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Effects of COVID-19 countermeasures on food supply systems and productivity of agricultural enterprises: A case study of Namelok Estate farm at Kajiado, Kenya

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Abstract

In this descriptive study, we document how health precaution protocols (cessation and restriction of movement) on COVID 19 pandemic affected the productivity and supply systems of Namelok Estate Farm. Data was collected through direct interviews and field observations. The study found out that countermeasures towards the pandemic affected the availability, stability and accessibility of food. Besides, the countermeasures put to contain the spread of the virus reduced mobility of labor and key agricultural inputs. Resilience-building into small and large-scale farming system, government investment in input supply systems and subsidies to cushion agriculture productivity is recommended.

Keywords: Cessation and restriction of movement, COVID-19, mobility of labor, resilience-building

Introduction

The COVID 19 pandemic has had major implications on world agriculture since it was first documented at Wuhan, China in 2019 (Zhu *et al.*, 2020) [1]. This has led to implementation and enforcement of containment measures that led to decline in agricultural production both in farm productivity and restriction of supply chains. Restrictions and cessation of movement highly negated outflow channels of farm produce, inflow channels of farm inputs and other production cycles (Pu & Zhong, 2020) [2]. Other countermeasures include ban of public gatherings that affected outdoor market systems of major cereals and vegetables. COVID-19 has disrupted global economies, with restrictions in movement (both domestic and international) leading to increased unemployment rates and global GDP (Gross Domestic Product) fluctuations.

Table 1: Health policies and measures to prevent the spread of COVID 19 in East African region (source: UN Migration Agency (2020) [3])

	Countermeasures
Kenya	March 13, 2020 – first case reported, March 15 - closure of schools, March 29 - curfew from dusk to dawn, April 6 - cessation of movement in high-risk counties, social distancing and mask-wearing, May 7 - partial lockdown, May 16 - partial border closure, April 8 – restriction of air transport, 16 May - ban on travel across the Tanzanian border
Tanzania	17 March - schools' closure, ban of public gathering, 25 March - suspension of air travel, May 17 - closure of Tanzania-Kenya border
Uganda	March 31 - total countrywide lockdown and curfew, April 10, restricted transportation

Morton (2020) [4] argued that the effect of the pandemic on agricultural productivity can be seen from a multidimensional perspective. While some studies focused on the effect of the pandemic on food security (Pu and Zhong, 2020, Workie *et al.*, 2020) [2, 5], others focused on the impact on agricultural supply chains (Gray, 2020) [6]. Other studies looked at the impact on food safety (Unhale *et al.*, 2020) [7]. There are few research studies that focus on the implications of COVID-19 counteractive measures on agricultural productivity.

This paper contributes to the already increasing literature on the effect of COVID-19 on agriculture. Our focus is on how lockdowns, restriction and cessation of movement affected agricultural productivity, assuming a case study from Namelok Estate, Kajiado Kenya.

