NUTRITION *in* CITY ECOSYSTEMS

March 2022

FARMERS' SURVEY

BANGLADESH

Key insights into farming systems in **Rangpur**

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 March 2022 in Rangpur, Bangladesh. Rangpur City Corporation is situated on the banks of the Ghaghat River within Rangpur district in northwestern Bangladesh. The local climate is one of high humidity with plenty of rainfall. Temperatures range from about 10 · C in January to around 30 · C in the hottest season. Rangpur city is a commercial hub that serves its surrounding districts. City dwellers are thus mostly involved in non-farming activities, but Rangpur's agricultural production still allows export to the rest of the country of about 50-60% of all agro-food produce.

150 rural and peri-urban farmers, representing a farming household, were interviewed in the farmers' survey to complement more nutrition-focused data collected as a baseline for the NICE project among urban residents in the secondary city. 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 Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists (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. Farmers' resilience levels are expressed in a set of 13 behavior-based resilience indicators scaling from 0-10. High scores indicate a high presence of the resilience indicators, suggesting a more resilient farming system.

After approval from the Department of Agricultural Extension in Rangpur, data collection was carried out by the local NICE team, supported by Professor Dr. Saiful Huda, a teaching professional at Hajee Mohammed Danesh Science & Technology University (HSTU), and the university's recruited enumerators..

Household information

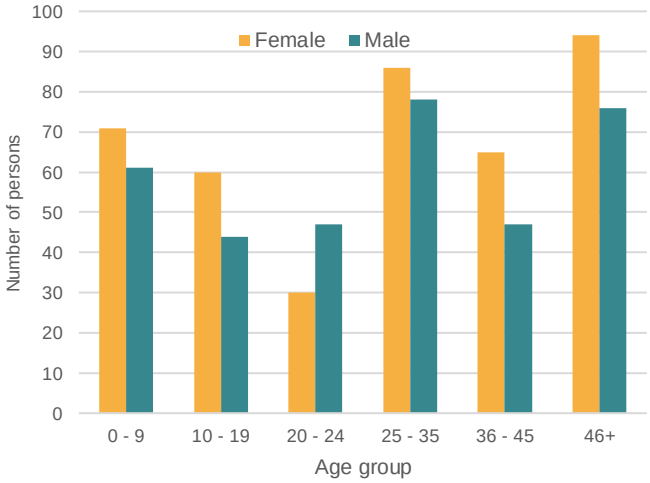

Figure 1: Age group distribution of the sampled household population in Rangpur

In Rangpur, the farmer's survey was carried out across 150 households, covering both urban and peri-urban regions. The respondents were predominantly male (82%,) with a smaller female representation (19%).

The households had an average size of 5.1 members. The age-based gender distribution was relatively even, though females were slightly more prevalent in most age brackets. In youth category (20-24 years), an exception was noted with a higher number of males compared to females.

Farming practices

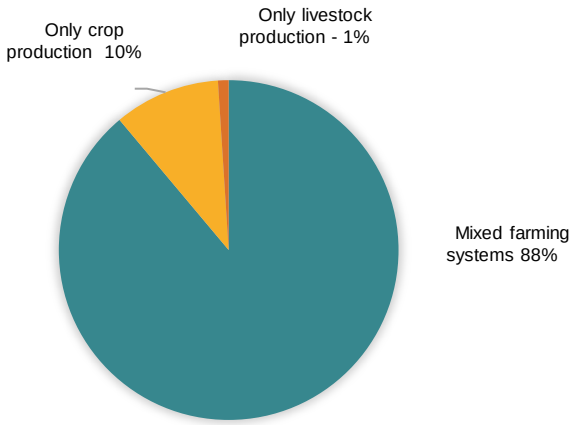

Figure 2: Different farming systems practiced in Rangpur

Mixed farming systems were the most prevalent in Rangpur, with 89% of the surveyed households in Rangpur combining both crop and livestock farming while a minority of 10% exclusively focused on crop production only and a negligible 1% dedicated solely to livestock production. 40% of the respondents also indicated to relay on non-farm income sources besides their revenue from agricultural activities. Still, thorough record keeping was affirmed by only 20% of the respondents, highlighting substantial shortcomings in farm management.

