Research Application Summary

Distribution and sourcing of fresh fruits and vegetables within Nairobi City County

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Abstract

Despite a rapidly transiting city, the operational nature of Nairobi City food system is unclear. A sample of retailers, collector agents at farm level, trader aggregators and wholesalers was obtained from survey sites within key markets in Nairobi city. The survey tool for this study the Rapid Urban Food System Assessment Tools (RUFSAT). Results of survey showed that the most traded vegetables were cabbages (25%) and tomatoes (22%), while fruits were mangoes (11%) and watermelon (13%). Of those interviewed, 40 percent were retailers and 60 percent were wholesalers, with 52% being female. All the vegetables were restocked on a daily basis while fruits had restocking frequency of up to 2 to 3 times a month. Mangoes and tomatoes had the widest distribution of source regions. The main mode of transport used was trucks or open pick-up vehicles. Oranges and tangerines had the longest mean distance from the source (478 km) while kales had the shortest (72 km). Low turnover of sales (33%), extended wet season (26%), poor offloading of produce and rodents were cited as some of the main causes of food wastage. The main function applied to the FFVs was grading and sorting while only 6.7% of the traders did any processing. Perception on usage of chemicals and market hygiene conditions was cited by respondents as important food safety concerns. Municipal services and infrastructure status such as cold storage, space for market stalls, education and training were rated lowest by all the respondents. Rules and regulations on import licences, water pollution, good agricultural practices were noted by 100% of the respondents as appropriate measures but lacking in enforcement. Information from the study would be useful for all stakeholders involved in the food chain for developing an urban food system strategy for the growing city of Nairobi.

Key words: Food safety, Infrastructure, market traders, mode of transport, Nairobi, source region, urban food system

Résumé

Bien qu'elle soit une ville en transformation rapide, la nature opérationnelle du système alimentaire de Nairobi n'est pas claire. Un échantillon de détaillants, d'agents collecteurs au niveau des exploitations et de grossistes a été obtenu à partir des sites d'enquête sur les marchés clés de la ville de Nairobi. L'outil d'enquête utilisé était les outils d'évaluation rapide du système alimentaire urbain. Les résultats de l'enquête ont montré que les légumes les plus commercialisés étaient les choux (25%) et les tomates (22%), alors que les fruits étaient les mangues (11%) et la pastèque (13%). Parmi les personnes interrogées, 40% étaient des détaillants et 60% étaient des grossistes, 52% étant des femmes. Tous les légumes étaient réapprovisionnés quotidiennement tandis que les fruits avaient une fréquence de

réapprovisionnement allant jusqu'à 2 à 3 fois par mois. Les mangues et tomates avaient la plus large répartition des régions d'origine. Le principal mode de transport utilisé était les camions ou les pick-up ouverts. Les oranges et les mandarines avaient la plus longue distance moyenne de la source (478 km) tandis que les choux avaient la plus courte (72 km). Un faible chiffre d'affaires des ventes (33%), une saison des pluies prolongée (26%), un mauvais déchargement des produits et des rongeurs ont été cités comme principales causes des pertes d'aliments. La fonction principale appliquée aux FFV était le classement et le tri, tandis que seulement 6,7% des commerçants effectuaient un traitement. La perception de l'utilisation des produits chimiques et des conditions d'hygiène du marché a été citée par les répondants comme des préoccupations importantes en matière de sécurité alimentaire. Les services municipaux et l'état des infrastructures tels que l'entreposage au froid, l'espace pour les étals de marché, l'éducation et la formation ont été moins bien notés par tous les répondants. Les règles et réglementations relatives aux licences d'importation, à la pollution de l'eau et aux bonnes pratiques agricoles ont été considérées par 100% des répondants comme des mesures appropriées mais manquant d'application. Les informations tirées de cette étude seraient utiles à toutes les parties prenantes impliquées dans la chaîne alimentaire pour développer une stratégie de système alimentaire urbain pour la ville de Nairobi en pleine croissance.

