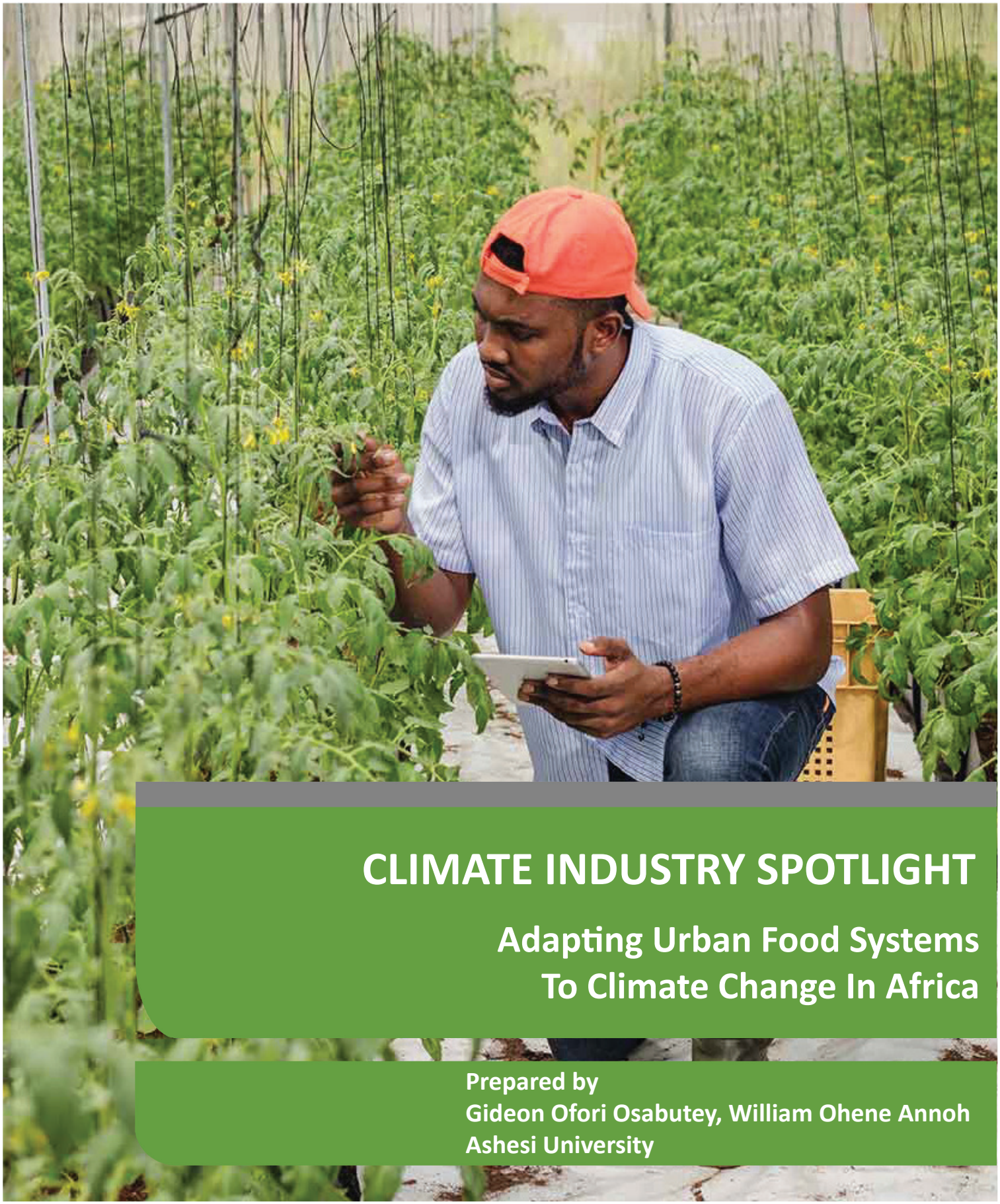

CLIMATE INDUSTRY SPOTLIGHT

Adapting Urban Food Systems To Climate Change In Africa

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INTRODUCTION

Urbanisation is a growing trend in our world. The UN predicts that by 2050, two-thirds of the world's population would reside in cities, the majority of which will be found in developing countries and the northern hemisphere. By 2050, Africa will have the most urbanized population distribution of any continent. The urban population is rising in Africa more quickly than it is globally. This suggests that as populations become more urbanised, urban food markets will continue to expand in Africa and worldwide. High population growth and rising earnings, which are the two main outcomes of rapid urbanization, have led to high food prices, which worsen urban poverty and cause hunger and food insecurity among the urban poor.

