



INITIATIVE ON

Transforming Agrifood
Systems in South Asia

Availability of data on agrobiodiversity in South Asia

A report on data availability
for Bangladesh, India,
Nepal, and Pakistan

Data Note 13
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ABOUT THIS DATA BRIEF

Global and local data consistency and interoperability is lacking for many crucial aspects of agrobiodiversity. Here we present a summary of public data availability for agrobiodiversity-related indicators of regional agrifood systems. Data have been drawn from surveys, reports and censuses in Bangladesh, India, Nepal, and Pakistan. This brief can be used by researchers, policymakers, and development planners to understand the data landscape and to identify measurement priorities for future data collection and curation efforts.

KEY FINDINGS

From open-source and freely accessible reports, surveys, and data sets, we identified agrobiodiversity-related information at national and district levels within Bangladesh, India, Nepal, and Pakistan. Additionally, we incorporated household-level data specifically from the Bangladesh Integrated Household Survey (BIHS), India's Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural, and the 3rd Pakistan Rural Household Panel Survey (PRHPS). Comparable surveys for Nepal were unavailable.

When assessing agrobiodiversity data, we considered five components: information about crops, livestock, fisheries, forestry and cropping patterns. Bangladesh is the only country which appears to have a comprehensive, publicly available, dataset covering all five components. In India and Nepal substantial data are available for four components, but not for cropping patterns or intensity. In Pakistan there is a discernible gap between data available the provinces of Khyber Pakhtunkhwa and Sindh and that available in other Pakistani provinces.

Food composition tables from all four countries contained nutritional information on crops, livestock and fisheries. Fisheries and livestock datasets were limited in terms of their availability, and spatial and temporal resolutions for all countries except Nepal and in three provinces in Pakistan. District-level livestock data are consistently inconsistent.

Recognizing the importance of agrobiodiversity data in informing public policy on biodiversity conservation, and on dietary and nutritional diversity, our findings underscore the necessity for increased financial and technical investments to enhance data availability in South Asia.

BACKGROUND

Agrobiodiversity is declining in the South Asia, and this is likely to negatively affect conservation efforts and human dietary diversity. Diets low in diversity are often inadequate in micronutrients, contributing to malnutrition. Agrobiodiversity in food systems can contribute to healthier diets, more sustainable food production, and increased resilience to environmental and socio-economic challenges, thereby enhancing food security and agricultural sustainability while enhancing ecosystem services (1, 2). Globally, inconsistent data however exist for crucial components of agrobiodiversity, with a particular lack of information at national and sub-national level in South Asia. This data gap hinders an accurate assessment of regional agrobiodiversity, compromising the quality of global food system assessments and potentially masking poor diets and malnutrition in humans (1, 3). Effective programs and policies to improve agrobiodiversity require recent data and evidence, which should be routinely updated, to assess the performance of agrobiodiversity indicators in food production systems.

OBJECTIVE

We evaluated the accessibility and availability of data useful to assess food system indicators related to agrobiodiversity across four South Asian countries: Bangladesh, India, Nepal, and Pakistan. In doing so, we generated meta-data on agrobiodiversity data in these countries. The compiled meta-data from the information sources described in this data brief has been published online (<https://hdl.handle.net/11529/10548988>).

DATA AND METHODS

We conducted an exhaustive search for the most recent and consistently available agrobiodiversity-related data, with a primary focus on various facets such as crop species, area under production, livestock, fisheries, forestry and cropping intensity.

Where, Cropping Intensity = $(\text{gross cropped area} / \text{net cropped area}) \times 100$.

Three criteria were used to identify appropriate data. (1) Data are publicly available, (2) they include agricultural information (e.g. crop area, production, livestock, fisheries, forestry, consumption and others), and (3) they are available for download online. Thirty-three surveys and datasets were identified: six in Bangladesh, fourteen in India, five in Nepal, and eight in Pakistan (Table 1).

Our data compilation drew extensively from reports and surveys, primarily accessed through online sources including national official websites and data repositories like Dataverse. We incorporated country-level Food Composition Tables (FCT) into our data assessment to provide additional information on the nutritional aspect of agrobiodiversity. Data sources were reviewed to identify the usefulness of the data in assessing agrobiodiversity-related food system indicators.

A preliminary assessment of dataset quality was undertaken by examining dataset availability, and spatial and temporal resolutions. We comment on data richness and the ability of researchers compute agrobiodiversity indicators and agrobiodiversity related food system indicators from the raw data.

