NUTRITION *in* CITY ECOSYSTEMS

March 2022

FARMERS' SURVEY

BANGLADESH

Key insights into farming systems in **Dinajpur**

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 Dinajpur, Bangladesh. Dinajpur municipality is part of the wider Dinajpur district in north-western Bangladesh. In terms of climate, Dinajpur faces few but heavy rains during the monsoon. Average daily temperatures for much of the year are around 30°C, and about 16°C from November to January. Dinajpur's economy mainly depends on agriculture with a strong focus on rice production.

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 Dinajpur, 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.
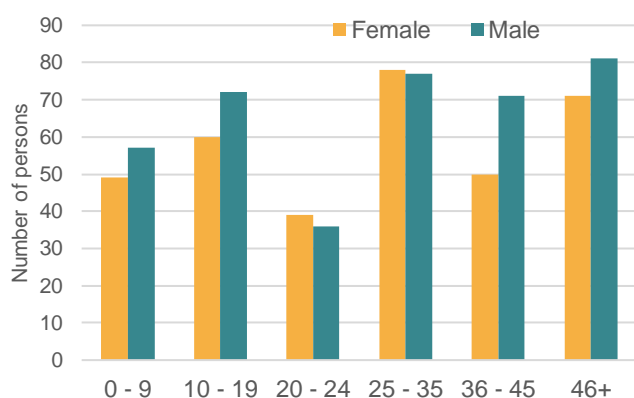
Household information

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

The farmer's survey in Dinajpur covered 150 households from urban and peri urban areas. The respondents were predominantly male (88%) with a smaller female representation (12%) despite the fact that up to 45% of the households were reported to be headed by women. The surveyed population showed a balanced distribution of gender across most age groups, with slight variations. The average household size was 4.9 members.
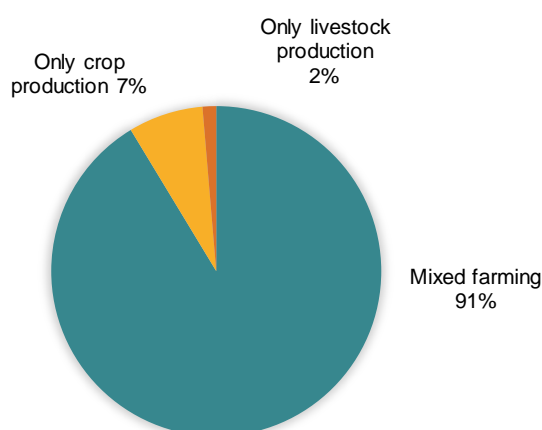
Farming practices

Figure 2: Different farming systems practiced in Dinajpur

Mixed farming systems were the most prevalent in Dinajpur, with 91% of the surveyed households in Dinajpur combining both crop and livestock farming while a minority of exclusively focused on crop production only and a negligible 2% dedicated solely to livestock production. 51% 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 17.6% of the respondents, highlighting substantial shortcomings in farm management.

Crops and animals

The diversity of crops grown in Dinajpur suggests a multi-faceted agricultural landscape. Rice (91% and potatoes (77%), 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	91%	Litchi	36%	Alfalfa	27%
Potato	77%	Mango	61%	Lentils	27%
Bitter gourd	38%	Lemon	15%	Soya bean	18%
Brinjal	37%	Guava	13%	Neem	9%
Tomato	31%			Sesbania	9%
Cauliflower	19%			Lucerna	9%
Chilli	19%				
Cucumber	19%				
Cabbage	17%				
Sweet gourd	9%				
Wheat	3%				
Drumsticks	3%				
Bottle gourd	1%				

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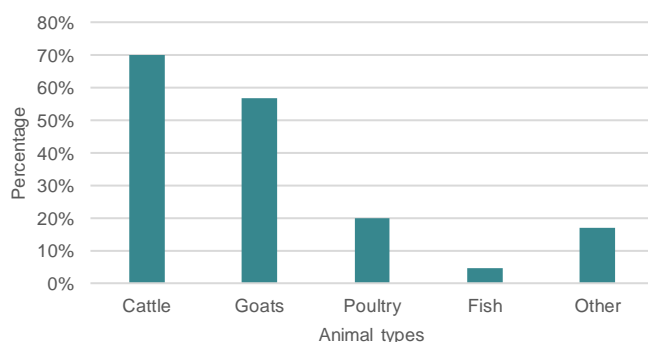[b] Perennial crops are plants that live for multiple years and produce crops year after year.

