

Agricultural production and use in Nalanda, India

Crop, homestead, livestock, and fish cultivation & use

Data Note 44

December 2023

ABOUT THIS TAFSSA DATA NOTE

The TAFSSA district food systems assessment aims to provide a reliable, accessible and integrated evidence base that links farm production, market access, dietary patterns, climate risk responses, and natural resource management in Bangladesh, India, and Nepal. It is intended to be a multi-year assessment. This data note summarizes data collected in March-April 2023 to describe what smallholder farmers are cultivating and what they do with the farm products produced. It is part of a pack of data notes that, together, provide a holistic picture of the food system in the district. The survey methodology is briefly summarized in the penultimate page of this data note.

Figure 1. Research location in Nalanda District, India

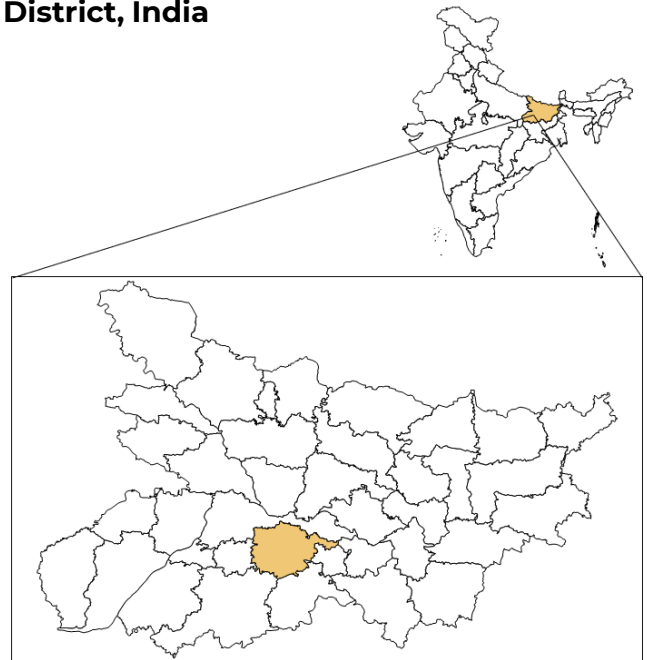
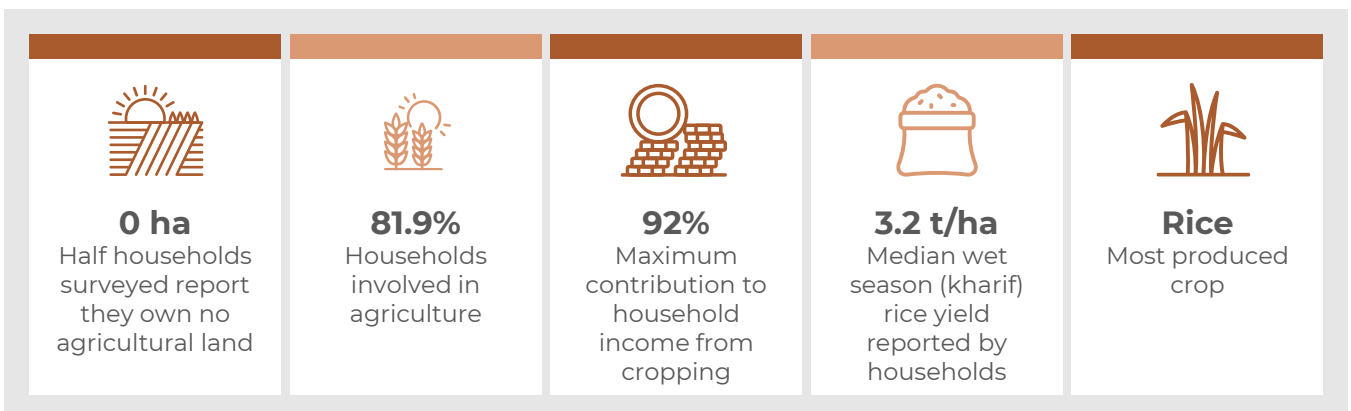


Figure 2. Highlights from this data note



AGRICULTURAL PRODUCTION DATA NOTE OVERVIEW

This data note summarizes information provided by households in Nalanda District in India. It starts with a general overview of agricultural productivity, followed by more detailed information on crop production, the use and sale of crops, livestock and livestock-derived food production, and the use and sale of animals and animal products. Finally, information is provided on households' production of "sentinel foods," i.e. 25 commonly consumed foods or food groups whose production and consumption are being tracked across the TAFSSA Initiative's learning landscapes throughout South Asia.

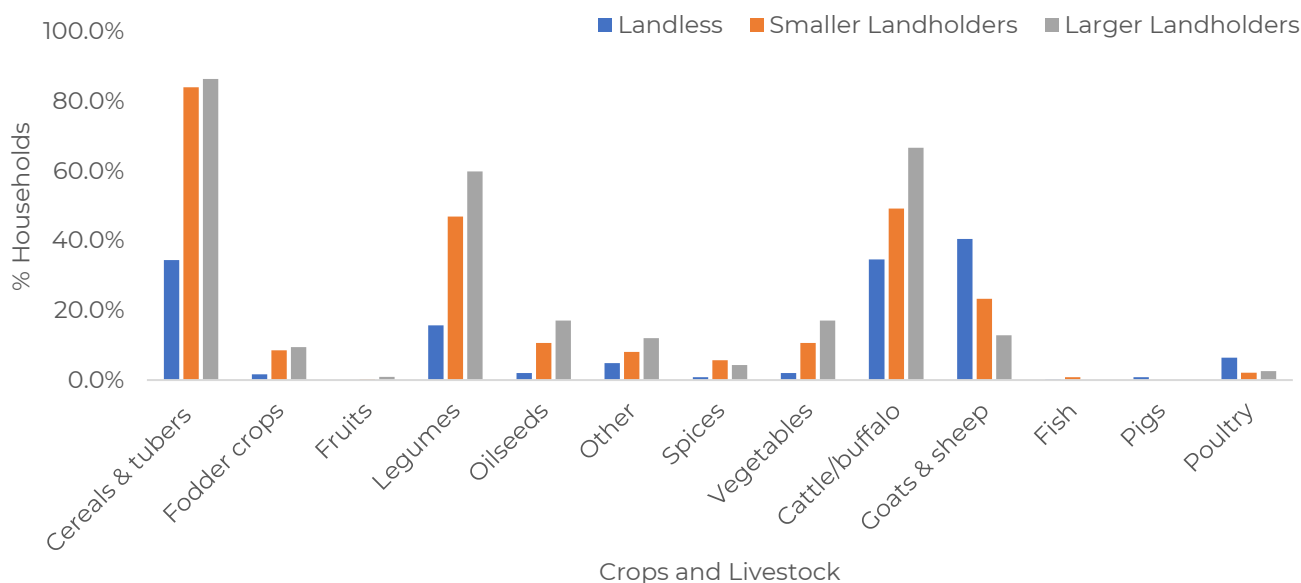
Households have been categorized into three groups based on landholding size. Of the surveyed households, 21% own no land and are referred to here as "Landless," and 38% of surveyed households own between 0 and 0.5 hectares and are considered "Smaller Landholders." The remaining 12% of surveyed households own more than 0.5 hectares, and are termed "Larger Landholders."

