



Inadequate Infrastructure: The Bane behind Food Loss and Food Security in the Savannah Zone of Ghana

著者	NYO Abass K.
journal or publication title	Journal of Developments in Sustainable Agriculture
volume	11
number	1
page range	43-47
year	2016-08-04
URL	http://hdl.handle.net/2241/00150266

doi: 10.11178/jdsa.11.43

Inadequate Infrastructure: The Bane behind Food Loss and Food Security in the Savannah Zone of Ghana

Abass K. Nyo*

Savannah Accelerated Development Authority, Post Office Box Tl 883, Tamale, Northern Ghana

The world loses approximately 1.3 billion tons of food—about one-third of the total produced annually for human consumption and an amount almost equal to the entire net food production of sub-Saharan Africa—through waste or loss. The issue of food loss is highly important in terms of its impact on hunger and food security, especially in the world's poorest countries. The exact causes of food losses are varied and depend greatly on the socioeconomic conditions in any given country. Food losses in sub-Saharan Africa are basically influenced by crop production technologies and infrastructure. Until recently, the agricultural sector was the largest contributor to both gross domestic product and employment in Ghana, until it was overtaken by the service sector. The agricultural sector remains the largest employer in the Northern Savannah Ecological Zone (NSEZ) of Ghana. This zone encompasses about 54% of Ghana's entire land mass and is considered to be the country's bread basket. Even with its agricultural potential, The NSEZ is still considered the poorest part of the country.

The zone is poor in part because very little has been done to tap its potential in terms of agricultural infrastructure investment. The infrastructure deficiencies in the agricultural sector have contributed to food losses from seedbed preparation to final consumption. There are huge losses along the whole value chain, thereby rendering smallholder farmers even poorer and more food insecure. A serious re-evaluation of infrastructure investment, including in roads, warehouses, and improved technologies, is needed to help increase productivity and reduce the amount of food loss in the Savanna Accelerated Development Authority zone. This would help ensure food security in the zone and in Ghana as a whole.

Key words: food loss, food security, infrastructure, investment, productivity

Introduction

Roughly one-third of the food produced across the world for human consumption—approximately 1.3 billion tons (Gustavsson *et al.*, 2011)—is lost or wasted every year, and consumers in rich countries waste almost as much food (222 million tons) as the entire net food production of sub-Saharan Africa (230 million tons). Food loss rates are estimated to be 280–300 kg/year in Europe and America and about 120–170 kg/year in sub-Saharan Africa and South and Southeast Asia (Gustavsson *et al.*, 2011). Given that the world population is expected to reach 10.5 billion by 2050, reducing the annual amount of food lost may

help to feed future generations.

The issue of food loss is of great importance in the effort to combat hunger, raise incomes, and improve food security in the world's poorest countries. In addition, food losses have impacts on food quality and safety, economic development, and the environment. The causes of food loss vary throughout the world and depend greatly on the specific local conditions in any given country. In broad terms, food losses are influenced by crop production choices and patterns, infrastructure and capacity, marketing chains and channels of distribution, and consumer purchases and food usage practices. Irrespective of the level of economic development and maturity of various systems in a

given country, food losses need to be minimized to increase farmer incomes and ensure food safety and security.

Food losses also represent a waste of resources, such as land, water, and energy, used in production. In addition to the loss of economic value of the wasted food, producing food that is not consumed leads to unnecessary CO₂ emissions. Moreover, economically avoidable food losses have a direct and negative impact on the incomes of both farmers and consumers. Given that many smallholder farmers live on the margins of food security, a reduction in food losses could have an immediate and substantial impact on their livelihoods. For poor consumers (households that are both food insecure and or at risk of becoming so), the priority is clearly to have access to food products that are nutritious, safe, and affordable; food insecurity is often more a question of access (i.e., purchasing power and price) than a supply problem. Improving the efficiency of the food supply chain could help to bring down the cost of food to the consumer and thus increase access. Given the current magnitude of food losses, making investments in reducing the losses could be one way to reduce the food costs both locally and globally. This would, however, require the financial gains from reducing losses to be greater than the costs.

Little research has been conducted on estimating amounts of food loss or ways to reduce food loss. This is quite surprising, because forecasts suggest that food production must increase substantially to meet future global demands. In particular, insufficient attention has been paid to current global food supply chain losses, which are probably substantial. Perishables, such as fruit and vegetables, undergo the greatest proportion of post-harvest losses in developing countries, and these losses are likely a reflection of an underdeveloped farm-to-retail supply chain. The situation in Ghana is similar to that in other developing countries in sub-Saharan Africa. Much of the food loss in Ghana, especially in the Northern Savannah Ecological Zone (NSEZ), can be attributed to the insufficient development of infrastructure and technology in the agricultural sector.

