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Food sovereignty in sub-Saharan Africa: Reality, relevance, and practicality

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The recent discourse on food sovereignty places much emphasis on democracy in determining localized food systems, and whether the food is culturally appropriate while leaning heavily on sustainable agricultural practices such as organic agriculture, ecological intensification, agroecology, nature-based solutions, and regenerative agriculture. Sustainable agricultural practices are intended to ensure that the land is managed without the use of synthetic fertilizers and pesticides, while going further by focusing on improvements on soil and land health. However, what are the practicalities of food activism and relying entirely on nature while yields are still very low in much of sub-Saharan Africa (SSA)? We attempt to answer this question in four main sections: (a) we start by defining the concept of food sovereignty and the associated practices, (b) we highlight some of the main socio-ecological conditions that are common in SSA, and (c) we present evidence of some of the limitations of food sovereignty due to the diversity in ecological, political, cultural, and socio-economic contexts that characterize SSA; finally, (d) we focus on food preferences, marketing and certification aspects. We conclude that agroecology alone cannot solve the multiple objectives of increasing crop productivity and replenishing soil nutrients especially on small farms and relying on natural rainfall. There is an urgent need to combine superior crop varieties and judicious use of external inputs in tandem with the manipulation of the agroecological processes to increase the efficiency of input use and achieve higher food productivity, resilience to climate change, and preservation of the natural resource base in specific locations.

KEYWORDS
agroecology, regenerative agriculture, rainfed conditions, small farms, food systems, diets, activism, choices

Introduction

Food sovereignty (FS) is the right of peoples to sufficient, nutritious, healthy, and culturally accepted food produced through ecologically sound and sustainable methods, and allowing producers to have a right to define their own food and agriculture systems (Dekeyser et al., 2018; Carlile et al., 2021). Though the original definition of food sovereignty has evolved since the food sovereignty movement's official inception, Schanbacher (2010) states that the core elements have remained the same. FS tends to hinge on a broad advocacy for farming systems that are both food secure and ecologically sustainable (Edelman et al., 2014). As such, interpretations of the term food sovereignty revolve around agroecology, sustainable intensification, ecological intensification, nature-inclusive agriculture, nature-based solutions, organic agriculture, and/or fair trade-oriented agriculture, and some include views of more industrial but localized farming systems (Ajl, 2018). The basic principles for food sovereignty are to localize food systems and work with nature by offering a strategy to change the current structure and function of trade, human diets, and eating habits and creating new pathways for food production systems that are environmentally sustainable for local producers and consumers (Connor, 2008). The discourse on food sovereignty places much emphasis on democracy in determining localized food and agricultural systems, and whether the food is culturally appropriate (Edelman et al., 2014; Carlile et al., 2021).

Food sovereignty has thrived as a 'dynamic process'; however, there has been insufficient attention to the practical challenges of implementation (Edelman et al., 2014) and consequently the discourse does not offer a useful practical framework for public authorities particularly in sub-Saharan Africa. FS comes in multiple dimensions and territorial scales (Patel, 2009; Edelman, 2014; Loudiyi, 2018), and as with sovereignty in general, the various kinds of FS do not necessarily co-vary (Krasner, 1999). As stated by Edelman et al. (2014) one of the unanswered questions so far is what it would take to implement FS now and in the future in economically, politically, and ecologically diverse contexts. As FS was declared a logical precondition for the existence of food security (Patel, 2009), the question is how relevant and practical are the FS concepts and approaches to the attainment of food and nutrition security in sub-Saharan Africa?

Food sovereignty is closely associated with organic agriculture, sustainable intensification, ecological intensification, nature-inclusive agriculture, nature-based solutions, and agro-ecology (Holt-Giménez and Altieri, 2012). We define these terms upfront for clarity as in many cases in literature; these terms may be used interchangeably. The broader organic agriculture concept refers to an agricultural system that uses ecologically based pest controls and biological fertilizers derived largely from animal and plant wastes and nitrogen-fixing cover crops, promotes crop rotations, and focuses on soil fertility and localized nutrient cycles (Muller et al., 2017). Sustainable intensification (SI) is defined as an agricultural production system where yields are increased and maintained while limiting the negative environmental impacts and without the need to convert additional non-agricultural land (Pretty and Bharucha, 2014). Ecological intensification (EI) focuses on environmentally friendly replacement of man-made inputs and/or enhancement of crop productivity, by including, regulating, and supporting ecosystem services management in agricultural practices (Bommarco et al., 2013). On the other hand, nature-inclusive agriculture (NIA) refers to innovations in farm management, technology, and resource use that have the potential to address farmland biodiversity decline beyond solely focusing on yields (Vermunt et al., 2022). Nature-based Solutions (NbS) are cost-effective interventions that use the ability of nature to provide ecosystem services that can enhance resilience in agriculture and food production, while mitigating climate change and enhancing the environment (Sowińska-Świerkosz and García, 2022). Agroecology is an approach to farming that maximizes ecological processes and does not degrade the natural resource base (Carlile et al., 2021). Agroecology is based on local and traditional agricultural knowledge, environmentally safe and culturally significant sustainable development, organic rather than capital and chemical intensive inputs, and biodiversity (Schanbacher, 2010). A recent buzz word, regenerative agriculture is considered a re-framing of sustainable and ecological intensification with a focus on restoration of soil health, carbon sequestration, climate change mitigation, and reversal of biodiversity loss (Giller et al., 2021a).