Table 1. Key characteristics of each household group

Household group	Landholding size	Proportion of total households	Proportion engaged in agriculture	Proportion owning land	Proportion where women own land
Landless	0 ha	50%	33.8%	0.0%	3.4%
Smaller Landholders	0-0.5 ha	38%	36.9%	100.0%	5.8%
Larger Landholders	> 0.5 ha	12%	11.2%	100.0%	3.3%
Total	n/a	100%	81.9%	50.0%	12.5%

- ✓ Over 80% of households with land produce cereals & tubers. At least 46.9% of these households produce legumes and at least 49.2% cattle/buffalo.
- ✓ More Landless households produce goats & sheep (40.4%) than produce cattle/buffalo (34.6%), cereals & tubers (34.4%) or legumes (15.7%).
- ✓ Small ruminant ownership is lower in households with land than in Landless households.

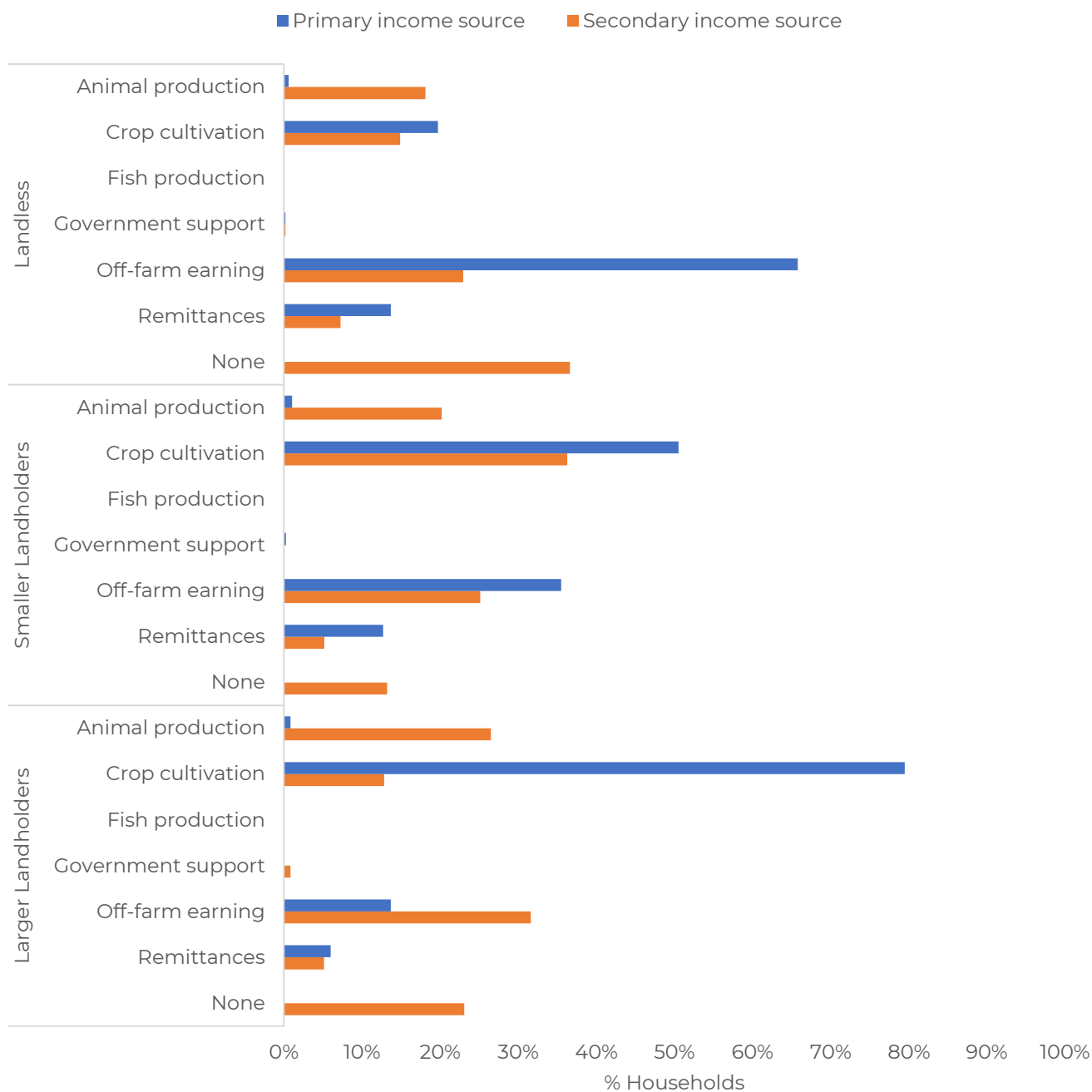
Figure 3. Crop production and livestock ownership in each household group



