



CRIFS Technical Brief
Who is a small-scale producer?
A proposed operational definition

Didier Yelognisse Alia, Becca Toole, Federico Trindade
and C. Leigh Anderson

Professor C. Leigh Anderson, Principal Investigator

August 15, 2025

Key messages

- *Agricultural producers in food systems face differential climate risks given heterogeneity in land size, farming systems, labor endowments, proximity to markets, and other socio-economic characteristics.*
- *While there is broad agreement that small-scale producers (SSPs) are the most vulnerable segment of food systems, there remains a lack of consensus on a definition of SSPs, complicating tracking and targeting SSPs to strengthen their role in inclusive food system transformation.*
- *This technical brief reviews the literature to synthesize the key indicators commonly used to define SSPs and builds on an analysis of nationally representative agricultural survey data to formulate an operational definition to guide the research of the UW Center for Risk and Inclusion in Food Systems (CRIFS).*

Background

In most low- and middle-income countries (LMICs), agricultural production involves millions of households cultivating small plots of land or raising small numbers of livestock (Lowder et al., 2016). These households are often among the poorest and most food-insecure (Larson et al., 2016), yet they contribute a significant, if not the majority, share of crop production in LMICs (Khalil et al., 2017). Given their prevalence and importance in food security, as well as their vulnerability, these households have been the focus of initiatives for increasing productivity and income—efforts seen as central to eliminating hunger (SDG #2), but also essential to broader rural development goals and reducing poverty (SDG #1) (Pingali, 2012; Timmer, 1995). Additionally, these farm households play a central role in fostering inclusive food system transformation.

The literature features many similar terms used to implicitly refer to all farm households characterized by low assets, including “small-scale farms”, “smallholder farms”, “family farms”, “subsistence farms”, to cite a few. The multitude of terms used to characterize small-scale farms reflects both the organic way in which language evolves and the substantial heterogeneity in farm households and farming systems within and across countries (Nagayets, 2005; Tittonell et al., 2010; Alvarez et al., 2018). **Throughout this brief, we refer to small-scale producers (SSPs) rather than the commonly used term “smallholder farmers” to include farming on land that is not necessarily “owned” or “held” and to include livestock keeping.**

Despite being commonly referred to in policy documents and research, there is no universally accepted, nor commonly provided, definition of a “small-scale producer” or other related term. Some definitions recognize that input use, access to markets, output diversification, and labor—among other factors—are important for

EPAR uses an innovative student-faculty team model to provide rigorous, applied research and analysis to international development stakeholders. Established in 2008, the EPAR model has since been emulated by other UW schools and programs to further enrich the international development community and enhance student learning.

Please direct comments or questions about this research to Principal Investigator C. Leigh Anderson at eparcla@uw.edu.

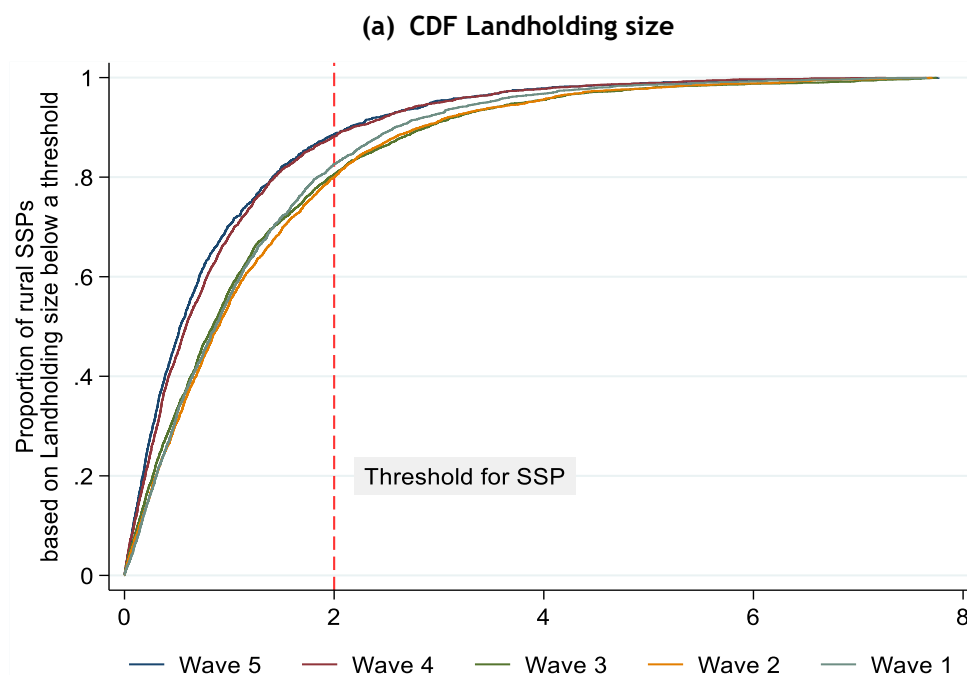
characterizing small farms. Many studies refer to a definition devised by the Food and Agriculture Organization (FAO) of the United Nations in the 1990s that uses land size less than 2 hectares (ha). However, farm size-based definitions still vary considerably in the thresholds used to identify small and large farms across studies and contexts. Examples of thresholds used include 1 ha in the Democratic Republic of Congo, 2 ha in India, 4 ha in Namibia, 5 ha in Senegal, 10 ha in Kenya, and Mozambique, and 20 ha in Colombia (GRAIN, 2014). Some definitions consider a relative threshold set at a certain percentile of landholding size or other criteria. For example, Khalil et al. (2017) propose a fully relative definition as farm households at the bottom 40% of the distribution of operated land size, tropical livestock units, and farm revenues.