Infrastructure Development and Food Losses in Ghana

Until recently, agriculture was the largest employer in Ghana's economy (GSS, 2013). The sector em-

ployed more than 55% of the skilled and unskilled labor force and contributed 35% of the country's gross domestic product (GDP). Currently, the service sector has overtaken the agricultural sector, with 43% of employment and about 50.1% of GDP, followed by the industrial sector (26.2%) and the agricultural sector (23.7%).

The agricultural sector has experienced low investment in infrastructure; this has led to food losses and has made the sector less attractive and less profitable to younger workers, who have been migrating to other fields such as the service sector, industry, and small-scale mining (locally known as *galamsey*).

According to Annerquaye (2014), almost half of the food crops produced in Ghana do not make it to the final consumer. Research commissioned by the Alliance for a Green Revolution in Africa was conducted in 2013 by The Urban Association Limited (TUAL) on post-harvest losses of selected food crops in 11 African countries (TUAL 2013). The study found, for example, that as much as 60% of yams produced in Ghana do not make it to the consumer. In addition, losses that occurred in maize production ranged from 5% to 70%, and those of rice ranged from 11% to 27%. Similar losses were observed for other crops as well.

Dr. Irene S. Egyir, a Senior Lecturer in Agricultural Economics at the Agribusiness Department at the University of Ghana, described the loss levels as a "serious issue" and reported that the losses are even worse during bumper-harvest periods (B&FT, 2014). Post-harvest losses typically occur through a host of factors, including human activities such as transporting, dehusking, shelling, winnowing, drying and bagging, and preparing seedbeds. Dr. Egyir indicated that food waste and spoilage in Accra, the capital of Ghana, can also be attributed to a lack of financing, appropriate storage facilities, and a proper transportation network.

Although banks, donor partners, and other financial institutions have provided a means of procuring agricultural finance, the costs of these financing options are usually high and act as a barrier to farmers and other key stakeholders within the value chain. This is important, because value chain development is vital to the introduction of a paradigm shift in agricultural productivity in Ghana to reduce food losses and increase food security. Improving agricultural infrastructure is key to achieving this paradigm shift.

The NSEZ remains the most impoverished part of Ghana. About 45% of workers in Ghana are employed

by the agricultural sector, but the percentage in the NSEZ is about 73% (GSS, 2013). This area is largely considered to be the country's bread basket, but food insecurity and famine remain problems here. These problems can be attributed largely to high levels of food loss, which result at least in part from a lack of infrastructure and technology in the agricultural sector.

Conditions in the NSEZ

The Savannah Accelerated Development Authority (SADA) was established by an Act of Parliament (Act 805) in 2010 to provide a strategic framework for the comprehensive and long-term development of the NSEZ and, among other things, to: (1) provide strategic planning guidance to governments regarding the implementation and review of an accelerated development strategy for the NSEZ; (2) mobilize human, financial, and other resources for the implementation of the accelerated development strategy; and (3) coordinate existing and future development and related policies affecting the NSEZ with a view to ensuring coherence in policy-making and policy implementation. The zone covers five regions, namely three northern regions (Northern, Upper West, and Upper East) and Northern Brong Ahafo and Northern Volta. Together, these zones account for more than 54% of the land area of Ghana (Fig. 1).

Research has confirmed that trade has a large positive effect on income (Acemoglu *et al.*, 2005). Simi-

larly, research has suggested that the lack of inter-continental and intracontinental trade integration is a determining factor in the development in Africa (Rodrik, 1998; Johnson *et al.*, 2007; Buys *et al.*, 2010). Several studies have noted the conjunction of challenging geographic conditions and poor infrastructure as the main obstacle to trade expansion in Africa (Radelet and Sachs, 1998; Limão and Venebles, 2001; Buys *et al.*, 2010). Studies have also shown that the presence of roads in rural areas reduces poverty in connected villages by integrating labor and goods markets, thereby providing new economic opportunities to local inhabitants. For example, farmers are able to obtain higher profits as a result of cheaper agricultural inputs and higher farm-gate prices.

In 2005, sub-Saharan Africa had 0.002 km of rail-road track per 1000 km²; Ghana had 4 km per 1000 km², whereas China had 7 km, India 21 km, the United States 25 km, and Europe 51 km per 1000 km² (World Bank, 2010). The road infrastructure in Africa in general, and in Ghana in particular, is similarly underdeveloped.

