Received: 28 July 2020 | Accepted: 29 November 2020

DOI: 10.1002/aepp.13139

FEATURED ARTICLE

"Essential non-essentials": COVID-19 policy missteps in Nigeria rooted in persistent myths about African food supply chains

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Editor in charge: Craig Gundersen

Abstract

Food supply chains are extremely important for food access and livelihoods across Africa, but their role is often overlooked and underappreciated. Under normal conditions, the gap between myth and reality can result in the design of policies and programs with limited or negative impacts on food security and welfare. The shock of COVID-19 has heightened this disconnect, with potentially dire consequences for food security. This paper demonstrates the importance of recognizing and accounting for the essential role of food supply chains when designing policy and interventions, particularly in response to COVID-19, and provides recommendations for action based on current realities.

KEYWORDS

Africa, COVID-19, food systems, food supply chains, policy

JEL CLASSIFICATION

O20; Q13; Q18

INTRODUCTION

Food supply chains (FSCs) are important to African food security. On average 80% of food consumed (in value terms) is purchased from FSCs (Reardon et al., 2019). Millions of Africans

derive their livelihoods from the micro, small, and medium enterprises (SMEs) that process, trade, and deliver 85% of the food in FSCs (Reardon & Liverpool-Tasie, 2020). Jobs in FSCs account for 65% of all rural employment FTEs (full-time equivalents) in six African countries (Ethiopia, Malawi, Niger, Nigeria, Tanzania, and Uganda), composed of 40% in own-farming, 5% in farm-wage-labor, and 20% in postfarmgate FSC employment. The latter forms 25% of FTEs in urban areas (Dolislager et al., 2020). Finally, FSCs condition the incentives for yield enhancements of millions of African small farms.

We contend that policymakers and international partners often have wrong priors (what we call myths) about the nature of African FSCs. By basing many policy decisions on the myths, governments harmed or forewent needed solutions to constraints to FSCs both before and during COVID-19. Here we discuss some of those myths, address how they affected policymaking during COVID-19, and identify problems caused for FSCs by those policies. We illustrate from Nigeria, Africa's most populous country and an important case for at least half the population of Africa, because Nigeria's FSCs are similar to other large coastal African countries including Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Mozambique, South Africa, and Tanzania.

We undertake two sets of data analysis. (a) To show which priors of policymakers deviate from reality and are thus myths, we use macro data from FAOSTAT and micro data from the World Bank Living Standards Measurement Study (LSMS) panel for various countries and years, and our own primary survey of about 2500 farms and firms along the maize, feed, and poultry value chains in two Nigerian states in 2017 (see Liverpool-Tasie et al., 2017b for details of the survey). (b) To show the effects of myth-rooted policies during COVID-19, we use data from our own primary surveys in Nigeria in 2020, covering 649 actors in the different segments of the fish and poultry value chains (with details discussed below).

We proceed as follows. In Section 2 we lay out our analytical framework showing the paths by which policies affect FSCs, via "vertical" FSCs (from farmer to consumer) and "lateral" supply chains (for materials, labor, and logistics), feeding each segment of the vertical FSCs. In Section 3 we outline the myths that we think African policymakers display concerning FSCs, and compare those perceptions with recent survey findings about FSCs in Africa as a "reality check." Section 4 shows that during COVID-19 those gaps between perception and reality led governments such as Nigeria's to implement policies that were suboptimal for FSCs. Section 5 presents our survey findings concerning the policies' impacts harmful to FSCs. The last section summarizes and presents policy recommendations; there we presen our key finding that governments' insufficient recognition of the importance of the lateral supply chains (such as logistics, labor, and materials) led to a policy approach that did not classify the latter as "essential" and indeed restricted them, in turn creating major bottlenecks for the FSCs.

CONCEPTUAL FRAMEWORK

Figure 1 shows a cluster of supply chains (SC) centered on a given food product. We illustrate using chicken as an example. (a) The middle column is the "vertical SC" of chicken from the upstream segment (feed supply to chicken farmers and chicken farmers), to the midstream segments (processors and wholesalers) to the downstream segments (retail, food service, and consumers). (b) The left-hand column is a set of "lateral SCs" that supply each segment of the vertical SC. These include logistics services (such as trucking from the feed mill to chicken farms), labor (such as local or migrant workers to farms or processors), and materials (such as maize to the chicken feed mill). Hence, for a given vertical SC there is a cluster of

