

DEFINING SMALLHOLDERS TO MONITOR TARGET 2.3. OF THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT*

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Abstract

Despite the central position occupied by smallholder agriculture in the current development debate, a general and operational definition of smallholders still does not exist. The question “what is a small farm?” keeps receiving different answers depending on the context in which is posed. Alternative ways of defining smallholders reflect heterogeneous historical, institutional, eco-systemic contexts and depend upon what is the role of small-scale agriculture in the rural economy. A harmonized and unique definition of smallholder agriculture still needs to be established and operationalized. This has become a pressing issue given the need to monitor the Sustainable Development Goals (SDGs), which refers to the concept of smallholder in indicators 2.3.1 and 2.3.2.

Within this context, this present paper reviews different approaches adopted in the literature to define small-scale food producers, and highlights pros and cons associated with each alternative. It identifies criteria to be considered in a harmonized definition of this concept and reflects on the difference between absolute and relative approaches. Given the absence of a one-size-fits-all solution, the “right” definition will likely depend on the particular purposes of the analysis and the trade-off between completeness and feasibility.

* Comments received on a previous version of this paper, provided by representatives of national and International organizations during the Expert Consultation on "Methodology for an information system on rural livelihoods and Sustainable Development Goals indicators on smallholder productivity and income" -held at FAO headquarters on 7-8 November 2016 - are gratefully acknowledged. The authors are solely responsible for any remaining errors.

1. Introduction

In September 2015, the 2030 Agenda for Sustainable Development was unanimously adopted by the 193 Member States of the United Nations. The Agenda, which includes 17 goals and 169 targets, is expected to guide policies and programmes of policy-makers, the civil society, the private sector and other relevant stakeholders in the next 15 years and beyond.

In March 2016, the UN Statistical Commission agreed on a list of 230 global indicators to track progress against the 169 SDG targets. FAO's strategic framework is closely aligned with the SDGs, and the Organization has been proposed as custodian for 21 SDG indicators. As a custodian agency, FAO will work towards ensuring that data collected at national level are comparable and aggregated at sub regional, regional and global levels. The organization will be responsible for collecting data from national sources, validating and harmonizing them, estimating regional and global aggregates and publishing them on FAOSTAT. The data will inform the annual SDG progress reports that feed into the High Level Political Forum's follow-up and review processes.

Among the 21 FAO-relevant SDG indicators, two are associated with target 2.3. This target envisages, in particular, doubling, by 2030, "the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment."

Indicators 2.3.1¹ and 2.3.2², which measure labour productivity and income of smallholders, are classified in Tier III, among those indicators for which an agreed methodology is not yet developed. The main reason for this classification is the lack of a universally-accepted international definition of "smallholder". Indeed, despite the central position occupied in the debate on agricultural transformation and rural poverty, available definitions of "smallholder" vary significantly, depending on the farm characteristics taken into account, ranging from socio-economic features, to resource endowments and agro-ecological dimensions. The term "smallholder" often overlaps and may be used interchangeably with "small-scale agriculture", "family farm", "subsistence farm", "resource-poor farm", "low-income farm", "low-input farm" or "low-technology farm" (Heidhues and Brüntrup 2003).

This paper reviews criteria and approaches adopted to define smallholders in agriculture. It highlights pros and cons associated with each alternative measure. In particular, we reviewed definitions used at national and international level in roughly 60 papers or websites, in view of laying the ground to operationalize the "small scale food producers" concept embedded in SDG indicators 2.3.1 and 2.3.2.

The thread along which all the review is developed is the idea that, given the absence of one-size-fits-all solution, the "right" definition always depends on the specific purpose that it addresses. Moreover, the choice of the key definitional criteria will be informed by existing trade-offs between completeness and feasibility, and the limitations posed by data availability. Most definitions reviewed are reported in a glossary presented under Annex A.

This paper discusses the existing options and propose a feasible approach for establishing an international definition of smallholders, with the objective of monitoring SDG indicators 2.3.1 and 2.3.2. We also consider the merits of absolute and relative approaches, where the term "relative" refers to definitions that classify smallholders with reference to the area or the country in which (s)he operates. It is important to highlight that any internationally agreed definition is not intended to replace country-specific definitions which are meant to reflect national policy priorities.

¹ 2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size

² 2.3.2 Average income of small-scale food producers, by sex and indigenous status

2. The challenge of defining smallholder agriculture

While the Monitoring Framework of the SDGs refers to the concept of small scale “food producers”, most of the literature refers to small farms. Farmers are in fact a sub-set of food producers, as they constitute the first part of a production chain that may include traders, processors, retailers and other agents depending of the specific product and context. They seem to be, however, the main target of SDG2. For this reason, indicators 2.3.1 and 2.3.2 must be operationalized first and foremost with reference to agricultural producers.

The concept of “smallholder farmer” can be approached from various perspectives, which are linked to the objective of the analysis. For instance, according to Narayanan and Gulati (2002), a smallholder “is a farmer (producing crop or livestock) practicing a mix of commercial and subsistence production..., where family provides the majority of labour and the farm provides the principal source of income”. In a FAO study by Dixon et. al. (2004), smallholders are defined as “farmers with limited resource endowments, relative to other farmers in the sector”. Finally, according to the World Bank Rural Development Strategy (2003) smallholdings are those farms “with a low asset base and operating in less than 2 hectares of cropland”.

A more articulated and comprehensive definition is presented in the Report of the High Level panel of Experts on Food Security and Nutrition according (CFS HLPE, 2013) to which a small farm is

“..an agricultural holding run by a family using mostly (or only) their own labour and deriving from that work a large but variable share of its income, in kind or in cash. The family relies on its agricultural activities for at least part of the food consumed – be it through self-provision, non-monetary exchanges or market exchanges. The family members also engage in activities other than farming, locally or through migration. The holding relies on family labour with limited reliance on temporary hired labour, but may be engaged in labour exchanges within the neighbourhood or a wider kinship framework”.

As stated by Nagayets (2005), one of the reasons why the sole consensus around the concept of small farms may be the lack of an agreed definition, is the wide variety of farm structure and characteristics across different contexts and geographical areas³. Much literature mentions the absence of such agreement, but few papers venture proposing definitions. One is the EU Agricultural Economic Brief of 2011 entitled “What is a small farm?”.

Additional reports and literature reviews that offered useful entry points for our research are those produced in the framework of the World Agricultural Watch (WAW) initiative (see Cimpoies et. al. 2013b; Even, 2014; 2016; Matus et. al. 2014). Although not directly focused on the definition of smallholders, the WAW worked towards elaborating an international typology of agricultural holdings and is preparing country level guidelines for the identification of farm typologies. These harmonized groups are used to monitor rural transformation and to support policy dialogue.

In the policy debate, the notion of “small farms” goes hand in hand with the idea of disadvantage, risk of poverty, lack of opportunities, and need of support (EU Agricultural Economic Briefs, 2011). Hence an ideal definition should be consistent with the concepts of absolute poverty and severe food insecurity, which are at the basis of the SDGs policy agenda. At the same time, an operational

³ See the IFC’s Handbook (2012) for a brief review of the main elements characterizing smallholders’ agriculture.

definition needs to balance completeness, relevance and practical feasibility; and must be based on a criterion that does not depend upon the outcomes that have to be measured (Offutt, 2016). For SDG indicator 2.3.1 and 2.3.2, this means that the criterion chosen to identify smallholders must be independent from the income and labour productivity of food producers. We propose three logical steps to be followed in the identification of an operational definition of smallholder farmers.

- 1) First, a criterion that characterizes smallholders must be chosen. This variable can be, for instance, land, labour, market orientation, etc.;
- 2) Second, data availability for the implementation of the selected criterion must be assessed;
- 3) Third, a decision needs to be taken of whether the criterion should be considered in absolute or relative terms;
- 4) Finally, a threshold to separate smallholders from other type of farms must be identified.

One additional consideration is in order. Target 2.3 (and the related indicators), as defined in the 2030 Agenda for Sustainable Development, refers to small-scale food producers. This means that reference is made to the holders of an enterprise, and not to the holding. The two concepts are different. Most of the literature refers to the holding rather than to the holder. In this paper we consider the farm as a proxy to capture some key characteristics of its holder, presenting criteria to identify small-farms.

While the most common and feasible approach is to identify a holding, it must be noted that, by introducing this approximation, we assume that the income and productivity due to be doubled by 2030 are those of the farm activity. Other income sources – such as non-agricultural economic activities in which the holder may be engaged – will not be considered. Furthermore, referring to the holding, we do not account for those cases in which a holder owns or operates more than one farm. Finally, as mentioned, we do not consider here small-scale firms involved in the processing of agricultural products, which would be part of the “food producers”.