HOUSEHOLD INCOME SOURCES

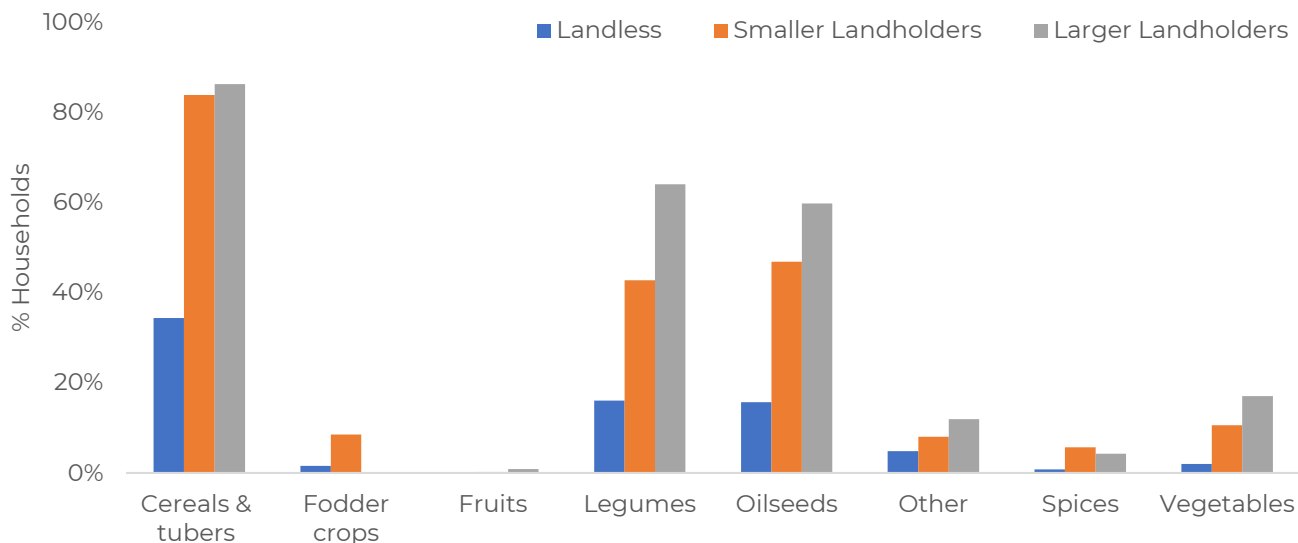
- ✓ Crop cultivation is the primary income source for 79.5% of Larger Landholder households and 50.5% of Smaller Landholder households.
- ✓ Off farm earnings are the primary income source for 65.8 % of Landless households.
- ✓ Animal production is a key secondary source of income for 18.1% of Landless households, 20.2% of Smaller Landholder households, and 26.5% of Larger Landholder households.

Figure 4. Primary and secondary sources of income in each household group



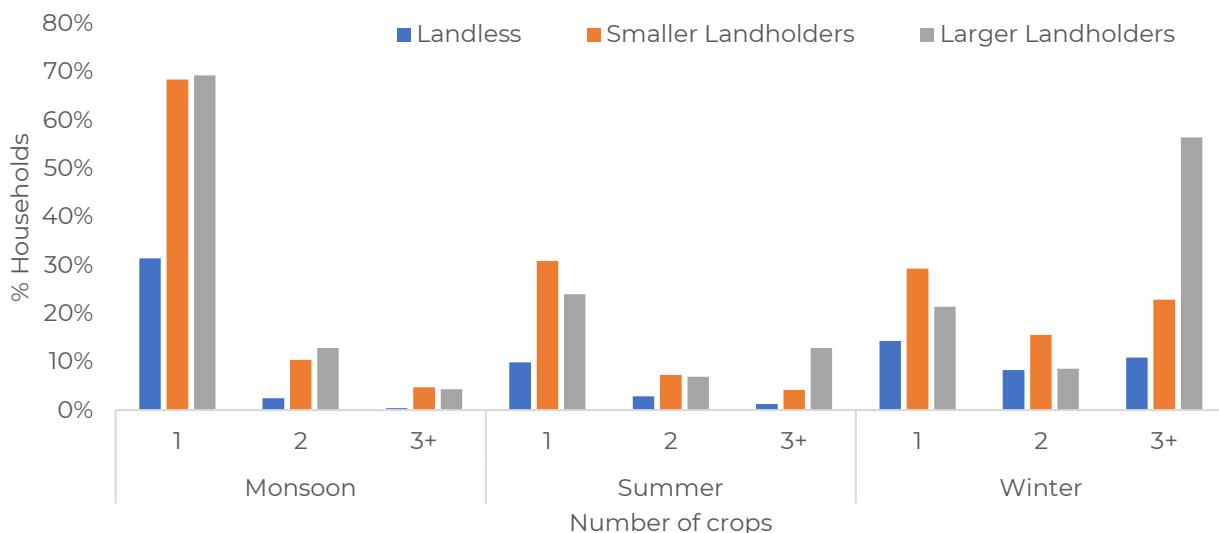
CROP PRODUCTION

Figure 5. Production of major crops by each household group



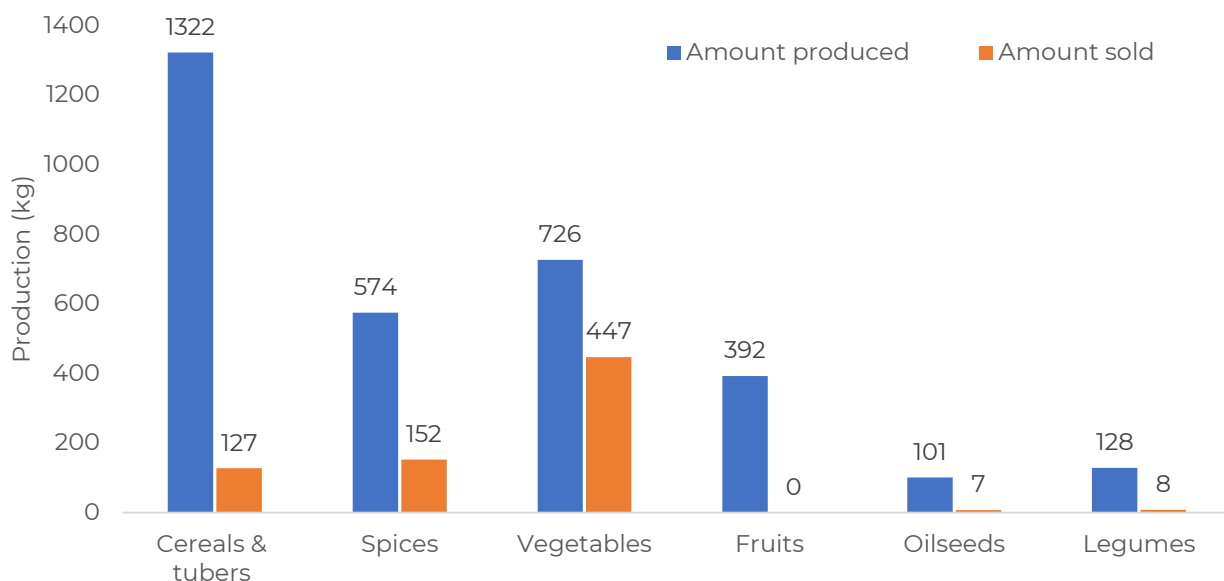
- ✓ Cereals (primarily rice and wheat), legumes (dals) and oilseeds (mustards) are the most widely produced crops.
- ✓ Smaller and Larger Landholders produce about the same amounts of cereals & tubers, while Larger Landholders produce more legumes and oilseeds than Smaller Landholder or Landless households.
- ✓ Vegetables and spice crops are more commonly grown by households with land.
- ✓ Many households grow one crop in the monsoon (kharif) season, which is when water-intensive rice is most likely to be produced, reducing irrigation requirements.
- ✓ Over half of Larger Landholder households (56.4%) grow three or more crops in the dry winter (rabi) season, which suggests access to water resources (irrigation) to facilitate crop growth.

