NUTRITION *in* CITY ECOSYSTEMS

May 2024

FARMERS' SURVEY

KENYA

Key insights into farming systems in **Bungoma**

The Nutrition in City Ecosystems (NICE) project works to improve nutrition and reduce poverty by increasing the supply of and demand for nutritious foods that are produced using agroecological practices in six secondary cities across Bangladesh, Kenya, and Rwanda. The NICE project works closely with local governments at city level and facilitates locally led actions to improve nutrition through agricultural, food, and health sector collaborations and public-private engagements, with strong emphasis on the role of women and youth entrepreneurs (see *Project Factsheet*).

Agroecological practices apply the concept of agroecology (utilization of ecological and social concept and principles in the design and management of sustainable agriculture and food systems) in agriculture. NICE specifically concentrates its efforts on five of the 10 main agroecology elements shaping sustainable food systems transformation: efficiency, recycling, diversity, resilience, and culture and food traditions.

Source: FAO

Nutritious foods are foods, that in the context where they are consumed and for the individuals that consume them, provide beneficial nutrients (e.g. vitamins, major and trace minerals, essential amino acids, essential fatty acids, dietary fibre) while being poor on potentially harmful elements (e.g. antinutrients, quantities of saturated fats and sugars etc.)

Source: GAIN

The six cities where NICE works are secondary cities, characterized by a relatively modest spatial scale and a physical proximity to rural areas, distinguishing them from primary or mega-cities. In these cities, food producers reside close to urban consumers, making shorter food supply chains with fewer intermediaries at least a possibility. The potential for direct producer-to-consumer connection offers practical opportunities for transforming food systems, notwithstanding it is quite common even for urban and peri-urban households to produce small amounts of food at the homestead in these contexts.

This short report gives the result of a farmers' survey held in May 2024 in Bungoma, Kenya. Bungoma is a secondary city within the Bungoma county in western Kenya. Agriculture is the main economic activity in Bungoma county with two growing seasons that follow the long rains and short rains periods. Maize covers 95% of the land under food crop production in Bungoma and 80% of the value of food crops produced annually in Bungoma county is from maize, still, the majority of farmers are reliant on rainfall for watering their crops.

Hundred-fifty-eight rural and peri-urban farmers, representing a farming household, were interviewed in NICE's Farmers' Survey to complement more nutrition-focused data collected among urban residents in the NICE project cities. Sampling was purposive to include farmers who are producing for the local market and to interview female farmers with a target of 50%.

Data from farmers and small holders were collected using an adapted version of a tool called **S**elf-evaluation and **H**olistic **A**ssessment of climate **R**esilience of farmers and **P**astoralists (SHARP+) developed by the Food and Agriculture Organization (FAO). The SHARP+ tool collects a mix of quantitative and qualitative data on various aspects of farming households, such as fertilizer application, sales outlets, daily consumption, and more. All the questions in SHARP+ serve a dual purpose: Firstly, they help gauge the prevalence or distribution of specific practices among farmers, often presented as percentages. Secondly, they contribute to understanding farmers' resilience levels through a combined score derived from the thematic questions.

Data collection for this Farmers' Survey was approved by the local authorities and all findings have been discussed with various district stakeholders in December 2024.

Household information

The farmers' survey in Bungoma covered 158 farming households. Of these, 87% were headed by males, 11% by females, and 2% were jointly headed by both.

Children (0-9), adolescents (10-19), and youth (20-35) were the predominant age groups in the surveyed farming households, indicating a population leaning towards younger individuals. The average household size among the surveyed farming households was 5.8 individuals with relatively even age-based gender distribution (Figure 1).

