting (cf. e.g., Simpson 1981, 206). All of the studies cited report a pattern whereby yields increase up to the third season in which land is cultivated, then fall sharply until the seventh, when they stabilize. Survey data reports steadily declining yields in Gedaref over the last thirty years (Table 2).[47]

The system described is less capital intensive than the post-1945 maize system in the settler economies. Given differences in typical farm size, there was little difference in the machinery used per unit. But in Sudan, unlike the settler economies, almost no other modern inputs besides tractors, harrows, seed drills and drawn herbicide sprayers were used. It was also correspondingly more labour intensive. On the basis of another Gedaref survey, O'Brien (1980) reports average employment per 420 ha farm, in addition to the farm manager, of 2 drivers, 2 drivers' assistants and about 80 labourers. All these, however, were employed for only 2-3 months a year (when they were lived in tents in temporary camps). Annualized, this translates into 0.4 workers per ha, as compared to 0.01 for the post-1960 South African maize system.

Sugar and sisal

As stated earlier, the literature covers PF farming systems in Africa only patchily, especially after 1945. Vail and White (1980, 383) describe the farming systems of sugar plantations in Portuguese East Africa in the early 1950s in terms closely paralleling those for grains in South Africa. Mechanization was applied only to ploughing and transport,[48] while synthetic inputs were not used at all. However, the late 1950s and early 1960s saw important changes. On Sena Sugar's Marromeu estate synthetic fertilizers were introduced in the mid-1950s and mechanical ditching and cane planting machinery was introduced in 1958. Overhead irrigation was installed on large parts of its Luabo estate in 1964, at a cost of USD 6.1 m. Although Vail and White note that this was in the context of a stabilization of labour supply (1980, 384-85), they provide no information on labour intensity or on yields.

If sugar plantations in east Africa were subject to adoption of modern farming methods from the late 1950s, this was not true (and probably remains untrue) of sisal plantations. Estates in Tanganyika/Tanzania at this time applied mechanization to ploughing and transport in the same way as in sugar estates to the south, and also observed rotations between sisal and fallow. But mechanization was never applied to land clearance, since use of heavy

[47] In contrast to the Sudanese yields cited in Table 2, South African yields were 670 kg/ha in both 1950-55 and 1960-65 and 1,740 kg/ha by 1990-95 (Vink and Kirsten n.d.). World Bank (2010) cites an Australian national average yield of 4,000 kg/ha in 2000.

[48] Including light railways and steam barges.

machinery was held to destroy the soil's natural fertility (Guillebaud 1958, 70). Nor were cover crops planted on fallow land or manure or synthetic fertilizers used (Lock 1969, 329). Moreover, when prices fell – as during a prolonged period after the Korean War – the tendency was to eke out more years from the life of existing plants rather than to clear, burn debris, leave fallow and replant according to recommended timetables (Guillebaud 1958, 10). Extensive replanting with hybrid varieties did occur, immediately following nationalization of most of the industry in 1967. But because of heavy calcium leaching by the new sisal varieties and a continued failure to apply any soil fertility management methods, yields fell from 1,724 kg/ha in 1968 to 1,088 kg/ha in 1988 (Hartemink 1995, 10-11). Measured in terms of labour per ha, labour intensity declined slightly from 1956-57 to 1970 (from ca. 0.28 labourers/ha to 0.21[49]), but no data is available after this.[50]

Data on capital investment levels in PF in Africa is almost completely absent, and in any case is often of dubious reliability[51] and relevance. In terms of relevance, this is because large investments were normally directed at processing operations rather than farming operations. As an example, Fieldhouse (1978, 508) reports Unilever investing GBP 3 m in the Congo prior to World War II, while it did not establish a proper plantation until some years later. Similarly the average GBP 25,000 investment by tea estates in pre-World War II Nyasaland reported by Palmer (1985b) must have been dominated by factory investment.

[49] Using Guillebaud (1958, 74) on real employment numbers for 1956-7, Sabea (2010) on employment in 1970, Guillebaud (1958, 116) on area in 1956 and author's own estimate for area in 1970.

[50] Data on labour per tractor is available only for a single point in time, 1958, when it was 49.7 (Rutman 1968, 65).

[51] Fieldhouse and Guillebaud for example generally cite data on capital employed rather than capital investment. In accounting terms, capital employed can be financed by sources other than investment, including depreciation.

LABOUR SYSTEMS

The literature on how labour was recruited and managed and how work was organized in LSF and PF in 20th century Africa is more extensive than that on farming systems, despite some gaps. These topics will be considered here under the general category of 'labour systems'. What is striking from this literature is similarities in developments over time between countries and between LSF and PF, relative to what appears to have occurred in farming systems. This is not to say that LSF and PF labour systems followed a common evolutionary path with the same changes happening simultaneously across most countries. Rather, a common sequence of changes occurred, with transitions taking place at different points of time, and with this sequence still remaining incomplete in some places. In what follows, recruitment, work organization and labour management and control are discussed in turn.

Recruitment and stabilization

Labour recruitment was normally considered an integral problem for LSF and PF since, as Buchanan (1938) observed, 'if the indigenous population is scanty enough to permit the large estate … it will be too scanty to furnish the labour supplies necessary.' An added complication was that the scanty populations indigenous to areas of LSF or PF operation in Africa (as in the case of the pastoralist Masai of Kenya's 'White Highlands') were often deemed unsuitable for employment or impossible to recruit.

Hence, from before World War I legal frameworks were devised creating obligations for native sedentary agricultural populations to work. These were backed by sanctions, and supplemented where necessary with systems for organised recruitment of long-distance labour.[52]

Taking an Africa-wide perspective, legal frameworks establishing obligations for native populations to work had two main components, whose deployment varied considerably from place to place. The first and most common was taxation in cash. In most places, adult male tax levels were calculated in terms of what colonial governments (with or without involvement of LS farmers or plantation companies) deemed to be a reasonable number of days of paid agricultural labour for natives to undertake.[53]

The second was official demarcation of labour recruitment zones or 'reserves', sometimes but not always backed by registration of natives and control of population movement – the workcard system (see below), pass laws, etc. Different categories of labour were distinguished. In British Africa the most regulated of these was so-called 'attested' labour, recruited by officially approved agents and issued with written contracts laying down a minimum working period within a maximum period of migration, as well as stipulating entitlements to shelter, food, medical attention and repatriation. Masters and Servants Ordinances (promulgated in 1912 in Southern Rhodesia, 1916 in Kenya and 1919 in Tanganyika) covered this category of recruited labour, which was identified with more arduous labour tasks. Breach of contract under the ordinances, including for 'desertion', could be punished with imprisonment (Daviron 2010; Cooper 1996; Berman and Lonsdale 1992; Shivji 1986; Rutherford 2001a). Similar conditions applied in French West Africa, until the colonial framework of labour law was abolished in 1948, and 'modern' employment legislation applied to plantations and European-owned LS farms from 1952 (Cooper 1996, 244-95).