An important pre-requisite for defining smallholders, is the availability of a workable and agreed concept of what is a farm, and what is a farmer. While this is not the topic of this paper, agricultural censuses and surveys worldwide are not always based on similar definitions. FAO defines an agricultural holding as “an economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural production purposes, without regard to title, legal form or size. Single management may be exercised by an individual or household, jointly by two or more individuals or households, by a clan or tribe, or by a juridical person such as a corporation, cooperative or government agency” (FAO, 2015c). FAO encourages countries to develop their national statistical definition on the basis of this standard concept. Nevertheless, most countries still adopt thresholds of farm size, below which farms are not included in the reference population. Lack of homogeneity on these choices may hinder inter-country comparisons, even if a unique criterion is used to identify smallholders.

Finally, it is worth noticing that in reviewing the definitions proposed, a number of potential overlaps emerged with concepts which are somehow related to that of smallholder, albeit inherently different. Examples include family farmers and subsistence farming, peasants, outgrowers.

3. A catalogue of definitions by type

A broad categorization of the definition of smallholders emerges by distinguishing those based on a single criterion from those based on multiple criteria. The former are more frequently used to identify

smallholders in a given population, and to produce statistics. The latter are more frequently used in theoretical work and in the policy debate.

The definitions based on a single criterion can be grouped in the four categories below, depending on the criteria on which they rely:

- 1) The endowment of factors of production such as land, labour, technology;
- 2) The type of management of the holding - notably the degree of involvement of the family;
- 3) The connection between the farm and the market (market orientation);
- 4) The economic size of the holding, measured - for instance – through the value of production.

Definitions based on multiple criteria are usually relying on a combination of the above mentioned criteria. The definitions derived from these criteria are analyzed in the next section, highlighting pros and cons of each of them.

3.1 Definitions based on the holding's endowments of production factors

This group of definitions uses the endowment of production factors such as land size, quantity of labour, or value of machineries to identify smallholders.

3.1.1 Land size

Limited access to land is a very common approach to identifying smallholders. About 70% of the literature reviewed define smallholders in terms of the physical size of the farm, primarily in terms of hectares of operated land or number of tropical livestock units (Eastwood et. al., 2009). An upper limit of 2 hectares is typically identified on the land area or number of livestock operated or owned by individual farmers and their families. As summarized by Thapa (2009) *"small farms... have been defined in a variety of ways. The most common measure is farm size; many sources define small farms as those with less than 2 hectares of cropland"*.

The paper *"Hungry for land: small farmers feed the world with less than a quarter of farmland"* (GRAIN, 2014) indicates the extent to which this criterion is widespread. To find out how much land is operated by smallholder farmers and how much food they are producing, the authors collected official statistics, FAOSTAT data and other FAO sources and relied, when available, the definition used by each national statistical authority. Where national definitions were not available, they adopted the 2 ha approach. Out of 122 countries in which a definition was available, 71 adopted land size thresholds, with country-specific thresholds (Table 3.1).

Table 3.1: Numbers of definitions of smallholders from national statistical authorities using the land size criterion (Source: Grain, 2014).

	Number of countries for which the official definition was available	Number of countries using the land size criterion	Number of countries using the 1 ha threshold	Number of countries using the 2 ha threshold	Number of countries using the 5 ha threshold	Number of countries using the 10 ha threshold	Number of countries using thresholds greater than 10	Number of countries using different thresholds
Africa	31	22	3	8	5	5	0	1
Asia and the Pacific	30	23	5	9	3	0	1	5
Latin America and the Caribbean	19	18	1	3	3	1	9	1
North America	2	1	0	0	0	0	1	0
Europe	40	7	0	2	2	1	1	1
Tot	122	71	9	22	13	7	12	8

The land size approach is adopted overall by 93% of the countries with a definition of smallholders (by 83% of the countries in the Asia and Pacific region).

It is worth noting that in considering the size of a farm, reference is made to the “operated land”, which is a measure of the amount of land effectively used by a farm or a household under different arrangements. This entity is different from the land owned by the holding, since it excludes land that is rented out, while it includes land rented in by the farm. At the same time, the “operated land” is different from the “cultivated land” as the former includes fallow land.

One reason for the popularity of this criterion in statistics and economic analysis is the relatively easy access to data: land size is often found in many national data sources, such as agricultural censuses and surveys and integrated household surveys, such as the LSMS-Integrated Surveys of Agriculture (ISA). In addition, land is independent from the outcomes to be measured on smallholders in the SDG monitoring framework, which monitors their income and productivity.

The measurement of operated land is frequent in the statistical practice, and undertaken with three main methods:

- 1) The traversing or “compass and rope” method;
- 2) the self-reported land area; and
- 3) the GPS-based land measurements.

The traversing method is considered the ‘gold standard’ of land area measurement. Being very accurate, it remains the approach of choice for specific types of data collection. However, the method is technically demanding, time consuming, and requires experienced staff. This makes it impractical for use in large-scale household surveys. Self-reported land area is among the most common approaches in agricultural and household surveys. This method is inexpensive and quick, and can be easily incorporated in a survey questionnaire. However, accuracy can be a concern. Methods based on GPS devices are gaining popularity. While being cheap and accurate, they need to be implemented by experienced enumerators who can operate GPS devices. Moreover, not all plots can always be visited by the enumerators, which may result in missing data; and the measurement of very small plots could pose challenges, hence reducing the accuracy.

Despite its many pros, the land-based criterion is not exempt from limitations. In particular, it has been argued, that similar land size can correspond to highly heterogeneous economic and social

conditions, so that the amount of land in itself cannot fully characterize a smallholder. Nagayets (2005), for instance, argues that a land-based measure “*fails to properly account for the quality of resources, the types of crops grown, or disparities across regions [...]. The size-based definition also precludes analysis or comparison of institutional and market arrangements available to farmers, which play a critical role in determining their income opportunities as well as their access to key social services, such as health and education. Further, the size-based definition does not shed light on a farm’s labour arrangements, such as relative shares of family and hired labour, which can also have substantial implications for the farm’s efficiency and productivity.*” In the same vein, Rapsomanikis (2015) argues that “*...across countries, the distribution of farm sizes depends on a number of agroecological and demographic conditions, as well as on economic and technological factors. Two hectares in an arid region of Sub Saharan Africa do not produce as much as two hectares of good quality land in the Black Sea region. In Kenya, classifying as smallholders those farmers who farm land smaller than 2 hectares and adding them up, would nearly result in the entire arable sector. In other countries, such as Nicaragua, farms smaller than 2 hectares would be really small. The 2 hectares threshold does not provide any meaningful information for an analysis across countries.*”

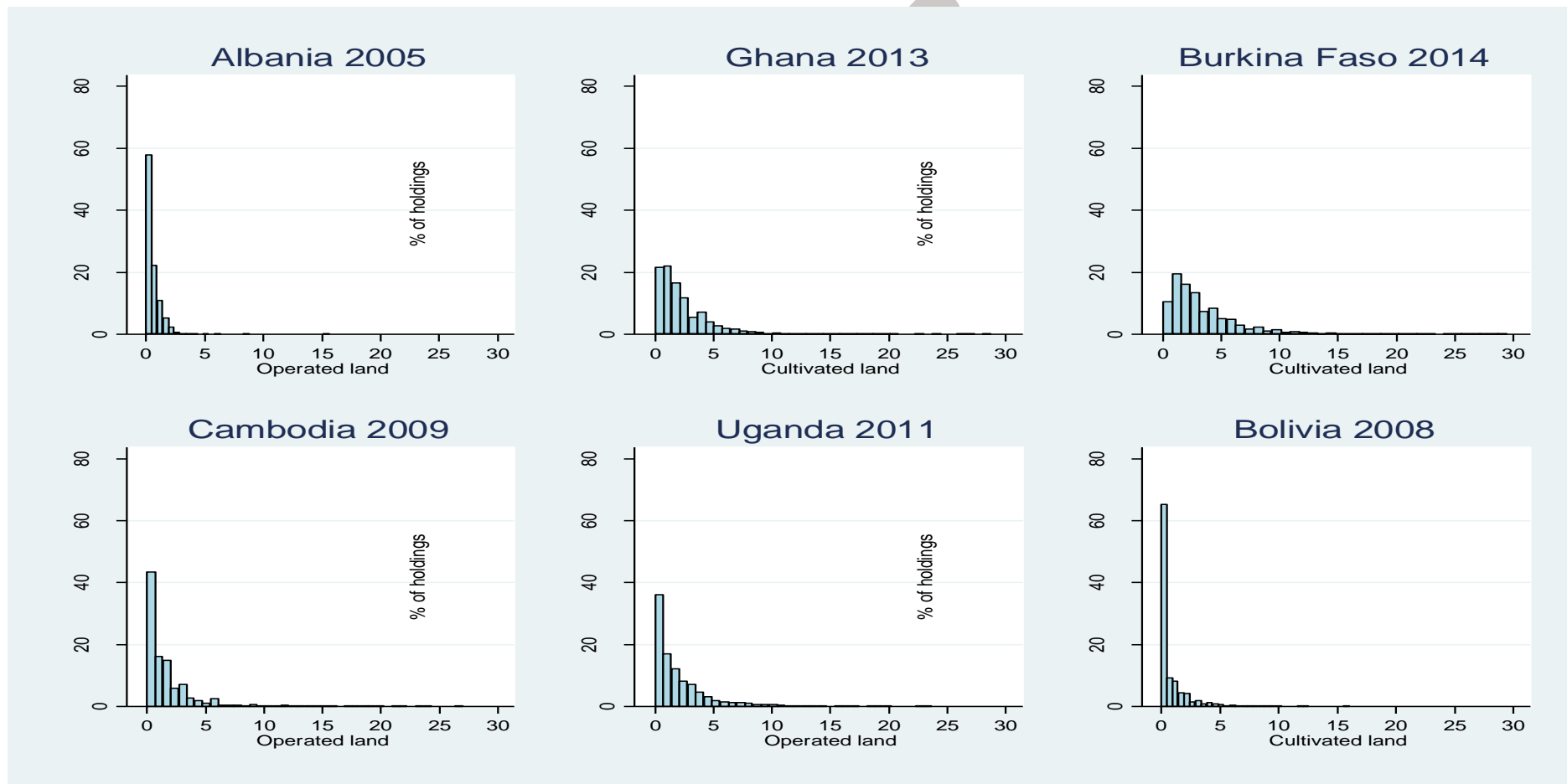
Pros and cons of the land size approach are also reviewed in the Agricultural Economic Brief from the European Commission (2011), Berdegú and Fuentealba (2011), and Braun (2004). Smallholders in the European Union were identified for long time on the basis of the so-called Utilised Agricultural Area (UAA)⁴: small holdings were those with less than 2 or 5 ha of UAA. Despite being a workable measure, easily available in most countries, capable of providing broad indications of structural changes, the UAA is considered to be overly simple. The sole number of hectares is considered not to be enough for characterizing the specific problems faced by a small farm. In fact, the criterion fails to consider factors such as diverse requirements of cropland depending on the type of farming, land fertility, irrigation system and other key characteristics.