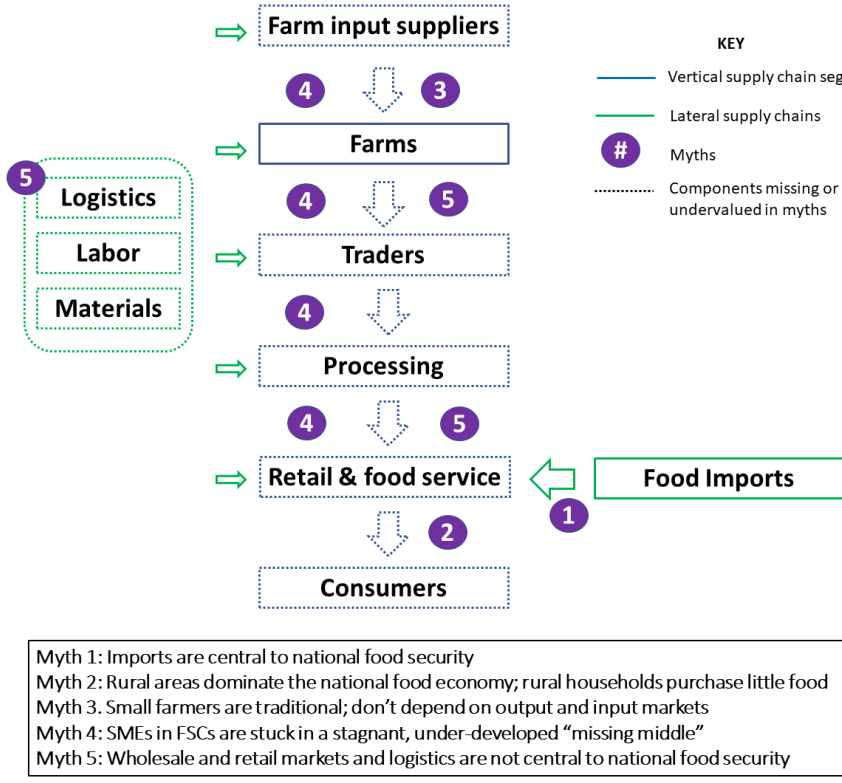

FIGURE 1 Food product supply chains as a cluster of a vertical and many lateral chains [Color figure can be viewed at wileyonlinelibrary.com]

complementary, lateral SCs. These lateral SCs often supply other product vertical supply chains as well, such as third-party logistics services (3PLS) supplying wholesalers of both chicken feed and fish feed. (c) The right-hand column shows the food imports SC from the port to local food retail, such as imported frozen chicken to retailers.

The link between this diagram and the discussion below is indicated in Figure 1. The numbers in the figure indicate the loci of myths about the nature of the segment of the SC or links between segments. The dotted lines indicate segments of the supply chain that tend to be considered missing or whose importance is undervalued in policymakers' priors.

FIVE KEY MYTHS INHERITED BY THE COVID POLICY DEBATE, AND SURVEY DATA-BASED "REALITY CHECKS"

Myth 1: Imports are central to national food security

Policy debates often position imports as central to food security in Africa (indicated by "#1" in Figure 1). The literature often notes that Africa is a net food importer (e.g. Rakotoarisoa et al., 2012) and asserts that Africa's food sector development has been held back by food imports (e.g. African Development Bank, 2016). In the COVID-19 debate, there are frequent assertions that Africa's food security is severely undermined by disruptions or restrictions to imports related to the pandemic.

TABLE 1 Import share of total food consumption.

	Ethiopia	Malawi	Nigeria	Tanzania	Uganda	All SSA
Import share 1	5.6%	1.1%	4.7%	3.7%	6.1%	9.7%
Import share 2	7.3%	1.8%	7.3%	4.3%	6.5%	13%

Source: FBS data from FAOSTAT, 2017, authors calculations, accessed August 15, 2020.

We contend that the centrality of imports to food security is a myth and that its hold on the debate focused attention on the trade effects of COVID and deflected attention from domestic FSCs. A "reality check" shows that imports are minor and domestic FSCs are by far the dominant source of food for Africa. Table 1 shows the food import share in total food consumption (in tonnage terms) using FAOSTAT data. A simple measure (Import share 1) uses observed amounts for consumption by disappearance (production plus imports, less exports); a complex measure (Import share 2) uses both observed data and FAO "estimates" of other components (production plus imports, less exports, less food output retained as seed, wasted, and used for nonfood production). By both measures, the share of imports in Nigeria and, for comparison, four other African countries, is below 10%. For all of sub-Saharan Africa (SSA), the import share averages 10% by the simple measure and 13% by the complex measure. Imports are important for some products. For instance, 60% of rice and most of wheat are imported, but they form only 2.5% of all SSA food consumption in tonnage terms (Awokuse et al., 2019).

Myth 2: Rural areas dominate the national food economy and rural households purchase little food

We believe that there is a widespread view among African policymakers that urban areas are a minor share of the food economy (shown as #2 in Figure 1) and that this image formed several decades ago (when the urban share indeed was only around 20%) and has yet to be revised. Moreover, there appears to be a common perception that rural areas feed themselves and rural households purchase very little of the food they consume. This image has its roots in the reality of 20–30 years ago when rural African households were mostly subsistence farmers. These views manifested themselves during COVID-19 in oft-heard assertions that rural households could "fall back on feeding themselves." An implication is that rural households do not depend on FSCs from cities or other rural areas to feed them.

A "reality check" shows that the share of the urban population in SSA's total population has jumped to 43%, and in Nigeria, 50% (United Nations, 2019). The urban share of total national food consumption is 1.4 times higher than its share in population (because of urban–rural income differences), as Table 2 shows for Ethiopia, Malawi, Nigeria, Tanzania, and Uganda. Table 2 also shows that a high share of rural food consumption is purchased: 78% in Nigeria, and an average of 67% for the five countries.

Myth 3. Small farmers are still traditional and poorly integrated with markets

The image of African farmers using only traditional technologies and buying few external inputs is persistent in policy debates (Sheahan & Barrett, 2017). The implication of this view is

TABLE 2 Urban consumption versus urban population across Africa

Country	Year	Total annual value of household food consumption per capita (PPP$)		Urban share of population	Urban share of total food expenditure	Percentage of food consumption expenditure that is purchased		Sample size
		Urban	Rural			Urban	Rural	
Nigeria	2018/19	1050	803	0.51	0.58	95.2	77.8	4922
Tanzania	2014/15	1212	669	0.32	0.46	94.9	63.5	3305
Uganda	2015/16	764	488	0.23	0.32	85.5	54.2	3189
Ethiopia	2015/16	1045	477	0.20	0.35	96.6	53.2	4951
Malawi	2013	1088	708	0.16	0.23	93.8	75.7	4000

Source: LSMS datasets across countries. Totals are in constant 2011 PPP international dollars. Purchases include: market purchases, food away from home and gifts/in-kind.

that farmers depend little on input and equipment SCs (shown as #3 in Figure 1) and that there are few input dealers in rural areas except where NGOs and donors have created their presence through projects. A related common image is that few African farmers are engaged in crop markets due to little marketable surplus and low yields. This view dovetails with Myth 1: African farmers' marketing little means countries are forced to import a lot. We believe the grip on the policy debate of these persistent views (African farmers as traditional and limited in technology and marketing) has led to underinvestment in rural wholesale markets (Reardon et al., 2019). These views encouraged limited attention to enabling business environments for input dealers, too much emphasis on donor programs and NGOs artificially subsidizing inputs and creating "agro dealers," and too little policy attention to private input supply chains (Liverpool-Tasie et al., 2019).