Clearly, transportation infrastructure is lacking in Africa, and for this reason, international organizations, such as the World Bank and IMF have advocated massive infrastructure investments there. For example, the Trans-African Highway network is a set of trans-continental road-based trade corridors being developed in Africa (African Development Bank, 2003). The African Union is also working on ways to link all railways on the continent (African Union, 2006). Even with these investments in road networks and other agricultural infrastructure, the agricultural sector still faces challenges in preventing food losses in Ghana, especially in the NSEZ.

Investing in pre- and post-harvest technologies can help substantially to improve food security in multiple ways, especially by reducing food losses and thereby increasing the amount of food available for consumption by farmers and poor rural and urban consumers. For example, controlling the larger grain borer (*Prostephanus truncatus*) greatly reduced maize losses in on-farm storage among smallholders in a number of African countries (Golleti, 2003). In addition to lowering prices and improving food security, post-harvest activities such as processing and marketing can create employment (and thus improve incomes), which also enhances food security.

Increased government expenditure is needed in agri-

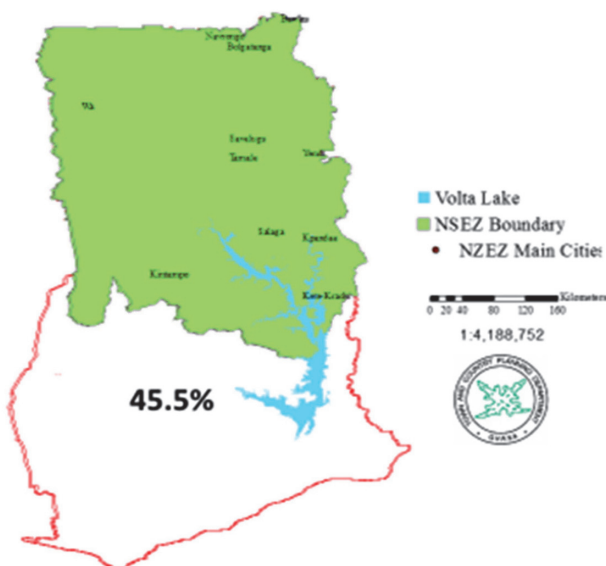


Fig. 1. The size of the Northern Savannah Ecological Zone (NSEZ) in Ghana. (Source: GSS, 2013)

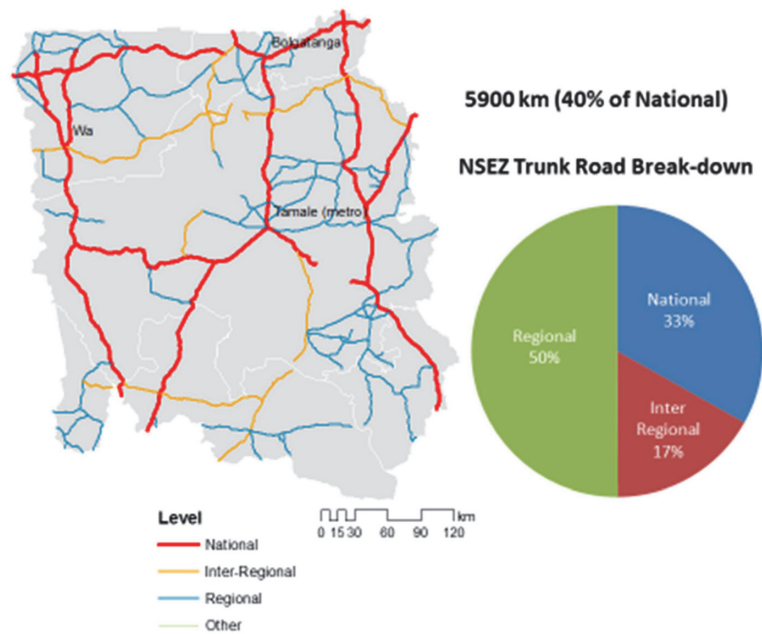


Fig. 2. The trunk road connectivity in NSEZ of Ghana (Ghana Towns and Country Planning Department)

cultural infrastructure to improve food security, and particularly to reduce food loss. Current conditions in the SADA zone are not nearly adequate. For example, the current road network in the SADA zone (54% of the country's land mass) comprises only 40% of the overall national network (Fig. 2).