Mots clés: sécurité alimentaire, infrastructure, commerçants sur le marché, mode de transport, Nairobi, région d'origine, système alimentaire urbain

Introduction

The rapid growth of urban areas (towns and cities) in developing countries poses many challenges for the local food systems (Cohen and Garreth, 2010). The proportion of Africa's population living in urban areas was estimated to have been 39% in 2010, and is expected to reach 50% by the 2030s (UN-Habitat, 2014). It is anticipated that in the future the concentration of hunger and poverty will become equally an urban as well as a rural issue. Although Nairobi contributes 12.7 percent to Kenya's GDP, unemployment and poverty rates are increasing annually (World Bank, 2013). Recent studies show that during "normal times", food insecurity in the slums is high with 85 percent of households experiencing mild to severe food insecurity especially during periods of acute crisis (Kimani *et al.*, 2014). Sustainable and healthy food security and nutritional security (FSNS) is the result of the interactions taking place between three categories of factors, namely food availability, food consumption and the existing territorial assets (FAO, 2018). Although there is emerging recognition that urban food security is a key dimension in making cities and human settlements inclusive, safe, resilient and sustainable' (FAO, 2016), the governance systems and operational nature of the food systems in many cities (including Nairobi) remains unclear. Based on the food system approach, this study was carried out to analyse the distribution system of fresh fruits and vegetables (FFVs) supply in Nairobi. The objectives were to determine the sources of different food types entering the Nairobi metropolitan region; track mode of delivery and distribution within the city and outline problems and constraints affecting FFVs distribution within the metropolitan area.

Materials and methods

The study was conducted in Nairobi City County, Kenya. The target respondents for the study were retailers, collector agents at farm level, trader aggregators at farm level and wholesalers. They were visited in the large open air markets of Githurai, Kangemi and Uthiru located in the more peri-urban sub-counties of Nairobi and in Korogocho, Gikomba, Nyamakima and Wakulima open air markets

located in the urban sub-counties of Nairobi. The survey tool for this study was the Rapid Urban Food System Assessment Tools (RUFSAT), developed in conjunction with FAO, which was designed to capture information on, the different regions from which the food is sourced and the seasonality of supply, modes of transport used, food purchasing behavior, food losses, food safety issues and adequacy of the enabling environment.

Results

Six different types of fruits and nine different types of vegetables were recorded among the traders. Mangoe was the most stocked and traded fruit by both retailers and wholesalers in the surveyed markets at 10% and 13%, respectively. Among the vegetables, cabbages and tomatoes were the most traded vegetables. Mangoes and tomatoes had a wide geographical source range, of up to 9 source regions, compared to the other products. Kales and Spinach had the shortest mean source distance (72 km) to Nairobi City, while oranges, tangerines, pawpaw and avocados had mean source distances of 250km to 480 km. Among the retailers, pawpaw and cabbages had the highest rates of wastage, 18% and 3.3% respectively while for wholesalers, watermelon and tomatoes had the most volume of wastage, 22% and 18% respectively. Extended wet season and low sales were cited as influencing factors for the losses. The main functions applied to the fresh fruits and vegetable were grading and sorting mentioned by about 40% of the retailer and 70% of wholesaler. Of all the respondents only 6.7% of the wholesalers did processing and none among the retailers. Perception on usage of chemicals and GMO materials in production and market hygiene conditions was cited by respondents as important food safety concerns. Municipal services and infrastructure such as cold storage, food safety inspection, space for market stalls, offloading space, education and training were rated lowest by all the respondents. About 100% of the respondents were negative on rules relating to hours of operation. Rules and regulations on import licences, water pollution, good agricultural practices were noted by 100% of the respondents as appropriate but lacking in enforcement.

Discussion

The distribution of food is about 'how food for consumption is physically moved to be available, in what form, when and to whom' with the key determinants of the process being transportation infrastructure, trade regulations and storage requirements" (Ericksen, 2008). Open air markets in Africa, although largely informal, serve as major entry points of food to cities and thus an important element of the urban food system (Warren, 2016). The source of food entering Nairobi City County varies with type and season. Field crops such as fruits were sourced from more distant regions as compared to vegetables. This could be due to their perennial life-cycle and thus need for land that is less likely to quickly change type of use as would happen within urban and peri-urban areas of Nairobi. The immediate hinterland of Nairobi serves as main source of vegetables especially the highly perishable cabbages, kales and tomatoes helping to meet the high demand in the city. As urbanization increases in the city, producers are being pushed to marginal areas or restricted to public spaces. Development of urban green belts could be useful for protecting productive land, minimize chances of pollution and ensure food safety (Kuusana, 2015). Typical issues on food safety concern among traders of FFVs in Nairobi and street food vendors include inadequate access to water and sanitation, inadequate refuse removal, weak regulatory systems and lack of training for food handlers which can all result in poor hygiene standards (Gadaga, 2008; Muyanja, 2011). Only few traders did any form of processing yet there was high reporting on food loss which implies that with support, there is opportunity for widening product range.