These formal arrangements were supplemented or in some cases entirely substituted, at least before 1945, by use of forced labour on the one hand and, on the other, by LSFs' and PFs' use of cash and non-cash individual recruitment incentives. Publicly organised forced labour was the norm throughout Africa during the 'emergency' years of World War II and ended immediately when hostilities had ceased. But forced labour procured by chiefs exercising sovereign control over their subjects was common in a number of countries and the norm in a few, including Angola and the Belgian Congo.[54] In South Africa, from the 1930s forced labour for LSF continued to exist in the form of prison labour. Its mobilization was to peak in the 1950s, and not to disappear until the 1970s or 80s (Marcus 1989, 56-73, 112-13).

The principal, though not the only, individual recruitment incentive offered to labour, throughout Africa, was access to land

[52] In some areas of Africa the labour recruitment problem was initially settled by buying or creating slaves, as in Zanzibar, Pemba and coastal Kenya (Cooper 1977, 1980), Angola (Clarence-Smith 1979, 30-33) and São Tomé and Principe (Clarence-Smith 1990).

[53] This varied upwards from two weeks a year, the level determined in 1900 by the administration of Portuguese East Africa. Even after this was doubled over the next decade, the PFs of Quelimane were obliged to replace their entire labour forces at least 10 times a year (Vail and White 1980, 124-25).

[54] Fieldhouse's official history of Unilever details arrangements in one area of the Congo in the 1930s where workers were 'recruited' for three year periods by chiefs paid a *per capita* commission, roped together and marched 200 km to the company concession area. 'The death rate was sometimes as high as 50 percent and when they could no longer work they were required to walk home' (1978, 515).

for grazing or cultivation.[55] Indeed, in Kenya, South Africa, Southern Rhodesia, Nyasaland, parts of mainland Tanganyika and in Angola, Zanzibar and Pemba after the end of slavery, a large share of LSF and PF labour prior to 1945 was organized through labour tenancy arrangements. Under these, access to LSF or PF land was granted in exchange for tenants (or their household members) supplying an agreed volume of labour over a specific period.[56] This system continued in Zanzibar up to the revolution of 1964 (Cooper 1980), was diffused from 'African' to plantation agriculture in Côte d'Ivoire after World War II – possibly in response to the modernisation of labour law (Cooper 1996, 484), and re-appeared in Malawi (Nyasaland) in the 1970s (Kydd and Christiansen)[57] and on Tanzanian tea estates in the 1980s (Faber 1995). In some cases, particularly where extensive grazing rights were granted, labour tenants engaged in annual circular migration; in others, their presence on LS farms or plantations was continuous.

Notwithstanding this long list of specificities, from around 1945 an increasing part of the LSF and PF labour force in Africa was recruited as wage labour (as opposed to labour tenants) through labour markets exhibiting increasing regional and sub-sectoral integration (rather than through formal recruitment arrangements). In the settler economies this was encouraged by laws outlawing labour tenancy (see above) but also stemmed from LSFs increasing their herd sizes and more widely adopting tractors and synthetic inputs. All these led to an expansion of the LSF-cultivated area at the expense of 'squatting' labour tenants. Against the background of the expulsion of tens of thousands of Kikuyu 'squatters' from Kenya's White Highlands in 1945, McWilliam (1976, 278) describes a 'flooding' of the Kenyan labour market, while 'in the two decades that followed, this surplus workforce was supplemented by a growing number of landless on the reserves'.[58] Similar processes occurred in the other settler economies, over a somewhat more protracted period, so that for example Beinart (2001, 207) observes that in South Africa by the early 1960s "the labour shortages which had been so central a grievance for white farmers, gradually turned into a surplus". In Africa outside of the settler economies, because of more limited land alienation, the opportunity cost of labour remained considerably higher. But population growth and local land shortages meant that even in Portuguese East Africa Vail and White (1980, 332, 372) could note an "easing" of the "problem of recruitment" around the same time. Likewise, O'Brien (1980) notes a combination of national agricultural market integration and relatively frictionless LSF recruitment in Sudan in the 1970s.

A corollary of the unravelling of labour tenancy systems in the settler economies was the stabilization of wage labour on LS farms, generally based upon some migrant workers obtaining permanent residential status (Jeeves and Crush 1997). Morris (1976) traces in detail the economic and legal lineages of this process in South Africa, while others describe its wider phenomenology: On-farm settlement in permanent housing of farm labourer

[55] Other common incentives were advances in the form of animals (Beinart 1982, 146), wage goods (O'Brien 1980, 234) or cash (Vail and White 1980, 124-25).

[56] Cowen 1989; Berman and Lonsdale 1992, 109; Morris 1976; Loewenson 1992, 83; Kydd and Christiansen 1982; Mbilinyi 1986; Clarence-Smith 1979, 33; Cooper 1980. In some countries regulations specified a minimum number of days to be worked annually, usually 180.

[57] Pryor and Chipeta 1990 state that it disappeared again in Malawi in 1990-94.

[58] Already in the early 1950s the principal public policy problem in Kenya was being defined as how to absorb surplus labour.

households, whose male or (sometimes, as in Western Cape) female head worked for wages throughout the year, while other family members supplied a captive reserve labour force to be mobilized during demand peaks. Since this stabilization concerned a core labour force, the requirement for recruitment did not vanish. But this now concerned supplementing core labour, for example by mobilizing local casual labour by the day or by hiring a contractor to perform some more specialized technical task.[59] For reasons relating to the much lower capital intensity of the Sudanese sorghum system, such stabilization never occurred there.