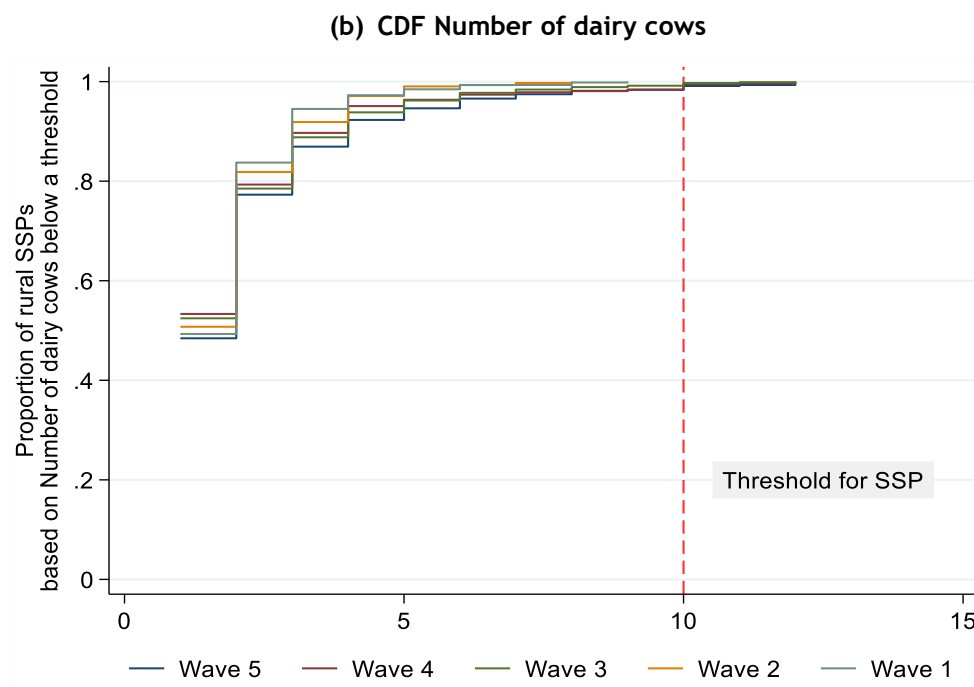
Formalization of an operational definition of small-scale producers

Our aim is to propose a definition that segments farmers into exhaustive and mutually exclusive groups according to a set of criteria (Perret & Kirsten, 2000). Hence, a small-scale producer is *classified* according to one or more *indicators* (e.g., land size) and *thresholds* (e.g., number of hectares). Taken together, the indicator and threshold constitute a *criterion*. We assess the six indicators found in the literature (Table A1 in Annex A) and commonly used in defining SSPs or related sub-populations against a set of guiding principles (Annex A). These principles include practicality in terms of the availability of data in common datasets, scope in terms of coverage of potential versus realized production, and considerations around the choice of thresholds.

We focus on two indicators, landholding and livestock holding, to use in the definition of small-scale producers. These two criteria also capture household production potential without confounding household behavioral decisions on input use, exposure to production risks and shocks, and other livelihood sources. With land and livestock, a first level segmentation of households is done; other indicators may be used to further segment SSPs based on their level of engagement with markets or the orientation of their income sources. To select threshold values, we examine the distribution of these indicators using LSMS-ISA data for Ethiopia and Nigeria, and NSSO Situation Assessment of Agricultural Households (SAAHH) and Land and Livestock Holding (LLH) data for India). We focus on cumulative distribution function (CDF) plots, which show the proportion of households below various thresholds. Figures 1 (a and b), 2 (a and b), and 3 (a and b) are the CDFs for landholding size and number of dairy cows for Ethiopia, Nigeria, and Indian states. CDFs for other livestock species are in Annex B. We opt for absolute thresholds which allow cross-country comparisons as compared to relative thresholds set at some percentile of the indicator distribution.

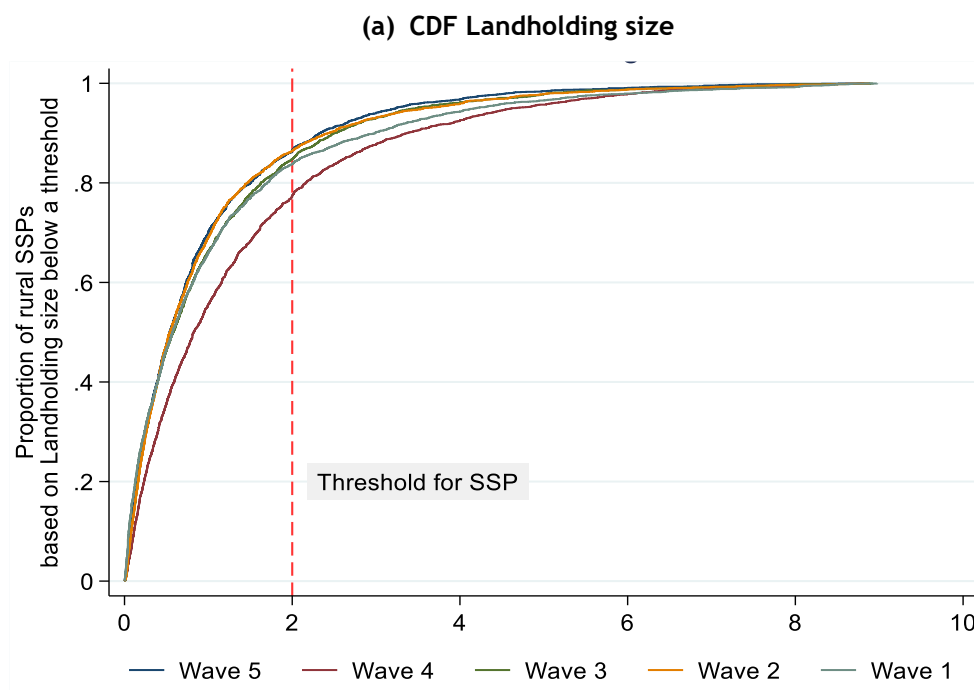
Figure 1: Distribution of land holding size and the number of dairy cows holdings- Ethiopia