Crops and animals

The diversity of crops grown in Rangpur suggests a multi-faceted agricultural landscape. Rice (89% and potatoes (69%), 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: Household participation in production of crops

Seasonal crops[a]	% of households engaged in production	Perennial crops[b]	% of households engaged in production	Leguminous crops	% of households engaged in production
Rice	89%	**Litchi**	23%	**Alfalfa**	15%
Alfalfa	15%	**Mango**	61%	**Lentils**	23%
Lentils	23%	**Guava**	18%	**Soya bean**	8%
Soya bean	8%	**Lemon**	21%	**Neem**	15%
Neem	15%			**Sesbania**	15%
Sesbania	15%			**Bambara beans**	23%
Bambara beans	23%				
Cauliflower	12%				
Sweet gourd	9%				
Cabbage	7%				
Wheat	4%				

[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.

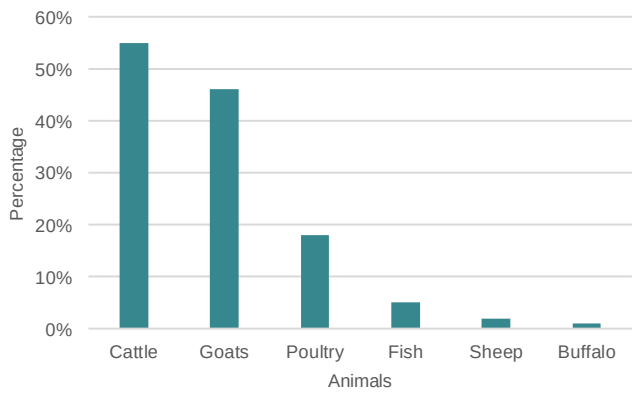

Figure 3: Household participation in production of animals

Among the households interviewed in Rangpur, livestock farming is predominantly focused on cattle and goats, with a considerable majority of households (55% and 44% respectively) engaged in their rearing, followed by poultry (18%) rearing, while only few of the respondents engaged in fish (5%), sheep (2%) or buffalo sheep (1%) farming.

Fertilizers and pest management

The surveyed farmers adopted a variety of approaches to soil fertility management, combining the use of on-farm produced organic inputs with external synthetic inputs. Livestock manure and compost were the most prevalent natural fertilisers, applied by 59% and 53% of farmers respectively. Notably, nearly half of the surveyed farmers produce these on their own farms.

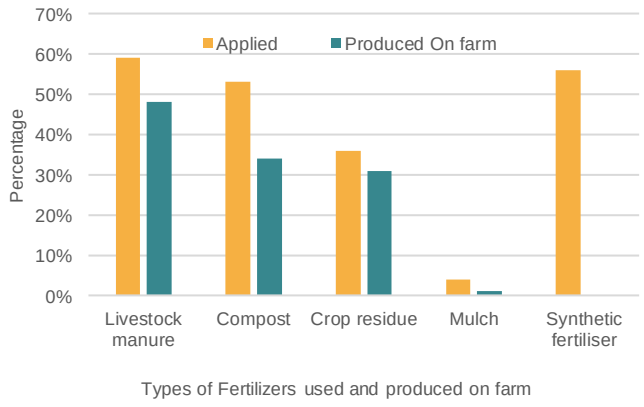

Figure 4: Organic and synthetic fertilizer use in Rangpur

In the surveyed area, a significant 74% of farmers faced challenges due to pests, yet only 25% employed pest management practices in the past 12 months, suggesting potential gaps in resources or awareness. Among the pests, aphids and beetles were the most predominant, affecting 26% and 23% of farmers respectively, emphasizing the need to target these pests for enhanced agricultural productivity.

Seeds varieties and sources

When it comes to seed selection, most farmers (56%) have a strong inclination towards new varieties that are preferred over traditional, local varieties. The opposite is the case for animals, where most farmers (71%) indicated to mainly rely on local breeds.