In the case of PF, stabilisation of wage labour was driven by three additional factors. The first of these was the price boom of the Korean War, which led both to plantation companies bringing more of their own land under cultivation, and to increased competition for labour between plantations. The latter triggered, on the one hand, provision of permanent housing on plantations, in order to reduce incentives for labourers to desert in favour of neighbouring plantations offering higher wages. On the other hand it led to increased recruitment by plantations from their surrounding areas, particularly for types of labour considered less arduous, and to offering bonuses to 'attested' workers for types of attendance resembling full-time permanent work (see below).[60]

The second was emergence of greater demand for settled labour as a result of another dimension of capital intensification – wider adoption of technologies that extended the growing season, thus allowing year round or near-year round harvesting. It is this characteristic, according to Graham and Floering (1984, 38-40), which distinguishes the 'modern' from the 'traditional' plantation. Relatively few examples of such developments in Africa prior to the 1990s are cited in the literature, though – one exception being Del Monte's application of plant hormone techniques allowing year round fruiting, when it opened its large pineapple plantation in Kenya in 1974-75 (Jaffee 1992; Ngigi and Minot 2004).[61]

The third was the objection of some independent African governments to forms of labour recruitment and attendance arrangements they considered to be 'colonial', and/or 'backward'. When independent Tanganyika's government first addressed the country's sisal industry in 1962, it was to discourage recruitment from the regions designated by the Germans and British as labour reserves, to abolish the category of 'attested' labour and to abolish the 'workcard' [*kipande*] system that accompanied it – all in favour of a system of full-time permanent residential labour (Rutman 1968; Sabea 2010).

The workcard system[62] involved registered African labourers, both in agriculture and mining, being issued with cards or (in southern Africa) 'tickets' when recruited. It dates from the 19th century. Workcards listed information on the labourer's name, date of birth, homeland, religion, special physical

[59] Wilson 1971, 149; Marcus 1989, 91-106; Crush 1993; Ewert and Hamman 1996; Rutherford 2001a, passim; von Blankenburg 1994, 87-93; Dolan et al. 2005.

[60] Guillebaud 1958, 67 describes these trends in the Tanganyikan sisal industry in the 1950s.

[61] Buchanan (1938) provides a list of earlier projects by plantations to lengthen the growing and harvesting seasons outside Africa, including by rattooning in the case of sugar – most of which however was associated with a lowering of yields.

[62] Workcards or tickets are described as regulating attendance and payment of agricultural workers in Kenya (Cowen 1989), Mozambique (Vail and White 1989, 219), Nyasaland (Palmer 1985a), Southern Rhodesia (Rubert 1997), South Africa (Murray 1997; Beinart 1997) and Tanganyika (Iliffe 1979, 153; Shivji 1986; Sabea 2010). They are described in Southern Rhodesian mining by van Onselen (1976).

characteristics, employment history and in some cases wages. It further had spaces for supervisors to record the worker's completion of a number of designated daily tasks, used to verify entitlement to payment. Payment became due after a labourer completed 30 designated daily tasks, within a maximum period of somewhere between 42 and 60 days, depending upon location. Thus, there was no requirement for the labourer to work on any specific day. Nor was there one that he or she had to work consecutive cards 'back to back'. An attested worker in the Tanganyikan sisal industry would be issued with 12 cards on recruitment, which had to be completed within a period of 18 months to 3 years. This corresponded to the upper range of contract lengths for formally recruited workers in Africa. The shortest ones appear to have been for only 6-9 months, on the sugar estates of Natal (Beinart 1997).

The only explanation for the structure of the workcard system offered in the literature is Shivji's (1986, 127), that the German colonists in pre World War I east Africa wanted a system that would "imitate the rhythm of peasant production". While this might be the case, it is also true that similar systems existed up to the middle of the 20th century in Europe. The British coal mining industry had a version of this system until nationalization in 1945, as did the London docks until the 1960s.

Amongst the effects of the workcard system was that a larger number of workers had to be recruited and registered, relative to those required for work in a given period (not to mention, on a given day). Thus on a tea estate in inter-war Nyasaland described by Palmer (1985b), to guarantee the presence of 1,250 workers at any one time, it was necessary for 3,000 to be registered. In Tanganyika in December 1956-January 1957 there were 125,600 registered sisal workers but only 75,000 with 'active' cards currently open (Rutman 1968, 85; Guillebaud 1958, 74). Swainson (1980, 32) cites a similar gap between numbers of Kenyan registered agricultural workers and those actually employed in the 1940s and 50s.

Another effect of the system was that it prevented application of 'scientific management' to African labour – referring to sisal in Tanganyika, Guillebaud (1958, 70) claimed "repeated efforts have been made in to introduce some form of teamwork cutting but they have always failed … due mainly to lack of continuity of African labour". It was also claimed that it induced worker 'laziness'. This belief was shared both by white employers and the government of newly independent Tanganyika (Rutman 1968). Probably the main source of complaint however has been from labour historians such as van Onselen (1976), according to whom the system invested supervisors with the power to extract unpaid labour through not endorsing a card or ticket, if he considered the designated daily task had not been completed. Most of these complaints only fully make sense if the card system is considered in conjunction with how the division of labour was, and to some extent remains, organized in African LSF and PF (not to mention mining) – that is, through the so-called 'task system'.

The division of labour and work organization

In the sense in which it was defined by Ferguson, Smith and Marx, there is little discussion of the division of labour in LSF and PF in the academic literature. But this subject was an important topic in the 'professional' literature, dating back at least as far as Laborie's

(1798) prescriptions on 'The Government and Care of the Negroes and Cattle' on slave-based coffee plantations in the Caribbean.[63]

The type of division of labour recommended by Laborie, and seemingly reproduced largely intact in LSF and PF over the next two centuries, was a basic one, guided by assumptions about the natural sequence of agricultural operations. With the exception of a small group of workers involved in the year round maintenance of farm/estate infrastructure (roads, canals, light railways, buildings, farm draft power and vehicles, etc), the workforce was otherwise normally divided according to whether it mainly performed land clearance and preparation; or preparation of planting material, planting and field maintenance; or harvesting and loading; or post-harvest processing; or grading and packing or baling.

All these naturally defined tasks were carried out by gangs, with an internal subdivision of tasks usually defined in terms of individuals being allocated responsibility for a given physical area (a row of bushes, a group of trees, or part of a field) rather than for a specific task stage. For a few tasks, for example where harvesting was deemed to involve separate natural processes such as reaping, gleaning and shelling of maize, sequential sub-tasks were distinguished and some internal gang coordination organised. In general however sub-task specialization and coordination was confined to post-harvesting processes, where these could be organized on a factory or packhouse basis in terms of a sequence of (semi-) mechanical operations.

Together with agro-ecological expertise, which provided guidance on the ideal locations and timing of these operations for different crops as well as their likely yields, this division of labour provided a potential basis for production and labour recruitment planning. The major questions it generated were mainly also influenced by naturalistic assumptions: Which types of person were 'best fitted' to specific tasks, and what magnitude of tasks could a 'best fitted' person (or a gang comprising a number of best fitted persons) be expected to perform during a working day? Answering the latter question in turn made it possible to estimate what overall composition of the labour force should be aimed at, in order to produce a given output – corresponding to the area it was intended to plant and/or to the physical capacity of a fully-utilised processing factory or farm packhouse.

