



Understanding Local Food Systems in South Asia: An Assessment Approach and Design

Methods Note # 1

December 2022

BACKGROUND

Home to one-quarter of humanity—one-fifth of whom are youth—South Asia has the world's largest concentration of poverty and malnutrition (1–3). Despite producing one-quarter of the world's consumed food, the region's agrifood systems face formidable challenges in producing an adequate and affordable supply of the diverse foods needed for sustainable healthy diets (4,5). Unhealthy food consumption is rising, and farming systems are threatened by unsustainable groundwater withdrawal due to poorly developed food and energy policies. In addition, South Asia's farmers are both contributors and victims of climate change and extreme weather, which contributes to rural out-migration—particularly of youth—resulting in rising labor scarcity and increased production costs.

TAFSSA (Transforming Agrifood Systems in South Asia), a CGIAR Regional Integrated Initiative, aims to address these challenges by delivering actionable evidence and scalable innovations across these regions through a coordinated program of research and engagement from farmer to consumer.

these challenges is the lack of credible and high-resolution data on food systems in the region. The TAFSSA 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, Nepal and Pakistan. It is intended to be a multi-year assessment.

APPROACH

The approach to the design of the assessment included a review of several conceptual frameworks, consultations with diverse stakeholders and field visits to target locations. A multi-disciplinary team lead the design of the protocol and specific measurement tools.

This research note describes the overall approach and design of the food systems assessment. Detailed protocols, tools and assessment data from the components of the assessment will be available in public domain in the near future.

In this note, we focus on describing the design of the core of the assessment: a primary integrated survey.

One of the roadblocks to addressing

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OBJECTIVES

The main objectives of the local food systems assessment are to:

1. Demonstrate the feasibility and the value of creating locally relevant agrifood system datasets, covering producers, processors, retailers, consumers, and the environment.
2. Collect high-resolution data that connects production systems, markets, diets and the environment to understand linkages between different components of local food systems.
3. Track key performance indicators of food system components.
4. Develop and showcase methods for collecting gender-disaggregated data from farms, markets, and households using a portfolio of tools including primary surveys, remote sensing, photo voice analyses, and new ways of capturing and repurposing digital data.

FRAMEWORKS AND ASSESSMENT CONTENT

The assessment is grounded in several conceptual frameworks as a theoretical foundation, including:

- The High-Level Panel of Experts Food Systems Framework (6)
- The Drivers of Dietary Choice Framework (7)
- Turner's Food Environment Framework (8)
- Njuki's Gender and Food Systems Framework (9)

A review of the domains and indicators linked to these frameworks informed the initial design of the TAFSSA assessment. Targeted field visits to survey districts and stakeholder meetings helped us to build a multi-component survey that can be fielded in multiple contexts. We will gather data on diverse components of the HLPE framework (below), with other frameworks informing specific sections.

- **Diets:** Dietary diversity, food security, sources of consumption
- **Consumer behavior:** Food purchase behavior, preferences, and costs, consumption of paid meals
- **Food environments:** Household food environment, food prices, retail environments
- **Food supply chains:** Cropping patterns, crop economics & sales, livestock, fish, homestead food production
- **Drivers (demographic):** Household composition, asset ownership, sources of income
- **Drivers (sociocultural):** Intrahousehold task allocation, drivers of food choice, aspirations
- **Drivers (political and economic):** Group membership, access to credit, access to social safety nets
- **Drivers (technology and infrastructure):** Weather shocks, climate services, coping mechanisms
- **Drivers (biophysical and environmental):** Farm machine use, irrigation methods, other amenities

ASSESSING DIETS AND FACTORS THAT SHAPE DIETS

The diets and dietary drivers assessment is based on Turner's Food Environment Framework (8) and the Drivers of Dietary Choice Framework (7). Together, these describe the food environment and understand how and why people eat what they do. Our aim is to characterize what is in the diets (of adults and adolescents) and which factors at individual, household, and community levels determine diets in each context.

WHAT ARE PEOPLE CONSUMING?

We will capture individual diets in two ways. First, we use validated assessment methods to capture diets in the last 24 hours. We also developed a tool based on sentinel foods to capture patterns of consumption of different foods in the previous 30 days.

