

Research Application Summary

Development of a sustainable value chain systems for cucurbita species (Pumpkins) in Northern Uganda: A brief review

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Abstract

Pumpkin is one of the many African indigenous crops grown across Africa due to its nutritional and medicinal attributes. Despite its vast nutritional and medicinal values, pumpkin remains one of the neglected and underutilized species (NUS) in Northern Uganda. Pumpkin is considered a magic “crop” because almost all the parts are eaten ranging from leaves both dried and fresh, the pulp, seeds and can also be transformed into pumpkin flour which is rich in both macro and micro-nutrients important for treating cancer, diabetes, improving eyesight, and memory loss. The fight against malnutrition, food insecurity, poverty could be partially tackled if NUS like Pumpkin are improved and knowledge documented to help increase production and thier utilization.

Key words: Food security, malnutrition, neglected and underutilized species, pumpkin

Résumé

La citrouille est l'une des nombreuses cultures indigènes africaines cultivées à travers l'Afrique en raison de ses attributs nutritionnels et médicinaux. Malgré ses grandes valeurs nutritionnelles et médicinales, la citrouille reste l'une des espèces négligées et sous-utilisées (NUS) dans le nord de l'Ouganda. La citrouille est considérée comme une “culture” magique, car presque toutes ses parties sont consommées, qu'il s'agisse des feuilles séchées ou fraîches, de la pulpe, des graines ou de la farine de citrouille, qui est riche en macro et micro-nutriments importants pour le traitement du cancer, du diabète, de l'amélioration de la vue et de la perte de mémoire. La malnutrition, l'insécurité alimentaire et la pauvreté pourrait être partiellement résorbée si les NUS comme la citrouille sont améliorées et si les connaissances sont documentées pour aider à augmenter la production et leur utilisation.

Mots clés: Sécurité alimentaire, malnutrition, espèces négligées et sous-utilisées, citrouille

Introduction

Pumpkins (*Cucurbita* spp.) belong to the family Cucurbitaceae and genus *Cucurbita*. The *Cucurbita* species is believed to have originated from America (Nakazibwe *et al.*, 2019). In most African countries like Kenya, Malawi, Nigeria, South Africa, Uganda, Zambia and Zimbabwe, pumpkins grow well (Ngwerume and Grubben, 2004). In Uganda's agricultural context, the main districts that grow pumpkins for commercial and household consumption include Kabale, Jinja,

Mbale, Mityana, Mubende, Luwero, Nakaseke and Kabarole (Ondigi *et al.*, 2008). Indigenous knowledge on pumpkins, its production and utilization in northern Uganda remain a mystery since there exists no research so far carried out to document such information. But traditionally, almost every household has one or two pumpkin plants in the backyard or “rubbish pit” for household consumption especially during hard economic times of food insecurity and the excess is sold in nearby markets. Pumpkin in Luo is called okono and there could exist several varieties grown in northern Uganda, different parts are eaten, and various ways of planting and utilization among other facts unknown to the scientific world and subsequently remain undocumented. Thus, pumpkins in northern Uganda are a Neglected and Underutilized Species (NUS), yet northern Uganda is blessed with two rainy seasons and a vast chunk of idle land that could turn to be an assurance to food security, reduced malnutrition, and income generation sources to smallholders farmers. Hamisy *et al.* (2002) reported that conservation of plant genetic resources in East Africa give priority to cultivated mainstream crops and underutilized plants like pumpkins are accorded little emphasis and research despite their potential. As time evolves, if no substantial effort is done to document original indigenous knowledge on production, a sustainable pumpkin value chain, utilization and conservation approach is not developed, original knowledge on local varieties of pumpkins in northern Uganda will be eroded.

Methodology

This article explores knowledge gaps on indigenous knowledge, utilization and value chain development of pumpkins in Northern Uganda. Articles on pumpkins, neglected and underutilized species, value chains, food and nutrition security, malnutrition, poverty and other topics were reviewed through a literature search on google scholar. The articles were subjected to thorough analysis for their impact and relevance regarding the topic under study and necessary information was retrieved.