Much later, some time around the late 1960s in Southern Rhodesia for example, it contributed to formulating and answering a further question, namely what given types of mechanical equipment, in what magnitudes, should ideally be employed together with given numbers of 'best fitted' workers to produce a given output of a given crop. Even at this time though, well into the heyday of 'work study', a division of labour deriving from the natural sequence of agricultural operations was assumed.[64]

Little evidence is available on the extent to which this 'natural division of labour' has been subject to modification in recent years. Some evidence suggests that it may not have been, and that therefore a large part of agricultural work remains organized in pre-Taylorist ways (see for example the entries on 21st

[63] The author is grateful to Benoit Daviron for pointing him towards Laborie (and where to obtain this work).

[64] Duncan and Stead published 'A Guide to Labour and Tractor Planning' in Rhodesia in 1968. This was used by de Jong, a work study specialist in Conex (the Rhodesian Department of Conservation and Extension), to produce a 'Simplified Approach' to the subject in 1974. See Duncan and Stead (1968) and de Jong (1974). The author is grateful to Blair Rutherford for pointing him towards de Jong, and supplying him with a copy.

century Mozambique in Table 4). But, where there is evidence of change, this suggests a skipping over of the 'Taylorist' phase that characterized 20th century industry for long periods, albeit rarely in an undiluted form. As capital intensity increased, where modification of the traditional division of labour happened, this was mainly in the direction of getting larger numbers of individual workers (or gangs of them) to perform several different separate tasks over the course of a year, rather than in the direction of more 'scientific' specialization. For example Larsen (2011) cites a Unilever tea estate manager in contemporary Tanzania describing the 'moderate involvement' of tea pluckers and tea factory workers in "weeding (both manual/chemical); irrigation tasks (overhead); fertilizer application (manual/fertigation); pruning (manual); roads and boundaries tasks (manual), depending on the season".

In other words, where the agricultural division of labour today has changed, this refers to the breadth of the tasks subject to performance by a single worker, and the number of workers who are now performing multiple tasks. This relates to capital intensification, but mainly indirectly through consolidation of a category of permanent workers, distinguished from other types of employees by the requirement that they attend work every day. Of course, examples of 'integration' in this form can be found that predate the permanent worker category.[65] Moreover, with some exceptions,[66] the different tasks now subject to performance by a single worker remain treated as irreducible to re-configuration or combination in a new single task.

Where the academic literature on the division of labour is more extensive, this is in relation to the issue of which types of person have been/are considered 'best fitted' to specific (irreducible) tasks (Table 3). In contrast, the literature is thin in relation to the magnitude of tasks assigned to 'best fitted' persons (Table 4). These topics will be examined in turn.

In terms of workers 'best fitted' to specific tasks, there appears to have been a clear trend over time, from a highly complex racial division of labour in the 1950s to a racially simpler one. This corresponded to the removal of whites and some groups of 'coloureds' from performance of manual, technical and lower managerial tasks. As a result, black Africans performed virtually all manual and supervisory tasks from the 1960s-70s, although it appears that a range of managerial tasks performed earlier by whites were simply scrapped.[67] In Western Cape (South Africa) however, 'coloureds' remain up to the present the backbone of the manual workforce.

In contrast, whereas the literature on LSF and PF up to the 1950s often refers to specific (ethnic) groups of black African males being given preference for heavy manual tasks and – albeit in this case different groups – for supervision, this topic is hardly touched on in the literature on subsequent periods. The literature on the earlier period refers to black African supervisors being drawn mainly from 'tribes' considered more

[65] Even in the 1950s the largest single group of workers on sisal plantations was the category of 'field upkeep', who covered clearing, stumping, weeding and planting, depending on requirements (Guillebaud 1958, 69).

[66] Dolan et al. (2005) mention a Kenyan cut flower farm introducing 'job integration', where harvesters were 'multi-skilled' to also perform some other greenhouse functions. This they did every day, not only seasonally.

[67] Fieldhouse (1978, 539) states that in the (Belgian) Congo around independence the rate of reduction in numbers of white managers exceeded greatly the rate of Africanisation of managerial positions. Dunlop (1971, Table 1) records a fall in the share of white wages and salaries from 16 percent to 10 percent of total Southern Rhodesian LSF costs between 1950 and 1965.

Table 3. 'Best-fitted' persons for given LSF and PF tasks, 20th century Africa

Country	*Period*	*Crop*	*Task*	*'Best fitted' persons*	*Source*
São Tomé	1910s	cocoa	lower s/vision	from Dahomey	Clarence-Smith, 1990
			upper s/vision	settled Portuguese exconvicts	
Nyasaland	1930s	tea	general labour	from Port. E Africa	Palmer 1985b
Tanganyika	>1950s	sisal	drivers, mechanics, construction and factory workers	Tanganyikan Asians	Shivji 1986, 115
	>1960s	sisal	cutting & loading	'long distance migrants' (esp. Nyamwezi)	Guillebaud 1958, 63; Sabea 2010
			weeding immature sisal	women	Sabea 2010
			'field upkeep'	30-40% of male recruits performing worst in physical	Guillebaud 1958, 68
			post-decortication drying	women	Guillebaud 1958, 73
			nursery work	children	Sabea 2010
South Africa	1911>	sugar	cutting	initially from Mauritius, later Transkei and Port E. Africa	Beinart 2001, 47
			factory workers	'Zulu speakers'	
	>1970s	all agriculture	drivers, mechanics, upper s/vision	whites	Beinart 2001; Murray 1997
Portuguese East Africa	1920s	sugar	overseers	Guyanan & S African coloureds	Vail & White 1980, 216
			factory work	Mauritians	
			clerical	Nyasaland coloureds	
	1950s	sugar	cutters	'long distance migrants'	Vail & White 1980, 377
			other field workers, factory workers, drivers	locals	
			supervisors	Ngoni	
			mechanics	Portuguese coloureds	
			technical staff	Mauritian, Nyasaland, Guyanan & Chinese coloureds	
			lower managers	Portuguese whites	
			upper managers	British whites	
Cameroon	1990s	tea	pluckers	women	Koning 1995
Zimbabwe	1990s	tobacco	graders and bundlers	women	Rutherford 2001a; Cramer et al. 2008
			farm clerks	Black Africans	
South Africa	>1990s	wine, grapes	trellising	coloured women	Ewert & Hammen 1996
		fruit	general labourers	coloured men	
			fruit bush pruners	coloured women	
	2000s	fruit	harvesters	coloured women	du Toit & Ally 2003
Kenya	2000s	cut flowers	scouts, sprayers, construction, maintenance, security, cold-store packing	men	Dolan et al. 2005
			harvesting, grading, bunching	women	

Note: Unless otherwise specified, 'best fitted' persons refer to male adults or youths

reliable in their general deportment (Murray 1997). Whites and black Africans alike generally shared tribal stereotypes, and their absence from discussion of contemporary events should not be taken as signalling their disappearance as a source of designation of 'best persons'.