- Dietary intakes: Intakes in the 24 hours preceding the survey will be captured using the Global Diet Quality Score application/tool (10). The GDQS collects 24-hour recall data on eating occasions and individual food consumption. It enables estimation of standard indicators of diet diversity and provides GDQS scores.
- Patterns of consumption of sentinel foods in the last month: We developed a sentinel food list that includes healthy and unhealthy foods across all major food groups through pre-survey field visits. We will assess broad patterns of consuming these foods for the 30 days preceding the survey.

HOW ARE PEOPLE GETTING THEIR FOOD?

This section aims to assess how food

was obtained (own production, received from government, purchased from outside, foraging etc.), where it was purchased (market type), and to understand food shopping behaviors.

WHAT FACTORS SHAPE PEOPLE'S DIETARY CHOICES?

To assess drivers of food choice, we are using a tool consisting of 14 statements to capture information on perceptions regarding external and internal factors (8) which influence food choice. Factors include availability, affordability, accessibility, convenience, desirability and social forces.



Photo: Shawn Sebastian, for IFPRI, 2018

MARKET AND LOCAL FOOD ENVIRONMENT ASSESSMENTS

What are the factors in the food environment that influence the production, access, and purchase of nutritious foods? How can food environments be improved in rural South Asia to encourage sustainable healthy diets? These are some of the research questions the assessment aims to answer through market surveys and household food purchase pattern interviews. Using the framework outlined in Turner's Food Environment Framework (8), the TAFSSA assessment focuses on two main areas:

1. Market surveys at points of retail food purchase

- Geospatial mapping of consumer access (using geo-coded household and market data and satellite images from secondary sources).
- Traditional markets for fruits and vegetables, and other farm produce markets (mandis / haats / bazaar)
- Small village retail shops or food outlets (tea stalls, restaurants, street



Photo: Purnima Menon, 2021

vendors)

2. Household surveys on food purchase patterns

- Household food environments to capture available food in households
- Shopping behaviors and preferences

The overall approach includes data collection from households on food shopping habits and preferences, census of markets and interviews with vendors, retailers and market managers to measure market functionality, resilience and prices (**Figure 1**). We also aim to link household survey data with data from the market census and the surveys of food retail environment

Figure 1: Components of the TAFSSA market and food environment assessment

Shopping practices: Timing, location

Transaction cost: Transport, distance

Attributes: Time, affordability, ease of access, quality of food, preference if income increased

Consumption of paid meals:
Consumed outside home

Market Functionality Index:
Assortment of essential goods, price, availability, resilience of supply chains, competition, infrastructure, services, food quality, access and protection

Market resilience: Collaboration, flexibility, agility, visibility and adoptability

Prices: Minimum, maximum and modal prices of "sentinel foods"

FOOD PRODUCTION, ENVIRONMENT AND CLIMATE CHANGE

Agriculture affects diets, health and nutrition, and the environment through multiple pathways. It is also highly vulnerable to the depletion of natural resources and climate change. The agrifood systems assessment will include the use of survey and non-survey data to measure the productivity and diversity of agriculture in South Asia and understand how food production affects local ecosystems and the planetary boundaries. We will also characterize farmers' access to and use of irrigation and assess how they cope with and adapt to climate change.

MEASUREMENT DOMAINS

Food production: We will collect data on different crops and animal foods produced by the households in their farms and homesteads for own consumption and sales to assess agrobiodiversity, income from food production, and linkages between production and diets.

Input use and agricultural practices: Data on input use and management practices will also be collected from

each farming household to measure land productivity, input use efficiency, and sustainability.

Use of water in agriculture: Access to irrigation is critical to the sustainable intensification of agriculture in South Asia and its resilience to climate change. We will use farmer and village-level data to measure the cost of irrigation for smallholders, changes in groundwater tables, and ways to increase the irrigation surplus without threatening its sustainability.

Climate shocks, environmental degradation, and the coping mechanisms: The assessment also includes self-reported data from farmers and village leaders on changes in the availability of groundwater, the experience of weather shocks and climate change, and adjustments made in agriculture (land and water use, cropping pattern, crop management practices, etc.) to adapt to these shocks or to cope with them. We also focus on the role of institutional extension in managing climate risks.