A reality check shows first that farmers' marketed surplus is pouring toward the cities in rapidly increasing quantities: Rural–urban FSCs have grown about 800% from 1995 to 2010 in SSA (Haggblade, 2011). The amount of food farmers sell to African consumers (*via* supply chains) is vast. FAOSTAT data show that 850 million tons of food were consumed in SSA in 2017. As only around 10% was imported, African farms produced 765 million tons of food. As purchases are almost 80% of total (urban plus rural) consumption, farmers sold 612 million tons of food via domestic FSCs.

Second, many African farmers have high rates of inorganic fertilizer use: 77% and 56% of farms in Malawi and Ethiopia (Sheahan & Barrett, 2017) and 40% in Nigeria, rising to 60% and 70% for rice and maize (Liverpool-Tasie, 2016; Liverpool-Tasie et al., 2017a; Table 3). Purchases of improved cereal seed have increased sharply (Sheahan & Barrett, 2014). Animal producers also use many inputs and are commercializing. In Nigeria, for instance, our survey of over 1400 chicken farmers showed that contrary to common perception in policy debates only 13% depend on traditional free-range foraging, but 85% buy feed or feed ingredients, and 45%, including many tiny farms, buy vitamins or antibiotics. This flood of inputs comes from private sector input supply chains dominated by input dealer SMEs.

TABLE 3 Market participation and input use among maize and poultry farmers in Nigeria

Market commercialization	**Total**	**Oyo**	**Kaduna**	**Sample size**
Share of output sold by maize farmers on average	0.80	0.91	0.70	581
Share of output sold by poultry farmers on average	0.76	0.75	0.82	1476
Input use (maize farmers)	**Total**	**Oyo**	**Kaduna**	**Sample size**
Share of farmers who used improved seeds	0.17	0.16	0.19	581
Share of farmers using fertilizer	0.57	0.14	0.99	
Share of farmers using tractors	0.57	0.73	0.40	
Input use (poultry farmers)	**Total**	**Oyo**	**Kaduna**	**Sample size**
Share of farmers use free range foraging for feeding	0.13	0.11	0.15	1476
Share of farmers purchasing branded feed	0.4	0.46	0.34	
Share of farmers purchasing vitamins	0.45	0.44	0.46	
Share of farmers purchasing medicines	0.48	0.45	0.52	
Share of farmers purchased antibiotics	0.48	0.47	0.51	

Source: Authors calculation from our stacked survey data in 2017.

Myth 4: SMEs in FSCs are stuck in a stagnant, underdeveloped "missing middle"

Frequently heard in policy debates before and during COVID-19, was the phrase "the missing middle." This is used in two main ways: (a) to refer to SMEs in supply chains that are neither in the "donor assistance target" of small subsistence farms, nor in the "commercially bankable" set of large food companies, but presumed to be unfunded or underfunded and needing financial help to emerge and thrive (FAO, 2019); (b) to imply that midstream services such as trucking and warehousing are largely missing because of a supposed lack of SMEs providing these services. We contend that "the missing middle" is a myth (shown as #4 in Figure).

A "reality check" shows the dynamic midstream of SME proliferation and development in SSA FSCs. Our surveys in Nigeria in 2017 of 2500 actors in the maize, feed, and chicken vertical SCs that also elicited details on their use of the "lateral" logistics supply chain showed the following. (a) Feed mills grew rapidly, corroborating macro evidence that feed milling surged 600% from 300,000 to 1.8 million tons over 2007–2016. (b) A 1000-kilometer north–south maize supply chain developed to supply feed and flour mills in the south, and with it have emerged thousands of urban-based maize traders and many thousands of rural aggregators. (c) Only 5%–10% of urban maize traders own trucks or warehouses, and 85% of their maize transport and storage comes from 1000s of SMEs undertaking 3PLS (Liverpool-Tasie et al., 2017b). Despite its importance and dynamism, this activity remains largely absent from the policy debate: a "hidden middle" (Reardon, 2015), not a missing middle.

Myth 5: Wholesale and retail markets and logistics services are not critical to food security

In the 2000s/2010s there has been little treatment in the African policy debate or literature of wholesale markets, retail wet markets, domestic SME traders, and logistics services. This

contrasts with the 1970s and 1980s, when many of Africa's wholesale markets were built, and the 1990s with its flurry of debate around privatization of cereal distribution parastatals and liberalization of cereal markets. The recent 20-year near-ignoring of these crucial services and institutions contrasts with their current extreme importance in reality for the functioning of FSCs and thus for African food security.

We surmise that the lack of attention to the domestic distribution segments is due to the following. First, Myths 1–4 dominate the policy debate, so the import debate figures centrally, while the domestic midstream is ignored or thought undeveloped. Second, after the central government parastatals were eliminated by structural adjustment, domestic market policy largely ceased to be a central government policy issue and thus largely vanished from the national and regional debates. Instead, the policymaking locus for wholesale markets, wet markets, and local highways has often devolved to municipal or provincial levels, and is relegated to the sphere of local debate. We have often observed that questions in policy forums about wholesale market policies and conditions are often met with surprise and a lack of information from policymakers and researchers. Third, much of the literature on African markets is ethnographic and anthropological, and focused on issues such as gender ties, ethnic tensions, and cooperation and conflict among market actors rather than on the economics of domestic distribution of food (Ikioda, 2013).