The gender division of labour is a central part of the literature on contemporary arrangements. This division of labour appears to have remained essentially identical for a century, although there may have been some marginal movement of women into a few categories previously monopolized by men. In general however, women seem to move more into new categories of work rather than to take over traditionally male ones. The new categories include those where 'best persons' are thought to require stereotypically female attributes such as 'nimble fingers' (which earlier reserved selective crop harvesting to women), or appreciation of cosmetic appearance (which earlier reserved tobacco grading to them).

Table 4. Standard daily task magnitudes, LSF and PF in 20th century Africa

Country	*Period*	*Crop*	*Task*	*Magnitude*	*Source*
Zanzibar	1909	cloves	weeding	area beneath 6 trees	Cooper 1980
	1925	cloves	weeding	area beneath 10 trees	
São Tomé	1910	cocoa	harvesting	10 baskets	Clarence-Smith 1990
Tanganyika	1958	sisal	cutting and loading	70 bundles of 30 leaves	Guillebaud 1958
Tanzania	1968	sisal	cutting and loading	90 bundles of 30 leaves	Lock 1969
Mozambique	2003	sisal	cutting and loading	98 bundles of 30 leaves	Cramer et al. 2008
Tanzania	1968	sisal	planting	400 plants	Lock 1969
Cameroon	>1980s	tea	plucking	26 kg	Koning 1995
	1990	tea	plucking	32 kg	
Mozambique	1950s	sugar	weeding	0.42 ha (20 person gang)	Vail & White 1980
Mozambique	2003	sisal	weeding	3 rows	Cramer et al. 2008
Mozambique	1950s	sugar	cutting & loading	6-9 tons (8 man gang)	Vail & White 1980
'global norm'	1970s	sugar	cutting & loading	2.5-3 tons	Courtenay 1980
Mozambique	1950s	sugar	residue clearance	2.12 cu. m.- 2.8 cu. m.	Vail & White 1980
Southern Rhodesia	1971	cotton	hand picking	35-40 kg	de Jong 1971
	1973	groundnuts	hand picking	1-2 bags	Collett 1973
	1971	groundnuts	hand picking using beater bars	5-7 bags	de Jong 1971
	1974	tobacco	digging holes for planting	0.2 ha	de Jong 1974
		tobacco	top dressing	0.4 ha	
		tobacco	hand cultivation	0.08 ha	
		tobacco	reaping	capacity of 3 barns (48 person gang)	
		tobacco	grading	50 kg	
		maize	harvesting	3 ha (22 person gang + 2 drivers & a boss boy)	
Sudan	late 1970s	sorghum	harvesting	192-240 kg	O'Brien 1980, 249

Note: tasks are individual unless stated

Material on task magnitudes [*kipimo* in the version of Kiswahili used on Kenyan LSFs] is very patchy, with some gaping absences – e.g., any coverage of maize in Kenya and South Africa – making generalization difficult. Nonetheless, Table 4 provides four cases where task magnitudes can be compared over time, including one where they can be compared over three periods. In each case task magnitudes increased, sometimes substantially.

According to the 'professional' literature of the 1950s and 1960s (e.g., Guillebaud 1958; Lock 1969), tasks were generally capable of completion by designated individuals or gangs in 5-6 hours under normal conditions. When conditions were adverse, e.g. if sisal or sugar cutters were working at a distance from a loading point, the magnitude was supposedly adjusted downwards so that it would not exceed 5-6 hours. These statements may have been accurate at the time. Guillebaud (72) states that 20 percent of cutters on Tanganyikan sisal plantations in the 1950s performed more than 30 designated daily tasks during the allotted 42 day workcard period, suggesting that at least some may have completed more than one on a single day.

The academic literature observes however that in many circumstances standard tasks took and still take up to 14 hours (Murray 1997; Rutherford 2001a, 110-11; Smith et al. 2004). It further observes that, while some tasks today may be designated on paper as individual, in practice they cannot be performed within a period of less than 14 hours without assistance from one or more family members. Thus, some recent cases of increases in magnitude of required tasks may also reflect the creation of the new employment category of 'permanent' worker, backed up by a reserve of family members. Since there may also be other explanations of increased task magnitudes (e.g., reduced attention to crop quality, leading to less selective harvesting), this is clearly a topic requiring further investigation.

Control of labour

Employed labour is usually subject to control by a combination of supervision, wage payment systems and non-wage methods of motivation. Historically in the case of LSF and PF in Africa, the conditions under which labour control occurred had a number of specificities. Probably the most important of these related to the remoteness of LSF and PF operations from large population centres, meaning that LSFs and PFs had to organize residential accommodation for workers. This entailed a need for LSFs and PFs to organise an additional dimension of labour supervision. But it also provided an opportunity for LSF and PF operators to use patron-client relations as an additional dimension of labour control.

Although the salience of this background condition has faded in some locations in Africa, it remains more or less undiminished – or even may have increased – in others. But three other types of condition for labour control systems have changed quite radically and consistently over time. Firstly, as noted, the labour market slowly but surely after 1945 began to function for wage labour in a normal capitalist way. Secondly, state power passed into black African hands – in French and British Africa in the 1960s, in Portuguese Africa in the 1970s and in Zimbabwe and South Africa in the 1980s and 1990s. Thirdly, modern labour legislation (repeal of Masters and Servants Ordinances, provisions for minimum wages, pensions, paid leave, etc.) was extended to agriculture, but except in French Africa only after changes in the racial control of state power.

On the basis of these considerations, one might anticipate that labour control systems would develop in two or three clearly demarcated stages, corresponding to the sequential dominance of three types of labour: forced labour and recruited labour, corresponding to the absence of a functioning labour market and of modern labour legislation, and to state power resting in white hands; and later stabilized labour, corresponding to the reversal of each of these conditions.

On the other hand, a brief reflection on the history of labour recruitment presented in the previous section of this paper suggests that the lines of division between these periods were blurred. While use of forced labour (except for prison labour) in private employment died out generally in 1945, recruited labour overlapped both with this system, and later also with labour stabilization. Labour stabilization itself is held to have emerged *de facto* in a few places in the settler economies as early as the 1930s (Hodder-Williams 1983, 140-41), while according to Clarence-Smith (1990) the slave owners of the cocoa plantations of São Tomé pursued policies aimed at stabilization as early as 1900-10. The discussion of labour control that follows will be divided for heuristic reasons into three historical periods (forced, recruited and stabilized labour), but – for the reasons reviewed – it will not assume as a premise that there were sharp breaks between them.