The land size-based criterion does not, per se, preclude the inclusion of other relevant variables in a definition where they are available and easily measured; while at a same time it can provide an easily operational criterion where information is scarce. An option that could be considered is also the definition of qualitative parameters of land, accounting for their potential, or their use. This would reduce the difficulties of comparing hectares in very different context, making hectares of e.g. cereals different from hectares of horticultural products; and avoiding that two hectares of greenhouses are treated as equivalent to two hectares of meadows.

In general, the distribution of land across farmers tends to be negatively skewed, with most observations located on the left tail. In practice, a limited number of farmers operate large-size farms, while a large number of farmers operate small-size farms. Few examples of this pattern are reported below (**Figures 3.1**). What changes across countries seems to be mostly the absolute position of the distribution. For instance, while in Albania most farms operate less than 3 hectares and almost half of them operate less than 0.5 hectares, in Burkina Faso, holdings operate on average 4 hectares, and almost 75% of the farms operate less than 5 hectares.

⁴ This criterion is being progressively replaced by another one, based on the economic size of the holding (see section 3.6)

Figure 3.1: Land size distribution in selected countries



Data sources: calculations based on Albania Living Standard Measurement Survey (2005), Ghana Living Standard Survey (2012-13), Burkina Faso Enquête Multisectorielle Continue (2013-14), Cambodia Household Socio-Economic Survey (2009), The Uganda National Panel Survey (2010-11), Bolivia Encuesta de Hogares (2008). When data to compute operated land was not available, we resorted to the cultivated land, which excludes the land left fallow.

3.1.2 Labour

The total amount of labour input per holding can be used as a criterion for identifying small farms. The idea is that a small farm is likely to require a lower labour input compared to a large-scale one. The EU Agricultural Economic Brief on the definition of smallholders (European Commission, 2011) considers also this option for the implementation of EU common agricultural policy⁵. This approach shares some of the advantages and the limitations of the land size-based criteria. Moreover, given that the monitoring of SDG 2 requires the monitoring of labour productivity – indicator 2.3.2 -- information on labour inputs per farm must be collected in any case.

However, measuring labour input is not straightforward. The number of persons working in a holding would be a poor proxy for it, given the large presence of part-time, seasonal and casual labour and work in agriculture, which partly stems from the high variability of labour demand. Moreover, assessing the effective contribution of contributing family members involved in agriculture required detailed and specific surveys (i.e. time use surveys).

One solution is the computation of an equivalent number of full time labour units associated with the farm. The EU (2011), for instance, proposes the use of annual working units (AWU). This allows considering small farms those holdings with a value of AWU lower than a given threshold. Information on the AWU, namely the number of hired and family workers and the time that they spend working in the holding, requires a detailed Farm Structure Surveys (FSS), which is carried out in EU member states every 2 or 3 years based on a common methodology.

It is important to note that, whereas the use of new technologies – such as GPS – can facilitate the collection of land data, hence reducing measurement errors, in the case of labour data there are less technical alternatives to in-depth surveys, involving long reference periods. As a matter of fact, data availability is a major challenge. Especially in developing countries, agricultural surveys are seldom performed on a regular basis, and household surveys integrated with an agricultural module only provide partial information. For example, most available household surveys do not report data for computing AWUs.

As for land size, considering labour input only, may imply that relevant socio-economic and agro-ecological characteristics of the farm are not captured. For instance, few labour units can easily operate a large-scale farms if machinery is accessible. Also in this case, therefore, the labour-based criterion should be used in combination with other criteria.

In the case of labour, however, it is also possible to consider its *type*, and not only its quantity. Several definitions are based on the type of labour. One approach is based on the idea that smallholdings rely mostly or entirely on family labour, with a small number – or no -- hired workers. Shares of family and hired labour in the holding are found in many smallholder definitions, often as a complement to land size. For instance, IFAD (2009) defines small farms as those with less than 2 hectares which rely on household members for most of the labour input. In the same vein, Hazel et. al. (2007) describe small farms as “those depending on household members for most of the labour or those with a subsistence orientation, where the primary aim of the farm is to produce the bulk of the household’s consumption of staple foods”. Lipton (2005) defines small or family farms as those “operated units that derive most of labour and enterprise from the farm family”. Also the WAW considers the type of labour used as a central criterion to define farms typologies (Even et. al., 2016).

⁵ More details on EU Agriculture and Rural Development Strategy for 2014-2020 can be found at the following link: http://ec.europa.eu/agriculture/rural-development-2014-2020/country-files/index_en.htm

Small farms prevalently use family labour. Examples are provided from Ethiopia, in which four members out of a family of five persons work in the farm on a daily basis. Similarly, in Bolivia, families of four provide more than two people per day to work in the holding. Non-family workers are generally hired on a seasonal basis, even though the contribution of hired labour is small. In Kenya smallholder families are reported to provide on average twenty times more labour than hired workers; and in Nicaragua the ratio of family to hired labour is over 11 (Rapsomanikis, 2015).

However, there are limitations to the use of the share of family labour for defining smallholders. Firstly, “family” farms and small farms, despite some overlap, do not coincide; and they operate considerably different shares of agricultural land on a global scale (Lowder et al., 2014). Secondly, the degree of involvement of family members in the holding can vary to a great extent: some of them only provide marginal contributions, and data to assess these differences is not always available.

The implementation of a set of integrated farm surveys – through the Agricultural Integrated Survey (AGRIS) project – can address some of these problems. The AGRIS methodology is structured around a core module collecting data on crop and livestock production and four rotating modules. One of the rotating modules, administered once every three years, focuses on labour. Its questionnaire collects information on hired and family labour input in the agricultural holding, disaggregated by sex, age and other characteristics. This will pave the way to the computation of an AWU type of measure, normalizing the actual contribution of each worker in the holding.

3.1.3 Structural constraints

From a more general standpoint, the definitions reviewed so far are all based on the notion that smallholders operate under structural constraints, implying access to sub-optimal amounts of resource, technology and markets. Dixon et al. (2004) summarize this idea when they say that “the term smallholders refers to the limited resource endowment of farmers compared to those of other farmers in the sector”. In the same vein, Brooks et al (2009) define smallholders as “farm households which struggle to be competitive, either because their endowments of assets compare unfavourably with those of more efficient producers in the economy or because they confront missing or underdeveloped markets”. According to Murphy (2010), “smallholder farmers are characterized by marginalization, in terms of accessibility, resources, information, technology, capital and assets...”.

There seem to be no examples of how this more general criterion can be operationalized for statistical purposes. In fact, access to land and labour input are one way of operationalizing the concept of structural constraint, albeit in relative terms. Indeed, the idea of limited availability of resources, per se, does not provide an operational method to estimate the number of smallholders. From a procedural point of view, those categories of resources whose access is constrained for small farmers -- land, labour, water, machinery, market access, etc. – should be identified first and then a threshold should be set. A key operationalization problem is that such constraints should be assessed with reference to an optimal resource endowment, which is not easily defined in absolute terms, and would not be homogenous across countries, regions and through time.