Our main contention is that local food sovereignty is not urgent for the generality of the developing world population especially in SSA characterized by declining yields, declining soil fertility, and diminishing returns to labor, and where first phase conservation and productivity gains are overtaken by population growth (Bernstein, 2013) but rather relevant in higher income situations where consumers are able to make choices driven by ecological citizenship (Seyfang, 2005).

Socio-ecological context of Sub-Saharan Africa

Sub-Saharan Africa is characterized by diverse socio-ecological conditions. This diversity is underpinned by an interplay of biophysical factors such as soils and climate, socioeconomic factors such resource ownership and access to capital and markets, as well as farmers' production objectives. Soil degradation and unpredictable rainfall synergistically constrain food production and the viability of smallholder agriculture in SSA, where 90% of main crop production is under rain-fed conditions. The situation is compounded by poor capital outlay, limited labor, small and dwindling land sizes, and an insecure land tenure faced by most smallholder farmers (Sanginga and Woomer, 2009). In addition, population is increasing, diets are changing, and arable land is shrinking due to land degradation and soil fertility loss (Giller, et al., 2008) while climate variability and change are becoming more and more acute (Challinor et al., 2007).

Cereals especially maize dominate production and are intended mostly for food but can be used as cash crops when farmers produce a surplus (Giller, et al., 2008). On the other hand, livestock are also important in the farming system, with cattle closely integrated with crop production. Cattle is used for draught power, for food through milk and meat, for nutrient management through the manure, and increasingly as an insurance in times of urgent cash needs and often a symbol of wealth (Thornton and Herrero, 2001). At the household level where decisions are made, inadequate resources such as labor, cattle manure, and purchased fertilizers lead to multiple nutrient deficiencies and soil fertility gradients within and across farms (Tittonell et al., 2007; Zingore et al., 2007).

In SSA, women produce up to 80% of basic foodstuffs both for household consumption and for sale, and the figure can be higher in some of the least developed countries (Glazebrook and Opoku, 2020). Women in agricultural production suffer drudgery in addition to low returns on labor (Doss, 2018). Also, as in many areas, women are the main custodians of neglected and under-utilized crops and the associated traditional knowledge; men in many cultures concentrate on producing staple and commercial crops (Kuhnlein et al., 2009; Padulosi et al., 2013).

Another characteristic that hampers smallholder farmers is limited market participation especially in specialized markets. The reasons are many but center on lack of reliable market information, poor market access, high transaction costs, poor infrastructure, and weak institution. In addition, usage of certification services in Sub-Saharan Africa by smallholders is low, and many smallholders do not receive price premiums for producing higher quality staples (Abate et al., 2021).

Local environmentally sustainable food production systems?

The transformation toward the ecological intensification of agriculture is an interaction of several socio-economic and environmental factors which may result in unpredictable outcomes. Ecological intensification systems rely on (a) on-farm renewable resources such as compost manure, green manure, and bone meal for nutrient management; (b) natural pest control through the management of ecological and biological processes such as crop rotation, mixed cropping and fostering insect predators; and (c) exclusion of external synthetic fertilizers and pesticides (Tittonell, 2014). When a full understanding of the ecological relationships and process in agricultural systems is established, it is possible to manipulate these systems to increase productivity, reduce loses, and limit environmental damage through ecological intensification (Schanbacher, 2010). Though ecological intensification has little to no artificial fertilization, herbicides, and pesticides, it requires greater expertise and more time to optimize farm management and achieve high productivity (Geertsema et al., 2016).