In addition to inadequate road infrastructure, there is currently poor warehousing infrastructure (including cold storage) and a serious shortage of equipment for seedbed preparation. For example, the ratio of tractors to smallholder farmers is very low, although no firm estimate is available because no rigorous research has been conducted in this area. The lack of mechanized devices makes seedbed preparation more difficult and time consuming, and most smallholder farmers use manual labor and livestock for seedbed preparation.

The SADA zone has one rainy season, which used to last for about 6 months. With climate change, this rainy season has become even shorter, at about 4 months. If farmers delay their seedbed preparation it reduces crop yield—and given the lack of mechanized equipment, farmers usually do delay preparation.

Conclusion

Reducing food waste and loss is very important to improve food security in every country, especially with the growing global population. To tackle this issue,

governments and donor agencies need to be committed to developing agricultural infrastructure as well as investing in technology and working to shift public attitudes.

In Ghana, the SADA zone is in a particularly precarious situation because of the low level of agricultural infrastructure development, especially in light of the fact that even though the area is largely agricultural and constitutes about 54% of Ghana's land mass, it is also the most food insecure. A great deal of investment is needed in the zone all along the value chain to enable Ghana as a whole, and the NSEZ in particular, to reduce food losses and improve food security.

Although the SADA zone has the potential to feed all of Ghana and the nearby landlocked Sahelian countries, infrastructure in the zone must be improved to achieve this, and this must include the improvement of agricultural extension services. Although this is not a research paper, I encourage any interested parties to conduct research to determine which parts of the value chain in the SADA zone are most vulnerable, namely which ones contribute most to food losses and need to be strengthened.

Acknowledgements

I thank Mr. Pius Sanyare for his numerous reviews

of this paper and his constructive criticism. My gratitude also goes to my superiors at SADA— Director of Integrated Development Programs Dr. Emmanuel Abeere-Inga and Chief Executive Officer of SADA Mr. Charles Abugre—for their support, encouragement, and input towards my completion of this paper.

References

- Acemoglu, D., Johnson, S., 2005. Unbundling institutions. *Journal of Political Economy* 113, 949–995.
- African Development Bank, 2003. Review of the Implementation Status of the Trans African Highways and the Missing Links. African Development Bank: Tunis, and UN Economic Commission for Africa: Addis Ababa.
- African Union, 2006. Rail Development in Africa: Stakes and Prospects, Objectives and Missions of the African Rail Union (ARU). Document prepared by the ARU General Secretariat for the Conference of African Ministers In Charge of Rail Transport. 10–14 April 2006, Brazzaville, Congo.
- Annerquaye, R. A., 2014. Food losses level frightening. <http://annerquaye.com/2014/10/10/food-losses-level-frightening/>, (accessed November 15, 2015).
- Business and Financial Times (B&FT), 2014. Ghana, 11th November, 2014.
- Buys, P., Deichmann, U., Wheeler, D., 2010. Road network upgrading and overland trade expansion in sub-Saharan Africa. *Journal of African Economies* 19, 399–432.
- Goletti, F., 2003. Current status and future challenges for the postharvest sector in developing countries. *Acta Horticulturae* 628, 41–48.
- GSS (Ghana Statistical Service), 2013. Ghana Housing and Population Census. Ghana Statistical Service. Accra, Ghana.
- The Urban Association Limited (TUAL), 2013. Food losses level Frightening. Report by Ghana Web Business News of 11 November 2014. <http://www.ghanaweb.com> (accessed November 15, 2015)
- Gustavsson, J., Cederberg, C., Sonesson, U., Van Otterdijk R., Meybeck, A., 2011. Global Food Losses and Food Waste: Extent Causes and Prevention. United Nations, Food and Agriculture Organization. Rome, Italy.
- Johnson, S., Ostry, J. D., Subramanian, A., 2007. The Prospects for Sustained Growth in Africa: Benchmarking the Constraints. IMF Working Papers 07/52, International Monetary Fund.
- Limão, N., Venables, A. J., 2001. Infrastructure, geographical disadvantage, transport costs, and trade. *The World Bank Economic Review* 15, 451–479.
- Radelet, S., Sachs, J. D., 1998. Shipping Costs, Manufactured Exports, and Economic Growth, Columbia University Academic Commons, <http://hdl.handle.net/10022/AC:P:8301>.
- Rodrik, D., 1998. Trade Policy and Economic Performance in Sub-Saharan Africa. NBER Working Papers 6562, National Bureau of Economic Research, Inc.
- World Bank, 2010. World Development Indicators. Washington DC: World Bank Data.