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Who Is Employed? Evidence from Sub-Saharan Africa on Redefining Employment

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Abstract

The 19th International Conference of Labour Statisticians (in 2013) redefined the labour statistics standards, and most National Statistical Offices are currently transitioning to the revised standards. A major change, of which few academics seem to be aware, is that the concept of employment has been narrowed to work for pay or profit. By the revised standards, farming, which is mainly intended for own use, is no longer considered employment, and such a farmer is no longer considered to be employed or in the labour force. Instead, their work is captured under a new indicator of own-use production work. This paper analyses the implications of the revised standards on measures of employment in Sub-Saharan Africa drawing on specialised agricultural surveys from Ghana and Malawi and nationally representative multi-topic household surveys from two early adapters, Malawi and Nigeria. In some contexts, 70% to 80% of farmers produce for family consumption and are therefore, based on this activity, not considered employed by the revised standards; however, there is wide geographic variation. Moreover, farmers are more likely to produce for sale at the end of the growing season of the main local crop than earlier in the season. Men are more likely than women to produce for sale. Official labour statistics, based on the revised standards, show significantly lower employment-to-population ratios in rural Africa and give the impression of rural populations much less reliant on agriculture and much further along in the process of structural change than what was indicated by the previous standards.

Keywords: labour statistics, agricultural labour, gender, own-use production work, survey design, Sub-Saharan Africa
JEL classification: J21, C83, Q12

1. Introduction

In 2013, the 19th International Conference of Labour Statisticians (ICLS) adapted a new resolution concerning statistics of work, employment and labour underutilization (ILO, 2013b, referred to as the '19th ICLS standards' or the 'revised standards'), which supersedes previous international standards for labour statistics (from 1982).[1] The revised standards narrow the definition of employment to work performed for pay or profit, which is based on the *self-declared main intended use of the output*. In the case of agricultural activities, own-use production of goods, for example, crop cultivation for own/family consumption, is no longer considered employment and, hence, does not count towards employment or labour force participation. Instead, such work is captured as a separate form of work under the headline indicator of 'own-use production work'. The main objective of these changes was to increase visibility of all forms of work, paid and unpaid, by advocating for separate measurement and acknowledging that individuals may engage in different activities. Many national statistical offices (NSOs) are still in the process of transitioning to the revised standards. As we will document in this paper, the ongoing process of operationalising the 19th ICLS standards has significant implications for labour statistics in developing countries, and especially in Sub-Saharan Africa (henceforth Africa), where a large share of the population produces goods for family use.[2] They also raise important issues about how to use this definition in a consistent and robust manner.

The operationalisation of the 19th ICLS standards requires household surveys measuring labour market engagement—for example, dedicated labour force surveys (LFSs) and multi-topic household surveys—to differentiate between individuals engaged in own-use production work and employed individuals. While own-use production of goods can take many forms (e.g., collection of water/firewood), the revised standards have the largest implications for the measurement of agricultural work, where surveys need to distinguish between a farmer producing for family use or for sale. However, this is difficult to measure, and historically, there has been scant guidance on measurement practices. While the 2007 Standard Classification of Occupations (ISCO-08) distinguishes 'subsistence farmers, fishers, hunters and gatherers' (sub-major group 63) and 'market-oriented skilled agricultural workers and forestry, fishery and hunting workers' (sub-major groups 61 and 62) (ILO, 2013a), this separation has had limited practical relevance, as occupational breakdowns rarely go below the level of major groups (i.e., combining all agricultural occupations) and are often left to the discretion of enumerators and data entry personnel.[3] Under the 19th

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1 The ICLS is a standard-setting body in labor statistics, hosted every 5 years by the International Labour Organization (ILO).

2 Based on World Development Indicators (WDI) metadata for national employment-to-population ratios (series: SL.EMP.TOTL.SP.FE.NE.ZS; retrieved 04/04/2022), 13 out of 48 Sub-Saharan African countries (Botswana, Cote d'Ivoire, Gambia, Ghana, Lesotho, Liberia, Malawi, Nigeria, Rwanda, Somalia, Uganda, Zambia and Zimbabwe) transitioned to the 19th ICLS employment definition between 2016 and 2019, while Statistics South Africa excluded own-use production workers from its national labor statistics even before the 19th ICLS. However, it is possible that additional countries have also transitioned, without explicitly being marked as 'excluding own-use production workers' in the WDI metadata.