Figure 6. Number of crops grown each season by each household group



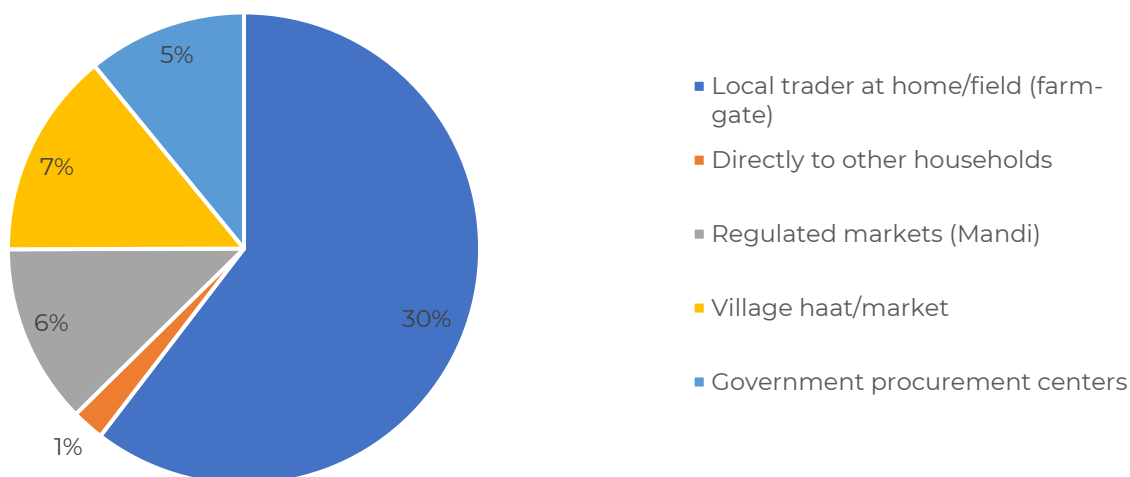
PRODUCTION AND SALE OF CROP PRODUCTS

Figure 7. Average annual per-household production and sale of major crop products, for households which sell crop products



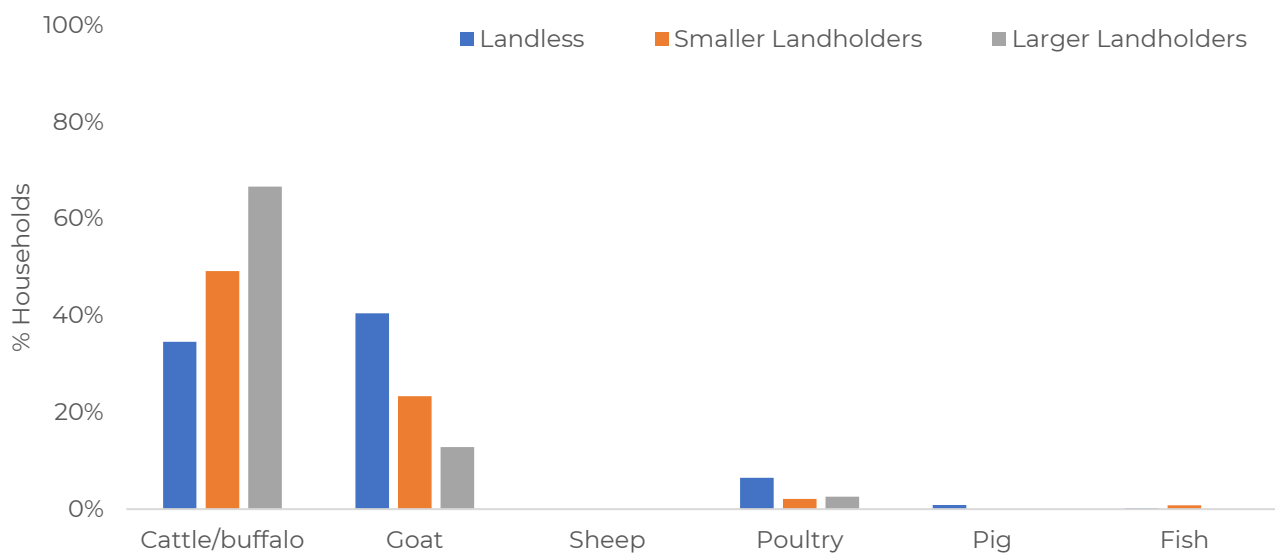
- ✓ Households sell proportionally more vegetables (61.6% of amount produced) than other crops.
- ✓ Proportionally higher amounts of legumes (93.8%), oilseeds (93.0%), cereals & tubers (90.4%), and spices (73.5%) are retained for home consumption.
- ✓ Half of households (51%) do not sell farm products, regardless of farm size (data not shown).
- ✓ When farm products are sold, 30% of households sell to local traders at the farm gate, with fewer than 10% of households selling products at regulated markets (mandis), at local markets (haats), or to government procurement centers.