3.2 Definitions based on the type of management of the holding

Many of the sources reviewed pointed out that the terms “family farms” and “smallholder agriculture” are often used as synonyms, especially in the agricultural policy jargon. However, as mentioned, “small” and “family” refer to different dimensions.

As documented in Garner and De La O Campos (2014), beside the common use of the term family farms in the literature, authors seldom define or locate family farms within well-defined categories of agricultural production systems. Thus, also the definitions end up applying varying sets of criteria, depending on the country-context and even the political motivation of the user.

Berdegué and Fuentealba (2011) define *“smallholder or family-based agriculture... as a social and economic sector made up of farms that are operated by farm families, using largely their own labour.”* They note that the *“... two categories [...] could be controversial. The subsistence farmers, who derive a large fraction of their income from non-farm sources, including non-farm employment, remittances and cash and in kind social welfare support. Second, a sub-sector that is smaller in number of farms, but of much greater importance when it comes to economic participation; these are commercial family farmers who may employ one or two permanent nonfamily workers, but where still much of the farm work and of the farm management is done by family members”.*

One of the objectives of Garner and de la O Campos (2014) was identifying the unique aspects of family farms vis-à-vis smallholder farmers. The authors recognize that both these concepts are based on the limitations in size and labour capacity as well as on the barriers these farms face in market access. However, they also illustrate distinctive characteristics of family farms that do not coincide with those of smallholders. They conclude that a uniform definition of “family farm” is difficult, as there is no such a concept that applies to all contexts. Rather than a binding definition, they propose to highlight the most important characteristics of family farms. Using their words “Family Farming (also Family Agriculture) is a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production which is managed and operated by a family and predominantly reliant on family labour, both women’s and men’s. The family and the farm are linked, coevolve and combine economic, environmental, reproductive, social and cultural functions.”

The Consultative Group to Assist the Poor (CGAP), a global partnership of 34 leading organizations hosted by the World Bank, offered a numerical representation of the difference using estimates from the FAO’s State of Food and Agriculture 2014 derived from six different rounds of the World Census of Agriculture (from 1960-2010). The global number of small farms was estimated using the land size criterion with the 2 ha threshold. The GCAP found that 84% of the 570 millions of farms are smaller than 2 hectares. These only operate about 12% of total farmland in the sample. Assuming that this sample is representative of world agriculture, the estimate points to more than 475 million of small farms worldwide.

To identify family farms, the GCAP used two operational criteria, which are common to many definitions:

- A member of the household owns, operates and/or manages the farm, either in part or fully;
- A minimum share of labour comes from the owner and his or her relatives.

In virtually all of the 52 countries which reported information on these criteria, more than 90% of farms were managed by a single individual, a group of individuals or a household – as opposed to being managed by corporations, cooperatives, governmental institutions or other institutional arrangements. In these countries, the vast majority of permanent labour was provided by the household rather than by hired workers. According to these criteria, more than 90% of the farms in the sample countries could be considered family farms. These operate 75% of the agricultural land. Assuming that this sample was representative of farms and agricultural areas worldwide, the estimate points to more than 500 million agricultural holdings in the world to be classified as family farms (Lowder et. al., 2014).

In conclusion, given that 90% of the farms are family farms and 84% small farms, there is an obvious and considerable overlap among the two groups. However, the amount of agricultural land occupied by the two groups differs markedly – family farms control about 75% of all agricultural land and small farms control only about 12%. Hence they are clearly two separated groups. These findings highlight that the terms “family farm” and “small farm” should be used to indicate different groups of farmers, which often overlap but are not the same (Lowder et. al. 2014).

3.3 Definitions based on the market orientation of the holding

Many definitions in the literature identify smallholders on the basis of concepts such as subsistence agriculture, own-consumption, or market orientation of the farm. An example is provided by the OECD (2015), which defines smallholders as farmers that “struggle to be competitive and hence to produce an income to support themselves and their families”. Furthermore “they often live in poverty and produce at least part of their produces for self-consumption”.

The WAW, for instance, considers the criterion associated to output orientation toward commercialization or self-consumption as one of the most useful for identifying farm typologies (Even, 2016). Engagement in market activities is considered to be directly connected to the notion of rural transformation (Davidova et al., 2009).

Also in FAO (2014), farms’ categories are defined on the basis of their relation to markets and their capacity to innovate. These categories include:

- Subsistence and near-subsistence smallholders, who produce essentially for own consumption and with little or no capacity to generate surplus production for the market;
- Small farms that are either market oriented and commercial, generating surplus production for a market (local, national or international), or have the potential to become market-oriented;
- Large farms, showing characteristics of industrial ventures.

The literature on the constraints that smallholders face in accessing markets also suggests criteria for identifying small farms on the basis of their market participation. Wiggins and Keats (2013), suggest that poor farmers are not linked to markets for a variety of reasons: remoteness, low production, low farm gate prices, and lack of information. In more details, OECD (2015) summarizes the main constraints affecting the access of small farms to the markets (Table 3.2). These limitations are analysed in Arias et. al. (2013).

Table 3.2: Major categories of constraints affecting smallholder access to markets (Source: OECD, 2015)

Resources	Technological	Financial	Product	Structural
Land size, land quality	Land Productivity	Cash flow deficit	Volume	Infrastructure
Water access	Technical Efficiency	Credit	Product quality	Weather
Education	Know-how, training	Insurance	Seasonality of Production	Geography
Health	Storage Capacity		Lack of associativity	Legal
Low Income				Land Tenure

In principle, it would be ideal to identify a criterion allowing to distinguish among farms according to their level of competitiveness. In fact, this is not straightforward. What is relatively easier, is to measure the share of agricultural production allocated to own-consumption, as this information is often collected in many types of surveys including household budget surveys, LSMS, and other integrated surveys. This approach, however, has been seldom used in the statistical practice, partly due to the difficulty of collecting accurate data on consumption – including own-consumption – at the individual level through household budget surveys.

In the EU, market participation of farms is regarded as a potential dimension to be used for defining smallholders for statistical purposes. The EU (2011) proposes a classification of small farms, to be used in alternative or in parallel to the one relying on the land size, based on the proportion of own-consumption of the holding. According to this criterion -- which can be operationalized by setting specific thresholds -- farms are divided into subsistence, semi-subsistence and commercial farms. The EU (2011) states that *“this criterion can provide some information on the economic situation of the farm, since it is possible to deduce that a high level of self-consumption goes hand in hand with low revenues”*.

This approach is controversial. Let's consider two extreme cases, the first being a subsistence farm that uses all its production for own consumption and to generate income for the family; the second being a farm operated by a family, where all the members work in the farm only marginally during their leisure time from the main employment, which is also their source of income. In both cases, the production of the farm is mainly used for own-consumption. Using this approach we would classify these two completely different farms as smallholdings, i.e. holdings needing support in order to improve their income and productivity. One possibility to overcome such problems could be to set a minimum proportion of income derived from agriculture for defining “farmers”.

3.4 Definitions based on the economic size of the holding

Some of the national official definitions of small farm use concepts related to the economic, rather than physical, size of the holding. The USDA Economic Research Service (USDA-ERS), for instance, defines farm size by making reference to gross cash farm income (GCFI). A small farm is one that produces and sells less than \$250,000 per year.

Also in the EU, the economic size is adopted as a criterion for defining smallholders. Both the Farm Structure Survey (FSS) and the Farm Accounting Data Network (FADN), which are the main official data sources for EU agricultural statistics, provide the necessary data to compute these indicators. Until 2007 the economic size of the holding was measured as Standard Gross Margin (SGM) per holding. The SGM was a measure of the production that considers all the separate activities of an agricultural holding and their relative contribution to the overall revenue. For each activity, the SGM was estimated, considering the area (for crop output) or the number of heads (for animal output) and a standardised SGM coefficient for each type of crop and livestock, calculated separately for different geographical areas to allow for differences in profit. The sum of all these margins per hectare of crop and per head of livestock in a farm is a measure of its overall economic size, expressed in European Size Units or ESU (1 ESU = 1200-euro SGM). Since 2010, however, the SGM has been replaced by the so called “Standard Output” (SO). The SO is the average monetary value of the agricultural output at farm-gate price, in euro per hectare or per head of livestock. A regional SO coefficient is calculated for each product, as an average value over a reference period of 5 years. The sum of all the SO per hectare of crop and per head of livestock in a farm is a measure of its overall economic size, expressed in euro. Economic sizes measured as SGM and SO are not comparable with each other. In fact, the way they are calculated differs:

- $SGM = \text{Output} + \text{Direct Payments} - \text{Costs}$
- $SO = \text{Output}$

Standard output thresholds could be, in principle, used as international thresholds, once converted in international dollars or Purchasing-Power-Parity dollars. This would allow an effective comparability of the economic size of the holdings across countries. However, poor data availability and statistical capacity in many countries has so far prevented the use of this criterion.