Due to increasing pests and disease damage, heat and drought stress, and flood effects, climate change is predicted to have a severe impact on crop output in Africa. This will seriously jeopardize food security and endanger the way of life for people who depend on agriculture. Urbanization is also associated with dietary changes to accommodate shifting tastes or modern, unhealthy lifestyles that result in obesity, malnutrition, and other health problems (Landert et al. 2017). There is a pressing need for African governments to critically examine urban food systems and investigate how they might be adapted to the effects of climate change in the context of a rapidly expanding urban population.

Urban food systems may be impacted by several challenges, such as the effects of climate change, which include extreme weather events, and the tension between rising food demand and declining food supply. About 60 percent of the population of Africa is employed by the agricultural sector; thus, dire consequences of climate change impacts on livelihoods are predicted for the region, as well as for individual countries and their households. The danger level has been rated as "extremely high" if global mean temperatures rise by 2° to 4°C over pre-industrial levels by 2080–2100. This will have a particularly negative impact on the production of some crops, including rice and wheat.

According to the FAO, urban food systems (UFS) are a series of activities that occur within the physical boundaries of a specific city in which food is consumed, with an emphasis on where the food is produced, how it is distributed, and how it is used, as well as where, how, and for whom the systems contribute to food (in)security and unhealthy eating habits. In addition, the urban food system includes people, surroundings, infrastructure, regulatory institutions, and the results of actions related to those of the participants in the food chain (Parson and Hawks, 2018; Smit, 2016). All facets of human life, including health, the environment, culture, politics, and the economy, are consequently intertwined with food systems. In this brief, we concentrate on the urbanization and food systems in Africa. We consider potential adaptation strategies that may be required to address the effects of climate change on Africa's urban food system.

UNDERSTANDING URBAN FOOD SYSTEMS IN AFRICA

It has been noted that intermediate and smaller cities in Africa, Asia, and America see urban expansion, which is typically fueled by emigration from rural areas. According to estimates, more than a third of the urban population in these areas resides in slums with little access to basic services and a high unemployment rate. Food is often purchased for consumption in most African cities, including Ghana (Smit, 2016), with food prices being greater in urban than in rural areas. Given the greater cost of food in metropolitan regions, most urban households spend more than half of their income on food (de Zeeuw and Prain, 2011).

Since most of the food consumed in urban areas is either grown nearby in rural areas or may even have been imported from industrialized food supply chains operating in other nations or parts of the world, the UFS has longer supply chains than those in rural areas. This leads to a lengthy network of players and services, including distribution (transport, preservation), farming, processing, and packaging, among other activities. The UFS in Africa is made up of numerous middlemen who connect the supply and demand chains. These middlemen can take the form of wholesalers, agro-processors, food retailers, or assembly traders who buy food directly from farmers and distribute it to city people.

Food stores play a crucial role in the UFS because they communicate demand signals from urban customers to farmers, which in turn affects the products that farmers produce. Depending on its strength and worth, the food network's duration varies (Thomas et al., 2020). For instance, complex supply chains that require storage, processing, and packaging are common for low-value grain commodities that are typically grown in rural locations. In contrast, higher-value non-perishables like meat, milk, and vegetables are typically grown in peri-urban regions that are adjacent to cities. Every stage that food goes through in the system adds expense, which drives up food prices in urban areas. This is not to say that food isn't produced in cities; rather, the percentage of food produced there is on the decline as a result of the constraints placed on urban lands to meet housing demands (Thomas et al., 2020).

The proliferation of supermarkets is another factor that has steadily taken over the UFS in Africa. Although supermarkets account for between 10 and 20 percent of UFS in Africa, the way they work with farmers ensures that farmers adhere to a set of standards that farmers do not adhere to in open marketplaces. Arguments have been made that as supermarkets' market share increases in Africa, smallholder farmers who cannot meet the criteria set by the supermarkets will be cut off from the supply chain. Currently, it has been noted that MNC supermarkets with locations in significant African cities, such as Shop-Rite and the Game, purchase food in bulk from medium-sized suppliers and mark it down to costs below those found on the open market. This is done to increase demand at the grocery stores.straints placed on urban lands to meet housing demands (Thomas et al., 2020).