Figure 8. Places where households sell farm products



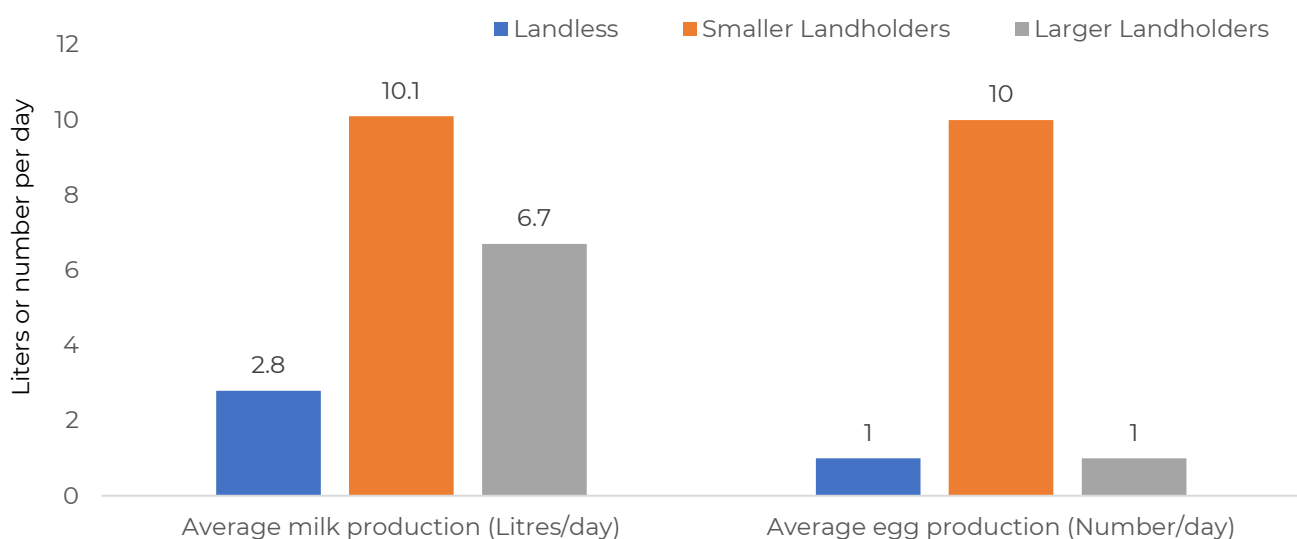
PRODUCTION OF LIVESTOCK AND LIVESTOCK-DERIVED FOODS

Figure 9. Livestock cultivation in each household group



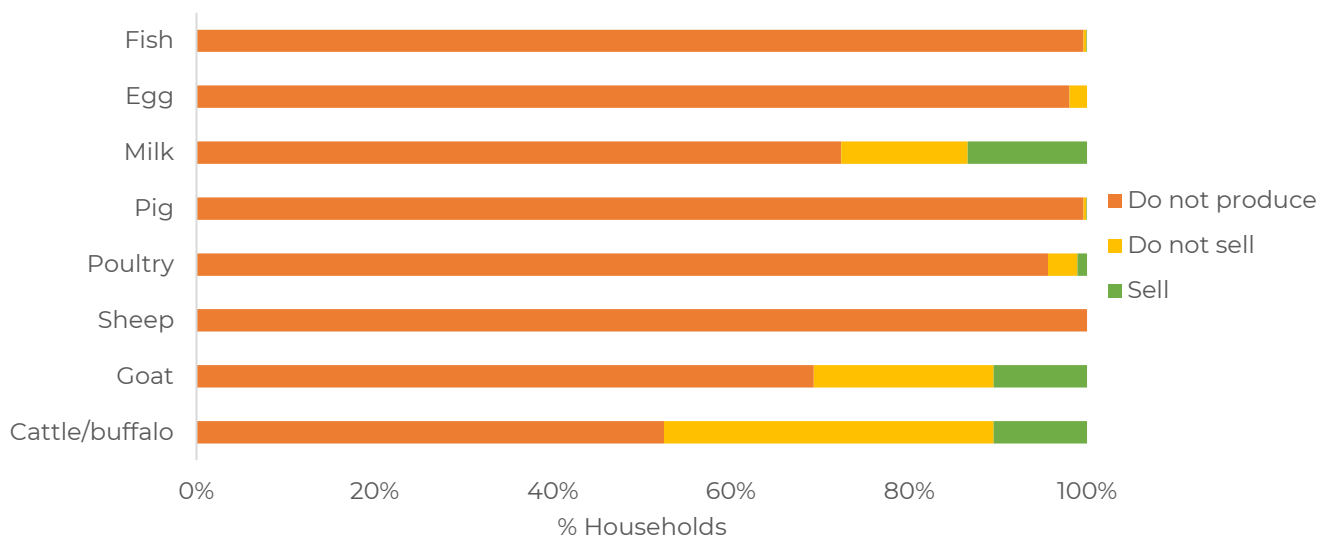
- ✓ Cattle/buffalo are owned by more households with land. At least a third of households (34.6%) in all groups own cattle/buffalo.
- ✓ Goats are owned by 40.4% of Landless households and by 12.8-23.3 % of households with land. Goats are more efficient and easier to produce on less land than larger ruminants like cattle/buffalo.
- ✓ Poultry is owned by 6.4% of Landless households, and by fewer households with land.
- ✓ Daily average milk production is highest in households with land, particularly for Smaller Landholder households. This may reflect the higher quality of feed these households are able to provide to their livestock
- ✓ While Smaller Landholder households produce more eggs per day than Larger Landholder or Landless households, most households in this district do not produce eggs (see Figure 11).