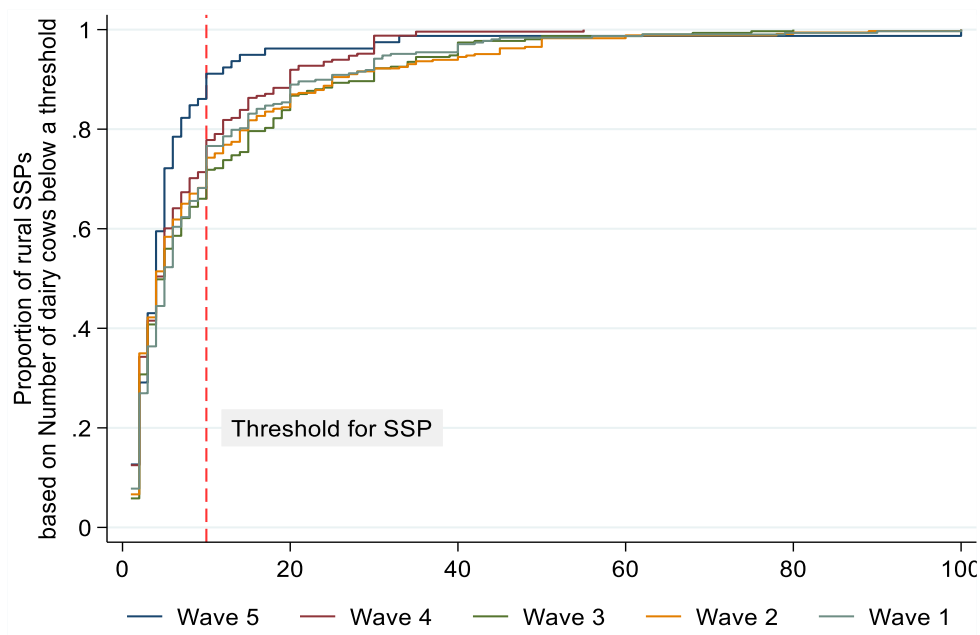


Data Source: Ethiopia - Socioeconomic Survey (ESS): Wave 1 (2011-12), Wave 2 (2013-14), Wave 3 (2015-16), Wave 4 (2018-19), and Wave 5 (2021-22)

Figure 2: Distribution of land holding size and the number of dairy cows holdings- Nigeria



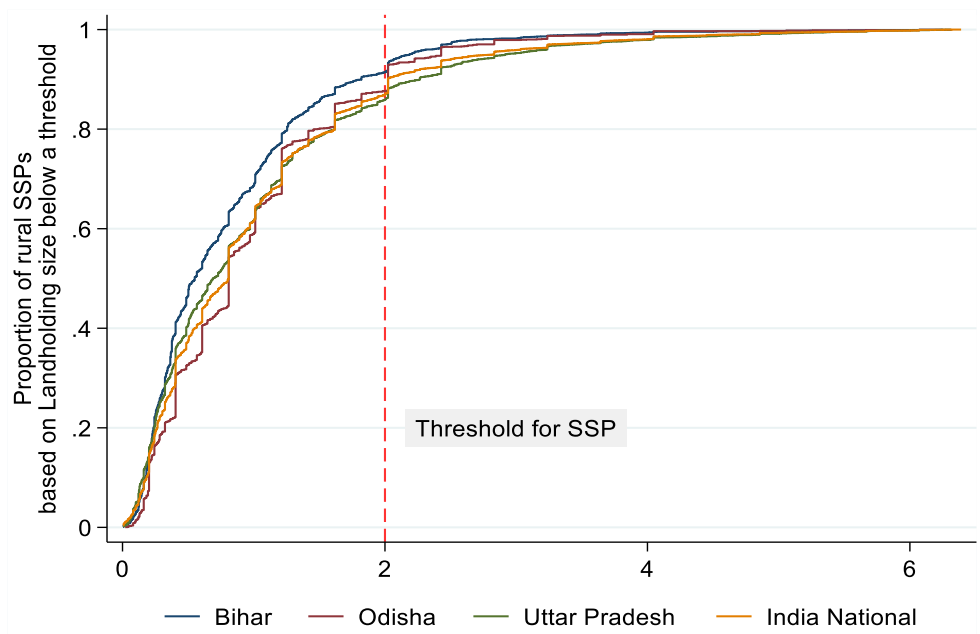
(b) CDF Number of dairy cows

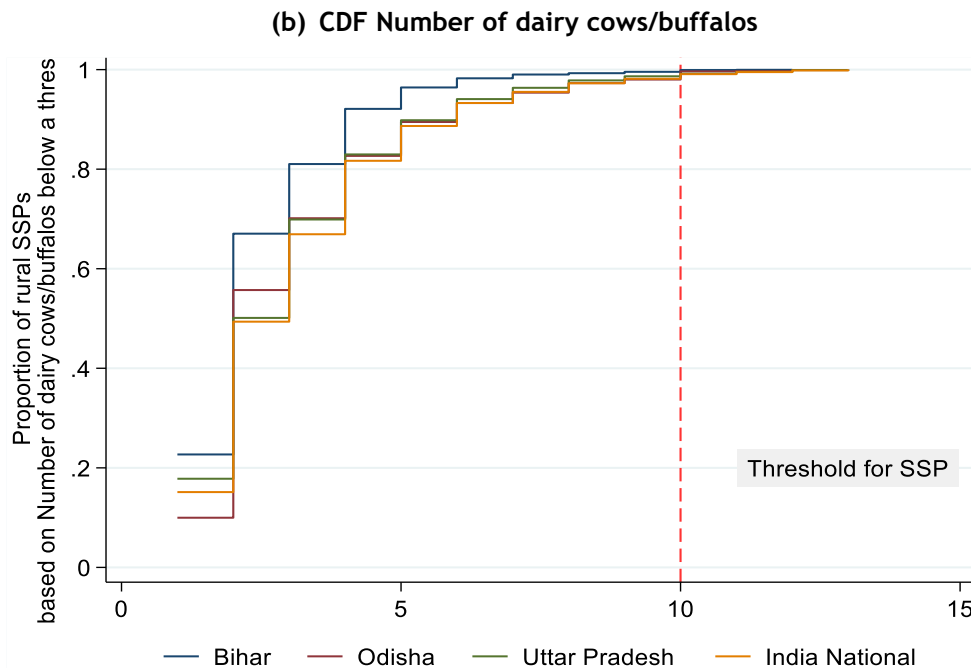


Data Source: Nigeria - General Household Survey (GHS): Wave 1 (2010-11), Wave 2 (2012-13), Wave 3 (2015-16), Wave 4 (2018-19), and Wave 5 (2023-24)

Figure 3: Distribution of land holding size and the number of dairy cows holdings - Nigeria

(a) CDF Landholding size





Data Source: India - Situation Assessment of Agricultural Households (SAAHH) 2018-19

After a careful analysis of these data, we propose to define a small-scale producer as a rural farm household with “land operated size no greater than 2 ha AND number of cows or buffalo kept not greater than 10 AND number of goats or sheep kept not greater than 10 AND number of chickens kept not greater than 50.”