The political food sovereignty movement has largely adopted agroecology as a strategy of resistance to industrial agriculture and is centered on agroecology as a normative form of production (Edelman et al., 2014). Prescribing FS based on agroecology as a 'silver bullet' solution to end hunger and malnutrition in SSA is problematic due to the diversity of farms and farming systems (Vanlauwe & Giller, 2006) as earlier mentioned. Agroecology strives for a deep understanding of ecosystems, such as how plant and animal life interact with the human production of foods and resources (Schanbacher, 2010). Taking an objective look at the low-input, low-output characteristics of local production in SSA (Sheahan and Barrett, 2017), we also ask ourselves, will low-input agricultural production meet global food security (De Ponti et al., 2012; Giller et al., 2008)? Existing analyses of organic agriculture have put the carrying capacity of organic agriculture at 3–4 billion, well below the present population of 8.0 billion, and 10 billion projected for 2050 (United Nations, 2019). With the world's population set to increase, the farming spectrum should seek to optimize the use of factors of production, inputs for productivity, and environmental sustainability (Ponisio et al., 2015). So far, the trend in SSA has been cereal yields growing more slowly than population and demand resulting in a total cropland area increase of 14% between 2004 and 2013 through deforestation, conversion of marginal grazing land, and more crop cycles per year on the same field (Van Ittersum et al., 2016).

For illustrative purposes, we use the term organic agriculture in reference to ecological intensification practices. Schader et al. (2021) reported that in SSA, the potential for organic agriculture is often not utilized due to poorly implemented organic interventions, and that a differentiation is needed to distinguish between desirable and objectionable ways of organic agriculture. De Ponti et al. (2012) reported that balanced nutrition in purely organic systems is difficult to maintain, which contributes to a significant large yield gap. For example, De Ponti et al. (2012) compiled and analyzed a meta-dataset of 362 publications and showed that organic yields were on average 80% of conventional yields depending on the type of crop and production region. However, a recent paper by Connor (2022) pointed out that the crop yield gap of 20%–25% of organic versus conventional agriculture is only part of the full gap: at systems level (including the land that is needed to produce organic inputs such as N from N fixing crops and manure) the yield gap between both types of agriculture is much larger. In case of nitrogen (N) fertilization, it might not be practical to rely solely on the natural process of biological nitrogen fixation (BNF) as the BNF process may be hampered by multiple-nutrient deficiencies inherent in most soils of SSA. There is an urgent need for judicious use of external inputs in tandem with the manipulation of the ecological processes to increase the efficiency of input use to achieve higher food productivity and preservation of the natural resource base (Buresh & Giller, 1998; Sanchez, 2002; Rusinamhodzi et al., 2012).

The need of an enormous productivity increase and associated nutrient requirements for SSA to be self-sufficient in the future has been assessed and previously reported (van Ittersum et al., 2016; ten Berge et al., 2019). In addition, literature is replete with evidence on the relevance and urgency to incorporate integrated soil fertility management (ISFM) in production systems especially on small farms that dominate SSA. ISFM is defined as a set of practices related to cropping, improved varieties, synthetic fertilizers, organic resources and other amendments on smallholder farms to increase production, input use efficiency and resilience (Vanlauwe et al., 2010). ISFM is better placed than organic agriculture alone to achieve food security, soil health, and self-reliance. ISFM does not demand copious quantities of each form of fertilizer (organic + chemical), and this increases the chances of widespread adoption and a positive spiral effect on the environment (Vanlauwe et al., 2010). External inputs, especially soil nutrients, are needed in the short term following the 4Rs (right source, right rate, right time, right place) of nutrient stewardship (Johnston & Bruulsema, 2014) to correct the severe nutrient imbalances and raise baseline productivity that can trigger other positive ecological processes.

The world needs a highly productive agriculture that can save as much land as possible for nature and at the same time meet global food security (Connor, 2008). From a resilience and sustainable production systems point of view, the production of minor crops (neglected and underutilized crops) and livestock species (Blench, 1997) could be promoted; however, the resultant complex production systems with diverse neglected and underutilized crops and livestock species in diverse landscapes would require different value chains and policies and legislation for some of the products (Padulosi et al., 1999; Windfuhr and Jonsén, 2005).

Local preferences mean a focus on "local", "traditional", neglected, and underutilized crops and livestock species (mostly chickens) which inherently have lower productivity than the modern main staple crops and improved animal breeds. Indigenous crops and animals may be better adapted to local conditions in the face of climate change, and some crops may be more nutrient dense than the modern crops (Akinola et al., 2020), but in some instances, the crops are difficult to collect, e.g., leafy vegetables such as *Cleome gynandra*; tedious to process, e.g., small grains such as sorghum, pearl, and finger millet; and take long to cook, e.g., legumes such as Bambara nut, which implies that food might not appeal to most individuals/ households (Kuhnlein et al., 2009; Padulosi et al., 2013). For example, smallholder farmers in Zimbabwe identify labor demands associated with the processing of small grains (sorghum and millet) as one of the limiting factors. This implies that food sovereignty might not only be about defending food cultures but also about reinvigorating or even rebuilding them, and consciously working to enhance 'food literacy' and modify consumer tastes (Edelman et al., 2014). Also, relying entirely on local production raises the question of competing claims on land and competition over other resources needed for food, feed, the bio-based economy, and nature conservation (Giller et al., 2008).