Photo: Shawn Sebastian, for IFPRI, 2018

GENDER AND INTRA-HOUSEHOLD DYNAMICS RELATED TO FOOD SYSTEMS

How do women's agency, gendered social norms, and access/control over resources influence diets within the household? These questions form an integral part of the socio-economic drivers in the food systems framework.

To address these questions, modules in the primary surveys have been developed using the gender and food systems framework (9). These include questions pertaining to household task allocation, perceptions of time poverty, dietary patterns of women, attitudes towards gender norms, financial independence and family support, agency around mobility, and membership of social organizations.

Dietary decisions span three stages: before food enters the kitchen, when

the food is in the kitchen and while the food is being served. In the first stage data on agricultural production and food purchase decision-making such as what is grown, what is purchased and from where gives a sense of women's involvement in these activities. In the second stage, data on the type of equipment used and fuel(s), segregation of duties within the kitchen, and decision-making regarding what is to be cooked and how provides an insight into women's roles in food preparation. In the last stage, information on intra-household allocation of food, sequential order of meal consumption across members and cleaning responsibilities can give an overview of gender biases in food consumption.



Photo: Shawn Sebastian, for IFPRI, 2018



Photo: Shawn Sebastian, for IFPRI, 2018

TARGETED COMMUNITY VISITS FOR ASSESSMENT DESIGN

Throughout 2022, a multi-disciplinary TAFSSA research team undertook visits to target districts where the food systems assessments and other TAFSSA research would be undertaken. These visits included explicit activities to understand various aspects of the local food systems – visits to local markets, interactions with local farmers, traders, vendors, meetings with local families, health workers and other key informants. Information from field visits was summarized around key aspects of the food systems – what were communities eating, where was food

being sourced from, what did retailers sell, what did farmers grow, what did women's lives look like, and more.

High frequency research team debrief meetings and summary reports of field visits were brought together in an assessment design workshop that included TAFSSA researchers and partners.

Insights from the community visits were brought together with the insights from the review of frameworks and indicators to design multiple components of the TAFSSA assessment.



Photo: Purnima Menon, 2018

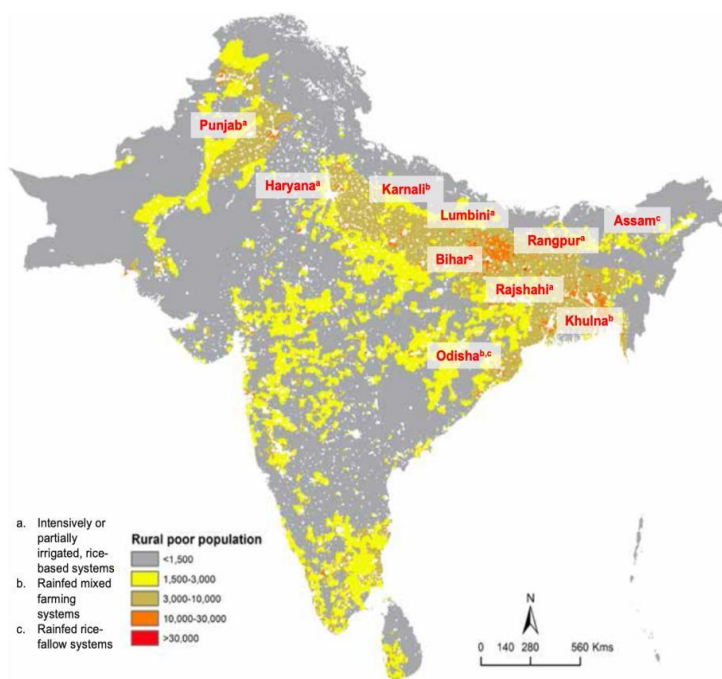


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SAMPLING AND SURVEY DESIGN

The assessments are being carried out in an initial subset of TAFSSA learning locations across Bangladesh, India and Nepal in early 2023. We also aim to carry out an assessment in Pakistan later in 2023. These diverse locations (**Figure 2**) are “hot spots” of poverty, malnutrition, social inequity, environmental degradation, and climate risks where significant development impact is possible and scalable.