- A farm household is a rural household in which at least one member self-declared as a farmer, which typically corresponds to an individual reporting that he or she derives income from agricultural activities or engages in agriculture as a livelihood.
- Landholding includes all agricultural land, whether cultivated or not, that is under the control of the household during the season (but not necessarily owned).
- Livestock includes improved and local breeds. It does not cover pastoralists, who are not typically captured in standard household surveys.
- Land size cultivated and livestock holdings are appealing criteria due to simplicity and ease of computation. Moreover, plot size and livestock holdings are widely available from agricultural censuses and household surveys.
- Applying absolute thresholds (as opposed to relative thresholds) avoids setting an artificial proportion of households categorized as SSPs, which undermines the potential to track whether SSP numbers are growing, shrinking, or exiting agriculture over time and makes cross-country comparisons less meaningful.

Following this definition, Figure 4 presents the number of SSPs and non-SSPs rural agricultural households (non-commercial farms) in Nigeria, Ethiopia, and selected agricultural Indian states. Table 1 shows the number of households with specific asset holding thresholds. We estimate the number of SSP households to be 12.8 million in Ethiopia in 2018/19 (79% of all rural farm households) and 9.9 million in Nigeria in 2018/19 (70% of all rural farm households). There is also an upward trend in the number and percentage of rural SSPs in both countries, reflecting both increasing population and some degree of land fragmentation. At the national level in India, we estimate that in 2018/19 there were 79.9 million rural SSPs representing 88% of all rural farm households, with some variation in the number and percentage of SSPs for the selected states.

Table 2 presents a profile of SSPs - meeting all 4 criteria - compared to non-SSPs, focusing on Ethiopia and Nigeria. In both countries, SSPs are consistently less likely to report using improved seeds, inorganic fertilizer, animal vaccines, and hired labor compared to non-SSP non-commercial farms. Consistent with the findings in the literature on the inverse farm size-productivity literature, SSPs have higher land productivity, as measured by the value of farm output per ha operated, than non-SSPs. However, they have lower labor productivity, as measured by the value of farm output per farm labor days.

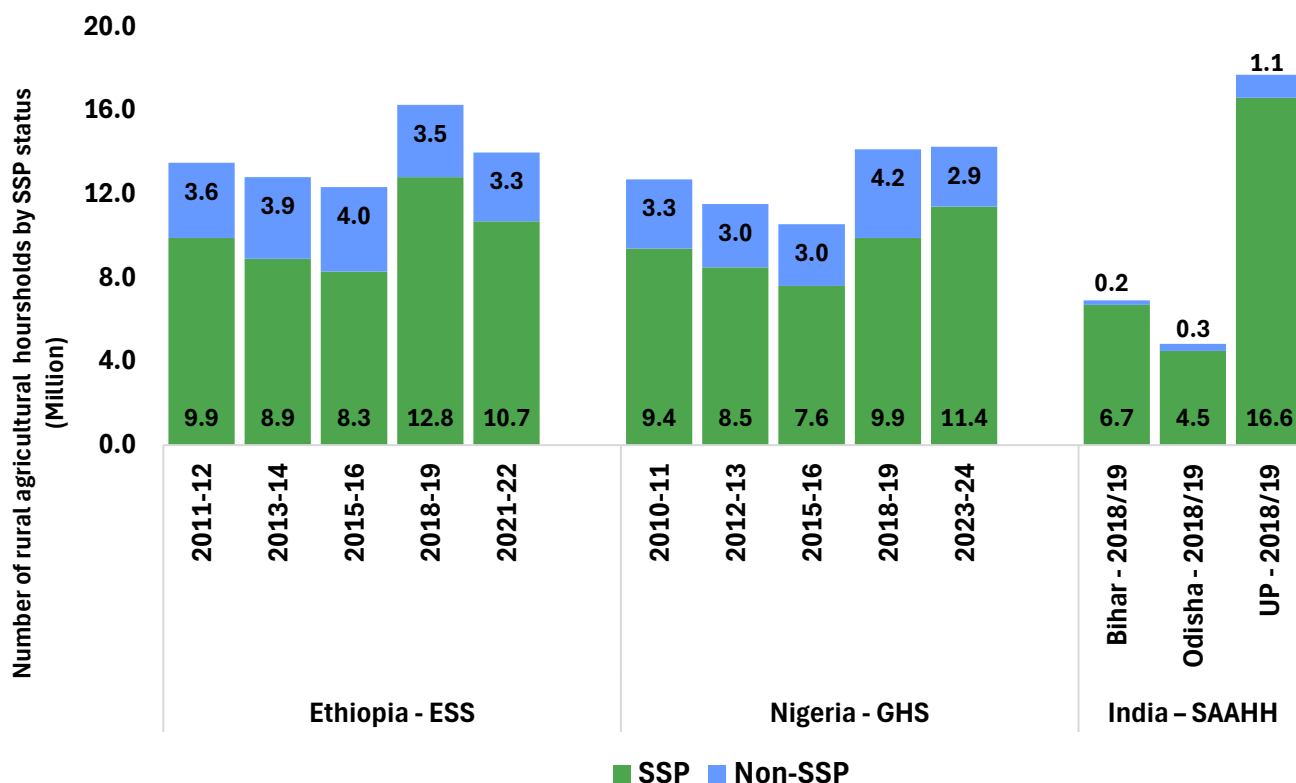


Figure 4: Number of rural agricultural households by SSP status in Ethiopia, Nigeria, and selected Indian states

Table 1: Number and percentage of SSPs among all agricultural households (non-commercial farms) covered by the definition for Nigeria, Ethiopia, and selected Indian states