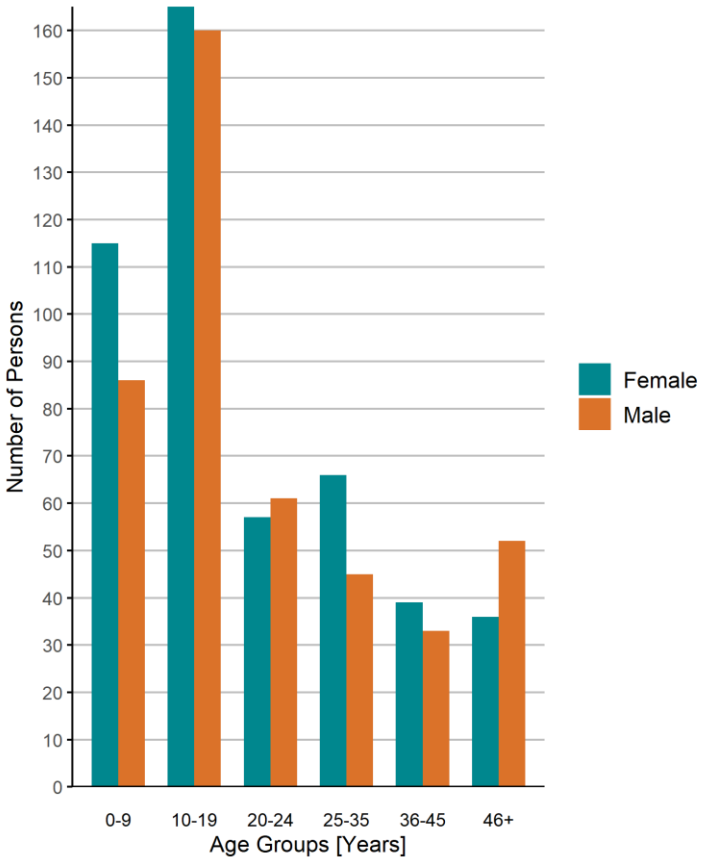


Figure 1: Age group distribution of the sampled farming households population in Bungoma

Food consumption

Based on the Household Dietary Diversity Score (HDDS), 92% of the surveyed farming households have an adequately diverse diet (defined by consuming at least 5 different food groups out of 12 in the 24 hours prior the survey). On average, 7.7 different food groups have been consumed by the surveyed farming households in the last 24 hours prior survey. While quantities of the consumed foods have not been investigated, most household indicated to have consumed cereals (92% of the surveyed households), vegetables (88%), fruits (81%), and also milk and milk products (83%) while other animal proteins such as meat or fish and seafood seem to have been consumed by only a few households, Figure 2.

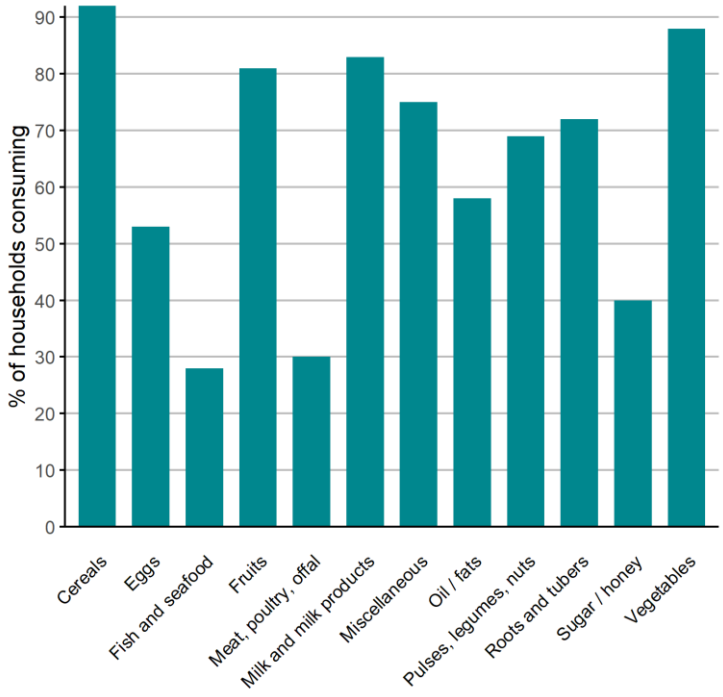
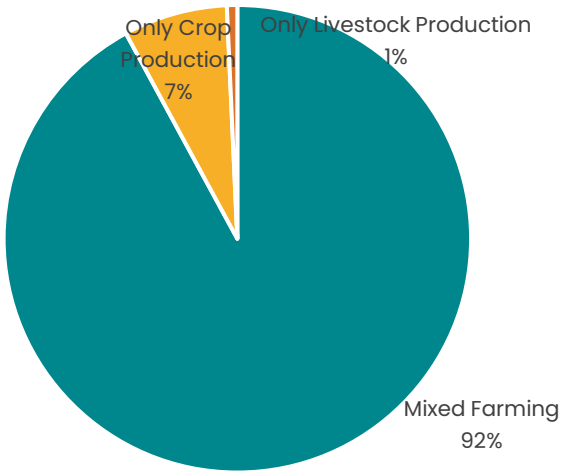


Figure 2: Household food consumption in the 24 hours prior survey

Farming practices



The farming system in Bungoma predominantly features mixed farming practices, with 92% of respondents combining crop and livestock farming while 7% of the respondents engaged solely in crop production. 72% of the respondents also indicated to relay on non-farm income sources besides their revenue from agricultural activities. The fact that two thirds (61%) of the farmers keep some form of farming records suggests a measure of proactive management within a segment of the farming community.