Agroecological practices

In Rangpur, the sampled households engaged in a variety of agroecological practices. From among the agroecological practices specifically asked for (Figure 5), input reduction, namely partial application of organic pesticides and fertilizers was the most prevalent category of agroecological practices, while besides these, only crop rotation was also affirmed by a third or more of the surveyed households.

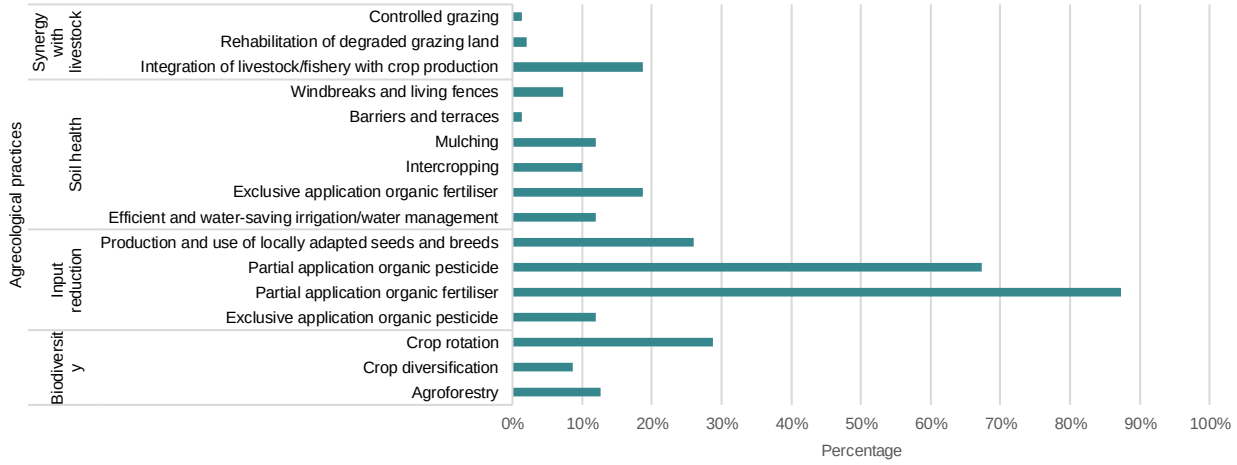

Figure 5: Agroecological practices applied by the respondents. Agroecological practices specifically asked for are in line with definitions used in other projects, e.g. promoted by Swissaid

Market access

Selling locations and prices

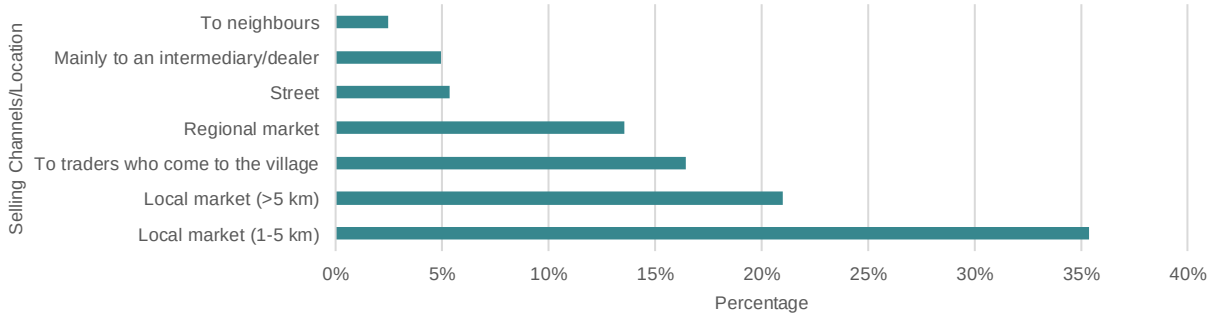

Figure 6: Selling Channels/locations of farming output in Rangpur

The majority of the sales from the interviewed households occurred at local markets, with 35% selling within a 1-5 km radius and 21% beyond 5 km. Direct sales to visiting traders were affirmed by 16% of the surveyed households, while regional markets account for 14%. Less common selling locations include street vending, intermediaries, and direct sales to neighbors, each representing 5% or less of the total.