	Landholding size ^a ≤2ha		Number of cows or buffalo holdings ^b ≤ 10		Number of goats or sheep holdings ^c ≤ 10		Number of chickens holdings ^d ≤ 50		SSP ^e	
	N (million)	%	N (million)	%	N (million)	%	N (million)	%	N (million)	%
Ethiopia										
2021-22 ^f	11.9	85.2%	13.9	99.7%	12.5	89.6%	13.9	99.7%	10.7	76.5%
2018-19	14.2	87.2%	16.2	99.7%	14.6	89.7%	16.0	98.7%	12.8	78.7%
2015-16	9.2	75.0%	12.3	99.6%	10.8	87.5%	12.2	99.0%	8.3	67.3%
2013-14	9.7	75.1%	12.9	100.0%	11.8	91.3%	12.9	100.0%	8.9	69.5%
2011-12	10.5	77.8%	13.5	99.9%	12.6	93.3%	13.5	100.0%	9.9	73.4%
Nigeria										
2023-24	12.2	85.9%	14.1	99.6%	13.1	92.6%	14.1	99.5%	11.4	80.0%
2018-19	11.0	78.3%	13.9	98.4%	12.4	87.7%	14.0	99.1%	9.9	70.0%
2015-16	9.1	86.0%	10.2	96.6%	8.8	83.3%	10.5	99.1%	7.6	72.0%
2012-13	10.1	88.1%	11.1	96.7%	9.7	84.2%	11.4	99.1%	8.5	73.8%
2010-11	10.9	86.5%	12.3	97.4%	10.9	86.2%	12.5	99.0%	9.4	74.0%
India - 2018-19										
Bihar	6.8	97.0%	7.0	99.9%	7.0	99.9%	7.0	99.9%	6.7	96.8%
Odisha	4.6	95.6%	4.8	99.5%	4.7	97.8%	4.8	99.9%	4.5	93.1%
UP	16.9	95.3%	17.6	99.1%	17.6	99.4%	17.7	99.9%	16.6	93.8%
India	81.5	89.3%	90.4	99.0%	90.1	98.7%	91.2	99.9%	79.9	87.6%

Notes: ^a In India, landholding size only accounts for agricultural land (used for production or fallow) and it includes land 'owned', 'leased in', and 'otherwise possessed'. In Ethiopia and Nigeria, land holding includes non-agricultural land but excludes land owned but rented out. ^b The India survey captures both cows and buffalos in the large ruminants category, while in Ethiopia and Nigeria, buffalos are not captured. ^c In India, 'goats or sheep' are grouped with other 'short mammals' such as rabbits, pigs and other animals with 'small heads'. However, sheep and goats represent the vast majority of the group. ^d In India, chicken includes other poultry animals. ^e An SSP is defined by having "land operated size less than 2 ha AND number of cows or buffalo kept not greater than 10 AND number of goats or sheep kept not greater than 10 AND number of chickens kept not greater than 50." ^f The 2021-22 Ethiopia datasets exclude the Tigray region and parts of the Afar region due to armed conflicts at the time of the data collection. Data sources are: LSMS-ISA/ESS (Ethiopia), LSMS-ISA/GHS (Nigeria), and SAAHH (India). In India SAAHH, the sample for farm households only captures households with annual agricultural income above 4,000 rupees. Data were drawn from UW EPAR (2025).

Table 2: Profile of SSP compared to non-SSP rural agricultural households (pooled sample)

	Ethiopia (2011-22)			Nigeria (2010-24)		
	SSP	Non-SSP	T-Stat	SSP	Non-SSP	T-Stat
Land holding size (ha)	0.71	3.24	-13.21***	0.54	3.58	-9.67***
Number of cows/buffalos (#)	0.67	1.43	-14.8***	0.12	3.45	-12.58***
Number of goats and sheep (#)	1.96	12.66	-10.28***	1.88	14.29	-8.17***
Number of chickens (#)	3.78	8.28	-7.19***	3.95	14.03	-11.11***
Percent growing maize (%)	49%	56%	-4.9***	43%	50%	-5.89***
Percent using improved seeds (%)	24%	29%	-3.82***	7%	6%	0.97
Percent using inorganic fertilizer (%)	56%	64%	-6.21***	39%	55%	-13.75***
Percent using animal vaccine (%)	36%	44%	-5.9***	11%	32%	-20.55***
Percent using hired labor (%)	34%	47%	-9.81***	68%	75%	-6.84***
Percent reached by extension services (%)	50%	55%	-2.93***	24%	30%	-5.21***
Labor productivity (\$PPP/person-day)	9.02	11.25	-4.24***	20.13	24.13	-4.01***
Labor productivity (\$PPP/ha)	1932.52	1112.98	11.5***	4718.51	3056.76	8.62***
Share of crop output sold (%)	27%	19%	9.38***	24%	22%	3.11***
Share of income from non-farm sources (%)	14%	9%	8.44**	46%	32%	15.55***
Daily per capita consumption (\$PPP/person/day)	1.79	1.86	-1.4	3.54	2.80	13.62***
Percent poor (internal poverty line) (%)	51%	46%	3.48***	37%	49%	-10.59***

Notes: *, **, *** denotes statistical significance at 10%, 5%, and 1% levels respectively. Data sources are: LSMS-ISA/ESS (Ethiopia), LSMS-ISA/GHS (Nigeria), and SAAHH (India). Data were drawn from UW EPAR (2025).

Annex

Annex A: Guiding principles for formulating an operational definition of SSPs¹

A definition of SSPs could potentially serve two purposes:

- i. *Targeting*: Decisions made in practice to include or exclude producers as targeted beneficiaries (e.g., receipt of subsidies for vaccine or seed; inclusion in extension programs).
- ii. *Tracking*: Monitoring the status of SSPs over time and against an investment (e.g., periodically reporting statistics on indicators; inclusion in data collected at the investment level).

With these two purposes in mind, we propose some guiding principles and tradeoffs to consider when devising an operational definition of an SSP. We categorize these principles and tradeoffs in three groups: indicators, thresholds, and criterion (indicator + thresholds) considerations for classifying households as SSPs.

A. Considerations for an operational definition of an SSP

- i. **Practicality**: Ideally indicators for defining SSPs could be constructed uniformly using established longitudinal datasets such as the LSMS-ISA and 50x2030 and future survey initiatives such as Resilient Futures. For example, when adding new livestock species in the definition, it is prudent to consider what the available survey data capture.
- ii. **Potential v. realized production**: The definition could reflect the potential for production (the asset base held by a household) or the actual value of production (the economic scale). Estimating the value of production requires price data not readily available in most surveys and subject to short-term production shocks and price variability, hence asset holdings are preferred to indicators capturing farm revenue or production decisions.