Figure 3: Different farming systems found in Bungoma

Crops and Livestock

The diversity of crops grown in Bungoma suggests a multi-faceted agricultural landscape. Maize (99%) and beans (86%), which are staple crops providing the primary sustenance for the local population, dominate the agricultural scene. Alongside these, a variety of crops, including seasonal ones that are planted and harvested within a single year, and perennial crops that live for multiple seasons and yield harvests over time, are also cultivated as shown in table 1.

Table 1: Share of surveyed farming households practicing the production of selected crops

Seasonal crops[a]	% of households engaged in production	Seasonal crops[a]	% of households engaged in production	Perennial crops[b]	% of households engaged in production
Maize	99%	**Arrowroot**	8%	**Banana**	85%
Beans	86%	**Sorghum**	8%	**Avocado**	51%
Black nightshade	68%	**Finger millet**	6%	**Mango**	33%
Groundnut	65%	**Onion**	6%	**Sugarcane**	28%
Spider plant	56%	**Tomato**	6%	**Coffee**	10%
Cowpeas	53%	**Bambara**	3%	**Lemon**	3%
Sweet potato (Orange)	44%	**Cabbage**	2%	**Orange**	3%
Cassava	40%	**Sesame**	2%		
Soybean	35%				
Amaranthus	33%				
Sweet potato (White)	33%				
Pumpkin	20%				

[a] Seasonal crops are plants that are cultivated and harvested during specific times of the year.
[b] Perennial crops are plants that live for multiple years and produce crops year after year.

Among the surveyed farming households in Bungoma and having animals on their farms (n=126), livestock farming is predominantly focused on cattle and poultry, with a considerable majority of households (88% and 75% respectively) engaged in their rearing, followed by goat rearing (20%), while only few of the respondents engaged in sheep, fish, bees or pig farming.

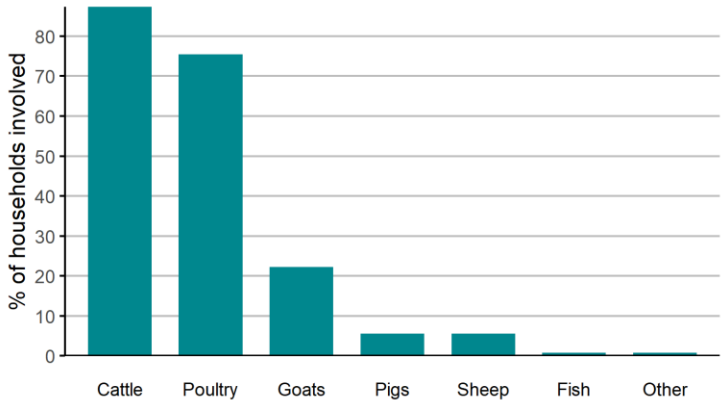


Figure 4: Share of surveyed farming households rearing selected livestock

Fertilizers and pest management

82% of the interviewed farmers in Bungoma reported the use of some form of organic or synthetic soil amendment.

The high adoption rates of crop residues (82% of responding farmers), compost (80%), animal urea (78%) and mulch (77%) indicate a commitment to recycling organic materials within the farming system in Bungoma. Many farmers report to produce almost all the organic fertilizers on-farm, highlighting a strong inclination towards self-sufficiency. 70% of the farmers also report to also apply synthetic fertilizers.