Neglected and Underutilized species. Inventing new ways to mitigate poverty and hunger incidence does not entirely rely on the genetically modified crops or introducing new varieties, but when indigenous foods are reignited to interest smallholder farmers can ascertain food security, income generation, fight malnutrition, promote agricultural biodiversity, and preserve local cultures (Amanda *et al.*, 2011). FAO (2018) defined NUS as “species with under exploited potential for contributing to food security, nutrition, health, income generation and environmental services”. According to Senyolo (2018) the increasing interest in neglected and underutilized species is due to their great potential to immensely contribute to agricultural and rural development, effective land use, diet enhancement and monetary returns to the smallholder farmers. The local contribution of these species is limited because of the lack of indigenous knowledge on production, consumption, and value chain challenges. The neglect and failure to document, develop and commercialize pumpkin production in northern Uganda has contributed to food insecurity, malnutrition, and low-income generation for the poor (Magbagbeola *et al.*, 2010)

Pumpkin Value Chain

The term value chain refers to the full range of activities that are required to bring a product (or a service) from conception through the different phases of production to delivery to final consumers and disposal after use (Kaplinsky and Morris, 2000). Plainly, with pumpkins being planted or “germinating” in the backyard of rural households in northern Uganda, there are hardly any value chain developed to generate value from the input suppliers, the farmers, traders, the processors and the final consumers of different pumpkin products. Understanding the pumpkin value chain in the context of Northern Uganda will improve food and nutrition security, income generation,

and malnutrition which are so prevalent in Northern Uganda with nearly 48,000 children acutely malnourished (Padulosi *et al.*, 2013; IPC, 2020). The study conducted by (Yok *et al.*, 2016) in Malaysia to establish the supply chains of pumpkin revealed that the chain actors in the pumpkin value included farmers, middlemen, processors, retailers and the final consumers consuming both in the processed form of pumpkin flour and fresh.

Socio-economic benefits of pumpkin

Food security. The UN Sustainable Development Goals (SDGs) of zero hunger and food security are now one of the major challenges to the rest of the world. Food security is the ability by which everyone can access enough food for a dietary, healthy and productive life (Senyolo, 2018). With the world population projected to be about 9 billion by 20250 (van Dijk *et al.*, 2020) hopes of having a secure and productive population are minimal if nothing is done to step up the research on neglected and underutilized species like pumpkins. Pumpkins have the potential to address food insecurity in northern Uganda. Pumpkin leaves can be picked and boiled after barely two weeks of planting as well dried and stored. The mature pumpkin fruits when harvested can stay for up to eight months in the shelf (Nakazibwe *et al.*, 2019), an easy to grow crop, and can withstand harsh climate. This is a strong indication that pumpkins coupled with a strongly developed value chain can be a source of a long-lasting food security in Northern Uganda and wider Africa.