B. Threshold considerations

- i. **Uniform v. variable thresholds**: A uniform threshold (e.g. 2 ha) applies to all geographies whereas a variable threshold is specific to each geography (e.g. distribution of landholding). Uniform thresholds allow for simpler cross-country comparisons while variable thresholds can be more contextually meaningful for different geographies. For example, median landholding size is smaller in India than most SSA countries. Differentiating by region would better represent SSPs in their respective country distribution, but hampers comparability across geographies.
- ii. **Absolute v. relative thresholds**: Similarly, rather than choosing an absolute landholding size, it is possible to choose a common relative measure such as farms below the median landholding or in some other percentile of landholding size. This requires knowing the relevant distribution of landholding in a geography and is more data intensive, thus an absolute threshold may be more practical.

C. Criteria (indicator + thresholds) considerations

- i. **Crop/livestock duality**: Given the high prevalence of mixed crop-livestock farming, and the importance of both crop and livestock, a duality in the definition of small-scale crop and livestock producer is more inclusive.
- ii. **Level of focus**: The threshold for production scale could be set based on total aggregate production or based on specific components, i.e. a particular type of livestock, within a household's farm enterprise. For example, some definitions may consider a household as an SSP if they hold a small number of chickens, irrespective of the size of their cattle herd or the size of their landholding.

For livestock, there is a trade-off between aggregating all household livestock holding into a single measure such as the FAO tropical livestock units (TLUs) or considering each species separately. We choose to include species separately for two reasons:

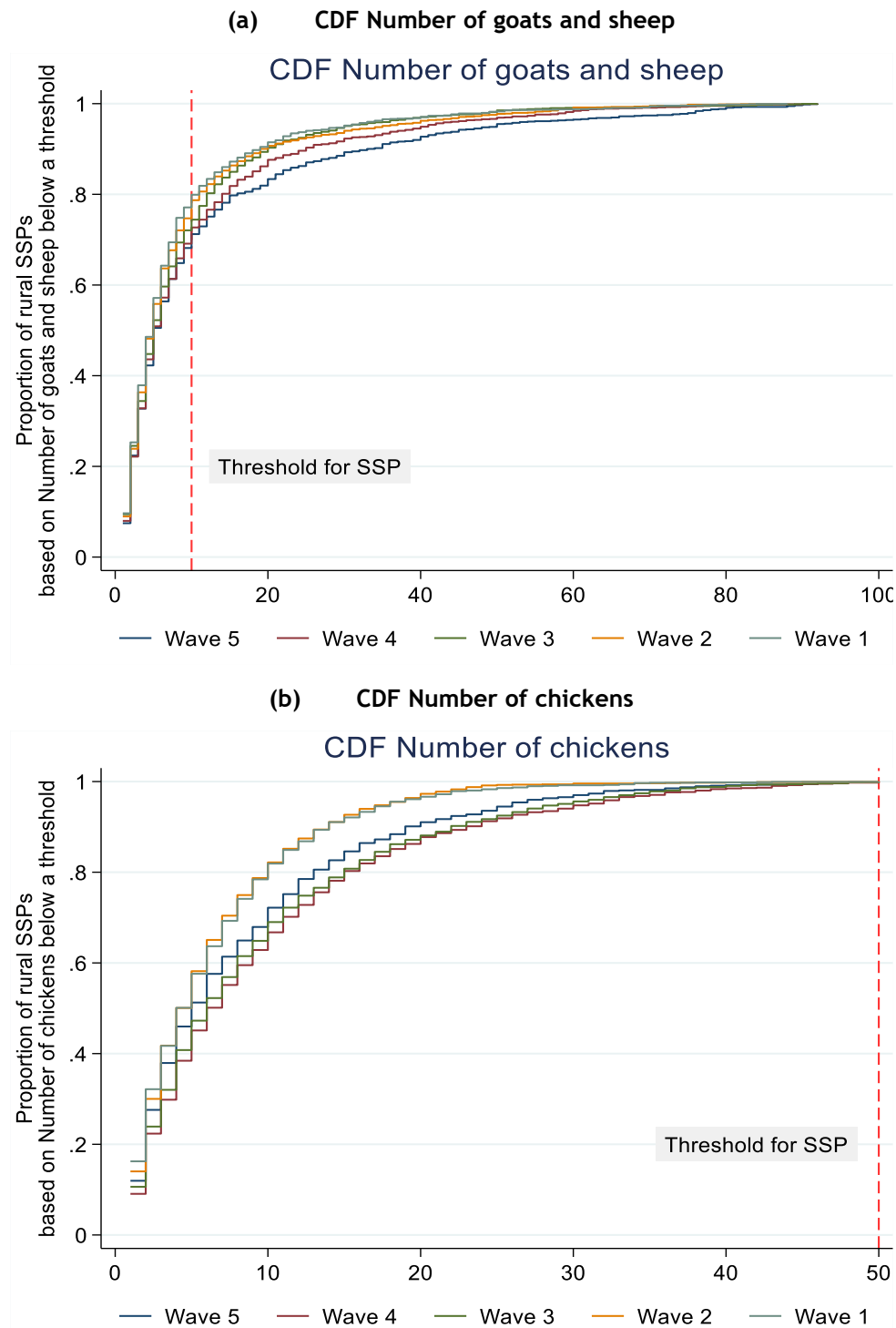
- Measures to aggregate livestock species, such tropical livestock units conversion factors, can only partially reflect equivalencies between species. For example, TLUs are based on livestock grazing comparisons or the weight of the animal, not their production or by-product value.
- Development organizations tend to have species- specific interests. Including livestock species separately allows the definition to focus on species of interest to particular organizations (e.g. dairy cows instead of all cattle) and allows the meaningful threshold to vary across species.

¹ We thank Dr. Ayala Wineman, Dr. Travis Reynolds, and several cohorts of UW EPAR research assistants for earlier inputs into this work. We are also grateful for the many conversations we have had with foundation policy officers, researchers, and practitioners in the international agricultural development community.