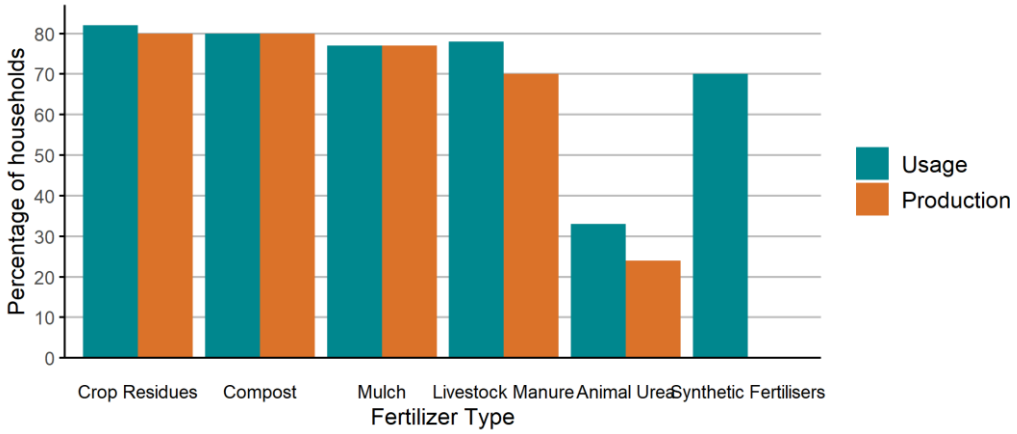


Figure 5: Organic and synthetic fertilizer use in Bungoma

High agricultural productivity also brings a high incidence of pests. In 2024, 79% of respondents reported to have been affected by pests or diseases in the past 12 months, with the fall armyworm remaining the most significant pest, followed by aphids, cutworms, stalk borers, and weevils. In consequence of high pest and disease prevalence, 83% of the interviewed farmers practice pest and disease management, with synthetic pesticides the dominant countermeasure (applied by 66% of the armers, see Figure 6).

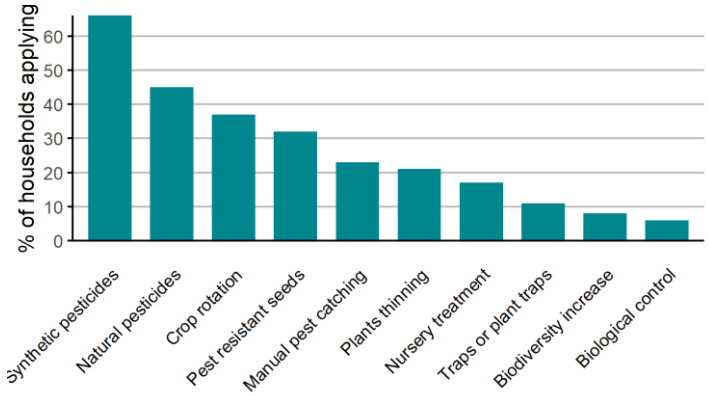


Figure 6: Pesticide use in Bungoma

Seeds and breeds

The majority of surveyed farming households in Bungoma, 97% of responding farmers engaged in crops farming reported to make use of local crop varieties, while 94% indicated the use of newly introduced (non-native) and improved crop varieties, highlighting the tendency to combine reliance on both local, context-adapted and new, resistance-improved varieties. Similar patterns are seen for the rearing of animal breeds, 92% of the interviewed farmers involved in livestock rising indicated to have local animal breeds, while 79% of the interviewed livestock risers affirmed the rearing of newly introduced breeds and crossbreeds.

Agroecological practices

When looking closer at the 17 agroecological practices defined and promoted by SwissAid, promising tendencies are seen in Bungoma. More than 80% of surveyed farming households are engaged in either or the application of organic fertilizers (91%), crop rotation (90%), intercropping (88%) and the use of local seeds and breeds (85%), Figure 7.

On the other hand, only very few farmers are exclusively using organic fertilizers (32%) or organic pesticides (25%) and only a few farmers engage in 'rehabilitation of degraded grazing land' and 'other water and soil conservation practices' (15% and 8%, respectively). All interviewed farmers in Bungoma applied at least one of the 17 probed agroecological farming practices.

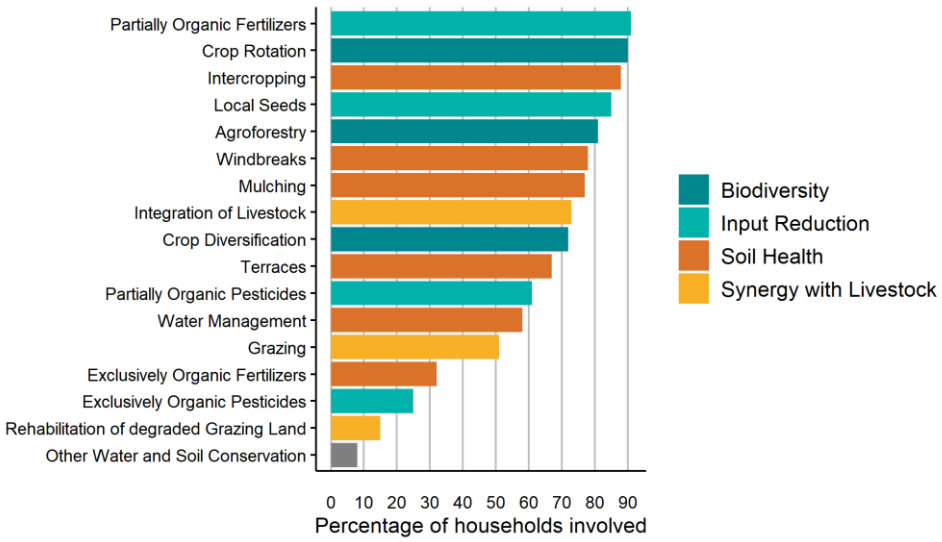


Figure 7: Agroecological practices applied by the respondents. Agroecological practices specifically asked for are in line with definitions used in other projects, e.g. promoted by Swissaid

