

Introduction

Insects are consumed as a food source in 80% of all nations globally, and the majority of these nations are found in tropical and subtropical regions where insects can survive year-round and often grow to large sizes (Van Huis, 2013). Mexico, India, and China all have over 300 species of edible insects. In forty African nations, there are 500 species of edible insects, and there are over eighty within Zambia, which is where I conducted my research (Jongema, 2017). In addition to being plentiful, they are highly nutritious. Edible insects are excellent sources of protein, iron, and dietary fiber. The United Nations Food and Agriculture Organization cited edible insects as a potential solution to food insecurity in developing nations (Van Huis, 2013). In Zambia, edible insects are normalized as a source of food, especially in rural areas. The volume and diversity of insects consumed is culturally tied to geographical location and tribal traditions.

Insect farming has been suggested as a way to protect wild insect populations from overharvesting, reduce the economic stress caused by seasonal changes in wild-harvested insect populations, improve food security in rural areas, and improve the economic stability of rural villages (Stull, 2018). Research into edible insect farming is important to consider in tropical or subtropical regions that both economically and calorically rely on maize. Research suggests that maize productivity declines by approximately 15% with every one-degree Celsius increase in temperature. The micronutrient availability of iron, zinc, protein, and phytate decreases by approximately 4-6% as carbon dioxide levels increase past 550 ppm (Myers et al, 2014). Approximately two billion people suffer from deficiencies in these micronutrients, and rising carbon dioxide concentrations will likely continue to put these populations at risk. In Zambia, 53% of children are considered anemic, and 40% are considered stunted. Many

species of edible insects are high in these types of micronutrients, and therefore could be a solution to address malnutrition in Zambia and around the world.

Locust, grasshopper, and caterpillar farming has been successful in many other parts of the world (notably Thailand, China, New Zealand, South Africa, and Zimbabwe), but has been not been thoroughly investigated in Zambia, despite high rates of insect consumption. The purpose of my research this summer, which was graciously funded by the Institute for International and Regional Studies, is to assess knowledge and perceptions of insect farming among insect sellers and consumers, and to identify potential barriers to the sale of edible insects in Lusaka District. Lusaka was chosen the main research site for this study because it is the largest urban area in the nation, it is the nation's capital, and it is the most diverse region in the country.

Summer Research Description

This summer, my research assistant and I selected ten markets to conduct informal, semi-structured interviews of insect sellers, distributors, and consumers. These markets are located in wards that have varying socio-economic status. We grouped these wards into three socio-economic brackets (low, low-medium, and medium-high) based on current home market values and the prevalence of national and international development programs. At least two markets were selected from each directional quadrant of Lusaka district (northeast, southeast, northwest, southwest), and two markets were selected from central regions.

Throughout these interviews, we asked our interlocutors questions to elicit their awareness and opinions of edible insect farming. We were interested in uncovering whether their opinions differed for more commonly known edible insects (caterpillars and locusts) and lesser known edible insects (spotted field crickets). To evaluate this theme, we asked sellers and consumers about their awareness of insect farming and their willingness to sell or consume these specific insects. We asked open ended questions to assess reasons why they would sell or consume

them. This research directly benefits a non-profit, Nutripeople, that is growing crickets in community-led farms in Monze in southern Zambia.

Our informal interviews suggest that where consumers and sellers spend most of their childhood and their tribe likely impacts their knowledge of insects as food and their willingness to consume or sell them. The spotted field cricket is considered food by the Bemba tribe in the northern and eastern regions of Zambia, but it is rarely sold in Lusaka because it is difficult to harvest in the wild. This cricket species is currently being farmed by Nutripeople with the intention of sale in markets, and thus is a primary focus of this study. People living in Lusaka who immigrated from rural regions in northern and eastern Zambia are likely to see this insect as food, and may be interested in consuming it if it is available in markets. Locusts and grasshoppers are seen as food by most tribes in Zambia, but are generally a less desired insect compared to caterpillar species. Caterpillars are extremely popular in Lusaka, and are commonly found in markets. These insects are typically harvested in woodlands in northern Zambia, but are highly regulated by tribes in the region. Caterpillars often have a complex life cycle and their harvest is regulated by Traditional Ecological Knowledge of local tribes. This makes them more difficult to farm.

My research uncovered is that 96% of insect sellers in Lusaka were women, and 76% of the insect sellers interviewed identified themselves as the financial head of their household. This information increases the importance of the edible insect industry in Zambia because it economically supports women in both urban and rural regions. Despite low awareness of edible insect farming, we found that most sellers, distributors and consumers viewed the practice favorably (84%). Our interlocutors cited that insect farming could make the prices fluctuate less often and increase year-round availability of species. One distributor said that if we had farmed insects to sell to them that day, they “would sell them...no problem.” This applied to the locusts, grasshoppers, and caterpillars, but not to the crickets. Several insect sellers described insect

farming as being similar to mushroom farming, which is another traditionally female-run industry that transitioned successfully to large-scale farming.

I am extremely grateful to the Institute for Regional and International Studies for financially supporting my summer research. I was able to develop strong relationships with my interlocutors and gained a deeper, more well-rounded understanding of edible insect consumption in Zambia. I am excited to continue my research in coming years by pursuing a doctoral degree. I plan on returning to Zambia at least two more times to continue my research and to support Nutripeople and other non-profits that are working to develop sustainable, climate-informed food security solutions in Zambia.