Forced labour

If anything differentiates the system of labour control corresponding to forced labour it is the primacy of the moment of supervision, rather than wage payment systems or patron-client relations. Across Africa supervision in this system was dense, regimental and bloody. Its density is evident in the number and organization of supervisors. Where supervision of forced labour is described in the literature, it always involves at least two layers: A white overseer, usually with a black deputy, and a small army of black *surveillants* or 'small deputies'.

Given the primitive nature of the division of labour, the ratio of supervisors to labourers was very high – in São Tomé, a white overseer to every 50 labourers and a black *surveillant* to every 16 (Clarence-Smith 1990); in Portuguese East Africa, a white overseer to every 200 labourers and a black deputy or small deputy to every 28 (Vail and White 1980, 218). Labourers were deployed, for greater visibility, in lines – performing a sequence of set moves to numbers chanted by overseers (op. cit., 123). Languages of command consisting mainly of nouns, numbers and imperatives, such as *Chilapalapa* in Rhodesia and pidgin Swahili in interior east Africa, were developed and diffused (cf. Rutherford 2001a, 124). Overseers rode on horseback and carried whips, while deputies carried truncheons. Both weapons were used freely, and public beatings, woundings and chainings were also common (Clarence-Smith 1990). On larger plantations there were prisons. These powers were delegated to plantations and LSFs by colonial powers who, when challenged by workers, underwrote them, 'with any means necessary'. Fieldhouse recalls an incident in the Unilever concession in the Congo in 1931 where workers resisted chiefs' demands for their recruitment. Government officials "whipped and seized the wives of offenders and also burned villages and seized hostages where workers fled". This in turn "provoked a rising…put down by the *Force Publique* with extraordinary savagery" (Fieldhouse 1978, 516).

Yet supervision was not the sole method of labour control used, even in this generally barbaric period. Wage payment systems were

deployed too, mainly but not only coercively. The slave owners of São Tomé and Principe were obliged by Portuguese law to pay wages to their slaves, and they used this obligation mostly to further discipline workers by withholding payment for non-completed tasks or minor infractions of compound discipline. However, on occasions they also awarded cash bonuses for satisfactory or exemplary work, and these were distributed at the same public occasions (the 'evening lineup' of all workers) used to administer severe beatings (Clarence-Smith 1990). Bonus payments were likewise made to forced labourers, and cash advances granted to recruited migrants working side by side with them, in the pre-World World I plantations of Portuguese East Africa (Vail and White 1980, 124-25, 178).

The slave plantations of São Tomé moreover utilized forms of control and motivation independent both of supervision and payment systems. Their owners strove to import roughly equal numbers of male and female slaves, and encouraged co-habitation and even marriage. They established churches as well as shops. Via offering credit (and thus creating debt) the latter bound workers tighter to the plantation. Finally, the owners provided resources for workers' celebrations, and 'judiciously rationed rum' (Clarence-Smith 1990). Hence coercion was supplemented by some efforts aimed at promoting cohesion and dependent social relations.

Recruited labour

In respect of recruited labour, supervision systems were widely characterized by the same features as were evident in relation to forced labour. Neither the density of supervision nor its basic technology changed much. Murray (1997) reports foremen to worker ratios of around 1: 16 on LS maize farms in eastern Transvaal in the 1930s and frequent use of corporal punishment, especially for breaking in 'raw recruits', while Beinart (1997) states that overseers' use of the *sjambock* [whip] remained pervasive on Natal sugar estates until the 1950s. Indeed, given the degrading nature of some of the tasks that workers were required to perform, which in eastern Transvaal might involve them being spanned like oxen to drag agricultural machinery (Murray op cit), it is hard to see how the overall use of violence could have fallen.

What does seem to have changed in this system is that PF and LSF owners made increased use of wage payment systems for labour control. Some of these efforts involved use of various ruses to detain workers for the full length of their contracts, or to put them in a position where they were obliged to extend their contracts. The crudest of these was to simply withhold payment of wages until the worker had completed a series of back-to-back workcards or tickets, rather than paying the worker after each one was completed. Rubert (1997) and Beinart (1997) report the prevalence over a long period of delaying payment until completion of, respectively, three and six cards on Southern Rhodesian maize farms and Natal sugar estates. As will be seen, these methods were complemented by judicious use of cash loans or gifts. But more striking is widespread evidence of widespread wage-based attempts to incentivise increases in output. Given the rigid nature of the task-workcard system this called for some ingenuity.

One method was to provide a bonus for performing tasks additional to those required under the system. The largest sugar company in Portuguese East Africa from the 1930s paid a bonus when workers completed tasks on six consecutive days (Vail and White 1980, 301). In the sisal sector of east Africa, the *kibarua*

system was introduced.[68] Under this, workers performing more than 30 tasks in a 42-day period could chose either to have these recorded on their card, or to be paid for them in cash and at a higher pro rata rate 'outside the card' (Guillebaud 1958, 72). From the late 1940s provision for transition from a standard task rate to a piece rate, once the standard task had been completed, became another widespread method (cf. Beinart 1997). Experiments were also made from time to time to pay pro-rata increases in the task wage, against increases in task magnitude. Guillebaud (58) for example reports attempts on two Tanganyikan estates in 1956-58 to increase the cutting task from 70 to 105 bundles of leaves in return for a 50 percent increase in the task wage.[69]

Secondly, it became common to pay differential rates for tasks considered either physically or technically more demanding, or to designated groups of workers identified with performance of such tasks. The use of differentiated wage scales for production workers, depending on these variables, is reported from the inter-war period by Guillebaud (1958, 72-74) for sisal in Tanganyika (three rates, with the highest 50 percent greater than the lowest), by Hodder-Williams (1983, 111) for tobacco in Southern Rhodesia (three rates, with the highest 400 percent greater than the lowest) and by Murray (1997) for maize in eastern Transvaal (again three rates, with the highest 230 percent greater than the lowest).