Table A1: Indicators commonly used in definitions of small-scale producers

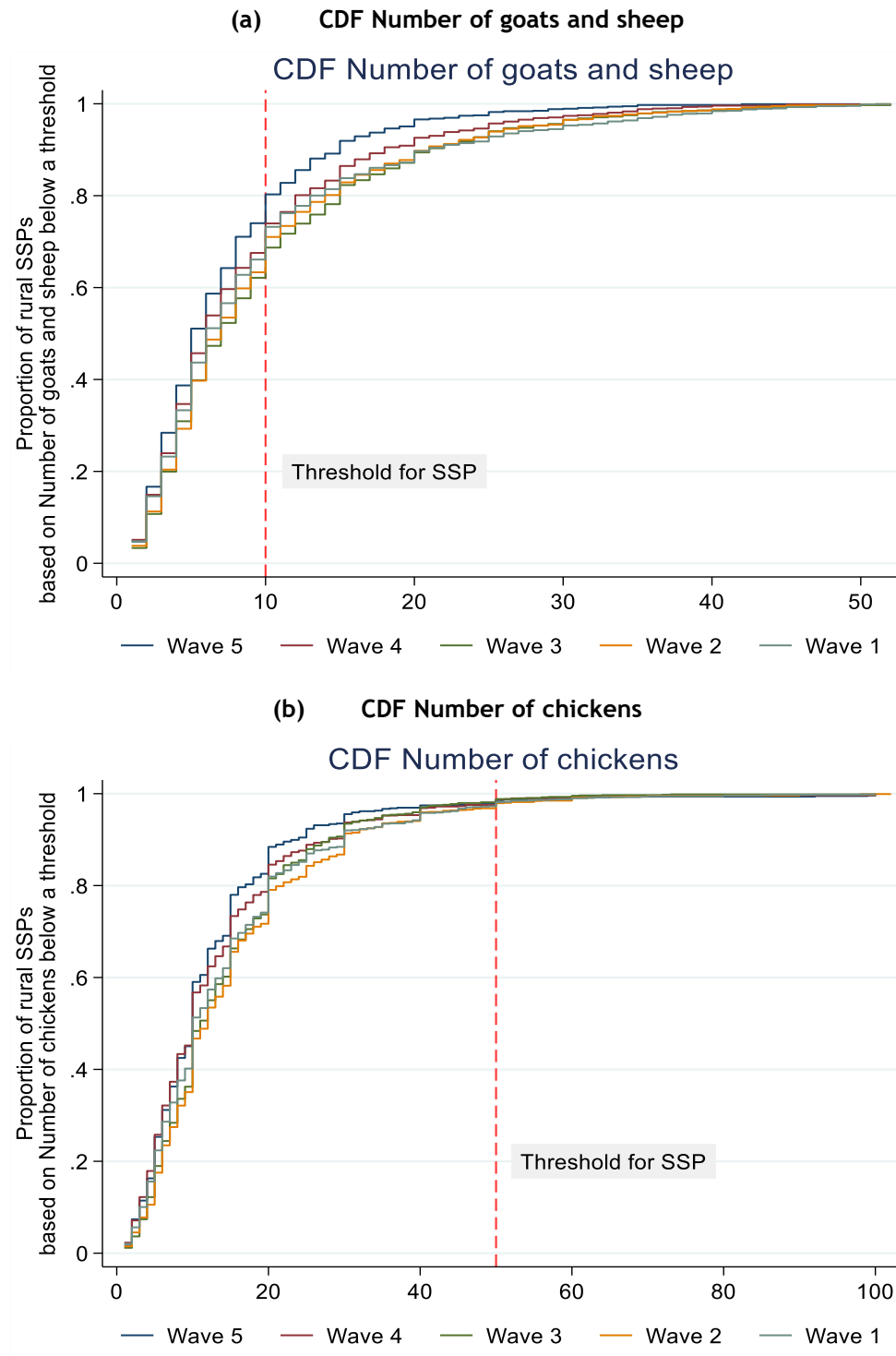
Indicators	Main dimension of farms captured	Operationalization	Practicality	Potential v. realized production	Use in proposed definition
Land holding	Land resource endowment	Farm size measured as total farm size or total area planted is used as a proxy for the scale of crop production.	Yes, available in most surveys	Potential, including all ag land (even fallowed)	Yes
Livestock holdings	Livestock assets	Livestock holding is a measure of the scale of production in mixed crop-livestock based farming systems and a proxy for assets.	Yes, available in most surveys	Potential, including all livestock in the count irrespective of age and purpose	Yes
Share of output value sold	Access to markets and degree of commercialization	The proportion of crop output sold to markets is used as a proxy for market orientation.	No, requires data on production, prices, and sales	Realized, limited only to actual production and sales	No
Farm revenue	Economic size	Total farm revenue is used as a proxy for the scale of operation and provides insights into the farm economic opportunities or lack thereof.	No, requires data on production and prices	Realized, limited only to actual production	No
Income diversification	Reliance on agriculture	The share of non-farm income in total income is used as a proxy for household reliance on agriculture and income diversification.	No, requires data on production, prices, and non-farm income	Realized, limited only to actual production and other income	No
Use of hired labor	Type of management a	The proportion of farm labor days by family members is a proxy for the type of management of the farm and its use of external input.	No, requires data on the type and amount of farm labor	Realized, limited only to actual labor used	No

Figure B1: Distribution of the number of goats and sheep and chickens holdings- Ethiopia