The economic size of the holding has been recommended as a valid criterion also for the identification of farm typologies in the WAW framework. Looking at economic-related indicators instead of physical-based indicators, it is in fact possible to compare farms involved in widely diverse agricultural activities. In this respect, the consideration of the revenues instead of the income of the holding is perhaps the best option. Indeed, high cost of production in one particular year may result in negative or very small income values for farms that, in other circumstances, would not be considered small.

3.5 Definitions based on multiple criteria

These definitions are based on combinations of the criteria reviewed so far. While being very comprehensive, they have hardly been operationalized in statistical practice, mostly due to poor availability of consistent data.

Furthermore, problematic results may occur when criteria conflict. What if, for instance, a farm is classified as small in terms of land, and not small in terms of labour input? Conflicts can be overcome by combining criteria based on a hierarchical definition, which prioritize those criteria that better identify smallholders as farmers at risk of poverty. Table 3.3 above summarizes the advantages and limitations of the different criteria, as they have been discussed so far.

Table 3.3: Review of alternative criteria to define smallholders

Category	Criteria	Type of data sources	Pros	Cons	How does it work in practice?
Production factors endowment	Land size	Agricultural surveys, Agricultural Censuses, Integrated household surveys	Simple to measure, easily available, widely utilized in the literature for statistical and economic analysis.	It does not account for: 1) quality of resources, type of crops grown, disparities across countries and regions; 2) socio-economic and agro-ecological characteristics; 3) land distribution	This criterion can be utilized setting a threshold of land size (or number of livestock) under which the farm is considered small.
Production factors endowment	Labour Input	Agricultural surveys, Agricultural Censuses, Integrated household surveys	Simple to measure, intuitive	It does not account for: 1) quality of labour; 2) socio-economic and agro-ecological characteristics; 3) factors that could affect the quantity of labour input	This criterion can be utilized by setting a minimum number of equivalent full-time workers under which the farm is considered small.
Type of Management	Family Farming	Agricultural surveys, Agricultural censuses, Integrated household surveys, Household budget surveys	data easily available	Family farms and smallholders are different agricultural categories.	This criterion can be utilized selecting an operative definition of family farm (Lowder et. al. 2014).

Market Orientation	Market Orientation	Agricultural surveys, Integrated household surveys, Household budget surveys	In principle it would be appropriate, as it is based on competitiveness and of the returns of the holding	1) Quite difficult to measure in a harmonized way; 2) Provides only a partial representation of the economic situation of the holding. 3) criteria based on elusive concepts	A possible solution to make this criterion operative, consists in setting a share of own-consumption of the holding.
Economic Size of the holding	Economic Size	Agricultural surveys, Integrated household surveys	Give a representation of the economic situation of the holding and its risk of incurring in poverty	Lack of reliable and homogenous data.	This criterion entails setting a threshold to the standard value of production or the standard output under which a farm is considered small.
Multiple criteria	Multiple criteria	Agricultural surveys, Agricultural censuses, Integrated household surveys, Household budget surveys	More complete than a single criterion	More time and data consuming	This criteria can be applied using a combination of the thresholds considered for the other groups.

4. Absolute versus relative measures

Once a criterion is adopted to define smallholders, the issue remains of choosing between a relative and an absolute approach. Thresholds to separate large from small agricultural holdings, in other words, can be set either in absolute or relative terms. Most criteria reviewed in the previous section can be cast both in absolute or relative terms. An absolute approach will assign, for a given criterion, the same exact threshold to all contexts at hand; in the case of the SDG monitoring, the same threshold will be applied in all countries, regardless of their agro-ecological and socio-economic conditions. A relative approach, instead, entails setting a threshold at one point in the distribution of the criterion variable that separates the small from the large. As a matter of fact, the relative approach implies the use of country-specific thresholds. None of the two approaches is *a priori* superior, and the choice between the two should be made by keeping in mind the purpose of the exercise. But what would be the difference in practice?

Below we reproduce a numerical example from the EU agricultural economic brief (2011), which helps illustrating the difference between the two approaches. Figure 4.1 shows the share of farms that would be classified as small in the EU-27⁶ using 2-hectares and 5-hectares absolute thresholds. The criterion variable chosen in this case is the Utilized Agricultural Area (UAA).

A corresponding relative approach is a threshold that covers the smallest farms whose combined acreage accounts for e.g. 10% or 20% of the total hectares of operated land in a country. From the same source, Figure 4.2 shows the share of farms in the EU that would be classified as small based on a relative threshold. This is designed to include in the smallholder set the farms whose combined UAA makes up 10% of the total UAA in each member country.

⁶ In Figure 4.1 labels of “new” and “old” member states aggregates refer to the 2004 enlargement of the EU.

Figure 4.1: Share of holding with less than 2 and less than 5 ha of UAA and their UAA in the EU (Source: EU Agricultural Economic Brief, 2011. Data from EUROSTAT, Farm Structure Survey, 2007)

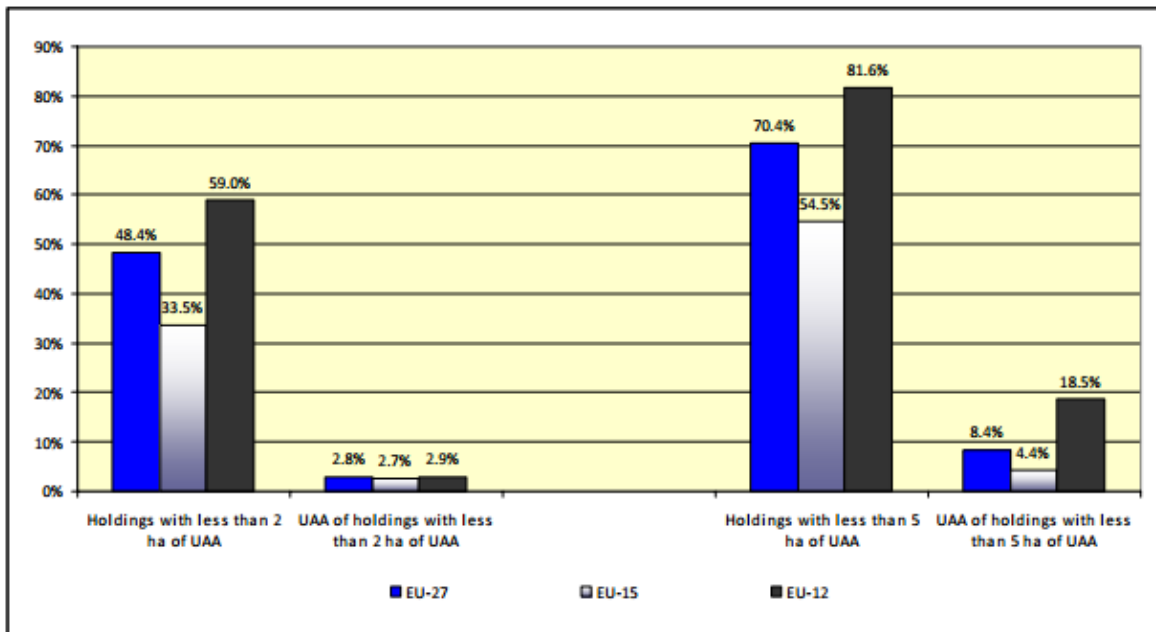
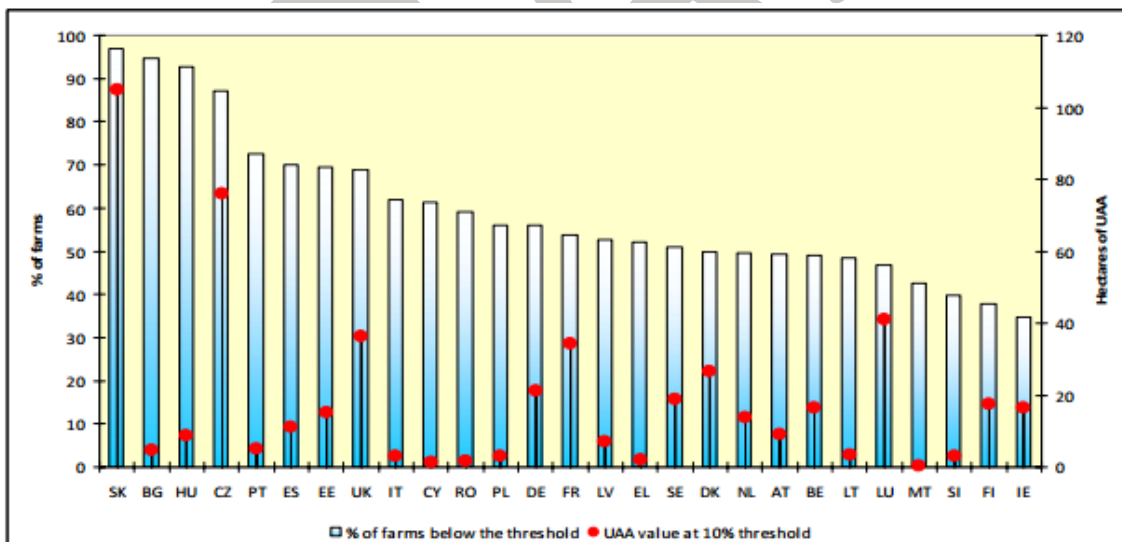


Figure 4.2: Share of farms when UAA threshold is set at 10 % of total UAA and corresponding area (ha) threshold in the Member States (Source: EU Agricultural Economic Brief, 2011. Data from EUROSTAT, Farm Structure Survey, 2007)



Among relative thresholds, Key and Roberts (2007) suggest the so-called weighted-median acreage, which identifies as small the farms sizes accounting for the bottom 50% of total acreage. An example can help illustrating this approach. Table 4.1 reports the size of the operated land of five hypothetical farms. To compute the acre-weighted median, farms are ordered from the smallest to the largest. The mid-point of the total operated land – 22 hectares – would correspond, in this case, to the farm that operates 10 hectares. This would be the threshold, thus all holdings operating less than 10 hectares

will be classified as small. This approach was used to identify smallholders in the FAO’s Smallholder Data Portrait project (Rapsomanikis, 2015).