Figure 10. Milk and egg production in each household group



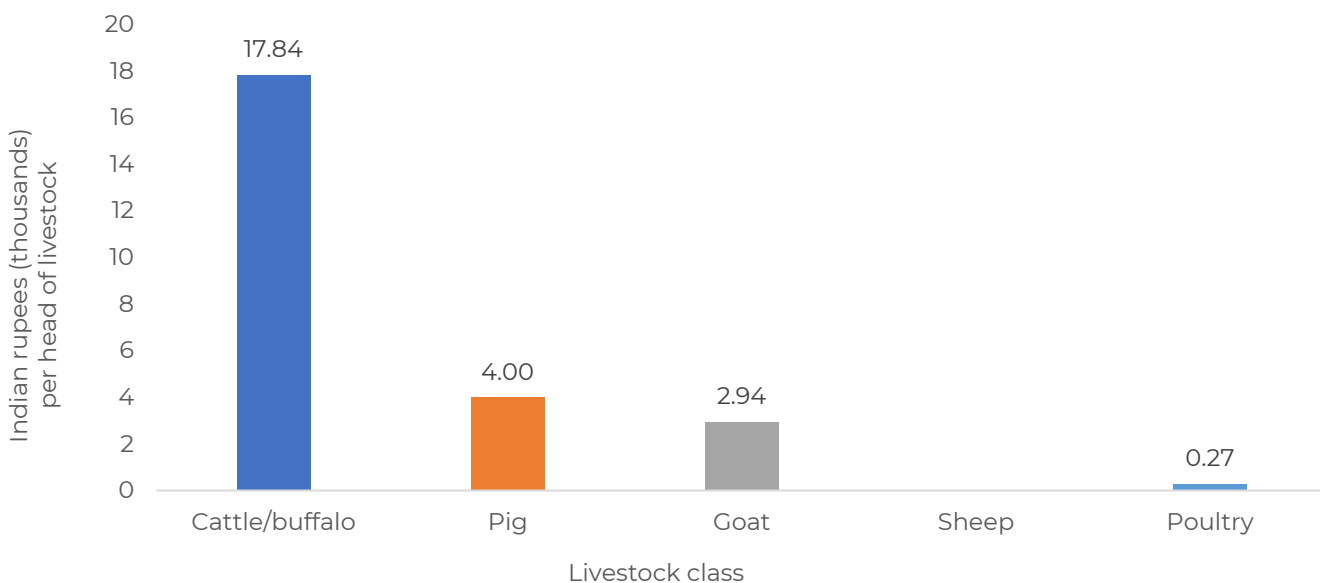
USE AND SALE OF LIVESTOCK PRODUCTS

Figure 11. Households producing, selling or retaining livestock products



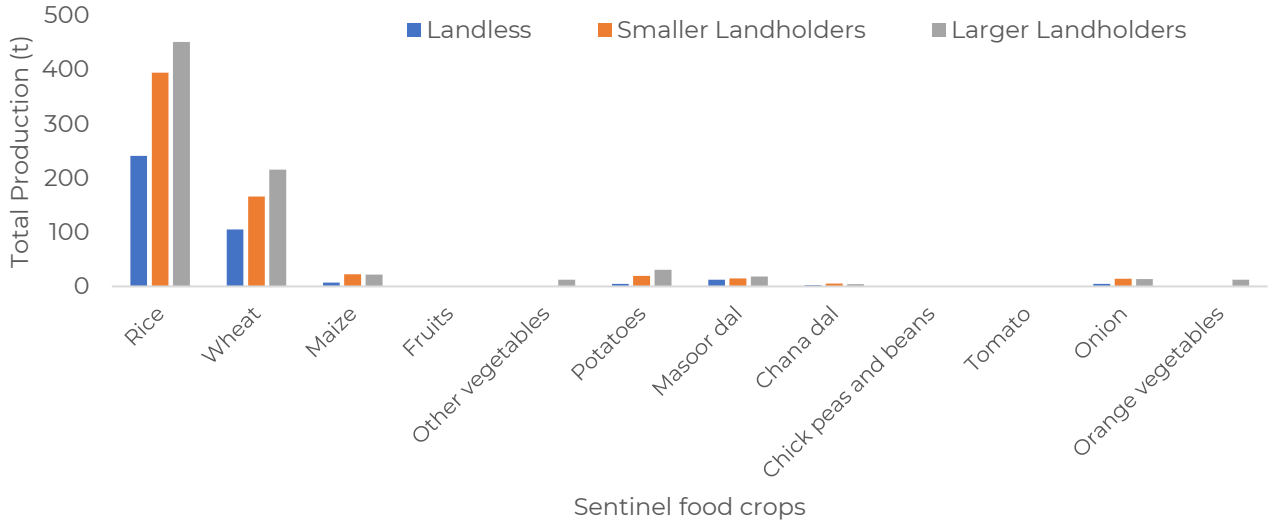
- ✓ Cattle/buffalo, goats, and milk are the most commonly produced animal products, produced by 47.5%, 30.7% and 27.6% of households, respectively.
- ✓ Most households that produce cattle/buffalo, goat and milk products consume more than they sell of these products.
- ✓ Poultry, eggs, fish, pigs, and sheep are each produced by fewer than 5% of households.
- ✓ Farm gate prices are considerably higher per head for cattle/buffalo than for pigs or goats.
- ✓ Poultry prices are low, and many flocks may be self-replicating.

Figure 12. Average farmgate livestock prices



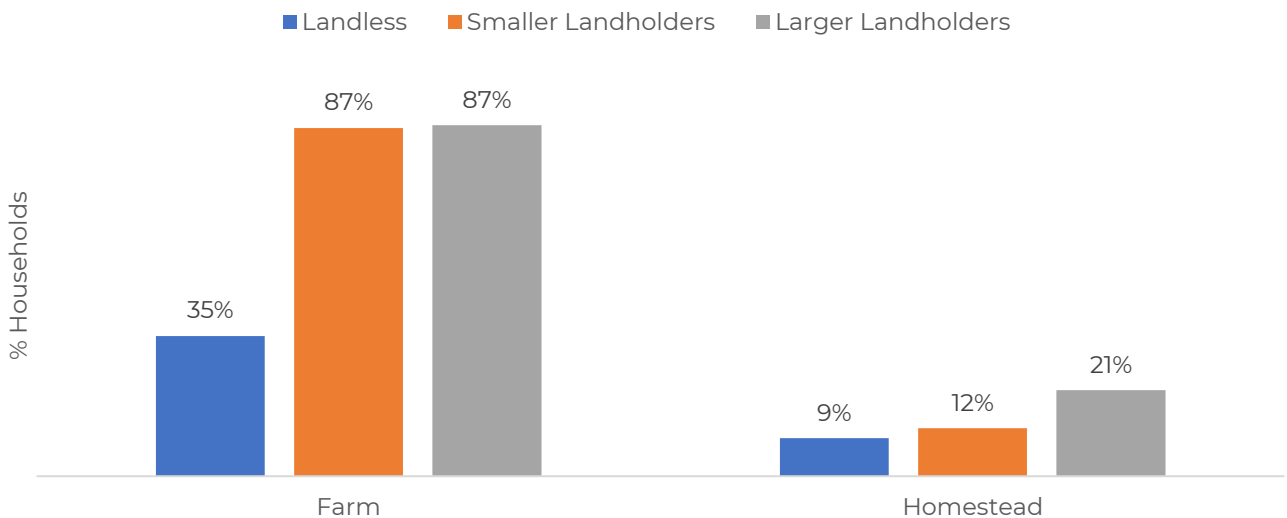
PRODUCTION AND SOURCES OF SENTINEL¹ FOODS