Among the households interviewed in Dinajpur, livestock farming is predominantly focused on cattle and goats, with a considerable majority of households (70% and 57% respectively) engaged in their rearing, followed by poultry (20%) while only few of the respondents are engaged in fish farming (5%).

Figure 3: Household participation in production of animals
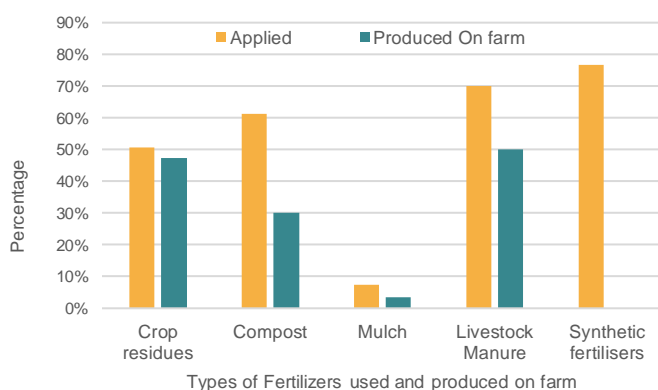
Fertilizers and pest management

The sampled population adopted a variety of approaches to soil fertility management, combining the use of on-farm produced organic inputs with external synthetic inputs. While a large majority of farmers preferred synthetic fertilizers (77%), organic fertilizers are also widely used (70% apply livestock manure, 51% use crop residues and 61 apply compost).

In the surveyed population, pests affected a substantial 72% in the past, and the most significant threats to crops were borer, brown hopper, and beetles, impacting 38%, 23%, and 20% of households, respectively.

Figure 4: Organic and synthetic fertilizer use in Dinajpur

Seeds varieties and sources

When it comes to seed selection, most farmers (75%) have a strong inclination towards local, traditional breeds in livestock farming, but new varieties in crop farming (76%).

Agroecological practices

The data quantifies the diverse adoption of agroecological practices in Dinajpur, highlighting both successful implementations and areas with room for enhancement to support biodiversity, soil health, and sustainable agriculture in the region.
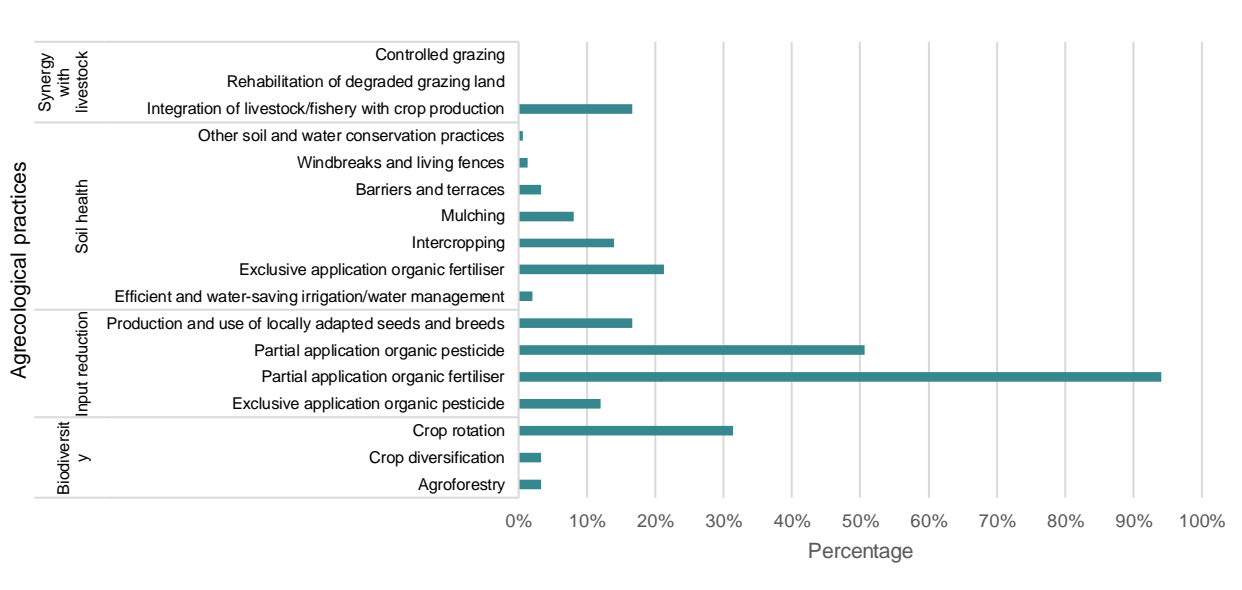

Figure 5: Agroecological practices applied by the respondents. Agroecological practices specifically asked for are in line with definitions used in other projects, e.g. promoted by Swissaid.