Table 4.1: Example of calculation of the acre-weighted median

	Operated land (ha)	Cumulated land (ha)
Farm 1	2	2
Farm 2	5	7
Farm 3	7	14
Farm 4	10	24
Farm 5	20	44
Total operated land	44	
Median ha	22	

An alternative and more general relative approach for the identification of small farms is presented in Doran (1985) - cited in Karfakis and Hammam Howe (2010), Gorton and Davidova (2004), Verma and Bromley (1987). The arbitrarily-selected cut-off is replaced by a threshold estimated from the data using a switching regression. Let Z be the farm size -- or any variable used to characterize the smallholder farmer -- and $\Phi(Z)$ be a function that accounts for the multidimensional character of the smallholders. Goldfelt and Quandt (1972) suggested to estimate Φ using the cumulative normal distribution function. Therefore,

$$\Phi(\mu, \sigma) = \Phi\left[\frac{Z - \mu}{\sigma}\right]$$

The parameter μ defines the mean of the distribution and the cut-off point, while σ is the standard deviation. With a 95% confidence interval, small and large farms are those for which $Z < \mu - 1.96\sigma$ and $Z > \mu + 1.96\sigma$, respectively. If $\sigma = 0$ or is not significantly different from zero, the threshold μ will allow identifying two categories of holdings, small and large. If σ is significantly different from 0, it would be possible to identify a third category of farms in between the two above mentioned. One limitation of Doran’s (1985) approach is the need to assign a form to the distribution followed by the criterion variable used for identifying smallholders. As seen in **Figure 3.1** above, the normal or logistic model can be inappropriate, for instance, for land.

To offer more empirical evidence on the different thresholds, we estimated the percentage of smallholders in 21 countries obtained using various absolute and relative thresholds of the operated land size. Data have been extracted from the pool of household surveys processed in the context of RuLIS. Table 4.2 below summarizes the main results of the simulation.

In most cases, the results obtained with relative thresholds, such as the average size of the operated land and the weighted median, are substantially different from those obtained with absolute thresholds, notably the much widely-adopted 2-hectare threshold. The discrepancy is more pronounced in Mali, Nicaragua, Pakistan and Peru. As observed from the land distribution plotted in the section 3 -- **Figure 3.1** -- most countries show similar distributions of the operated land.

What is the most suitable approach to be employed for monitoring the SDGs? As observed also by the EU (2011), the relative approach is more appropriate when national specificities and different patterns need to be emphasized. The relative approach is probably more suitable to analyse patterns of

structural transformation of the agricultural sector, that is, to understand the factors that are driving the change in one particular context. A single absolute threshold, in this context, would be relevant for some countries and unsuitable for some others. A relative threshold would enhance comparability among the structural factors that make smallholders relatively disadvantaged in each country.

The absolute approach – such as the widely employed 2-hectare threshold – tends instead to emphasize the condition of extreme deprivation for those involved in food and agricultural production on a global scale. The weakness of smallholders is not seen as context-specific, rather it is observed as global condition, regardless of where the specific group operates. Absolute thresholds, therefore, enhance international comparability among farmers that are deprived in absolute terms. This concept would be more consistent with the analogous concept of extreme poverty and severe food insecurity measured by SDG indicators 1.1.1 and 2.1.1, respectively. The majority of developed countries would therefore have a very limited number of smallholders, as they have a negligible number of extreme poor and severely food insecure.

Looking at land distribution in different countries, it can be easily verified that what changes from one country to the other is mostly the position of the distribution, not its shape. Again, this could be an argument in favour of a relative threshold, if the condition of disadvantage of smallholders is considered with respect to the national context. But it would be an argument in favour of an absolute threshold, if the relative position of countries needs to be taken into account. While the absolute thresholds emphasizes the different position of countries (rich and poor), regardless of the similarity of the internal distributions, the relative threshold emphasize the similarities in the distributional form, neglecting the different positions.

Table 4.2: Percentages of smallholders obtained with various thresholds set in absolute and relative terms

Country	Survey title	% of smallholders: 2 ha threshold	land weighted median	% of smallholders: land weighted median	% of smallholders: land weighted median - 1 stdv	Average land - national level
Albania 2005	LSMS 2005	87.7	1.09	72.1	71.4	0.69
Armenia 2010	Integrated Living Condition Survey - 2010	37.7	2.21	38.6	38.2	0.95
Burkina Faso 2014	Enquête Multisectorielle Continue - 2014	40.4	6.00	83.0	73.3	4.48
Ethiopia 2014	Ethiopian Rural Socio-Economic Survey - 2013/14	80.1	1.90	78.0	77.2	1.28
Georgia 2010	Monitoring Household Survey - 2010	91.8	1.10	79.4	78.5	0.68
Ghana 2013	Ghana Living Standard Survey - 2013	45.5	4.04	70.7	70.6	2.57
Guatemala 2011	Encuesta Nacional de Condiciones de Vida - 2011	87.3	1.75	85.7	84.7	1.02
Iraq 2012	Household Socio-Economic Survey - 2012	54.1	8.50	82.4	82.3	3.90
Kenya 2005	Kenya Integrated Household Budget Survey - 2005	88.7	1.62	86.9	82.8	0.97
Malawi 2013	Integrated Household Panel Survey - 2013	87.4	1.09	73.0	72.7	0.76
Mali 2014	Enquête Agricole de Conjoncture Integree aux conditions de vie des menages - 2014	33.2	21.00	90.2	90.1	8.12
Nepal 2011	Nepal Living Standard Survey - 2010/11	44.2	3.76	62.8	62.7	2.39
Nicaragua 2014	Encuesta Nacional de Hogares - 2014	22.8	42.25	43.0	43.0	7.72
Niger 2011	National Survey on Household Living Conditions - 2011	26.4	8.00	79.6	78.0	5.20
Nigeria 2013	General Household Survey - 2012/13	86.5	2.05	86.9	86.6	0.94
Pakistan 2014	Pakistan Social Living Standard Measurement Survey 2013-14	11.1	24.71	88.1	84.2	14.64
Peru 2014	Encuesta Nacional de Hogares - 2014	73.2	18.00	97.0	96.9	2.90
Tanzania 2013	National Panel Survey - 2013	35.1	9.79	88.0	87.7	4.70
Timor-Leste 2007	Timor-Leste Survey of Living Standard - 2007	81.2	1.20	76.0	75.6	0.50
Uganda 2010	The Uganda National Panel Survey - 2010	55.2	4.40	82.7	82.5	2.61
Vietnam 2010	Household Living Standard Survey - 2010	91.1	1.00	83.1	81.3	0.48

5. Towards a workable definition of smallholders for the SDG monitoring framework

In the context of the SDGs, the notion of “smallholder” seems to point mostly towards a condition of absolute economic disadvantage. For this reason, criteria based on economic results and structural constraints affecting food production activities would probably be the most appropriate, as they point directly to the intended target population. However, the implementation of multiple criteria entails a comprehensive survey programme at national level, as assessing structural constraints and the economic size of a farm requires a proper account of the functioning of input and output markets, and of revenue sources. The universal focus of the 2030 Sustainable Development Agenda calls for a feasible criterion to be identified, which can be widely applied in different countries. How can this trade-off be balanced?

In several countries, data limitations today prevent the implementation of complex criteria. In terms of feasibility, access to land should be considered as the main alternative: it is not by chance that the 2-hectare absolute threshold of operated land is, at the moment, the most widely used criterion. Access to land can be considered as a proxy for structural constraints on one key factor of production employed in food production. In the context of a comprehensive approach, multiple criteria would include the endowment of factors of production in a farm, its management, its connection with markets and ultimately its economic results. Again, it is not by chance that these complex criteria are implemented where more data are available, as it is the case in the United States and the EU.