Thus, we observe that domestic markets and logistics are largely invisible in national and regional policy debates, in the absence of a sensational event such as a fire or riot. The result is that markets suffer from a lack of public investment and tend to be treated as mere "cash cows." For example, in Nigeria, there are many cases where traditional markets are shifted from areas with good urban access to unfavorable locations, where markets are left to become dilapidated, insecure, and unduly taxed (Porter et al., 2010).

A "reality check" shows that the policy debate is ignoring a sector as important as farming to African food security. While moving along "quietly out of the view of the policy debate," often with dilapidated and outdated infrastructure, the operation of wholesale markets and retail wet markets and the logistics firms that facilitate their work remains critical not only for consumers across Africa, but for farmers and a multitude of actors all along vertical and lateral FSCs.

First, the retail segment is crucial to food security due to the strong reliance on food purchases by both urban and rural households. Second, domestic wholesale is crucial as some 80% of African food (that is, all but the 20% of food which is rural subsistence-based consumption) flows through the wholesale sector. In Nigeria, many tens of thousands of urban and rural wholesalers inside and outside wholesale markets and hundreds of thousands of truckers, loaders, porters, and warehouse agents are the channels by which food flows to retailers and consumers. If their operations are constrained (as they were under the policies around COVID-19) then food flows to consumers are hobbled, food system employment is reduced, and other services such as cold storage of vegetables for farmers are cut off (Ikegwuonu, 2018).

Third, as a major "lateral supply chain", the logistics sector is crucial to the functioning of the wholesale and retail segments. Our 2017 Nigeria survey shows that traders depend heavily on 3PLS markets in trucking and warehousing: 40% of chicken farmers deliver their chickens to market but only 10% own a truck and 14% a motorcycle, so the rest depend on 3PLS; 80% of rural maize traders use 3PLS, while only 6% own trucks; 70% of urban maize traders use 3PLS, but only 5% own trucks; 20% of traders rent warehouses (from 3PLS firms), as do 49% of feed mills; 5% of feed mills have their own trucks; the rest use 3PLS; 83% of chicken retailers depend on 3PLS (Table 4).

TABLE 4 The importance of 3PLS along the maize-poultry value chain in Nigeria

Poultry farmers	**Total**	**Oyo**	**Kaduna**			
Share of poultry farmers who deliver chickens to the market or buyers	0.36	0.33	0.41			
Share of poultry farmers who own a truck	0.09	0.15	0.01			
Share of poultry farmers who owned a motorcycle	0.14	0.08	0.21			
Number of observations	581	290	291			
Rural Maize aggregators	**Total**	**Oyo**	**Kaduna**			
Share that paid a fee to a transporter to bring maize from their maize supplier	0.80	0.72	0.9			
Share that have their main stall inside wholesale market	0.64	0.88	0.39			
Share of aggregators who own trucks	0.06	0.09	0.02			
Share who deliver maize to their maize buyer	0.71	0.95	0.45			
Share who rent warehouses	0.22	0.3	0.14			
Number of observations	123	64	59			
Urban and regional maize traders	**Total**	**Oyo**	**Kaduna**	**Kano**	**Katsina**	**Plateau**
Share who go to collect maize from their farmer suppliers	0.50	0.43	0.6	0.35	0.65	0.73
Share who paid a fee to a transporter to bring maize from maize supplier	0.68	0.21	0.79	0.83	0.64	0.45
Share who deliver maize to their buyers	0.28	0.31	0.37	0.17	0.46	0.31
Share who own trucks	0.06	0.00	0.04	0.05	0.22	0.01
Share who rent warehouses	0.20	0.34	0.30	0.12	0.46	0.02
Number of observations	1405	128	199	653	218	207
Feed millers	**Total**	**Oyo**	**Kaduna**			
Share that stored grain in last high season in 2015	0.48	0.86	0.33			
Of millers who stored in last high season, share that stored in rented warehouse	0.30	0.12	0.49			
Share of feed mills who traveled to the site of the purchase of their feed ingredients	0.18	0.11	0.47			
If traveled, share of feed mills that used own transportation	0.05	0.04	0.08			
Number of observations	147	88	36			
Chicken retailers	**Total**	**Oyo**	**Kaduna**			
Share who rented a truck in 2016	0.51	0.83	0.07			
Share who had their product delivered by a hired ambient transporter (conditional)		0.81	0.85			
Number of observations	527	239	288			

Source: Authors calculation from our stacked survey data in 2017.

Fourth, the distribution segments employ huge numbers of people and are crucial employers in rural and urban areas that are lynchpins in the food system. For example, Liverpool-Tasie et al. (2017b) found over 1300 maize wholesalers located in city markets in Ibadan (in the South) and Jos, Kaduna, Kano, and Katsina in the North; and 6000 maize wholesalers operating out of 61 regional wholesale markets in the four northern states alone. Sauer et al. (2020) showed that nearly a million persons are employed in the midstream segments of the maize-feed-chicken cluster of value chains in Nigeria.

POLICIES DURING COVID-19, THEIR ROOTS IN MYTHS, AND THEIR NEGATIVE IMPACTS ON FSCS

The myths above appear to have been the "priors" of many policymakers entering the COVID-19 crisis and influenced their policy choices. Many of those choices hurt food security by constraining FSCs. This section is ordered by sets of policy actions; for each set, we discuss: (a) the policy actions taken, based on policy announcements and press coverage of these; (b) our assessment of the policies' roots in the myths; and (c) the impacts of the policies on vertical and lateral FSC actors.

