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Tractors, states, markets and agrarian change in Africa

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ABSTRACT

Mechanisation has made a comeback to agricultural policy in Africa, encouraging scholars to revisit seminal literature on induced innovation. Recent studies emphasise the role for markets in addressing Africa's mechanisation gaps and warn about past government failures to be avoided. The trust in the ability of markets to offer optimal solutions is debatable. Markets are shaped, as states are, by the interests of their most powerful players. A history-informed analysis of mechanisation and agrarian change in Africa sheds light onto how states and markets are co-constituted. The much-hyped rise in demand of tractors by medium-scale farmers can be linked back to earlier government intervention. And today's public-private partnerships for mechanisation services illustrate how private interests shape public policy. Top-down tractor programmes continue to largely bypass smallholder farmers, though some are able to benefit. Though tractors are only one element of a complex story of agrarian change in Africa, they illustrate the enduring process of commodification of land, farming and agrarian relations that benefits the few and subjugates the many.

KEYWORDS

Tractors; Africa; mechanisation; state; markets; agrarian change

In recent years, the mechanisation of African agriculture has become a hot topic in policy, business and academic circles (ACET 2017; CEMA 2017; FAO and AUC 2018; Mrema, Baker, and Kahan 2008). Governments see mechanisation as a route to modernising agriculture and transforming rural areas (FAO and AUC 2018) and have revamped programmes abandoned since the days of Structural Adjustment (Sims and Kienzle 2006). Supported by a new wave of South-South cooperation with countries like Brazil, China and India (Agyei-Holmes 2014; Cabral 2016; Cabral et al. 2016; Kaplinsky et al. 2009), African governments have become once again directly involved in the international procurement of

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This article is part of the Special Forum on 'Tractor politics in Africa' guest edited by Kojo Amanor and Lídia Cabral. The latest wave of mechanisation policies introduced by governments in Africa are framed in the language of liberal markets, enabling states, and public-private partnerships. Besides their role in state-mediated global capital accumulation, tractors are vehicles of accumulation that feed ongoing processes of social differentiation and class formation locally. They illustrate the enduring process of commodification of land, farming, and agrarian relations that benefits the few and subjugates the many. And they continue to stir debates on states and markets in African agriculture that remain fundamentally unresolved.

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farming machinery, mainly tractors, and in setting-up tractors services for smallholder farmers who cannot afford to buy their own (Diao, Silver, and Takeshima 2016; Houmy et al. 2013). Having embraced market liberalisation policies, governments have called upon the private sector to enter public-private partnerships (Mrema, Baker, and Kahan 2008), offering businesses access to subsidised machinery (Cabral 2019). This machinery has been financed with concessional loans, such as the one provided by Brazil to Ghana, Kenya, Mozambique, Senegal and Zimbabwe. By expanding the supply of machinery and services, governments have promised to increase agricultural productivity and address food insecurity while transforming African smallholders into profitable businesses.

Meanwhile, in parts of the continent, increases in demand for tractors and tractor services have been attributed to structural changes in the rural economy, including the rise in rural wages driven by urbanisation, the development of land markets and concentration of land holdings, and the emergence of medium-scale capitalised farmers made of entrepreneurs (from within or outside agriculture) as well as retired civil servants (Jayne et al. 2016). Capitalised farmers are not only buying machinery to use in their own farms but are also hiring it to other farmers, as an additional business and/or to pay off their investments. Markets for second-hand machinery, machinery rental or service provision have expanded in Ghana and Tanzania (Cossar 2017; Diao et al. 2014; van der Westhuizen, Jayne, and Meyer 2019). Mobile phones and digital platforms have facilitated these transactions, quickly connecting service providers with clients (Cabral and Sumberg 2017).

These supply- and demand-side trends have encouraged scholars to revisit some of the seminal literature on mechanisation in Africa, including that focused on the conditions for innovation and adoption of mechanical technology (Binswanger 1986; Binswanger and Pingali 1988; Binswanger and Ruttan 1978; Pingali, Bigot, and Binswanger 1987; Sanders and Ruttan 1978), which suggested that mechanisation was not suitable for contexts with labour abundance, low wages and land fragmentation. Labour was inexpensive relative to capital, and mechanisation was physically challenging in fragmented and rugged plots. Also, difficulties in ensuring the supply of spare parts and repair services and lack of credit to assist the predominantly small and undercapitalised farmers, prevented markets from developing. Diao et al. (2014, 2016) argue that conditions have changed, in some countries at least, and private sector-led demand for labour-saving mechanical technologies is rising and prices are responding to changing factors. It is also argued that governments can disrupt these markets through interventions in the purchase and distribution of machinery. Markets, not the state, it is claimed, provide the answer to Africa's mechanisation deficit and governments should confine their action to creating an enabling environment for private sector investments in mechanisation (Daum and Birner 2017; Diao, Silver, and Takeshima 2016; Ströh de Martínez, Feddersen, and Speicher 2016).