Figure 13. Annual production of sentinel food crops by each household group



- ✓ Across all household groups rice and wheat are the most-produced sentinel crops, and few non-cereal sentinel crops are produced.
- ✓ Production of sentinel foods varies with landholding size, with Smaller and Larger Landholder households producing more, in absolute terms, than Landless Landholders.
- ✓ In Smaller and Larger Landholder groups, most households (87%) use the farm to produce sentinel foods, and 12-21% of households use the homestead.
- ✓ For the Landless group, a third of households (35%) produce sentinel foods on the farm, and 9% in the homestead.

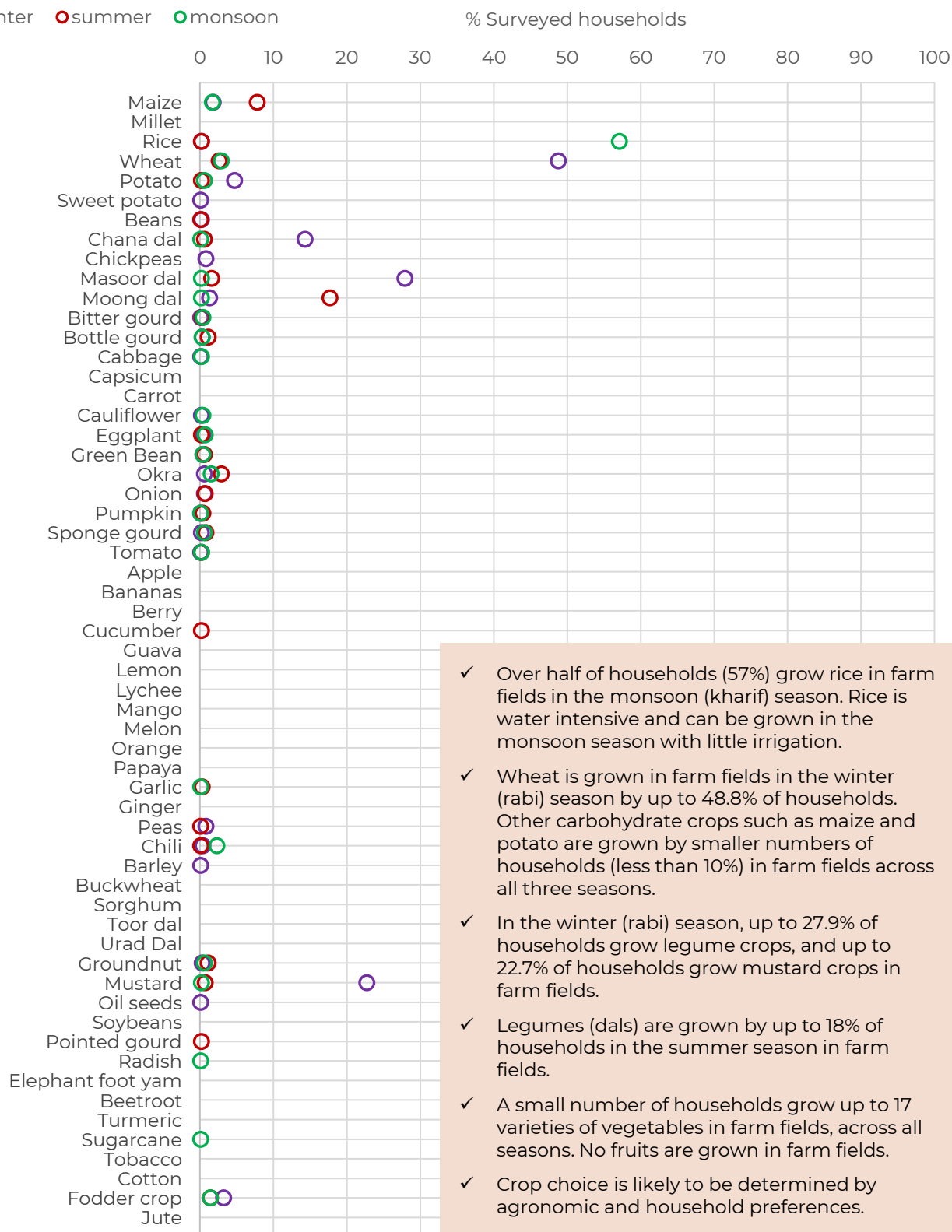
Figure 14. Where household groups produce sentinel foods



¹ The 25 sentinel foods/food groups monitored in TAFSSA's learning landscapes are: rice; wheat; maize; millets; moong dal; masoor dal; chana dal; chickpeas and beans; potato; poultry; fish; other meat; eggs; milk; orange vegetables; green leafy vegetables; onions; tomatoes; fruits; instant noodles; chips, biscuits and baked sweets; deep fried food; soda, soft drinks and packaged juices; and tea or coffee with sugar.