A solution that maintains the universal character of the definition while allowing enough precision, can be obtained by combining these different criteria in a hierarchical approach, while allowing countries to gradually improve the accuracy of the definition as more data becomes available and the additional criteria can be implemented. The idea is to set a minimum standard criterion for identifying smallholders. This could be the land size, which is the information available in the largest number of countries. Other criteria could be combined hierarchically with land size, where data is available. This extended criterion could be the revenue of the holding, which indicates the economic size of the activity. This second criterion would apply on top of land size in defining smallholders.

Therefore, in data-rich countries, a smallholder would be defined as a farmer with a small land endowment, whose output is smaller than a given revenue. In a data-scarce country, a smallholder would be defined simply as a farmer with a small land size. Data for land use are not available in a standardized form across countries; yet, they are relatively more easily accessible compared to those on economic results.

This approach would have several advantages. First, it would allow balancing differences in data availability, while considering that an increasing amount of information of growing quality will likely become available during the monitoring period of the SDGs. Projects like AGRIS and the LSMS-ISA will likely contribute to increase data availability in the coming years, hence facilitating the adoption of progressively more complex criterion.

6. Concluding remarks

This paper reviewed alternative approaches to defining smallholders in the literature, using various national and international sources. Given the absence of one-size-fits-all solution, the guiding principle of this review was that the appropriate definition has to be tailored to the specific objective of the analysis. In this case, the focus is to operationalize a definition of smallholder that would enable to

monitor target 2.3. of the Sustainable Development Goals, and specifically the labour productivity (indicator 2.3.1) and income (indicator 2.3.2) of small food producers.

There is an evident trade-off in the methods between completeness and feasibility. Less data-intensive criteria based on land endowment, such as the 2-hectare threshold, are easily implemented in most countries, but run the risk of resulting in poor targeting. More data-intensive approaches have the advantage of better capturing the meaning of SDG2 and its focus on small scale food producers. But they can only be implemented in few countries at the moment. A proposal was advanced to overcome this hurdle. In a nutshell, the idea is for the simple land size criterion to be used where this is the only feasible one; but to combine it hierarchically with a more complex criterion, based on economic results, where data is available, and *as* data becomes available.

Regarding the choice between an absolute and a relative approach to the definition of smallholders, the two approaches may probably co-exist, with each country identifying a standardized relative threshold together with the international absolute one for global reporting. Absolute thresholds do emphasize international comparability, and tend to be easily communicated, defined and monitored. Relative thresholds emphasize national specificities and nuances.

This document is meant to serve as first step in the process that will lead national and international stakeholders to agree on a common approach for identifying smallholders for monitoring SDG indicators 2.3.1 and 2.3.2. In this framework, the findings of this paper should be accompanied by analysis of the target groups addressed by policies at national level, which aim at promoting income and productivity of food producers. This would help getting a more complete understanding of whether an internationally valid criterion for identifying smallholders, such as the one implied by SDG2, would be meaningful also for national monitoring.

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ANNEX A: Glossary of Smallholding Definitions

Source	Definition
<p>Agricultural Census, India</p>	<p>The Agricultural Census of India distinguishes between five size classes of farmers:</p> <ul style="list-style-type: none"> - Marginal farmers below 1 ha; - Small farmers between 1 and 2 ha; - Semi-medium farms between 2 and 4 ha; - Medium farms between 4 and 10 ha; - Large farms above 10 ha.
<p>Berdegúe and Fuentealba (2011)</p>	<p>"Smallholder or family-based agriculture is defined as a social and economic sector made up of farms that are operated by farm families, using largely their own labor. Therefore, they include two categories that could be controversial. The subsistence farmers, who derive a large fraction of their income from non-farm sources, including non-farm employment, remittances and cash and in kind social welfare support. Second, a sub-sector that is smaller in number of farms, but of much greater importance when it comes to economic participation; these are commercial family farmers who may employ one or two permanent nonfamily workers, but where still much of the farm work and of the farm management is done by family members."</p>
<p>Bollinger and Olivera (2010)</p>	<p>Smallholdings are identified using the land size criterion. Farms are considered to be small when they have a territory of 10 ha or less.</p>
<p>Braun (2004)</p>	<p>They define small farms through the land size criterion</p>
<p>Brooks, Cervantes-Godoy, and Jonasson (2009)</p>	<p>"Here the term smallholders is taken as shorthand for farm households which struggle to be competitive, either because their endowments of assets compare unfavorably with those of more efficient producers in the economy or because they confront missing or under-developed markets. A limiting factor may be insufficient farm size, although other assets, such as farm management skills may also be lacking. It is important to note that what constitutes a small farm may differ markedly from one country to the next. For example, the average farm size in many Asian countries is less than a hectare, whereas much larger operations in Latin America may be considered as small."</p>
<p>Censo Agro-Pecuario (1999/2000) Instituto Nacional de Estadística. Mozambique</p>	<p>In the Agricultural Census Mozambique farms are classified according to the size of their cultivated area or livestock population. They distinguish between small, medium and large farms. In particular, small farms are farms with less than 10 ha of cultivated area without irrigated land, fruit trees or plantation, or less than 10 head of cattle, or less than 50 head of sheep/goats/pigs or less than 5000 head of poultry.</p>

CFS HLPE (2013)	A smallholding is: “.. An agricultural holding run by a family using mostly (or only) their own labor and deriving from that work a large but variable share of its income, in kind or in cash. The family relies on its agricultural activities for at least part of the food consumed – be it through self-provision, non-monetary exchanges or market exchanges. The family members also engage in activities other than farming, locally or through migration. The holding relies on family labor with limited reliance on temporary hired labor, but may be engaged in labor exchanges within the neighborhood or a wider kinship framework.”
Chamberlin (2008)	“Built into the epithet smallholder is the connotation of limited land availability. However, many other aspects of smallness are critical to characterizing resource-poor small farmers in the developing world, such as limited capital (including animals), fragmented holdings, and limited access to inputs. Noting that resource-poor livestock keepers are a very diverse group, Chipeta et al. (2003) argue that defining the group by the number of animals held by a household may be misleading...landholding size is perhaps the most direct and easily introduced indicator of who is a smallholder.”
CORDAID (2015)	Smallholders are small-scale farmers, pastoralists, forest keepers, fishers who manage areas varying from less than one hectare to 10 hectares. Smallholders are characterized by family-focused motives such as favoring the stability of the farm household system, using mainly family labor for production and using part of the produce for family consumption. Smallholders sell part of their crops on the market to earn an income to cover for household expenses like clothing, school fees, medicines and transport. The degree to which smallholders are integrated into markets differs widely.
Dalberg Global Development Advisors (2012).	smallholders are defined as those farms operating a land of 2 ha or less
Dan (2006)	“China presents a unique type of smallholder farming. Collective land ownership ensured that every rural family has user rights for farming. According to the WCA there are close to 200 million smallholder farmers in rural China, and up to 250 million according to Dan (2006). The average farm size is less than 0.6 ha and is declining over time.”
CFS HLPE (2013)	“In Argentina the definition combines various criteria covering agro-physical situation (by provinces), which also corresponds to different types of farming systems, reference to the type of labor used (family labor), and legal status (not being registered as a corporation). The criteria used to differentiate the holdings also take into account the level of assets: machinery, size of cattle herd, planted or irrigated areas. In Argentina, Smallholders are those producers running a farm under the following criteria: 1) the producer works directly on the farm; 2) the producer does not employ non-family permanent labor; 3) the producer may hire temporary non-family labor. 4) The following conditions were established to avoid census registration of cases that were evidently non-family being incorrectly considered. 5) The farm is not registered as a joint stock company or other type of commercial

	company. 6) Upper limits of “capital level”: farm size, cultivated size of the farm, and size of cattle herd, machinery assets, planted area with fruit trees and irrigated area. Upper limits vary in the different regions of the country: for farm size between 500 and 5000 ha, for cultivated size between 25 (in irrigated oases) and 500 ha. Upper limit for cattle is 500 units of livestock.”
Dixon, Taniguchi, and Wattenbach (2003)	The FAO study defines smallholders as farms with limited resource endowments, relative to other farmers in the sector.
ETI Report (2005)	“The fair trade movement uses dependence on family, as opposed to non-family, labor as the basis for their definition. Smallholders may also be referred to as outgrowers. The term ‘outgrowers’ is usually used to mean smallholders in a more formal, managed relationship with an exporter. However, both terms are used differently across the world in different contexts. In this document we have used the term smallholders to cover both situations.”
European Commission: Report on the future of smallholders (2015)	The European commission uses definitions based on the economic size of the holding - the so-called ESU (European Size Unit), and on the number of persons who work in the holding, which forms the basis of the so-called AWU (Annual Working Units), and for some time a new category has been gaining in popularity - the standard output (SO), which is expressed in euros. According to this new typology, very small agricultural holdings are those with an SO under EUR 8 000 and small agricultural holdings are those with an SO of between EUR 8 000 and EUR 25 000. ...The most popular and at the same time most incomplete definition is based only on the area criterion, i.e. the Utilized Agricultural Area in hectares (UAA). It is thus generally assumed that small agricultural holdings are those of less than 2 or 5 ha UAA .
Fairtrade Foundation	The Fairtrade Labelling Organization (FLO) defines a smallholder as a producer who is dependent on family labor as a basis for its definition. Smallholder farmers supplying into Fairtrade markets are typically organized into cooperatives or producer associations which provide the link with the market and offer different levels of support to their members.
Fan, S et al. (2013)	the land size criterion is used in this publication
FAO (2010)	“Using the middle-sized farm as a threshold takes into consideration country specific conditions which shape the size of farms. For example, the middle-sized farm in Guatemala is 42 hectares, while the middle-sized farm in Viet Nam is 1.2 hectares. Population density and the use of irrigation in Asian countries, as compared with rain-fed agriculture in Latin America, are among the factors that determine these differences in the distribution of farm sizes.”
FAO (2013)	"An agreed definition of what constitutes a small-scale farmer must include a territorial and socio-economic assessment that considers the level of technology and external inputs used, the production process used and its relation to the local environment, agro-biodiversity involved in the production process and type of employment existent, among other factors."
FAO (2014)	The term ‘smallholder’ refers to their limited resource endowments relative to other farmers in the sector. Thus, the definition of