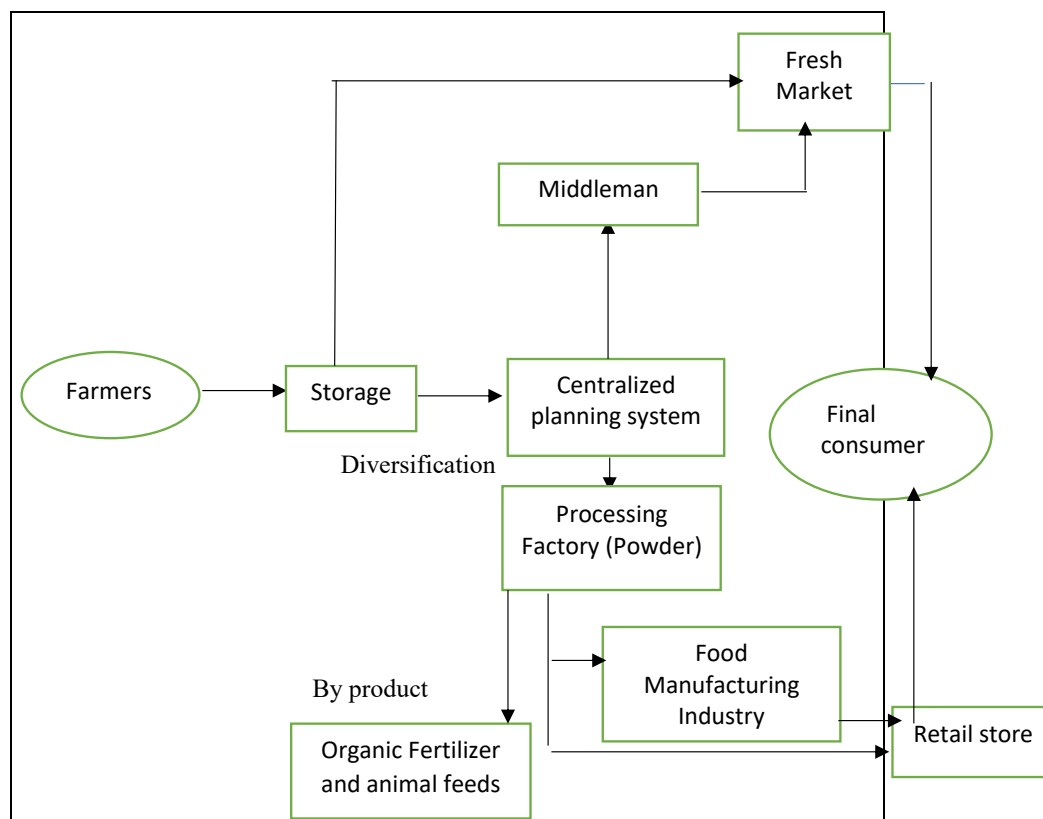


Figure1. The research model of value-based food supply chain of pumpkin in Integrated Agricultural Development Area, Samarhan, Sarawak, Malaysia

Source: Yok *et al.* (2016)

Malnutrition. Malnutrition is one of the significant burdens to the world's population. Malnutrition refers to the deficiencies, excess, or imbalances in a person's intake of energy and/or nutrients. Globally in 2020, 149 million children under five years were estimated to be stunted (too short for age), 45 million were estimated to be wasted (too thin for height), and 38.9 million were overweight or obese (WHO, 2021). In northern Uganda, about 48,000 children aged (6-59 months) are not only malnourished but are acutely malnourished with districts of Otuke and Omoro under alert stages of 6.1% and 5.9%, respectively (IPC, 2020). This is caused by a deficiency in zinc and iron, Vitamin A and proteins. All these micronutrients are high in pumpkins compared to in most of the mainstream crops being cultivated in northern Uganda.

Income generation. Additionally, the benefits of cultivating NUS to enhance its production and quality rely on their ability to improve the income of smallholder farmers and value chain actors (Padulosi *et al.*, 2013). The fact that most agricultural activities are carried out by rural women, an improved income would generate a positive multiplier effect on the household's education, health and food. More than (70 percentage) of Ugandan women actively participate in Agriculture with Northern Uganda having the highest percentage (53%) as reported by the Uganda Bureau of Statistics. (UBOS, 2017). Promoting production of pumpkins can greatly improve their standards of living.

Conclusion

In Northern Uganda, pumpkins are treasured and cultivated as a traditional and cultural crop making its full potential not to be put into full utilization. All parts of the pumpkin plant are consumed prompting no food wastage and combined with its ability to stay for long on the shelf can guarantee food security in the region. Indigenous knowledge, utilization and production of pumpkins in Northern Uganda has not been explored, hence the need to document this information. The knowledge that will be gathered in the process would be used to develop a sustainable value chain that involves scaling up pumpkin production and identifying which varieties are good for value addition, such as transforming the pulp into flour. The flour would be used for making porridge for infants, thus fighting malnutrition. Pumpkin contains a full range of micronutrients like zinc and iron. The literature reviewed shows that there exist knowledge gaps in documenting indigenous knowledge, utilization and production of pumpkins in Northern Uganda. These research gaps should be addressed.

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