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2. Conceptual Framework

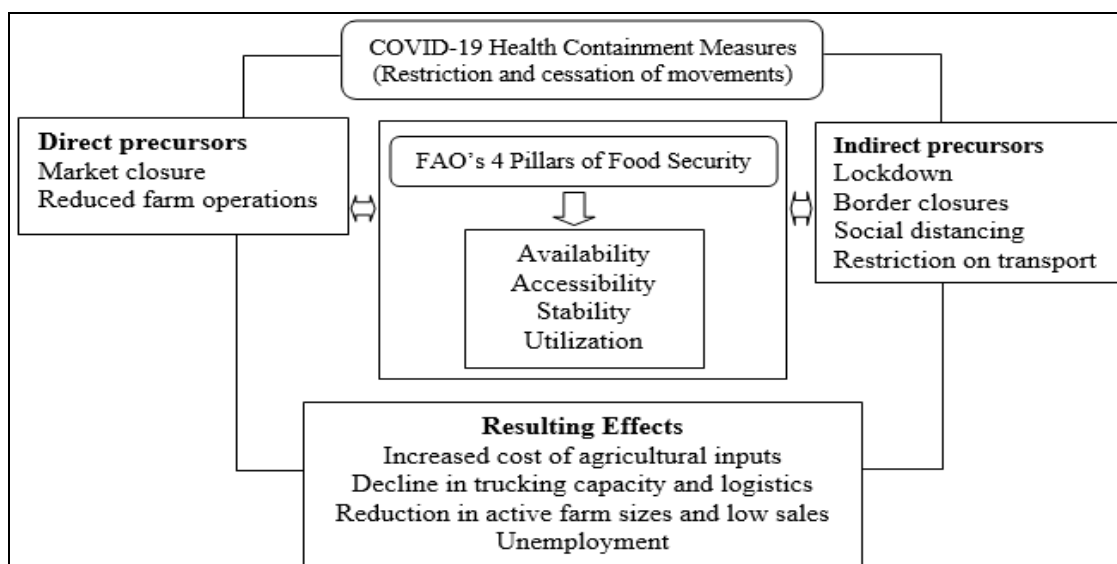


Fig 1: Conceptual framework on the impact of COVID-19 on agricultural production and distribution

The COVID-19 pandemic affected agricultural productivity directly or indirectly. Direct impacts of the pandemic include; closure of markets and reduced on-farm productivity activities due to the precedented transport and logistic challenges caused by restriction of movements. These direct impacts led to an instant cut of food supplies from the retail outlets to the consumer. Restriction of movement was a major precursor to movement of inputs such as labor and seeds and agrochemicals which negated farm operations. Indirect precursors to reduced agricultural productivity and supply chains are closure of borders, social distancing, restricted transportation and logistics and lockdowns.

3. Methodology

The research assumed a qualitative method of data collection. Data was collected through personal interviews and field observations. Interviews were selected due to their appropriateness when exploring the views, beliefs and motivations of subjects, provides deeper understanding of social phenomena than would be possible if a quantitative approach was used (Silverman, 2013)^[8], and good if little is known about the phenomena of interest (Gill *et al.*, 2008)^[9]. Semi-structured interviews were conducted with Namelok General manager Dickson Mutuku, and a few field workers. Field observations were also made and data was captured through photography.

4. Challenges

4.1 Increased costs of key agriculture inputs

The pandemic led to a great disruption in global value chains. Munywoki (2020)^[10] noted that global manufacturing industry suffered a big blow due to disruptions arising from direct supply which increased direct supply deficiencies. Agricultural inputs such as fertilizers, pesticides and planting material rose in prices. A rise in cost of these key implements led to an increase in cost of production, uneconomic production and low sales.

4.2 Decline in trucking capacity and logistics

Since registering its first COVID-19 case in 12th March 2020, the government put in place management interventions such as cessation of movements, curfew and lockdowns. Although

provision of agriculture was highlighted as a key essential service, a major shift in demand from commercial to households tethered to limited availability of logistical services had a negative impact to the sector. For Namelok estate farm, it was hard to transport its produce to its neighboring towns. Besides, the farm opted to truck relatively smaller volumes of produce due to consumers' inability to buy in large quantities. Both transporters and traders had challenges in accessing farms and markets due to restriction of movements.

4.3 Reduction in active farm sizes and low sales

Intervention strategies put in place by the government (lockdown, curfew and cessation of movement) made people to decongest from eateries and hotels for meals. Instead, many people flocked at supermarkets for supplies. This change made Namelok farm to scale down its operations only to satisfy target market and avoid wastages. For instance, big hotels and public schools were no longer calling for supplies and this led to a dendritic chain of effects at the farm level such as retrenchment of daily laborers.

4.4 Unemployment

The reduction in active farm sizes at Namelok led to the farm management scaling down labor input which led to unemployment of daily laborers at the farm. This was also a change management to ensure the farm does not incur huge operational costs amidst a low responsive market.

5. Conclusion and policy implications

The enforcement of containment measures in the wake of COVID 19 had detrimental effects on the food supply systems as well as productivity of agricultural enterprises. Cessation and restriction of movement as health containment measures affected mobility of labor, farm produce and on-farm inputs such as fertilizers and insecticides. We recommend building resilience into the local agricultural food supply chains, and provision of government subsidies to cushion farmers during emergency.

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