Post-harvest practices

Post-harvest practices vary from crop to crop. Seasonal crops like rice and potato are primarily consumed immediately, with significant emphasis on transportation to markets. Other crops such as for example mangoes engage in cleaning, sorting, and packaging. Animal-based products also often undergo post-harvest processing.

Women & youth empowerment

Women participation in farming practices

When asked about their participation in agricultural decision-taking, female respondents affirmed the broad prevalence of joint decision-taking in subsistence crop farming, while their decisive power in other agricultural fields such as cash crops, input decisions, or even post-harvest processing decisions was much more limited.

Food consumption

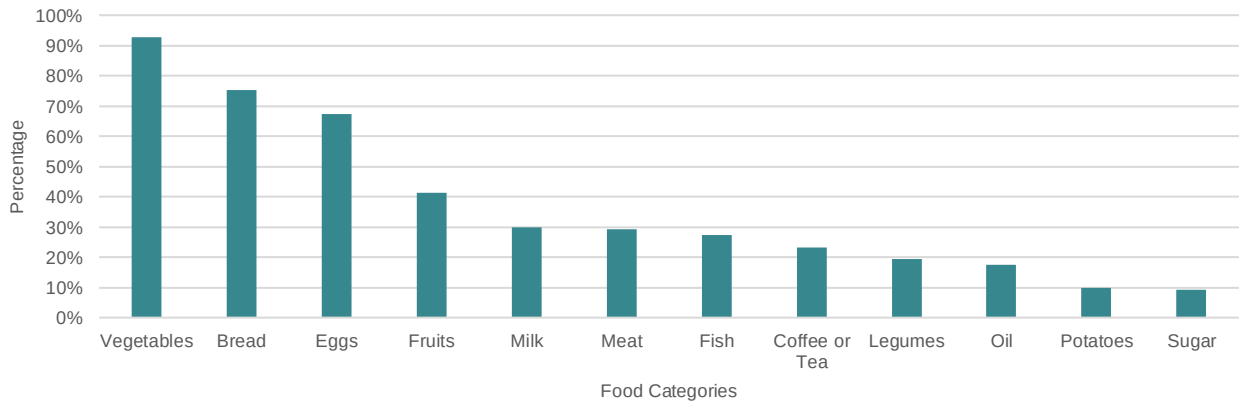

Figure 7: Respondents' household food consumption patterns in the 24 hours prior to the survey

The dietary pattern of the surveyed households in Rangpur reveals a strong inclination towards vegetables and bread consumption. Similarly, eggs also play a critical role in the daily diet, featured in the meals of 67% of households. In contrast, other animal products such as milk and meat were consumed by less than a third of the surveyed household the previous day, as are protein-rich legumes but also coffee and tea or also sugar.

It is important to note that this analysis provides a snapshot of food consumption patterns at the time of the survey without delving into underlying factors such as seasonality of produce or personal dietary habits or requirements.

Farmers' resilience

Figure 8 illustrates scoring on each of the 13 behavior-based resilience indicators evaluated with the SHARP+ tool and provides a detailed assessment of Rangpur's food system resilience.