	<p>smallholders differs between countries and between agro-ecological zones. In favorable areas with high population densities they often cultivate less than one ha of land, whereas they may cultivate 10 ha or more in semi-arid areas, or manage 10 head of livestock. Often, no sharp distinction between smallholders and other larger farms is necessary. Smallholders represent a large number of holdings in many developing countries and their numbers have increased in the last two decades.</p>
FAO RAP (2002-03)	<p>smallholder farms are defined as those farms operating 2 ha or less</p>
FAO SOFA e SOFI 2014 and 2015	<p>This publication uses the land size criterion to classify farms (choosing the absolute thresholds of 2 hectares for small farms).</p>
FAO, ESA (2014)	<p>This paper discusses farm size worldwide using as reference threshold the 2 ha of land size.</p>
FAO (2015c)	<p>The “<i>World Programme for the Census of Agriculture 2020. Volume 1: Programme, concepts and definitions</i>” explains that many countries apply a minimum size limit for the inclusion of agricultural units in the census. The manual states that “various criteria may be used to establish minimum size limits, such as area of holding, area of arable land, area of temporary crops, number of livestock, number of livestock over a certain age, quantity of output produced, value of agricultural production, quantity of labour used and quantity of produce sold.” However, specific guidelines on how to define smallholders are not provided as part of the methodology.</p>
Hazell et al. (2007)	<p>They describe small farms as those depending on household members for most of the labor or those with a subsistence orientation, where the primary aim of the farm is to produce the bulk of the household’s consumption of staple foods</p>
Hazell et. al. (2009)	<p>smallholders are defined as those farms operating a land of 2 ha or less</p>
Hazell et.al. (2010)	<p>the land size criterion is used in this publication</p>
IFAD (2009)	<p>The term “small farm” and “family farm” are used interchangeably (the paper starts saying: small farms, also known as family farms, have been defined in a variety of ways). In this paper, small farms have been defined as those with less than 2 hectares of land area and those depending on household members for most of the labor.</p>
Japan Census of Agriculture	<p>In Japan, there is no official nor statistical category for “smallholder”, however, scholars and officials usually consider size of the holding and part-time farming as criteria.</p>
Key and Roberts (2007b)	<p>The so-called middle-sized farm approach, determines smallholders through the weighted median and is calculated by ordering farms from the smallest to the largest and choosing the farm size at the middle hectare as the threshold to choose smallholders in each country/region.</p>
Key, N, Roberts, M, (2007a)	<p>This paper defines small farms in the US as those with less than 50 acres. This threshold is determined with the weighted median approach.</p>

Kirsten and Zyl (1998)	"A small farmer is one whose scale of operation is too small to attract the provision of the services he/she needs to be able to significantly increase his/her productivity".
Lipton (2005)	In this paper, the concept of "family farms" and "small farms" are used interchangeably. Family farms are defined as "operated units that derive most labor and enterprise from the farm family."
Livingston, Schonberger and Delaney (2011)	smallholder farms are defined as those farms operating two ha or less
MAAF (2012)	In France is used the notion of "reference unit" which is defined as the size needed to ensure economic viability of the holding, taking into account all its agricultural activities. It is determined at local level, for each small agro ecological area.
Modrego et al (2007)	in this paper they use, as proxy for small farmers, the category "self-employed agriculture"
Murphy (2010)	Overall, smallholder farmers are characterized by marginalization, in terms of accessibility, resources, information, technology, capital and assets, but there is great variation in the degree to which each of these applies (Murphy 2010)
Narayanan and Gulati (2002)	They characterize a smallholder "as a farmer (crop or livestock) practicing a mix of commercial and subsistence production or either, where the family provides the majority of labor and the farm provides the principal source of income".
National Bureau of Statistics, United Republic of Tanzania	In the Tanzanian official statistics, small scale farms or smallholder households are defined as those having between 25 sq. meters and 20 ha of land under production, and/or between 1 to 50 head of cattle, and/or between 5 and 100 head of goats/sheep/pigs, and/or between 50 and 1 000 chickens/ducks/turkeys/rabbits.
OECD (2015)	"...a defining characteristic of smallholders is that they struggle to be competitive and hence to provide an income to support themselves and their families, they often live in poverty and produce at least part of their product for self-consumption; they also possess limited resource endowments, in particular land, and normally confront missing or under-developed input and output markets."
OECD (2015)	Brazilian official definition used by the Ministry of Agrarian Development (MAD): "a smallholding or family farm is defined as a production unit managed by the owner, with fewer than four fiscal modules. A fiscal module is a tax-related measure based on the potential income generation from the land, ranging from between 5 and 110 hectares, depending on the geographical area. Moreover a family farm must use principally family labor."
OECD (2015)	Official definition of Chile: "According to Organic Law of (The Agrarian Development Institute) INDAP the operative governmental definition of smallholders in Chile is: 1) farmers with less than 12 HRB (Hectares de Riego Basico), 2) with farm assets less than USD 150 000, 3) income generated mainly from farm activity and 4) works directly in the farm. The government also considers another differentiating factor to characterize smallholders: the gross value of production (GVP) of each farm unit. Smallholders are defined as those with less than 2 400 UF."

OECD (2015)	Official definition of Indonesia: “According to Law No. 19/2013 on the protection and empowerment of farmers, smallholders are farmers who operate farms of less than 0.5 hectares. However, this definition is commonly used in the context of food crop farmers. For farmers growing perennial crops (such as oil palm) a smallholder is defined as having less than 2 hectares.”
OECD, (2015)	Mexico: “There is no official definition of smallholders in Mexico, however farmers with less than 5 hectares are considered to fall into that category.”
Rapsomanikis (2015)	In this report the middle-sized farm is used as a threshold to define small farms. The middle-sized farm threshold varies from one country to another. It takes into consideration country specific conditions which shape the size of farms and their distribution and provides information about the typical smallholder farm.
RCI (2004)	For what concerns Côte d’Ivoire agricultural holdings are classified in modern and traditional holdings. According to these two macro categories, the groups are: <ul style="list-style-type: none"> - Large holdings in the modern sector; - Large holdings in the traditional sector (having a minimum specified area under a specific crop); - Small holdings in the traditional sector.
Sakami, Kamara and Brixiova (2010)	This study defines smallholder farmers according to the land size and number of livestock units approach. In particular, smallholdings operate less than 2 ha of land and own only a few heads of livestock.
Small Holding Sector, Preliminary data Release, Department of Census and Statistics of Sri Lanka	Sri Lanka: “smallholdings sector (peasant) are those holdings not falling into the category of estates. An estate or plantation sector is an agricultural holding of 20 acres (8.1 ha) or more in extent. If the different parcels add up to 20 acres, the holding is not considered an estate because the estate should have at least one parcel reaching 20 acres in extent. Similarly, a holding with 20 acres or more of purely paddy land is not considered an estate (Small Holding Sector, Preliminary data Release, Department of Census and Statistics of Sri Lanka). In other words, smallholdings are holdings that have no single parcel of more than 8.1 ha except if it is pure paddy land.”
Sun (2013)	smallholders are defined as those cultivating a land varying from less than one ha to 10 ha (definition for Uganda)
Syngenta Foundation (2010)	Smallholders are defined as those farms operating a land of 2 ha or less
Thapa and Gaiha (2011)	Smallholder farms are defined as those farms operating 2 ha or less
TWN (2008)	Smallholder farms are defined as those farms operating 10 ha or less
UNCTAD (2015)	Smallholder farms are defined as those farms operating 2 ha or less
USDA (2007)	In the United States, farm size is defined by an economic criterion: the “gross product”. In particular, a small family farmer is defined as one that grows and sells between \$1,000 and \$250,000 per year in agricultural products.
World Bank (2003)	Smallholders are those with a low asset base operating less than 2 ha of cropland