Table 1. The range and occurrence level of product types for fresh fruits and vegetables identified in the Nairobi markets

Product	Frequency		Percent	
	Retailer	Wholesaler	Retailer	Wholesaler
Avocados		1	0	6.7
Mango	1	2	10	13.3
Orange		1	0	6.7
Pawpaw	1		10	0.0
Ripe banana		1	0	6.7
Tangerine		1	0	6.7
Water melon		2	0	13.3
Amaranth	1		10	0.0
Cabbage	3	3	30	20.0
Kales	1		10	0.0
Night shade	1		10	0.0
Onions	1	2	10	13.3
Spider plant	1		10	0.0
Spinach	1		10	0.0
Tomatoes	2	4	20	26.7

Conclusion

The most common fruits traded by retailers and wholesalers were mangoes and oranges while vegetables were cabbages, tomatoes and onions. The key source areas were Machakos, Hola and Muranga for mangoes; Meru, Limuru and Kinangop for cabbages; Kisii and Tanzania for onions; Loitoktok and Mwea for tomatoes. The main activities traders carry to prepare FFVs for sale were sorting and grading and only 6.7% did processing. More than 70% of the respondents rated the provision of key municipal services and infrastructure as poor or very poor. Traders felt that useful regulations such as reduction of air and water pollution, good agricultural practices, food safety standards and hours of operation although appropriate, were not being enforced. Since most food is distributed through markets and also through informal shops, the sites are critical for urban governance by the Nairobi City and can impact on the accessibility, affordability and quality of food available to the increasing urban population.

Acknowledgement

References

Cohen, M.J. and Gareth, J.L. 2010. The food price crisis and urban food (in) security. *Environment & Urbanization* 22(2): 467–482. DOI: 10.1177/0956247810380375.

Ericksen, P.J. 2008. Conceptualizing food systems for global environmental change research. *Global Environmental Change* 18 (1): 234–245.

FAO. 2016. The state of food and agriculture: Climate Change, Agriculture and Food Security. Rome, Italy.

FAO. 2018. Social network analysis for territorial assessment and mapping of Food Security and Nutrition Systems (FSNS): A methodological approach, FAO.

Gadaga, T., Samende, B., Musuna, C. and Chibanda, D. 2008. The microbiological quality of informally vended foods in Harare, Zimbabwe. *Food Control* 19 (8): 829–832.

Kimani-Murage, E.W., Schofield, L., Wekesah, F., Mohamed, S., Mberu, B., Ettarh, R., Egondi, T., Kyobutungi, C. and Ezeh, A. 2014. Vulnerability to food insecurity in urban slums: Experiences from Nairobi, Kenya. Journal of Urban Health: *Bulletin of the New York Academy of Medicine* 91 (6): 1098-1113.

Kuusaana, E.D. and Eledi, J.A. 2015. As the city grows, where do the farmers go? Understanding peri-urbanization and food systems in Ghana - evidence from the tamale metropolis. *Urban Forum* 26 (4): 443–465.

Muyanja, C., Nayiga, L., Brenda, N. and Nasinyama, G. 2011. Practices, knowledge and risk factors of street food vendors in Uganda. *Food Control* 22 (10): 1551–1558.

UN-Habitat (United Nations Human Settlements Programme). 2014. The state of African cities 2014: Re-imagining sustainable urban transitions. Nairobi, Kenya: UN-Habitat.

Warren Smit, 2016. Urban governance and urban food systems in Africa: Examining the linkages. *Cities* 58: 80–86

World Bank. 2013. Kenya Economic Report. Nairobi, World Bank.