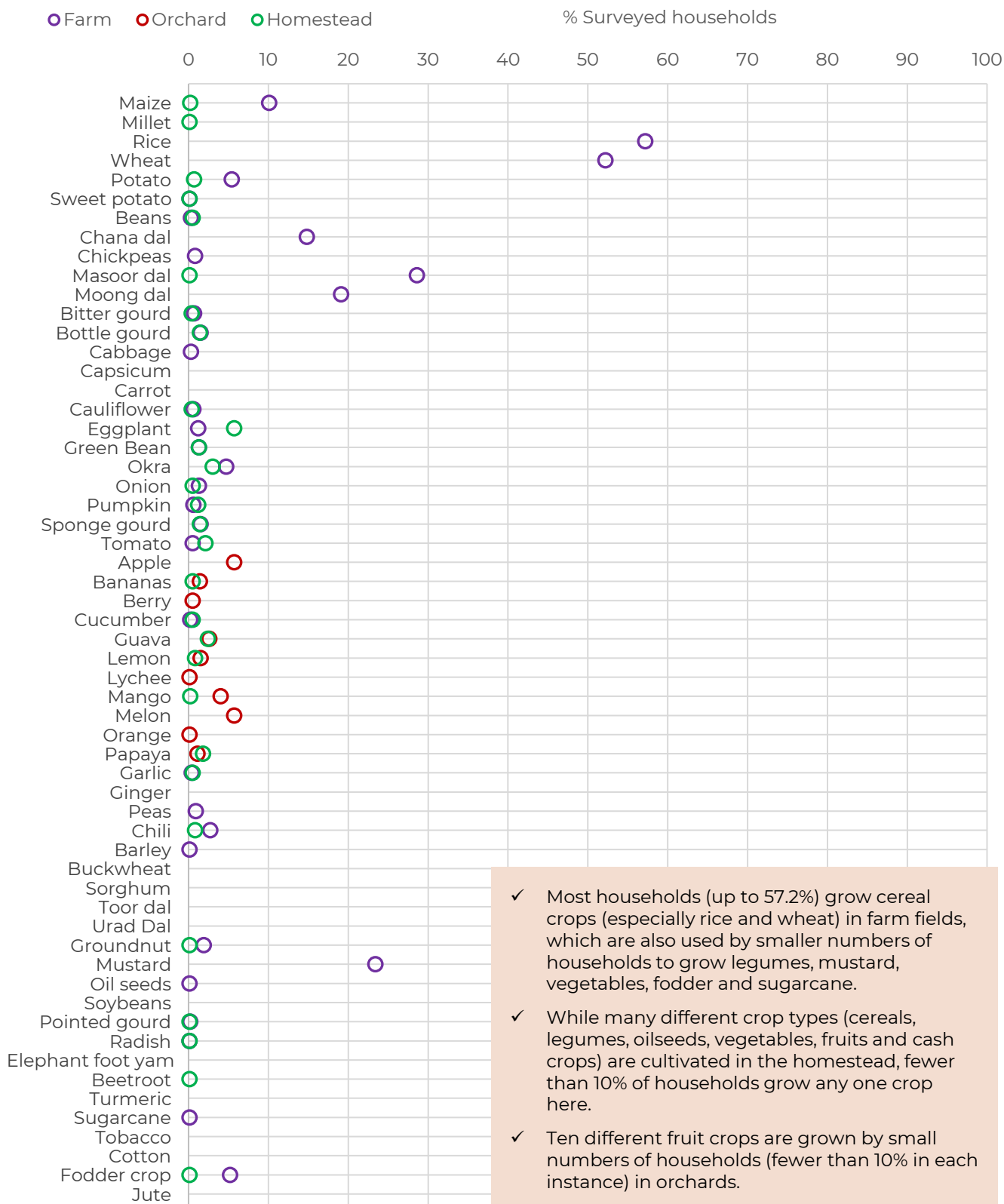
SEASONALITY OF FOOD AND OTHER CROPS

Figure 15. Food and other crops produced each season in farm fields



WHERE FOOD AND OTHER CROPS ARE GROWN

Figure 16. Where food and other crops are produced



KEY TAKEAWAYS

1. Most households (81.9%) identify as engaging in agriculture, with half (50%) being Landless and 38% owning less than 0.5 ha land.
2. Households consume most of what they grow on their farms.
3. Diversity in the number of crops grown is low in the monsoon (kharif) season when most rice is produced, and higher in the winter (rabi) season, particularly for Larger Landholder households where 56% grow more than three winter-season crops.
4. Ruminants are the most widely cultivated livestock classes, with half or more of Smaller and Larger Landholder households owning cattle/buffalo, and 40% of Landless households owning goats.
5. While most livestock are retained for domestic use or consumption up to half of milk produced is sold.
6. While half of households do not sell any farm products, those which are sold are mainly bought by middlemen at the farmgate.
7. Crops are the largest primary income source for Smaller and Larger Landholder households, and livestock is an important secondary income source for all three household groups.

KEY QUESTIONS FOR ACTION

1. What are the key barriers to improving farming system productivity in the district?
2. What are potential solutions to overcoming these barriers? What is needed from decision-makers and from program teams to implement these solutions?
3. How can women and men farmers be supported and enabled by decision-makers and program teams?
4. How can more marginal farmers be supported to increase their productivity?

SURVEY METHODOLOGY

Village and household sampling

We selected 25 wards in the district with a probability proportional to the number of households living in each village. Within each village we conducted a household listing to identify eligible households, i.e. those with adolescents (10-19 years old). From the households with adolescents we randomly invited 20 households to participate in the survey. If a household refused we replaced that household with another randomly selected eligible household to retain a total of 1,000 households in the district. Thus the findings reported in this data note are representative of rural households from this district which include an adolescent.

Respondent selection

Within households one adult female aged 20+ years, one adult male aged 20+ years, and one adolescent aged 10-19 years were selected as the respondents for the survey. When multiple adolescents were living in a household the oldest adolescent was selected. In some households an adult male was not available (often due to migration for work). In such households the female was the only adult respondent. At the beginning of the interview the adult in the household primarily involved in agriculture (either male or female) and the adult primarily responsible for food purchasing (either male or female) were identified as the primary respondents.

AUTHORS

Alison Laing, Agroecologist Specialist, CIMMYT
Mustafa Kamal, GIS & Remote Sensing Specialist, CIMMYT

Asif Al Faisal, Data Analyst, CIMMYT

Saral Karki, Research Associate, CIMMYT

Baishakhee Pashari Druti, Intern, CIMMYT

Ravi Nandi, Innovation Systems Scientist, CIMMYT

Neha Kumar, Senior Research Fellow, IFPRI

Avinash Kishore, Senior Research Fellow, IFPRI

Mahesh Gathala, Senior Scientist, CIMMYT

Timothy Krupnik, Regional Director, Sustainable Agrifood Systems Program, Asia, CGIAR Country Convener, CIMMYT Country Representative for Bangladesh

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<https://www.cgiar.org/funders/>

To learn more, contact: a.laing@cgiar.org

To learn more about TAFSSA, contact: t.krupnik@cgiar.org; p.menon@cgiar.org

ABOUT TAFSSA

TAFSSA (Transforming Agrifood Systems in South Asia) is a CGIAR Regional Integrated Initiative that supports actions improving equitable access to sustainable healthy diets, that boosts farmers' livelihoods and resilience, and that conserves land, air, and water resources in a climate crisis.

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