The trust in the ability of markets to offer adequate solutions is debatable. Markets are not virtuous level playing fields but are shaped, as governments are, by the interests of their most powerful players. As this forum illustrates, states and markets are not neatly separated but are historically co-constituted (Amanor 2015, 2019). This forum also highlights how mechanisation (state-driven or otherwise) intersects with processes of accumulation and social differentiation in complex ways that are overlooked by the linear rationality underpinning induced innovation modelling.

The forum reviews the experiences of four countries: Ghana, Ethiopia, Mozambique and Zimbabwe. These country studies combine an analysis of the macro drivers and policy narratives on mechanisation with field level examinations of socio-political dynamics of mechanisation and their repercussions for agrarian economies. The remainder of this introduction overviews three themes emerging from the country analysis: changing paradigms on mechanisation, states and markets throughout history; the new market dynamics and how these are connected to past state interventions; and the place of tractors in processes of accumulation and differentiation.

Changing paradigms on mechanisation, states and markets

The four countries have been through somewhat similar historical mechanisation trajectories, strongly shaped by aid geopolitics and shifting agricultural paradigms. In newly independent Ghana, Mozambique and Zimbabwe, governments extended colonial policies focused on tractor ploughing. Tractors inherited from colonial programmes were problematic, with land clearance and tractor ploughing often resulting in serious land erosion or a rapid breakdown of tractors unable to deal with the resistance of hard soils and robust root structures. Though contested (see Mozambique article in this forum), tractorisation programmes were rolled out, supported by either Western donors or the Soviet bloc. Given the low levels of capital accumulation in agriculture under colonialism, the independent states promoted agricultural modernisation, reflected in state farms, alongside initiatives to support private commercial farming. In Ethiopia, policy narratives about agricultural development also focused on modernising and transforming agriculture in ways that typically promoted large-scale mechanisation and bypassed smallholders.

By the late 1970s, the development of farming systems research and the adaptation of plant breeding to smallholders, emanating out of the international agricultural centres working on Green Revolution technologies, resulted in a backlash against large-scale estate agriculture, state farms and mechanisation across Africa. The theory of induced innovation showed the inadequacy of mechanisation given the widespread availability of labour and land, the prevalence of rotational bush cultivation, and the high costs of transforming fallow into ploughed land; and advocated for policies that promoted an intermediate stage of bullock ploughing (Pingali, Bigot, and Binswanger 1987) – which never materialised on a significant scale. Concerns with the availability of labour and scarcity of capital influenced arguments in favour of smallholders and labour-intensive solutions, which saw approaches focused on large-scale farmers and capital intensive technology as rooted in *urban bias*, the distortion of agricultural policies by elite interests (Lipton 1975). Hence, donors became reluctant to fund mechanisation programmes.

By the early 1990s, this smallholder focus became tempered by both debates on land reform in post-apartheid South Africa and the role of commercial agriculture, and by the expansion of agribusiness and contract farming. Lipton (1993) and Binswanger and Deininger (1993) advocated for power compatible solutions combining the efficiencies of smallholder production with the economies of scale of large-scale farming. Increasing impatience in some influential policy circles with smallholder resistance to high-yielding varieties and use of inputs influenced a shift of interest back towards larger-scale farmers, but also to synergies between smallholder and commercial agriculture, in which

the accumulation of capital among larger commercial farmers enables them to invest in the provision of services from smallholders. This led to a resurgence of interest in mechanisation, the uptake of mechanisation by medium scale farmers, and the provision of privatised mechanisation services for smallholder farmers by the expansion of larger farms (Diao et al. 2014; Jayne et al. 2016). The successes of mechanisation in southeast Asia and other emerging countries (Biggs and Justice 2015), and the growth of mechanisation industries in these countries, has also influenced policy (Mrema, Baker, and Kahan 2008). Several of these countries, including Brazil and India, are now exporting tractors and other machinery to Africa, and enacting bilateral agreements to facilitate trade. This is resulting in concerns in the North that this is facilitating the re-emergence of state subsidies and distortions of agricultural markets, leading to research that disassociates the present uptake of mechanisation from the state, rooting it within the successes of liberalisation policies and the market integration of smallholders. Recent approaches are concerned with revisiting the induced innovation theory, to account for the impact of the market and emergence of commercial farmers on changing factors of production and the uptake of mechanisation (Daum and Birner 2017; Diao et al. 2014; Diao, Takeshima, and Zhang 2020).

New market dynamics and historical continuities

Meanwhile, new mechanisation policies introduced by governments are framed in the language of liberal markets, enabling states and public-private partnerships (FAO 2017; FAO and AUC 2018). Smallholders are the claimed beneficiaries of programmes that see governments selling machinery to private businesses at subsidised prices, financed by South-South cooperation, and businesses taking on the role of service providers.