Small- and medium-sized grocery stores have been shown to grow in number inside the various communities in metropolitan areas as the stretch of urban land area rises. These stores are known to sell a wide variety of commodities, including packaged foods, loose grains, and packaged processed meals like grains of all kinds. Also, there are now more small- and medium-sized street food vendors and fast-food franchises throughout Africa's urban centers.

Contrary to earlier beliefs, there is now a wealth of evidence demonstrating that there are currently few rural-urban linkages in the urban food systems (UFS) of most of the world, especially Africa. This lack of rural-urban linkages leads to a reliance on imported foods produced in industrialized food supply chains, which makes the social, economic, and ecological aspects of the food system unsustainable (Roggema and Spangenberg, 2015). Achieving improved nutrition (Goal 2), better health and wellbeing (Goal 3), inclusive, resilient, and sustainable cities (Goal 11), promoting sustainable consumption and production (Goal 12), and lastly combating climate change and adapting to its effects are all defeated by this (Viera et al., 2018).

UFS CHALLENGES IN AFRICA

There are two categories in which the UFS in Africa faces difficulties. The first group is made up of difficulties that influence the overall system. These include issues brought on by resource depletion, growing food demand, and climate change, which has the added consequence of increasing climate variability. The greatest dangers to the food system and its governance come from climate change's effects since they will not only have an influence on the livelihoods of the underprivileged and their communities, but also on the long-term viability of the UFS (Schmidhuber and Tubiello, 2007). For instance, despite the fact that new crop varieties, productivity-enhancing inputs, and technology have all been introduced, and that climate change and variability have been shown to effect crop yields, most farmers lack access to these inputs due to transportation and financial issues (distance). These problems, together with other variables, contribute to African farmers' lower production when compared to their counterparts in Asia and South America (NEPAD, 2014).

It has been noticed that the UFS's issues have a comparable impact on rural residents, with some of the new ones even presenting opportunities. For instance, food production is gradually turning towards increased capital investment and technological use, which gradually reduces the participation of smallholder farmers, in an effort to meet the expanding demand for food in urban areas. High levels of food imports from international suppliers at a low cost compared to the same foods produced locally is another issue that is also affecting smallholder farmers' involvement in the UFS of their countries. Africa currently spends about US$72 billion yearly on food imports, including cereals, cooking oils, sugar and confectionery items, meat, fish, and milk (ITC, 2020).are typically grown in peri-urban regions that are adjacent to cities. Every stage that food goes through in the system adds expense, which drives up food prices in urban areas. This is not to say that food isn't produced in cities; rather, the percentage of food produced there is on the decline as a result of the constraints placed on urban lands to meet housing demands (Thomas et al., 2020).

Hence, it is the responsibility of all parties, notably policymakers, to advance the cause of safeguarding food systems, particularly in metropolitan areas. This is due to the fact that ensuring food security in urban areas can directly help nations realize the UN Sustainable Development Goals (SDGs), which are aimed at achieving improved nutrition (Goal 2), better health and wellbeing (Goal 3), inclusive, resilient, and sustainable cities (Goal 11), sustainable consumption and production (Goal 12), and finally, mitigating and adapting to the effects of climate change. (Viera et al., 2018)

The second group of issues that have been highlighted as affecting the UFS are brought on by social changes that have an impact on many aspects of the system and modify how people eat. City dwellers add particular foods to their diets as their wages rise. Many of these items are typically cooked, purchased, perishable, and processed (Tschirley, 2017). In some cases, it has been discovered that urban dwellers eat more meals prepared outside the home as a result of the need for a diverse diet, commercials, and the development of creative cuisine.

The degree of uncertainty surrounding the changing climate and other social developments is a significant obstacle to the UFS's adaptation to climate change. Even though urban food systems in developing nations face numerous obstacles, there are several economic and social advantages that can be realized. For instance, increasing demand for specific foods may open up chances for their production (high value goods like vegetables and grains) as well as boost UFS involvement in both urban and rural areas.