Figure 2: Density of rural poverty and farming systems in TAFSSA learning locations



Primary sampling units (PSU; villages and wards) in each district have been selected from national census datasets using a probability proportional to size (PPS) strategy to generate a sample that is representative at the district level.

The sample size is based on the total population in each district (Table 1). In the second stage of sampling, 500-1000 households with adolescent members are selected randomly from each PSU.

The primary household survey itself comprises of community, household and individual interviews (**Figure 3**) and uses validated tools where available.

Market assessments are also carried out across diverse retail environments that will be identified using market census data from village/ward level clusters.

Table 1: Census population of sample districts by country

Country	Division / State / Province	District	District population (in million)
Bangladesh	Rangpur	Rangpur	3
		Dinajpur	2.9
	Rajshahi	Rajshahi	2.9
		Chapainawabganj	1.6
India	Bihar	Nalanda	2.9
Nepal	Karnali	Surkhet	0.35
	Lumbini	Banke	0.5

Figure 2. Overview of survey data collection

Community	Key Informant	<i>Interview</i>	<p>Community infrastructure: Village demographic composition, infrastructure, employment, access to services, markets for agricultural produce, groundwater and land use</p>
	Store owners	<i>Observation, Interview, Photo Analysis</i>	<p>Market infrastructure: Marketing and promotion, food wastage, food quality and safety, food prices, market functionality index for fruit/vegetable mandis, specialized meat shops, retail shops, grocery stores, city markets and food outlets (tea stalls, restaurants)</p>
Household	Male / Female Adult	<i>Interview</i>	<p>Socio-economic factors and food/water insecurity: Demographic composition, sources of income, asset ownership, access to amenities, social safety net programs, access to credit; food/water insecurity (Food Insecurity Experience Scale, Household Water Insecurity Experiences), home food environment</p>
			<p>Food purchase: Shopping practices and preferences, costs of shopping, consumption of paid meals</p>
			<p>Agricultural practices: Land ownership, cropping patterns and sales, machine use and irrigation practices, homestead, livestock and aquaculture practices</p>
			<p>Climate adaptation and mitigation: Experience of extreme weather and climate events, other shocks, coping mechanisms, access to climate services and information, mitigation measures</p>
Individual	Male / Female Adult, Adolescent	<i>Observation, Interview, Use of GDQS application</i>	<p>Diets and drivers of dietary choices: Dietary diversity (Global Diet Quality Score), food frequency (Food Frequency Questionnaire), food sources, drivers of food choice, exposures to information.</p>
		<i>Interview</i>	<p>Future of farming: Aspirations for future careers</p>
			<p>Intra-household dynamics: Task sharing, decision making, intra-household eating practices, social capital, gender empowerment</p>

EXPECTED OUTPUTS

The primary aim of the assessment is to generate a data-grounded overview of food systems at a local level in South Asia. We also aim to engage relevant stakeholders around the findings of the assessment in ways that contribute to evidence-informed food systems actions across sectors.

The local food systems assessment will generate a variety of outputs:

1. A methods toolkit for data collection, analysis and dialogue that can be adapted and used widely
2. Local food systems assessment reports and data notes
3. Cross-context agrifood system analyses on production, markets, consumption, gender and social inclusion
4. Focused multistakeholder dialogues in each context to diagnose local food systems actions and higher-level policy challenges
5. Scientific papers and reports

analyzing different aspects of the food system

6. An open-access, integrated agrifood systems database with metadata

SUMMARY

Taken together, we anticipate that these assessments will foster an environment for evidence-based and data-grounded decisions at local, sub-national, national and regional levels. Working together with a wide range of stakeholders across food systems in South Asia within TAFSSA's stakeholder engagement strategy (see 11), we aim to bring data, diagnostics, dialogue and decision-making together.

TAFSSA welcomes collaboration and partnership on these local food systems assessments, including around the use of data, facilitation of dialogue and support to local food systems actors.

Photo: Shawn Sebastian, for IFPRI, 2018



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ABOUT TAFSSA

TAFSSA (*Transforming Agrifood Systems in South Asia*) is a CGIAR Regional Integrated Initiative to support actions that improve equitable access to sustainable healthy diets, improve farmers' livelihoods and resilience, and conserve land, air, and water resources in South Asia

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