For recruited labour, non-wage motivational methods were used in similar ways as in the case of forced labour, except that they now deployed more tactically. There was a more explicit aiming of these methods at physical stabilisation of a specific part of the workforce, and a more explicit attempt to juggle with the issue of race or ethnicity than was evident in the forced labour system. While advances had been made earlier to attract workers to a particular employer, together with loans and gifts, they were now used to persuade selected workers to remain with an employer. Rubert (1997) refers in the Southern Rhodesia maize sector to LSFs making bride price loans, or even bride price payments, for 'strategic' workers – against agreements that the recipient remained with the farmer until the birth of his first child. Encouragement of workers to bring their wives and families to farms or plantations – common from the late 1940s – had the same objective. From an early stage, those farms and plantations with more institutionalized worker housing arrangements, or 'compounds' as they were known in southern Africa, provided desegregated areas where workers could live with their families ('married quarters') (Vail and White 1980, 220).

Efforts to juggle with issues of race or ethnicity were provoked by the recognition that organized recruitment necessarily entailed 'mixing' of diverse groups, with potential risks and benefits. This was based on banal but complementary observations that some ethnic groups had histories of conflict with each other, while at the same time workers recruited from the same place or group expressed preferences to work together.[70] These observations led to the incorporation of segregation into compound design, not only between races but also between different 'tribal' groups.

These observations also provoked curiosity about the 'constructive' use of ethnicity

[68] When exactly is not clear. On Kenyan LS cut flower farms today, the term *kibarua* now refers to (casual) labour paid by the day.

[69] By 1958 this had already been abandoned on one of the estates. The author gives no reason for this.

[70] According to Murray (1997) groups of ethnically homogenous migrant farm workers arriving on their own initiative in inter-war eastern Transvaal would even go from farm to farm until they found a farmer willing to employ them all.

in forging internal cohesion in work gangs and in expanding the role of supervisors beyond that of policing. While this curiosity was probably less intellectualized in the agricultural sector than the mining one (where in the 1950s it was one factor behind the deployment of the cream of British social anthropology on the Northern Rhodesian Copperbelt), it led to the adoption of similar institutional arrangements, with approval of ethnically-based work gangs, encouragement of tribal dance [*ngoma*] groups, and re-packaging of the supervisor role in terms of the 'headman' one – complete with a work and residential dispute settlement mandate (see, for example, Sabea 2010). Thus, in relation to recruited labour, not only was supervision no longer the principal moment of control, but its modalities started to be influenced by the forms taken by control's other moments.

Stabilised labour

Control of stabilised PF and LSF labour is discussed explicitly and at length by Kritzinger and Vorster (1997); Ewert and Hamman (1996); Rutherford (2001a); du Toit and Ally (2003); Barrientos and Kritzinger (2004) and Ewert and du Toit (2005). Initially at least, the principal moment of control now shifted to non-wage methods of motivation. Kritzinger and Vorster (op. cit.) describe the resulting system as based on a "family ideology" while Rutherford (op. cit.) calls it "domestic government". The change in the nature of labour control that this entails involved a further redefinition of the nature of supervision. The backdrop to these changes was the emergence of (majority-rule-based) governments as the main arbiter of wages – meaning that, while wage-based forms of control remained significant, wage levels and payment systems could no longer be determined unilaterally by farm or plantation owners. While these changes were most evident in South Africa and Zimbabwe in the 1980s and 1990s, they appear to have been paralleled in the LSF sector in Kenya in the same period.

Rutherford (2001a, 101) observes that from 1980 supervision in Zimbabwe no longer relied principally on corporal punishment. Rather than stemming from labour stabilization as such, this change derived from a decline in farmers' wider power and prestige, based on the society-wide modification of relations between whites and blacks coinciding with majority rule. Non-payment for tasks deemed to be incomplete, and punishment of workers for insubordination, still occurred. But punishment would now take forms such as allocating particularly exacting tasks to offending workers. On the other hand, the dispute resolution component of the supervisor's role remained and no decline took place in the density of supervision[71] (Rutherford 2001a,114-18). Rutherford also notes two further changes in supervisors' roles. Firstly these now included more technical components and depended more on technical skills. Secondly and more centrally the supervisor spent a large part of his time mediating between workers and management/owners. This mediation related to the distribution of farmers' patronage.

A similar picture is painted by Dolan et al. (2005) and Mausch et al. (2006), describing LS Kenyan cut flower and horticultural farms. Supervisors still behaved abusively, but could not use corporal punishment. An upper level of supervisors carried out technical duties such as worker training, record keeping and monitoring. Supervisors' power was now based, in part at least, on their status as gatekeepers to various non-wage privileges,

[71] As Rutherford (2001a, 118) observes, such a decline may have been depressed by the increase in production of labour-intensive crops, particularly tobacco.

to which access was defined as discretionary. The wage-based forms of control characteristic of the recruited labour period retained importance, but government now set the minimum wages of stabilized ('permanent') workers, which – despite the continuing existence of wide differentials in pay scales[72] – came to define the modal wage. Government-set scales were supplemented on some Kenyan LS cut flower farms by 'performance-related pay systems', but details of their content and scope are sketchy. In general it seems that piece rate payments were reserved for casual workers.[73] Hence, it appears unlikely that wage-based forms of control, at least those aiming to discipline workers by rewarding higher output in transparent and systematic ways, increased in salience – although a core argument in favour of stabilization had always been that it would open up for their greater use.

The technologies of non-wage motivation now reported as being deployed in situations of labour stabilization largely represented a continuation of those deployed in earlier phases, with certain embellishments. Kritzinger and Vorster (1997) and Ewert and Hamman (1996) describe expansion and improvement of permanent housing and the opening of childcare and recreational facilities on LSFs in South Africa in the late 1980s and early 1990s. Rutherford (2001a) and von Blankenburg report similar developments in pre-land invasion Zimbabwe, as well as a substantial increase from the 1970s in the numbers of on-farm shops, butcheries, beer halls, schools and clinics. Along with these developments came opportunities for more women to work longer hours; probably better workforce health and greater social cohesion; and, in some contexts, higher levels of workforce debt. Reports from Kenya in the 1990s point in a broadly similar direction.

Probably the main embellishment of more traditional patron-client relations was a deepening of personal credit. Rutherford (2001a, 101-08) describes an emerging trend in 1990's Zimbabwe for farmers to supply farm inputs on credit to workers.[74] Indeed, he argues that credit in general now played the central role in labour control. The mediation between worker and LSF that filled so much of supervisors' time revolved in large part around negotiating extension and rolling-over of credit.