DATA AVAILABILITY ASSESSMENT

Table 1. Surveys and census data included in the data availability assessment.

SI	Dataset	Country	Spatial resolution	Temporal resolution
1	Yearbook of Agriculture Statistics (4)	Bangladesh	National, State, District, Block, Household	2018-19/2019-20/2020-21
2	Bangladesh Integrated Household Survey (BIHS) (5)			2011-12; 2015; 2018-19
3	Bangladesh Agriculture Census 2019 (6)		National, Division, District	1977 / 1983-84 / 1996 / 2008 / 2019
4	Livestock Economy at a Glance (7)		National	2017/18/19/20/21/22
5	Yearbook of Fisheries Statistics of Bangladesh 2019-20 (8)		National, State, District	2001-02 to 2021-22
6	Crop Production Statistics Information System (9)	India	National, State, District	1997-98; 2022-23
7	Department of Agriculture and farmers welfare (10)		National, State, District	2018; 2021
8	Agriculture census of India (11)		National, State, District,	1995-96, 2000-01, 2005-06, 2010-11, 2015-16
9	Land use statistics information system (12)		National, State, District	1998-99 to 2020-21
10	ICRISAT District level apportioned data (13)		National, State, District	1966-67 to 2017-18
11	ICRISAT District level apportioned data (additional) (13)		National, State, District	1990-91 to 2017-18
12	Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India (14)		National, State, National Sample Survey Region, Household	2002 (59 th Round), 2013 (70 th Round), 2019 (77 th Round)
13	Statistical Yearbook of India (15)		National, State	2011-2018
14	District-wise, season-wise crop production statistics (16)		National, State, District	1997-2015
15	Livestock Census -2019 (17)		National, State	2019

DATA AVAILABILITY ASSESSMENT (CONT.)

Table 1. Surveys and census data included in the data availability assessment. (cont.)

SI	Dataset\Domain	Country	Spatial resolution	Temporal resolution
16	States / Union Territories wise Inland and Marine Fish Production during 2014-15 to 2018-19 (18)	India	National, State	2014-15 to 2018-19
17	Horticulture Statistics of Haryana [2019-20] (19)		National, State, District	2019-20
18	Horticulture statistics at a glance 2018 (20)		National, State, District	2016-17
19	National Sample Census of Agriculture (21)	Nepal	General/household	2011-12
20	Statistical Information on Nepalese Agriculture (22)		National, State, District, Block,	2017-18 to 2021-22
21	Nepal Fishery Survey 2015 (23)		National, State, District	2015
22	Livestock statistics of Nepal (24)		National, State, District	2017 to 2020/21
23	Agricultural Statistics of Pakistan (25)	Pakistan	National	1972/1980/1990 /2000
24	Development Statistics of Sindh 2021 (26)		National, State, District	2020-21
25	Development Statistics of Khyber Pakhtunkhwa 2021 (27)		National, State, District	2020-21
26	Agriculture Statistics of Balochistan 2020-21 (28)		National, State, District	2020-21
27	Punjab Kharif Crop Estimates 2020-21 (29)		National, State, District	2020-21
28	Pakistan Rural Household Panel Survey (PRHPS) (30)		Household	2012 - 2014
29	Pakistan Statistical Year Book 2022 (31)		National, State	2007-2020
30	Food Composition Table for Pakistan (32)		National	2001
31	Food Composition Table for Bangladesh (33)	Bangladesh	National	2013
32	Indian Food Composition Tables (34)	India	National	2017
33	Food Composition Table for Nepal (35)	Nepal	National	2012

DATA AVAILABILITY ASSESSMENT (CONT.)

Table 2. Basic types of agrobiodiversity information identified

SI	Dataset	Crop	Livestock	Fisheries	Forestry	Cropping intensity
1	Yearbook of Agriculture Statistics	✓	✓	✓	✓	✓
2	Bangladesh Integrated Household Survey (BIHS)	✓	✓	✓	✓	✓
3	Bangladesh Agriculture Census 2019	✓	✓	✓	✗	✓
4	Livestock Economy at a Glance	✗	✓	✗	✗	✗
5	Yearbook of Fisheries Statistics of Bangladesh 2019-20	✗	✗	✓	✗	✗
6	Crop Production Statistics Information System	✓	✗	✗	✗	✗
7	Department of Agriculture and farmers welfare	✓	✗	✗	✗	✗
8	Agriculture census of India	✓	✗	✗	✗	✗
9	Land use statistics information system	✓	✗	✗	✓	✗
10	ICRISAT District level apportioned data	✓	✓	✗	✗	✗
11	ICRISAT District level apportioned data (additional)	✓	✓	✓	✓	✗
12	Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India	✓	✓	✓	✓	✗
13	Statistical Yearbook of India	✓	✓	✓	✓	✗
14	District-wise, season-wise crop production statistics	✓	✗	✗	✗	✗
15	Livestock Census - 2019	✗	✓	✗	✗	✗

DATA AVAILABILITY ASSESSMENT (CONT.)