Women participation in farming

Women > 35 years are involved in applying agroecological farming practices in 42% of the surveyed farming households in Bungoma, with highest contribution to partial application of organic fertilizer, intercropping and crop rotation (all in 39% of the surveyed farming households).

Young people 15-34 years most often engage with the agroecological practices of intercropping (where 93 young women and 74 young male are involved among the 158 surveyed farming households), use of local seeds (97 young women and 68 young men), crop rotation (80 young women and 77 young men) and the partial application of organic fertilizers (85 young women and 68 young men). Overall, young women 15-34 years contribute to agroecological farming in 23% and young men 15-34 in 24% of the surveyed farming households in Bungoma.

Market access

Selling locations

In Bungoma, 94% of the surveyed farming households indicated to sell most (57% of them) or at least a few (43% of them) of their produce. The majority of surveyed farming households prefer selling their agricultural produce directly to neighbors or through local markets (84%, Figure 8). Local and community-based commerce seems to be very important for the agricultural economy in Bungoma, which suggests the importance they place on convenience and accessibility.

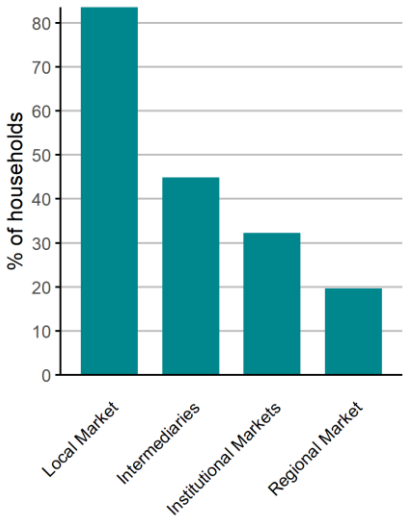


Figure 8: Selling locations of farming output in Bungoma

Post-harvest practices

68% of surveyed farming households in Bungoma apply at least one post-harvest value addition practice (other than immediate consumption or transportation and distribution) in at least one of their produced value chains, with packaging being the post-harvest value addition practices most often performed (51%). However, among the post-harvest value addition practices, most are actually applied for maize and beans.

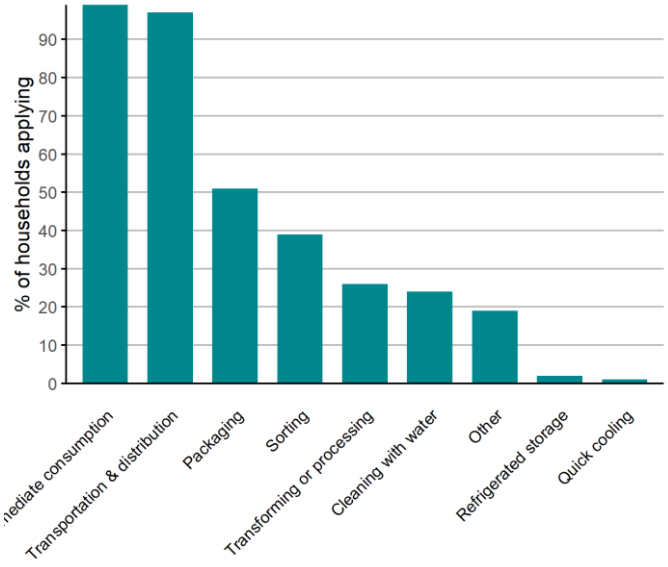


Figure 9: Post-harvest value addition practices applied by surveyed farming households in Bungoma

Authorship: Nutrition in City Ecosystems (NICE) project

The NICE project is supported by the Swiss Agency for Development and Cooperation and implemented by a public-private consortium that includes the Swiss Tropical and Public Health Institute, ETH Zürich, Sight and Life foundation, and the Sustainable Agriculture Foundation Africa.

Further information is available on the **NICE webpage:** *nice-nutrition.ch*