Labour stabilization also offered other opportunities to extend patron-client relations. Workers, as already noted, were often given permanent status on the understanding that they facilitate supply of family labour. Rutherford (2001a, 72) and Ewert and Hamman (1996) both mention that workers actively sought, and were allowed, to nominate relatives for seasonal work. 'Domestic government', as Rutherford explains, not only involved projection of the farm as a 'family', but also of the workforce itself as one. Over time in Zimbabwe and South Africa this projection may have actually corresponded increasingly to reality. Large numbers of permanent workers were born and were allowed to retire on the farms where they were employed, to obtain employment for their children and wider family members, and to shelter others in times of famine and hardship in the wider society – all mediated by supervisors

[72] Barrientos and Kritzinger (2004) cite a differential of 386 percent between the rates of pay for the top and bottom of three grades of permanent worker in South Africa; Dolan et al. (2005) cite a difference of 59 percent between top and bottom grade in Kenya, but do not say how many grades there are. No data is available from other stabilized systems.

[73] Ewert and Hamman (1996) state that, in Western Cape, permanent workers are paid by the piece during harvesting.

[74] Around a third of workers in his case purchased inputs from their employers (220). Von Blankenburg (1994, 93) similarly mentions that a half of Zimbabwean LS farmers in his sample ploughed land for their workers.

(cf. e.g., Kritzinger and Vorster 1997; Rutherford 2001a, 221; and von Blankenburg 1994, 92). This would not have been possible in a context of labour recruitment, although here too the often inter-generational ties between (families of) workers and specific PFs/LSFs should not be underestimated.[75] This may have fed too into a process of increasing on-farm ethnic homogenization – another source of cohesion – although Rutherford himself (2001a, 125) did not observe this.

CONCLUSION

Common trends spanning LSF and PF, African regions and historical periods in respect of farming systems are difficult to detect. There are some clear trends within the LSF systems of the settler economies, with an accelerating capital intensity centering on maize until ca. 1980, being followed on the one hand by significant reductions in the aggregate crop area and on the other by growing bifurcation in the capital and labour intensities of the crop production that remained. But there are no parallels to this in LSF or PF in other African regions since the 1980s as far as is known. At the same time, the literature suggests some parallels in terms of (low) capital intensity and in farming practices between LSF crop production systems in the settler economies before World War II, those for sorghum in Sudan up to the end of the 20th century and the PF systems of, for example, sisal – also up to the end of the 20th century. Thus, perhaps the best way to characterize LSF and PF farming systems is in terms of a three-way divide in capital intensity - high value LSF crops mainly in the settler economies, maize in the settler economies and certain other crops grown on LSFs and plantations elsewhere.

Labour systems on the other hand seemed to share common trends to a greater extent. Firstly, after a prolonged period in which labour recruitment across LSF and PF in Africa was based on a combination of extra-economic coercion, government schemes and *ad hoc* incentives in the form of land and livestock, increasing capital intensity and more favourable demand conditions after 1945 drove labour stabilization in most places.

Pre-stabilized 'recruited' labour was traditionally deployed on the basis of a simple division of labour mirroring what were considered as a natural sequence of agricultural operations. Performance of a given stage of activity in this sequence was formalized as a work task of a given physical magnitude to be completed in a standard working day. Individuals performed identical tasks every day. Evidence suggests that this system continues to be found in some areas after stabilization occurred, although in a few others 'stabilized' permanent employees became required to rotate between different tasks according to the season.

Throughout the history of 20th century LSF and PF, even where slaves were used, labour control involved a mixture of coercive supervision, cash incentives and giving and receiving patronage. The balance between these shifted systematically over time, in line with whether labour was predominantly forced, recruited or stabilized. Coercion diminished in favour of the other methods. However, as government regulation of agricultural wages and conditions became general from the 1980s, farm owners' prerogative in respect of cash incentives was reduced and patron-client relations appear to have assumed a height-

[75] "The more freedom [workers in Portuguese East Africa, PG] were given (in recruitment), the more they exercised it communally. Workers of the second generation tended to go where their relatives and friends had worked before" (Vail and White 1980, 375).

ened importance – at least in the former settler economies.

Although, according to some observers, the role of supervisors became more technical in the 1990s, it is striking that stabilization was as little associated with 'scientific' use of payment systems as it was with introducing a 'scientific' division of labour. In both areas, a premium was instead placed on arrangements that kept formal systems to a minimum (thus retaining scope for discretion), while increasing workforce flexibility. Nor does this seem to have been challenged much by workers, who identified the PF/LSF not only as an employer but also as a resource that could be utilized to satisfy a range of family welfare concerns over the human lifecycle.

There are of course lacunae in this otherwise common story. Apart from the absence of stabilization in Sudan, we know nothing about labour control systems there. Nor do we know anything about them after independence in Nyasaland/Malawi. Moreover, our knowledge even of labour control in the settler economies ends abruptly around 2000, in a context where for example labour and environmental standards started to gain ground. These are also likely to have entailed changes not only in labour but also in farming systems, especially as the context of their introduction is sometimes a more proactive governance of value chains by lead firms anxious to squeeze 'more out of less' from suppliers.

Turning to what all this implies for the stereotype of LSF and PF found in the contemporary literature that takes its starting point in the post-2004 'land grab', a few concluding words will be said in turn on 'low productivity', 'limited employment generation' and 'low quality jobs'. Given that the focus of this paper only touches lightly on land utilization (crops *vs* livestock), this element of the stereotype will be left to one side.

Low productivity has been shown in this presentation not to be an intrinsic feature of LSF and PF in Africa as such, although it may possibly be intrinsic to some sub-sectors in some countries. The albeit unevenly rising productivity of LSF food and tobacco production in the settler economies from ca. 1960 (evinced e.g. in yields, Table 2) relates to public interventions in the areas of credit, input supply and especially research and extension. These investments were racially skewed and costly – which in turn limited their lifespan. The high productivity characterizing LSF production of higher value crops from the 1980s onward, in contrast, seems to have related to the advent of a new generation of investors and the establishment of new, relatively short global value chains linked to dynamic changes in demand in retail markets.

Limited employment is also not intrinsic to LSF and PF. The employment generation potential of LSF and PF depends largely on what crops are grown. While the labour intensity of LSF maize production was never especially high, it fell from the 1960s in line with increases in capital intensity. This related to ease of mechanization. Production of many other crops is much more costly to mechanize and the benefits are often lower.

Low quality jobs have arguably been much more of a common feature. Not just in Africa, but close to universally, pay, health and safety, training and conditions of service on farms and plantations have been worse on average than in industry in the same locations. Yet the increasing salience of standards may be a reason for considering that this may also change. A more qualified statement on this issue requires bringing up to date knowledge of those sub-sectors in Africa (horticulture and cut flowers) where labour and environmental standards are being most commonly applied.

In short, productivity, employment generation and employment quality can all be subjected to modification by policy – policies to support capital intensification, policies to promote farming of more labour intensive crops and policies of labour protection. The debate on LSF and PF in Africa could usefully move in this direction.

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