In Ghana and Mozambique, state-sponsored and privately managed mechanisation centres have been established to hire out tractors. In Zimbabwe, smallholder cooperatives were allocated tractors to service members and other farmers. In Ethiopia, a new pilot project foresees the establishment of service centres in high potential regions, to be managed by cooperative unions or private businesses. But despite the hype around these business-like service centres, their ability (or willingness) to reach smallholders is limited, either because tractors are inadequate to service small, disperse and rugged plots of land or because managers prioritise larger farms on premium land that offer a better return to their investment (larger areas to service, more accessible location and hence lower fuel costs, and lower risk of tractors being damaged by stumps, rocks or ant-hills). In Zimbabwe, patronage politics also plays a role in mediating access to tractors. The majority of smallholder farmers struggle to get timely tillage services from these service centres, even when able to pay for the service. In Ethiopia, the Ethiopian Peoples Revolutionary Democratic Front, under Zenawi, adopted the then dominant smallholder-focused development framework, based on promoting land and capital saving technologies, and deprioritised mechanisation. But the successes in promoting smallholder teff cultivation with inputs created labour bottlenecks. This resulted in a policy change towards mechanisation in 2013 triggered by the demand for teff row planters, leading to the creation of new Mechanisation Service Centres managed by cooperatives and the private sector.

Private markets for machinery and services are also developing alongside these government-led programmes, particularly in certain regions in Ghana and Ethiopia. While this has been interpreted as evidence of market dynamism and of successful

entrepreneurial middle farmers (Diao et al. 2014), the rise in the demand for tractors observed in Ghana today can be linked back to past state interventions, specifically, the clearing of land by government-led tractorisation programmes that reduced the costs involved in converting and ploughing land (Amanor 2019). Also, some of these entrepreneurial farmers enjoy good relationships with state officials, as is the case of former civil servants turned farmers, a pattern observed in Ghana, Mozambique and Zimbabwe.

Furthermore, the public-private connection converges beyond tractor allocations and mechanisation services. For example, service centres in Mozambique were envisioned as hubs for a wide range of agricultural services, not just mechanisation, with plans being drawn between managers and international agribusiness corporations. As argued by Amanor and Iddrisu in this forum, government interventions in agricultural mechanisation can be regarded as an 'integral part of contemporary market liberal policies to induce demand for inputs through market interventions on behalf of the private sector' (p. 17).

Tractors, accumulation and social differentiation

Besides their role in state-mediated global capital accumulation, tractors are also vehicles of accumulation locally. Although larger and politically connected farmers and businesses have historically profited the most, accumulation also happens from below. In Ghana, the availability of tractor ploughing services has enabled small individual farmers, including women and young men, without access to a large pool of labour, to establish their own farms, although this is happening in a context of increasing costs of production and competition for land. In Mozambique, emerging small-to-medium farmers, who were able to buy government tractors and ploughing equipment not distributed to service centres, are themselves taking on the role of service providers to smallholders, generating income that they can reinvest in their farms and small businesses, including selling modern inputs to and buying produce from their peers. In Zimbabwe, some small to medium-scale farmers use surpluses to invest in tractors or pay for services.

This is not a new process as tractors have long been intertwined with processes of accumulation. In Mozambique, mechanised state farms played a role in local capital accumulation to the extent that their managers and most skilled workers benefited directly from public resources feeding into these farmers. When state farms collapsed, new opportunities arose for well off farmers to move into prime land. In Ghana, the collapse of the large estates owned by southern farmers during the 1980s and their retreat from northern agriculture created opportunities for farmers within the localities to move into these lands that had been cleared by tractors.

Tractors also feed an ongoing process of social differentiation and class formation that is altering the agrarian social fabric. In Ghana, the decline of the extended family compound farm under the authority of the lineage elder has created new opportunities for smallholders, including women and young male farmers, but it has also enabled commercial farmers who control ploughing services to gain access to land from chiefs at the expense of smallholders (Aminu 2016).

Overall, while tractors are only one element of a complex story of agrarian change in Africa, they are a good illustration of the enduring process of commodification of land, farming and agrarian relations that benefits the few and subjugates the many. And

they continue to stir debates on states and markets in African agriculture that remain fundamentally unresolved.

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Kojo Amanor is a professor at the Institute of African Studies, University of Ghana, Legon. His main research interests are in the land question, smallholder agriculture, agribusiness food chains, agribusiness linkages with communities, capital accumulation in agribusiness, forestry policy, environment, south-south cooperation, and long-term patterns of ecological change in smallholder agriculture. His work combines a focus on changing patterns of global accumulation in agribusiness with processes of social differentiation within communities and struggles over resources.