In Dinajpur, 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.

Market access

Selling locations and prices

The majority of the sales from the interviewed households occurred at local markets, with 31% selling within a 1-5 km radius and 25% beyond 5 km. Regional markets (17%) also played a substantial role in sales, suggesting that some farmers are willing to travel greater distances to reach larger, potentially more lucrative markets. Selling to traders visiting the village (13%) and to intermediaries (5%) is also a notable option enabling farmers to reach buyers without having to travel long distances. Informal street vending, selling to neighbors and public procurement are rare in Dinajpur.
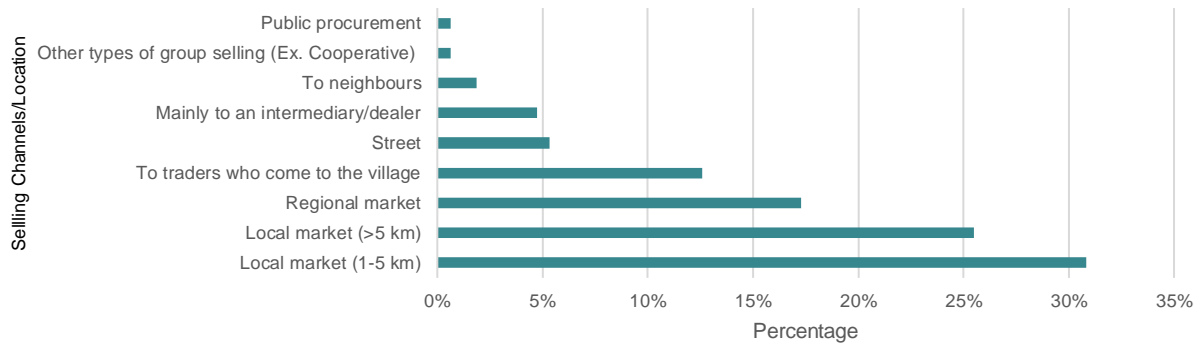
Figure 6: Selling Channels/locations of farming output in Dinajpur

Post-harvest practices

Post-harvest practices vary from crop to crop and from animal to animal. In Dinajpur cattle products for example are immediately consumed by many households as a source of fresh meat or dairy products. Many households engage in the direct transformation of cattle-derived raw materials such as dairy, while in contrast, smaller animals like goats, fish, poultry, and bees, are less frequently consumed directly and are less often transformed for various purposes. Similarly, for crops, immediate consumption is a common practice, especially for staples such as rice, potatoes, mangoes, and litchis that are just transported and distributed if not consumed immediately.

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
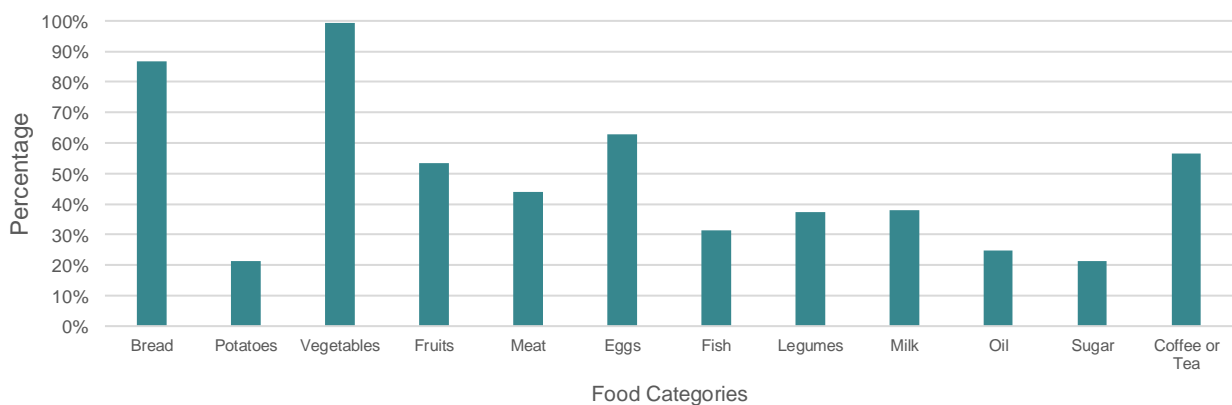

Figure 7: Respondents' household food consumption patterns in the 24 hours prior to the survey

The dietary pattern of the surveyed households in Dinajpur reveals a strong inclination towards vegetables and bread consumption. Also, eggs, coffee or tea, and fruits were consumed by more than half of the surveyed households the previous day, while less than half of the surveyed households consumed fish, meat, legumes or milk the previous day.