ADAPTING URBAN FOOD SYSTEMS TO CLIMATE CHANGE

The effects of rising sea levels on transportation infrastructure, modifications to the layout and placement of storage facilities, shifts in the geographic distribution and type of food pathogens, the effects of regulatory measures on the food system's capacity for adaptation, and the effects of energy and GHG mitigation policies on the economics of domestic food systems in African nations are all potential effects of climate change on urban food systems. Climate policy is still quite divisive in spite of the probable negative effects of climate change on agricultural and food systems and the ensuing need to prepare for and adapt to those effects. Many economic and political issues regarding the adaptation of agricultural and food systems are brought up by the prospect of a climatically uncertain future. Adaptation to climate change can be considered in the following aspects of food systems

Food safety and quality - For instance, higher CO2 levels may promote plant growth but diminish the protein content of cereals. Moreover, the quality of vegetables and fruits is extremely susceptible to temperature and water stresses (Hatfield et al. 2008). Climate change is also anticipated to have an impact on food safety through a variety of processes (FAO 2008). Food-borne infections like cholera and mycotoxins are likely to spread across more land, and outbreaks are frequently linked to severe weather conditions. Pathogen proliferation and human infection are predicted to increase when water resources are put under more stress. In addition, toxic algal blooms and the contamination of fish and seafood with infections and poisons are predicted to occur more frequently as a result of climate change, especially through an increase in pesticide contamination. The danger of food contamination, antibiotic resistance, and other health problems will undoubtedly grow with an increase in the prevalence of disease in livestock. It will be necessary to modify current public education, illness surveillance, and intervention strategies to address these increasing risks.:

Market Infrastructure - The location and operation of transportation infrastructure are two additional potentially significant effects of climate change on agriculture. As previously said, climate change is anticipated to cause a spatial reorganization of agricultural output. These regional changes may necessitate the relocation of rail infrastructure, shipping and storage facilities. The amount of agricultural commodities and processed goods traded across rivers and the sea has expanded along with the growing globalization of agriculture and the food chain. Changes in sea level may also have a significant impact on where and how storage and shipping facilities are used at key ports. The potential costs of altering the transportation infrastructure that supports agriculture and the food chain have not yet been properly examined. It is reasonable to predict that key determinants of these costs will be the pace of climate change and the risk of sea level rise.

The System For Processing and Distributing Food - Only a little amount of research has been done on the system's possible weaknesses. These are a few findings that might point to potential weak points. One sector where significant problems could develop is the meat slaughter industry. Because perishable meats are susceptible to harmful germs, higher temperatures would make it more expensive to refrigerate, package, handle, and store them. Modifications in the location of livestock production may also be required for feedlots, slaughterhouses, and livestock transportation. Perishable fruit and vegetable storage, marketing, and transportation are all likely to provide similar challenges. A greater part of the food production and distribution system relies on fossil fuels for transportation and packaging as well as energy for processing and refrigeration. So, initiatives to reduce GHG emissions that increase the cost of fossil fuels are expected to have a large influence on this sector as well as production agriculture in diverse ways. Few researchers that are researching the effects and adaptability to climate change have focused on this problem.

The following categories are where the World Bank estimates the cost of inaction on adaptation in African food systems:

Water Management - Improve water gathering and storage during the rainy season, as well as the efficiency with which irrigation water is transported and distributed in the field. Whereas the anticipated cost of inaction is $90.7 billion, the cost of adaptation is estimated to be $6.1 billion.

Research and Extension - Develop solid research functionalities, plan agile research services to quickly react to new threats, and improve your comprehension of the effects of climate extremes. While the expected cost of inaction is $71.2 billion, the cost of adaptation is projected to be $3.9 billion.

Land Restoration - lessen the degradation of land and execute long-term land use planning. Scale updates soil, land, and forest management methods. Inaction is predicted to cost $26.8 billion, whereas adaptation is estimated to cost $3.4 billion.

Infrastructure - Create cold storage facilities, plan transportation routes to enable remote connectivity, and plan practical logistics and infrastructure for food storage to prevent rotting. Whereas the expected cost of inaction is $12.6 billion, the cost of adaptation is projected to be $2.1 billion.

Early Warning Systems - seasonal weather forecasts, and climate information services are being developed in order to better prepare for and respond to natural disasters, pest outbreaks, and crop failures. Whereas the anticipated cost of inaction is $0.5 billion, the cost of adaptation is estimated to be $0.1 billion. Spending money on climate adaptation is less expensive than not investing. Estimated costs of adaptation is $15 billion, while inaction costs approximately $201 billion.