We illustrate these impacts using findings from our phone surveys of actors in fish and poultry FSCs in Nigeria. The first survey was by the CGIAR center WorldFish in May 2020 with recall over the first trimester of the pandemic, February–April, the "lockdown" period. We interviewed 92 actors along the fish supply chain in Southwest Nigeria (Middleton et al., 2020). Our second phone survey was by Michigan State University and WorldFish; we interviewed 557 actors along fish and poultry supply chains in Nigeria's six geopolitical zones , using the same recall period.

Policy set 1: Declaring vertical FSCs "essential" but lateral SCs "nonessential"

Policies and their roots in the myths

Like many African countries, Nigeria imposed movement restrictions ranging from complete lockdowns to nightly curfews. Persons, products, and services deemed "essential" and allowed full mobility included: (a) medical; (b) directly food-related (Human Rights Watch, 2020; Dixit et al., 2020; Balarabe, 2020). The federal government and some state governments restricted the movement of what they called "nonessentials": (a) nonmedical; (b) nonfood; (c) services that were not "food handling" but affected food supply.

Examples of things classed as "nonessentials" in the early lockdown in Nigeria included: (a) banking; (b) storage facilities rented by food retailers and wholesalers; (c) lateral supply chains of food processing inputs, including: (a) packaging materials; (b) processing machine retail, repair, and maintenance; (c) charcoal and firewood; (d) farm input supply chains such as of veterinary medicines, fertilizers, and seeds; (e) trucks returning to rural areas, either backhauling nonfoods or empty, after delivering food to urban areas; (f) workers such as farm laborers, who were not allowed to travel between states.

We infer that the government's classing lateral supply chains crucial to FSCs as "nonessentials" is derived from: (a) Myth 5, which led to inattention to 3PLS and its importance to

wholesale and retail; (b) Myth 3, which implies an underestimate of farmers' demand for farm inputs obtained via long urban–rural input supply chains and 3PLS.

Policy impacts

Designating key lateral supply chains as "nonessential" disrupted FSCs by depriving them of logistics, finance, materials, and labor. For example, while chicken farming was classed as essential, workers crossing state borders to work on chicken farms were not. Our chicken and fish field surveys abundantly illustrated these "lateral" constraints. For example, a poultry trader noted:

> Interstate travel bans affected delivery of products to major customers in the north and the east. Partial bank operations affected my business because when customers make payment to my account, it was extremely difficult to get funds from the bank to pay the hatcheries where I buy chicks because I don't do internet banking.

Poultry farmers noted that shortages of vaccines due to blocked veterinary medicine supply chains forced farmers to order from distant locations, resulting in delays, bird deaths, and large income losses. Fishers reported being unable to access cold storage facilities, forcing them to sell off fish at low prices before they spoiled, or having to pay very high rents for cold storage.

Policy set 2: Locked down retail wet markets and wholesale markets

Policies and their roots in the myths

Some degree of lockdown was imposed on many retail wet markets and wholesale markets across Nigeria by the federal and many state governments. The lockdown policies were made even more disruptive to markets because there was a lot of heterogeneity across levels of government and places in both policies and degrees of implementation, so market actors were sometimes left "guessing" and confused.

In Nigeria both the federal and the state governments make policy, and during COVID-19 they made very different and often contradictory policies. On the one hand, the federal government imposed strong restrictions in some cities and states but not in others, generally, as a function of its perception of the speed of the pandemic's spread and the density of population (with a particular focus on the big cities of Abuja and Lagos and neighboring Ogun state). On the other hand, the 36 state governments varied as to what restrictions they imposed, from strict, to lax, to none; implementation of rules varied from full to little, even changing over weeks; and lockdown rules were not correlated clearly with population density or city sizes in the states (Balarabe, 2020; Edo State Government, 2020; Salau et al., 2020).

The patchwork of responses from diverse policymaking bodies produced different policies with different levels of enforcement. A first type was a relatively strict but partial lockdown (such as in Abuja and states including Lagos, Kaduna, Ogun, Niger, and Plateau). Here retail wet markets and wholesale markets were allowed to function for only 2 days a week even though food sales were classed as essential. A second type of partial lockdown policy (such as in Oyo State) was where retail wet markets and wholesale markets could operate every day but

with a curfew from early evening through morning. A third type of policy (implemented in a few states, such as Edo) was to let markets function relatively freely but to fumigate them occasionally, and in some cases to shift the locale to unused school grounds in order to allow social distancing among traders. The market-restrictive policies appear to us to be rooted in Myth 4 (belief in a missing middle segment of SMEs) and Myth 5 (low importance given to wholesale markets and logistics).

Policy impacts

These policies appear to have been enacted with an inadequate understanding of the complexity and size of operations of the markets and their fragility to shocks, and of how the policies would affect markets and thus food flows. The impacts were as follows.

First, the partial lockdown policies severely disrupted the enormous wholesale markets in these states because they became too congested to do business effectively when regulations allowed them to open just two days of the week. Lockdowns limited to night curfews also constrained food flows through the market in cases where the supply chain's main movement (pre-COVID) was usually from 3 p.m. to 6 a.m., with the most intensive sales starting around 6 a.m. These curfews effectively restricted trucks with food from going to the main place where food is traded, the wholesale markets.

Second, the measures were often implemented with little advance warning. Traders in Abuja markets reported that they were not given adequate time to prepare for alternative trading activities nor provided any compensation for enforced business closures (Udo & Lere, 2020). The traders also noted that lockdown and market closure policies were often implemented in an inconsistent or haphazard manner. The share of businesses in our poultry/fish survey reporting challenges in operating their business jumped from 39% in February to 80% in April. The categories of challenges that increased the most related to controls on movement and business operations.