Women play key roles in food production, procurement, and preparation (Park et al., 2015). For these rural women, focusing on "local", "traditional", neglected, and underutilized food crops and livestock species implies less free time as they spend more time cultivating, gathering, preparing, and storing foods as well as fetching fuelwood (Thies, 2000 et al., 2013). Unfortunately, any additional work often falls on the shoulders of women, who contribute to most of the agriculture labor (Phiri et al., 2019). This reinforces what Carlile et al. (2021) pointed out that while a food sovereignty agenda might benefit small-scale farmers, it would not necessarily have positive impacts for women and girls who are often particularly marginalized in family farming systems.

Changing the current structure and function of trade

The ability of communities to produce food sustainably leans strongly on economic growth and competitiveness. Economic growth and competitiveness depend on productivity, demand for the products, and on the extent to which consumer prices reflect costs of externalities (Buttel, 2003). In this case, societal externalities include the potential environmental and health-related costs. A meta-analysis of smallholder farmers in Africa revealed that farmers sell a large proportion of their produce and are in the business of farming to improve their livelihoods (Cock et al., 2022). However, FS advocacy tends to be driven by strong preferences for 'local' (Edelman et al., 2014) with local trade being hinged upon barter exchange (Marti and Pimbert, 2006; Pimbert, 2009). Yet, barter exchange faces challenges emanating from the absence of money and by the presence of indivisibility (Fujishige and Yang, 2021). In cases of excesses, connecting peasants to global markets may mean a complete set of certification procedures, creation of brands and appropriate standard setting, and benefit from excess produce marketed as specialty e.g., organic or community-traded products. Introduction of grades and standards can play an important role in helping rural enterprises succeed in increasingly liberalized and unprotected markets (Chiputwa et al., 2015). Even as fair-trade certification attempts to deliver fair prices to producers, producer organizations must pay application, initial certification, as well as certification renewal fees (Dragusanu et al., 2014); certification costs place trading beyond the reach of most small-scale producers (Marshall et al., 2006). Additionally, there is no guarantee that certification programs will offer high enough price premiums to offset the costs of certification (Blackman & Rivera, 2011). Barriers in the form of taxes and certification of origin are significant for local producers and are on the increase, causing them to abandon their trade or continue it in a clandestine manner. Consumers need to be certain that food has been produced under good farming practices and should be able to verify, meaning that standardization is inevitable (Rigby & Cáceres, 2001). In cases where ecologically sound food production systems can be used, the costs of such food are often at least 10% more than conventionally produced foods (Peng, 2019), throwing food out of the reach of the majority consumers and violating one of the tenets of food security – access. Food insecure regions in sub-Saharan Africa which experience frequent droughts and total crop failures are often saved by food imports whose origins the recipients do not know. We do not make a case that the end justifies the means, but in many cases those acute interventions to avert hunger often take precedence over the need to define how the food was produced.

Finally, ethical purchase behavior as advocated for under food sovereignty is severely constrained by limited disposable income among consumers resulting in these practices being limited to the wealthier consumers. When consumers have limited budgets because of low income, they have lower willingness to pay and the perception of price as a barrier (Aschemann-Witzel & Zielke, 2015). High prices are a typical feature of specialty foods and constitutes a deterrent to their purchase, i.e., food sovereignty tends to be driven by strong preferences for local production ("indigenous", "traditional", "neglected and underutilized crops and livestock species") and underestimates the influence of changing food culture (Edelman et al., 2014).

Conclusions

Given the above, food sovereignty, though having some positive attributes, is challenging to practice at present and unlikely to solve the immediate food security needs in SSA where current crop productivity remains low or decreasing and the population is growing. External synthetic nutrient inputs are needed in combination with organic inputs, elite germplasm, along with improved water management strategies to initiate an increase in productivity and resilience against climate variability and change. Smallholder farmers who choose to go purely organic will need to be supported by better certification schemes and access better markets for improved returns to investments.

Data availability statement

The original contributions presented in the study are included in the article. Further inquiries can be directed to the corresponding author.

Author contributions

LR: conceptualized, paper outline and write-up and review. GMR: conceptualized, literature review, write-up and review. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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