Table 2. Basic types of agrobiodiversity information identified (cont.)

SI	Dataset	Crop	Livestock	Fisheries	Forestry	Cropping intensity
16	States / Union Territories wise Inland and Marine Fish Production during 2014-15 to 2018-19	x	x	✓	x	x
17	Horticulture Statistics of Haryana [2019-20]	✓	x	x	x	x
18	Horticulture statistics at a glance 2018, India	✓	x	x	x	x
19	National Sample Census of Agriculture, Nepal	✓	✓	✓	✓	x
20	Statistical Information on Nepalese Agriculture	✓	✓	✓	x	x
21	Nepal Fishery Survey 2015	x	x	✓	x	x
22	Livestock statistics of Nepal	x	✓	x	x	x
23	Agricultural Statistics of Pakistan	✓	✓	x	✓	x
24	Development Statistics of Sindh 2021	✓	✓	✓	✓	x
25	Development Statistics of Khyber Pakhtunkhwa 2021	✓	✓	✓	✓	✓
26	Agriculture Statistics of Balochistan 2020-21	✓	x	x	x	x
27	Punjab Kharif Crop Estimates 2020-21	✓	x	x	x	x
28	Pakistan Rural Household Panel Survey (PRHPS)	✓	✓	✓	x	x
29	Pakistan Statistical Year Book 2022	✓	✓	✓	✓	x
30	Food Composition Table for Pakistan	✓	✓	✓	x	x
31	Food Composition Table for Bangladesh	✓	✓	✓	x	x
32	Indian Food Composition Tables	✓	✓	✓	x	x
33	Food Composition Table for Nepal	✓	✓	✓	x	x

PRELIMINARY CONCLUSIONS

The accessibility of agrobiodiversity-related data in Bangladesh, India, Nepal, and Pakistan varies by country and dataset. In particular, while information on cropped species is common, data on cropping intensity or crop rotations within the same field are commonly lacking. In all countries, we also identified challenges with adequate data from very remote and mountainous regions.

In Bangladesh, the regular administration of comprehensive agricultural surveys offers detailed insights into the primary components of the agrobiodiversity, cropping intensity, cropping patterns and practices. However, census data are not always released in a timely manner, compromising the relevance of data for rapid-pace policy considerations.

India, which has a robust tradition of agricultural research, regularly publishes reliable and detailed census data which include socio-economic indicators, thereby facilitating greater understanding of the links between agrobiodiversity and rural livelihoods. Nonetheless, the lack of standard definitions and terms across the country's diverse and distinct agricultural regions may limit the comparability of data.

Nepal's census data places emphasis on local agricultural practices, contributing to an understanding of the diverse array of crop species. However, challenges in data collection and farm access in remote mountainous regions may result in underrepresentation of the farming systems in these areas. Furthermore, limited capacity for on-the-ground validation in certain remote areas may impact the accuracy of the data.

In Pakistan, the available central census-level data provide information only at the state or province level. However, government support has enabled additional robust district level surveys and data collection, including the incorporation of information on traditional farming practices. This contributes to a more comprehensive assessment at the district level from the central government, in addition to the province-level data.

RECOMMENDATIONS

In planning future surveys, consideration should be given to incorporating data necessary for the computation of recently developed and validated indicators of agrobiodiversity. This forward-looking approach will enable more comprehensive and contemporaneous understanding of agrobiodiversity dynamics. Furthermore, there is a crucial need for the data obtained to be made publicly accessible, with quality metadata published to accompany raw datasets. Posting available data in the public domain facilitates their widespread use for research purposes and facilitates evidence-based decision making on sustainable agricultural and environmental policies.

Recognizing the importance of agrobiodiversity data, particularly as related to conservation, sustainability assessments, and human nutrition, we underscore that financial and technical investments are essential for scaling-up the quality, frequency, and availability of data measurements in South Asia. Such investments would not only support the creation of robust dataset infrastructure, they would also contribute to informed decision-making at regional and national levels.

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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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