Challenges related to the impacts of these policies on lateral supply chains also increased over this period. Respondents reporting input shortages or high input prices jumped from 9% to 17% between February and April. (Figure 2). We added a rapid reconnaissance on transport costs per se and found that they rose 20% to 40% between March and April for poultry and maize farmers in Kaduna, Abuja, and Oyo States. These cost hikes fed into feed and fertilizer costs, which increased 30% and 40% respectively. These supply-side challenges were

FIGURE 2 Share (%) of businesses encountering challenges operating in February–April 2020, by type of challenge (Poultry/fish supply chain survey).
Source: Data are from our WorldFish 2020 survey [Color figure can be viewed at wileyonlinelibrary.com]

compounded by demand-side pressures. The share of poultry/fish survey respondents reporting low demand or low sales prices grew from 12% to 23% over February to April, reflecting the impacts of movement restriction policies on consumer mobility and spending power (Figure 2).

Policy set 3: Restrictions on roads, highways, borders, and 3PLS

Policies and their roots in the myths

In Nigeria, port cargo handling and port storage were exempted from lockdowns and allowed to remain open, with a policy of social distancing, masks, and sanitizers (ARBT, 2020; John, 2020). However, policies severely restricted the domestic logistics sector (e.g. trucks, buses, and taxis), on which the domestic food supply chain depends. Interstate passenger travel was banned (Reuters, 2020) despite the fact that before COVID-19 a significant amount of food was moved by market women as included-baggage on buses and trucks.

Even when food reached the cities, policy placed severe constraints on intracity movement of products. Commercial vehicles such as trucks and motorcycles used by companies to transport food products inside cities, as well as public transport such as buses and taxis, were classed by policy as "nonessential" in the first trimester of the pandemic (John, 2020). Moreover, even in laxer policy contexts, such as states or cities with less strict mobility rules allowing vehicles to move, transporters suffered transaction costs due to having to pay bribes to police (Agbedo et al., 2020). We believe that the logistics-related policy choices were influenced by Myths 4 and 5, that is, the belief that there is a missing middle of SMEs and that 3PLS is not crucial to food supply chains.

Policy impacts

Those who tried to move food and other essential services across state borders, or even across zones within states, faced significant bottlenecks despite the listing of food and medical supplies as "essentials." Application of restrictions on vehicle movement varied across states: In one state trucks could move without restriction, but movement across borders was barred; when borders could be crossed, movement in the other state was restricted.

The effect of interstate travel bans was reported by one of the fish farmers we surveyed in the following terms. "The biggest challenge I faced was the interstate lockdown. [As a result] I only sold to the available customers within the state." Several poultry/fish survey respondents reported that a ban on commercial motorcycles was among the biggest challenges they faced in operating their businesses. In another location where the motorcycle ban was not enforced, a fish retailer reported using his own motorcycle to make home deliveries when customer footfall to his usual place of sale was reduced, underlining the importance of small vehicles for petty trade.

Even transport of products recognized as belonging to essential vertical supply chains was hampered by the nature of enforcement. It appears that police were often confused, or took advantage of confusion about the rules to request bribes. One fish trader reported "too many police check points on interstate travels where bribes were paid." An egg retailer described similar problems: "Harassment by security agents: I had to settle them with cash or one to two crates of eggs." Another interviewee observed that "the police keep extorting money from

TABLE 5 Share of survey respondents attempting to buy or sell, access inputs or transport, and employing workers; share of fish farms buying inputs/seed and selling fish; fish sales prices by value chain segment; February–April 2020 (Fish supply chain survey)

Item	February	March	April
Respondents attempting to buy inputs (%) (of which)	68	54	46
Able to access inputs (%)	5	70	55
Able to access transport (%)	3	70	56
Respondents attempting to sell products (%)	67	52	42
Employed male daily workers (%)	52	26	20
Employed female daily workers (%)	22	4	2
Average daily wage (USD/day)	2.78	2.82	3.47
Farms buying inputs (%)	83	39	29
Farms buying fish seed (%)	25	0	0
Farms selling fish (%)	79	17	6
Farmed fish price (farm; USD/kg)	1.68	1.54	1.54
Farmed fish price (wholesale; USD/kg)	1.72	1.76	1.82
Farmed fish price (retail; USD/kg)	2.03	2.93	3.08

Source: Authors calculation from our WorldFish 2020 survey data.

drivers whenever there are state imposed movement restrictions, even when drivers have the permit for essential services." In any case, even "when roads are open, fares on *keke napep* (small three-wheeler motor vehicles) are increased because of the limited number of passengers."

Our fish supply chain survey showed that restricted logistics made it hard for suppliers to market products. The share of respondents attempting to buy inputs or sell products declined sharply, from 68% and 67%, respectively, in February to 46% and 42% in April. Among those who attempted to buy or sell products, the share able to do so declined from well over 90% in February to a little over 50% in April (Table 5).

Our poultry/fish survey also showed that delays caused by roadblocks, checkpoints, and closed roads led to product deterioration and spoilage, such as high mortality of day-old chicks. As noted by a fish processor, "some of the fish I processed got spoilt before I could reach out to my customers due to lockdown." Similarly, a poultry retailer stated, "I lost some birds before I could sell them due to lockdown; some of the birds delivered to me died before I could sell them."

Policy set 4: Restrictions on input logistics and cross-state movement of labor

Policies and their roots in myths

In some cases the government prohibited movement of trucks of inputs such as fertilizer across state boundaries even after they had freed the landing of the fertilizer in Nigerian ports

(Ojewale, 2020; Yahaya, Yusuf, & Ginfinyu, 2020). Most state governments also prohibited movement of people across state borders, which significantly affected the movement of farm labor and nonfarm informal sector workers (Aromolaran & Muyanga, 2020).