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 Dinajpur's food system resilience.
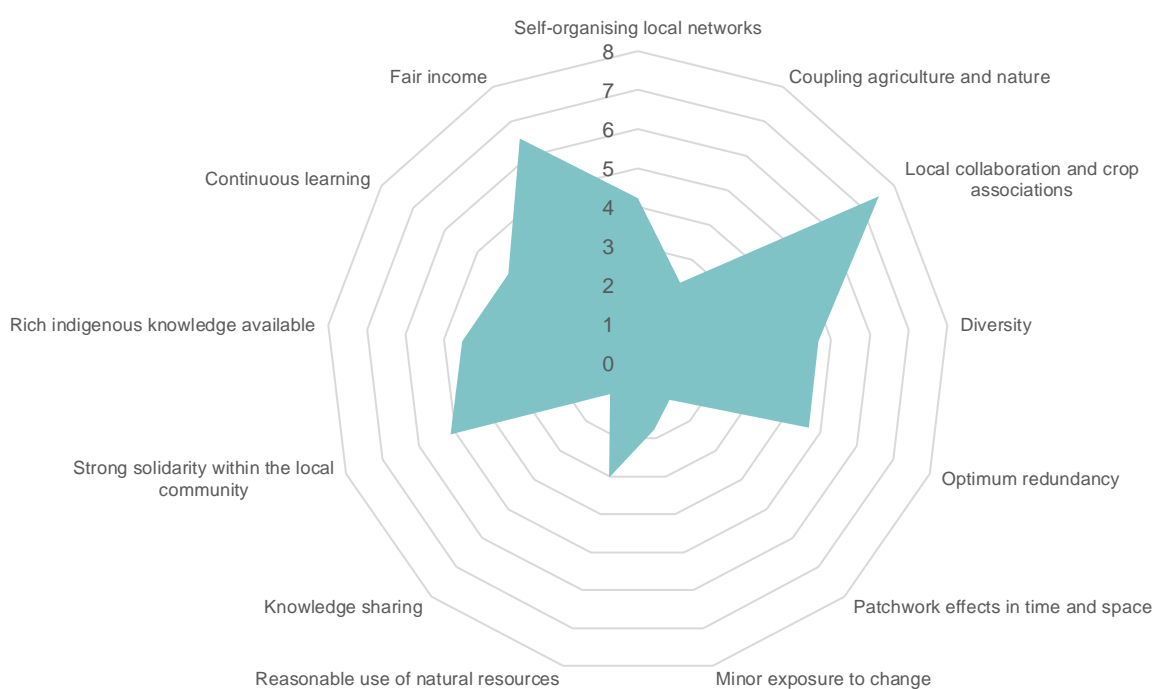

Figure 8: Representation of scoring on the 13 agroecosystem indicators of Cabell & Oelofse (2012)

The standout strengths of the surveyed farmers and small holders in Dinajpur lay in the following three indicators: A) 'local collaboration and crop associations' (7.5/10) indicator reflecting the community's adeptness at forging connections and synergies between different farming elements. B) the 'strong solidarity within community' (5.1./10) score highlighting the ability to foster local cooperation and collaboration among the farming systems' actors, while preserving a degree of independence of external inputs and challenges. And C) the 'fair income' (6.5/10) score, suggesting potential for financial stability among residents.

The surveyed community's approach to knowledge and learning presents a mixed picture. 'Rich indigenous knowledge available' scores 4.5/10 and shows the commitment to safeguarding indigenous knowledge, which is vital for maintaining cultural and knowledge-based resilience rooted in the community's traditions and practices. 'Continuous learning' scores 4.04/10 only.

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 2.33/10 and 2.3/10, 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' (1.3/10), and 'knowledge sharing' (1.0/10) 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. Households are characterized by a low ability to withstand low-level disruptions without significant adverse effects, expressed in the indicator 'minor exposure to change' (1.8/10).

Overall, the surveyed population of Dinajpur 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.

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