Trade - Agriculture-related trade among African countries enhances food security and enables more effective resource management in agricultural output. Interregional trade would be made easier with the support of the African Continental Free Trade Area (AfCTA). Due to the unpredictable nature of climate change, investments should focus on enhancing ongoing adaptation capability rather than making one-time purchases.

Adaptation Policy and Way Forward

Despite its complexity, the UFS enables the implementation of change at any point in the system. Yet, every change made to the system could have an impact on all of the system's participants as well as the system itself, both positively and negatively. As an illustration, when a policy intervention is adopted to address problems in one area of the system, its impact may have both planned and unintentional positive and negative effects on other areas of the system. For these reasons, even though there is ample evidence that urban food systems are not sustainable in any way, solutions to their problems are difficult to come up with (IPCC, 2019). Sustainable business investment opportunities can be fueled positively by adaptation policies that require actions, technological, behavioral and systemic change at all levels of the society to transition the continent to a green economy (United Nations Environment Program, 2020) The relevance of micro, small and medium enterprises in this transition must be strongly emphasized, and their need for transformative innovations, duly considered.

Implementing the Malabo Declaration 2014 and the Comprehensive Africa Agricultural Development Plan Framework (CAADP), which encourage investments in agriculture and agribusinesses, is one strategy to address the difficulties in Africa's UFS. This will be accomplished by fusing industry and agriculture with an execution plan that requires political will and stakeholder backing around its seven guiding principles (AfDB, 2016). Such a program will not only boost intra-regional trade between the continent's nations and increase productivity, but it will also encourage the adoption of climate-smart practices to boost productivity, stimulate research, and create data-use leverages. A thorough analysis of current and expected future strategies on adaptation in the agriculture and food sectors is required considering the possible effects of climate change on these industries. Several current policies affect agriculture and the food industry in addition to potential future mitigation measures, and many of these are expected to have an impact on adaptation. Many of these policies are not likely to center on climate change only, but it makes sense for policy design to take adaptation into account. Publicly sponsored agricultural research can also contribute to the development of knowledge about the effects of climate change and potential solutions.

References

Aragrande, M. and Argenti, O. (2001). Food into Cities Collection, DT/36-01EAfDB. Food and Agricultural Organization (FAO). Rome

AfDB.(2016). Feed Africa. Strategy for agricultural transformation in Africa 2016–2025. Abidjan, Côte d'Ivoire: African Development Bank (AfDB)

d'Amour, C.B.; Reitsma, F.; Baiocchi, G.; Barthel, S.; Guneralp, B.; Erb, K.H.; Haberl, H.; Creutzig, F.; Seto, K.C.(2017) Future Urban Land Expansion and Implications for Global Croplands. Proc. Natl. Acad. Sci. USA, 114, 8939–8944.

Haggblade, S. (2020). Overview. Feeding Africa's cities: Opportunities and challenges, and policies for linking African farmers with growing urban food markets. In AGRA (2020). Africa Agriculture Status Report, 2020. Nairobi, Kenya.

Intergovernmental Panel of Climate Change (IPCC). (2019). Climate Change and Land. Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Green House Gas Fluxes in Terrestrial Ecosystems. Eds. Shukla, P. R et al.

Landert, J.; Schader, C.; Moschitz, H.; Stolze, M. A. (2017). Holistic Sustainability Assessment Method for Urban Food System Governance. Sustainability 2017, 9, 490.

Parsons, K., and Hawkes, C. (2018). Connecting food systems for co-benefits: how can food systems combine diet-related health with environmental and economic policy goals?.

Stage, J., and McGranahan, G. (2010). Is urbanization contributing to higher food prices?. Environment and Urbanization, 22(1), 199-215.

Setoo, K.C. and Ramankutty, N. Hidden(2016) Linkages between Urbanization and Food Systems. Science 2016, 352, 943–945.

Smit, W. (2016). Urban governance and Urban food systems in Africa. Examining the Linkages.

United Nations (UN). (2014). World Urbanization Prospects: The 2014 Revision, Highlights; Department of Economic and Social Affairs, Population Division: New York, NY, USA, 2014.

United Nations Environment Program. (2020, March 17). Promoting African green business and circular economy for better policies. Retrieved from United Nations Environment Program: https://www.unep.org/news-and-stories/story/promoting-african-green-business-and-circular-economy-better-policies

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