We believe the input and labor movement restrictions arose from Myth 3 (that small farms are not highly dependent on external inputs). They are also rooted in Myth 4 (the belief there is a missing middle of SMEs), as midstream small and medium firms and farms are often dependent on hired labor, especially in the nongrain sectors such as chicken or fish farming. For example, in February 2020, the share of businesses in the fish value chain employing male and female workers was 52% and 22%, respectively (Table 5).

Policy impacts

Traders and truckers moving inputs often had to bribe transit police, an informal burden in addition to the formal strictures placed often on their movement. This of course hurt the traders and truckers and drove up transport costs faced by farmers and village input retailers (Osang, 2020). Restrictions on movement between states precluded accessing even the existing stocks of fertilizer from the port cities as well as those stored by agro-dealers in cities or towns, often far from farm areas (Ojewale, 2020). The decline in export revenues from the devaluation of the Naira also reduced the purchasing power of fertilizer traders to import.

The strictures also affected feed supply chains. For instance, according to a surveyed fish farmer: "It was quite difficult to get fish feed during the lockdown; I had to stock up on days when restrictions were lifted which had a great effect on my pocketbook as I have not started to harvest." A chicken farmer experienced similar issues, stating that "getting feed at the right time was a challenge; I usually go through exchanges and explanations with the security personnel." Higher than usual feed costs were also reported.

The impacts of these restrictions are apparent in Table 5, which presents results from the fish supply chain survey. The share of fish farms buying inputs such as feed dropped from 83% in February to 29% in April, while the share purchasing fish seed (juvenile fish for restocking ponds) dropped from 25% to zero. This pattern reflects reduced input access, but likely also farmers' efforts to reduce production costs and cash flow problems, as the share of farms selling fish collapsed from 79 to 6% due to transport problems, sluggish demand, and lower fish prices. Fish farmers received lower prices in March and April (when the restrictions were at their height) compared to February (pre-restrictions). While fish farmers are "price takers" and could not defend their prices, wholesalers and retailers could. Wholesale sales prices edged up, and retail prices jumped more than 50% from US$2.03/kg in February, to US$3.08/kg in April (Table 5). We surmise that this reflects higher transport costs and levels of risk endured by traders and especially retailers, operating in a highly unpredictable environment.

Moreover, labor supply chains were deeply affected by restrictions on worker mobility. For crop farming, cross-border movement restrictions (particularly from neighboring Benin) affected farmer access to migrant labor. However, domestic restrictions proved more significant. For example, movements of migrant labor from the North Central region to the South were badly affected. This disruption reduced hired labor availability and reportedly led to a drop in the cropped area in the South (Aromolaran & Muyanga, 2020).

Our fish value chain surveys showed the effects of labor mobility restrictions. A fish processor reported, "for some workers, even transportation home after work became a problem. I had

to offer accommodation to all workers that needed it." Some workers who traveled home were unable to return to work, as reported by a fish hatchery owner who was forced to operate singlehanded. The restrictions also held back fish farm owners from getting to their ponds: for instance, the Kwara State Government did not initially exempt fish farming from the total state lockdown, prompting appeals from industry representatives to allow them to travel to tend to the fish stocked in their farms. For poultry, the effects were also significant. A poultry farmer stated: "We lost over 50 birds due to the inability of my staff to go and take care of them as required because of the lockdown."

Female employment was hurt by the restrictions. Our fish supply chain survey showed that the share of fish businesses employing women plummeted from 20% in February (prepandemic) to just 2% in April. During the same period, the share of fish businesses employing male workers dropped from more than 50% to 20%. The movement restrictions and resultant labor shortages pushed up the average wage for casual workers employed in the fish value chain from US$2.78 to US$3.47 per day from March to April. (Table 5).

Policy set 5: Policy enforcement focused on urban areas, with little attention to rural impacts

Policies and their roots in the myths

Policy was formulated geographically broadly but de facto implementation was largely in urban areas in Nigeria. We believe policies were also conceived to fit urban areas given the priors of the government noted in the myths, as well as the government's concerns being focused on locations where the disease was most prevalent and the population densest. There appears to have been little consideration given to how the urban lockdown would transmit impacts to the other 50% of the population in rural areas.

Myth 2 (rural areas buy and sell little food), Myth 1 (urban areas are fed substantially by imports), and Myth 3 (small farmers buy few inputs) seem to have been the premises of the urban focus and lack of consideration for the ripple effects to rural areas. The idea that, if needed, farmers could "take refuge" in a return to full subsistence and wait out the crisis, featured repeatedly in the debate.

Policy impacts

Urban-focused policies hurt rural Nigerians via several channels. (a) Wholesale markets are the main interface between rural and urban areas, and their closures or strictures immediately shocked rural areas, such as in the case of fruit and vegetable supply chains (Ikegwuonu, 2020). (b) Imports of inputs do not typically go from ports direct to farmers, but rather are collected and distributed from cities. (c) Pre-COVID there were substantial urban-to-rural labor flows. Urban youths often return at planting and harvest time to their rural home communities. The urban strictures blocked all three of these urban to rural channels. This saw farmers facing higher prices for inputs coming from urban and peri-urban areas on one hand and lower market opportunities from urban areas. A poultry farmer in our survey put it thus: "The major customers I produce for are in Lagos. The shutdown of businesses

therefore affected my business very negatively as there was no demand for broilers from my customers."

Policy set 6: Focus on palliatives/safety nets rather than basic market support

Policies and their roots in myths

The following measures were announced by the Nigerian government to cushion the effect of lockdowns. Poor households that were part of a national safety net program would receive N20,000 (~US$50) each and the number of recipient households would double to 2 million between April and May (Falaju, 2020). Note that US$50 is equivalent to about two 100 kg bags of maize. In April, the government expressed its intention to extend food rations to households with children of school age who were not included in the cash transfer program (Agbedo et al., 2020; Eranga, 2020). Several state governments also announced food aid for the poor. However, the extent to which these announcements led to actual aid distribution is unknown. There were widespread complaints that the criteria for receiving assistance were not clear and that the programs were not fully implemented (Eranga, 2020).