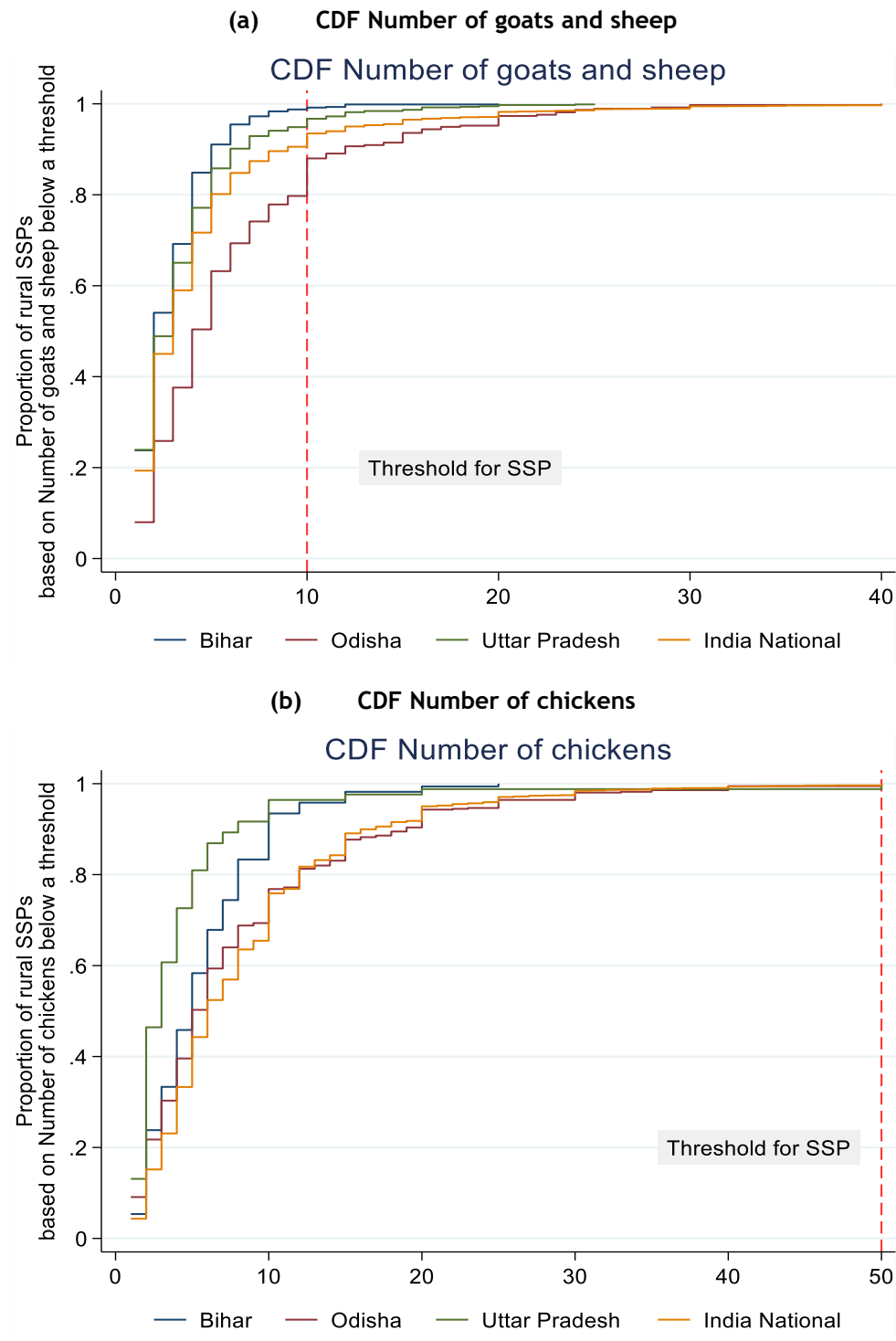
Data Source: Ethiopia - Socioeconomic Survey (ESS): Wave 1 (2011-12), Wave 2 (2013-14), Wave 3 (2015-16), Wave 4 (2018-19), and , Wave 5 (2021-22)

Figure B2: Distribution of the number of goats and sheep and the number of chickens holdings- Nigeria



Data Source: Nigeria - General Household Survey (GHS): Wave 1 (2010-11), Wave 2 (2012-13), Wave 3 (2015-16), Wave 4 (2018-19), and , Wave 5 (2023-24)

Figure B3: Distribution of the number of goats and sheep and the number of chickens holdings - India



Data Source: India - Situation Assessment of Agricultural Households (SAAHH) 2018-19

References

- Alvarez, S., Timler, C. J., Michalscheck, M., Paas, W., Descheemaeker, K., Titttonell, P., & Groot, J. C. (2018). Capturing farm diversity with hypothesis-based typologies: An innovative methodological framework for farming system typology development. *PloS one*, 13(5), e0194757.
- University of Washington, Evans Policy Analysis and Research group (EPAR) (2024) Living Standards Measurement Study - Integrated Surveys on Agriculture: Processed Datasets for Ethiopia ESS, Malawi IHS/IHPS, Nigeria GHS, Tanzania NPS, and Uganda NPS from 2008-2024."
- GRAIN (2014). Hungry for land: Small farmers feed the world with less than a quarter of all farmland. GRAIN Report May 2014. Available at <https://grain.org/en/article/4929-hungry-for-land-small-farmers-feed-the-world-with-less-than-a-quarter-of-all-farmland>
- Jayne, T. S., Chamberlin, J., Traub, L., Sitko, N., Muyanga, M., Yeboah, F. K., & Kachule, R. (2016). Africa's changing farm size distribution patterns: the rise of medium-scale farms. *Agricultural Economics*, 47(S1), 197-214.
- Larson, D. F., Muraoka, R., & Otsuka, K. (2016). Why African rural development strategies must depend on small farms. *Global Food Security*, 10, 39-51.
- Lowder, S. K., Scoet, J., & Raney, T. (2016). The number, size, and distribution of farms, smallholder farms, and family farms worldwide. *World development*, 87, 16-29.
- Khalil, C.A.; Conforti, P.; Ergin, I.; Gennari, P. Defining Small Scale Food Producers to Monitor Target 2.3 of the 2030 Agenda for Sustainable Development. In FAO Statistics Division Working Paper Series ESS/17-12; Food and Agriculture Organization of the United Nations (FAO): Rome, Italy, 2017
- Nagayets, O. (2005). Small farms: current status and key trends. *The future of small farms*, 355.
- Perret, S. R., & Kirsten, J. F. (2000). Studying the local diversity of rural livelihoods systems: an application of typological techniques for integrated rural development support in the Eastern Cape (South Africa).
- Pingali, P. L. (2012). Green revolution: impacts, limits, and the path ahead. *Proceedings of the National Academy of Sciences*, 109(31), 12302-12308.
- Timmer, C. P. (1995). Getting agriculture moving: do markets provide the right signals? *Food Policy*, 20(5), 455-472.
- Titttonell, P., Muriuki, A., Shepherd, K. D., Mugendi, D., Kaizzi, K. C., Okeyo, J., & Vanlauwe, B. (2010). The diversity of rural livelihoods and their influence on soil fertility in agricultural systems of East Africa-A typology of smallholder farms. *Agricultural systems*, 103(2), 83-97.
- University of Washington, Evans Policy Analysis and Research Group (EPAR) (2024) Living Standards Measurement Study - Integrated Surveys on Agriculture: Processed Datasets for Ethiopia ESS, Malawi IHS/IHPS, Nigeria GHS, Tanzania NPS, and Uganda NPS from 2009-2022."