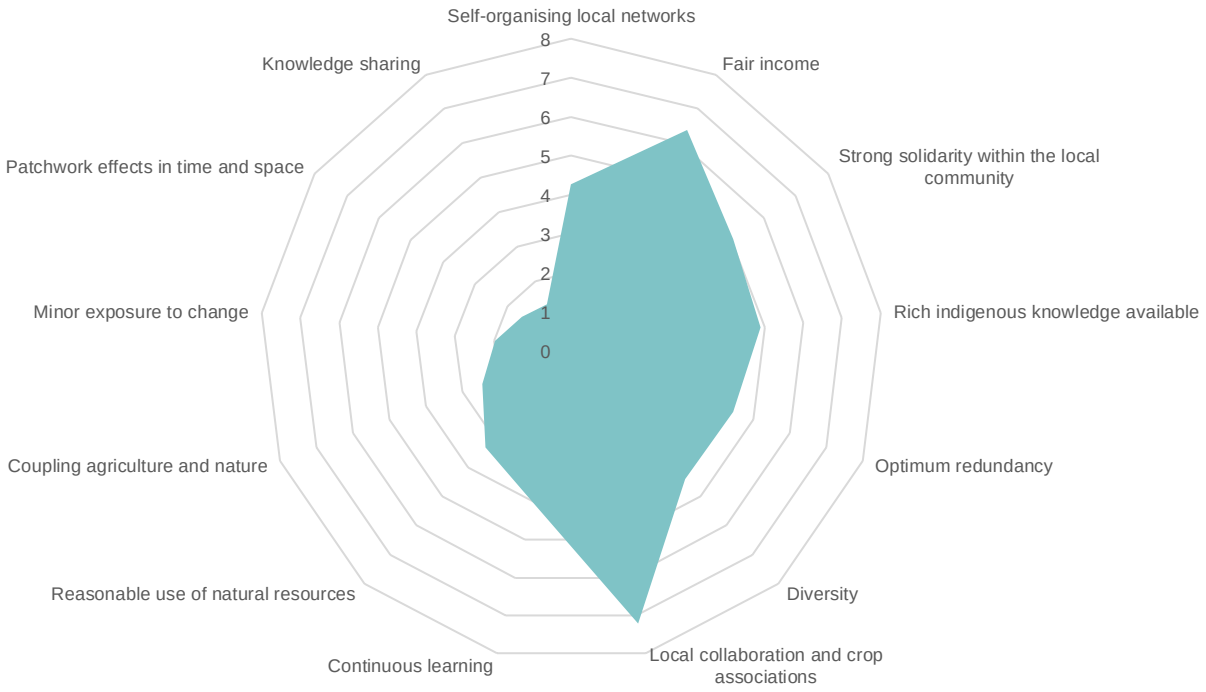

Figure 8: Representation of scoring on the 13 agroecosystem indicators of Cabell & Oelofse (2012)

The standout strength of the surveyed farmers and small holders in Rangpur is their substantial social infrastructure, as underscored by a score of 7.2/10 for 'local collaboration and crop association' reflecting the surveyed community's adeptness at forging connections and synergies between different farming elements. Furthermore, the 'fair income' indicator (6.4/10) exhibits a fairly sustainable livelihood with an adequately consistent financial stability. Additionally, the 'strong Solidarity within the Local Community' (5.1/10) highlights the ability to foster local cooperation and collaboration among the farming system' actors, while preserving a degree of independence of external inputs and challenges.

The surveyed community's approach to knowledge and learning presents a mixed picture. 'Rich indigenous knowledge available' scores 4.9/10, and 'continuous learning' scores 4.1/10: They exhibit a moderate level of community's commitment to preserving and incorporating traditional knowledge into farming and indicating potential room for growth in adopting new and adaptive learning processes.

Several indicators also highlight areas of concern that need prompt attention especially in the ecological dimension. 'Reasonable use of natural resources' and 'coupling agriculture and nature' only score 3.3/10 and 2.4/10, respectively, revealing a pressing need for more sustainable resource management and better integration of agricultural practices with the natural environment. Alarmingly low scores in 'patchwork effects in time and space' (1.5/10), and 'knowledge sharing' (1.4/10) signal significant vulnerabilities and underscore the community's limited exposure to and preparation for environmental changes, a lack of diversity in land use, and insufficient knowledge exchange infrastructure, all of which are critical for resilience.

Overall, the surveyed population of Rangpur showed commendable strong resilience in both social and economic spheres while targeted interventions are especially needed in the domains of knowledge dissemination, farming practice diversification, and fortifying community bonds, as suggested by certain lower resilience metric scores.

Authorship: Tshering Lhamo, Agri-Food Sustainability Consultant with guidance from ETH Zurich and Sophie van den Berg Consulting

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