The government also announced a limited direct support program to market women and artisans via a loan interest payment holiday of three months on short-term outstanding loans. We have seen no analysis of the extent of implementation of this program. The loans had been critiqued for being too small (https://startcredits.com/loans/tradermoni/) and the number of beneficiaries with such loans limited at 2.5 million, or 2% of the 90% of Nigerian working-age population estimated to be involved in the informal economy (Dixit et al., 2020).[1]

The emphasis on safety nets is essentially based on all five of the myths, as those taken together lead to an underestimation of the size and potential resilience of the domestic market. That underestimation is based in what we believe was an assumption that the market was stagnant and could not take care of shortfalls in particular places if allowed to work with some support.

Policy impacts

Our survey results show very little impact and coverage of the palliative transfer measures. Our poultry/fish survey showed that none of the actors surveyed received any government assistance. Moreover, just 1.6 and 0.7% of the total 557 actors interviewed in the fish and poultry value chains, respectively, received assistance from any source in April and March, and of those, family and friends were by far the most common source of support. One respondent reported receiving assistance from a trade association, and one from an NGO. This suggests that the government safety net was not widely implemented.

POLICY IMPLICATIONS

Assumptions about the nature of the African food economy have built up over many years into conventional wisdoms and priors that then form the information base and backdrop of

everyday policy decisions. We contended that a number of these assumptions are wrong; just myths. We justified that by "reality checks" using evidence from recent field survey data from Nigeria, to reveal trends that are also apparent from recent survey work in other African countries. We contend that the persistence of these myths gave rise to policies during the COVID-19 crisis that hindered FSCs directly and indirectly by hurting lateral supply chains such as logistics, materials, and labor that are crucial to FSCs.

The body of myths form an image of African cities mainly fed by imports, and of rural areas largely disconnected from cities and peopled by subsistence or near subsistence farmers whose families buy little food, sell little food, and buy few inputs. The image is of farms and rural households that rely little on cities or borders or supply chains to or from them. The image is also of a "missing middle" where supply chains are absent or underdeveloped and crippled by stagnation and lack of investment.

By contrast, survey evidence paints a picture very different from that of the myths. It shows that African countries are fed 90% from domestic supply chains. These supply chains are buzzing with many thousands, even millions of micro, small and medium enterprises making aggregate massive investments and moving millions of tons of food from rural to urban areas, and inputs from input suppliers to farmers. The evidence shows wholesale markets and retail wet markets as the vital pulse points and conduits of nearly all the food economy. It shows third-party logistics (3PLS) as the main way that food is moved, an extremely vital sector, constrained only at the peril of the countries.

We showed that peril was indeed produced not just by COVID-19 but by policies that largely shut down urban wholesale markets and retail wet markets, and constrained flows of labor and inputs and food products from rural to urban and urban to rural areas and across rural areas, all of which were massive and dynamic and vital flows before COVID-19. Direct assistance such as safety nets—as currently implemented—were not even close to being a substitute for these market forces. These policies could have been different, and should be different if the pandemic continues, recurs, or intensifies, or other crises of disease or climate shocks take its place. Two key recommendations arise from our findings.

First, it is crucial to protect and keep in free movement the "bones and arteries" of food supply chains. These include the highways, wholesale markets, retail wet markets, interstate borders, and finally (less important but still a factor) the international borders. Helping traders and truckers (among the most important actors in the African food supply chains, equal in importance to farmers) keep moving and selling is the basic requirement. This is compatible with investments in distancing and hygiene and the mechanics of flow needed to minimize disease transmission.

Second, it is crucial to complement public investment in upgrading market and logistics infrastructure with support for the hundreds of thousands of SMEs in all segments of food supply chains. If these SMEs experience severe problems of cash flow or access to transport or labor, then people do not eat. Policies could include cheap loans and targeted subsidies that can help SME food processors to pay rent, electricity, and petrol bills and keep staff on, and allow truckers, warehouse operators, and wholesalers to pay for repairs on vehicles, transit fees and wholesale market fees. Assistance and loans can be leveraged to get SMEs to upgrade premises and equipment to ensure a safe and hygienic environment for staff and customers. Targeted subsidies could encourage these upgrades.

ACKNOWLEDGMENTS

We acknowledge and appreciate financial support for this work from the United States Agency for International Development (USAID) under the Feed the Future initiative through the Nigeria Agricultural Policy Project, Associate Cooperative Agreement Number AJD-620-LA-15-00001 and the Sustainable Intensification Innovation Lab (SIIL), Cooperative Agreement AID-OAA-L-14-00006. We also appreciate financial support from the U.S. Department of Agriculture National Institute of Food and Agriculture and Michigan AgBioResearch. Funding for the studies of COVID-19 impacts on supply chains in Nigeria was provided by the CGIAR Research Program on Fish Agri-Food Systems (FISH) led by WorldFish, and the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by the International Food Policy Research Institute (IFPRI). We appreciate the helpful feedback from the journal editor and reviewers. Any views expressed or remaining errors are solely the responsibility of the authors.

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ENDNOTE

[1] Other support was for formal enterprises with official registration and thus beyond the reach of the majority of informal small and medium scale enterprises in Nigeria.

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How to cite this article: Liverpool-Tasie LSO, Reardon T, Belton B. "Essential non-essentials": COVID-19 policy missteps in Nigeria rooted in persistent myths about African food supply chains. *Appl Econ Perspect Policy*. 2020;1–20. https://doi.org/10.1002/aepp.13139