3 This mirrors difficulties in defining subsistence agriculture (Wharton, 1969; Brüntrup and Heidhues, 2002).

ICLS standards, the distinction between own-use and market-oriented work in agriculture has been propelled to the forefront of labour statistics in developing countries.

The present paper analyses the implications of the 19th ICLS standards on measures of employment obtained from multi-topic household surveys. We focus on Africa, where we expect a disproportionately large decline in measured employment using the revised standards, due to the high prevalence of subsistence agriculture.[4] The study draws on four data sets that are uniquely positioned for this purpose: agricultural surveys from Ghana and Malawi designed to support the operationalisation of the revised standards and nationally representative multi-topic household surveys from two early adapters, Malawi and Nigeria. The paper's main contributions are as follow: first, we discuss the evolution of labour statistics standards, rationale for changing the definition of employment and challenges for operationalisation in household surveys. A concern is that farmers may find it difficult to respond to questions on the intended uses of their agricultural produce (i.e., for own use versus for sale), which may lead to cognitive bias in reporting and measurement error. Second, we illustrate how measures of employment of male and female farmers change under the 19th ICLS standards and the implications on country-level employment headline indicators.[5] Third, the paper contributes to the broader literature on the sensitivity of labour statistics in developing countries (Bardasi *et al.*, 2011; Arthi *et al.*, 2018; Gaddis *et al.*, 2021; Heath *et al.*, 2021).

Our main findings are as follows. First, even with a geographical focus on rural Africa, there is large contextual variation in the share of farmers classified as employed under the revised standard, varying between 70% and 80% in parts of Malawi and Nigeria and 24% in parts of Ghana, at the beginning of the agricultural season (i.e., the growing season of the main local crop). Second, in contexts where gender differences in the intended use of output are significant, women are less likely than men to report producing only or mainly for sale. In-depth analyses for Malawi show that this gender gap is not primarily an artefact of the way the data were collected (i.e., via self-reports) but reflects differences in male and female farmers' labour allocation across crop and livestock products, which differ in their intended use. Third, in all three countries included in this study, farmers are less likely to report producing for sale at the beginning of the agricultural season than at the end, and there is evidence from Malawi that this may be linked to farmers' labour reallocation between subsistence crops and livestock. Although caution is warranted when generalising to other countries, this suggests that, under the revised standards, rural employment ratios

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4   The operationalization of the 19th ICLS standards provided an opportunity for methodological testing and research, which led to the re-design of LFSs and multi-topic household survey labor modules. Due to the co-occurrence of survey re-design with the rollout of the 19th ICLS standards, rising employment, especially for females, may be observed in contexts where traditional surveys failed to capture certain types of informal employment (Discenza *et al.,* 2021). Here we consider the rollout of the 19th ICLS standards in isolation, i.e., comparing employment under the previous (1982) and revised (2013) standards for the same household survey.

5   This complements the extensive qualitative and quantitative work carried out by the ILO in piloting alternative survey questionnaires to support the operationalization of the 19th ICLS standards in LFSs (Benes and Walsh, 2018b).

in Africa may be highly sensitive to the timing of data collection.[6] Fourth, the revised standards have significant implications for official labour market indicators, leading to lower employment-to-population ratios and lower measured shares of agricultural employment in overall employment, especially in rural areas. However, many farmers who produce only or mainly for family consumption remain employed because they are simultaneously engaged in non-agricultural activities (for at least 1 hour during the reference week), highlighting the need for household surveys to collect data on multiple, potentially overlapping, activities.

The remainder of this paper is organised as follows. Section 2 provides background on the 19th ICLS standards. Section 3 describes the data sources. Section 4 uses household survey data from Ghana, Malawi and Nigeria to illustrate how male and female farmers respond to questions about the intended uses of their agricultural produce and the share of farmers considered employed by the revised standards under different measurement approaches, paying attention to gender and over-time differences. Section 5 compares male and female employment-to-population ratios under the previous (1982) and revised (2013) standards. Section 6 discusses implications for labour statistics in developing countries.

2. The 19th ICLS resolution and its operationalisation in household surveys

2.1 Background

2.1.1 Own-use production in national accounts and labour statistics

The 19th ICLS standards are rooted in a century-old debate on the appropriate delineations and statistical treatment of market and non-market production in national accounts and labour force statistics. Historically, national income accounting emphasised the monetary economy (Benería, 1999), but the 1953 United Nations systems of national accounts (SNA) made an exception for primary producers (such as farmers). Such production was recommended to be included irrespective of whether it was exchanged or not. This position was formalised in the 1993 SNA, which specified that household production of agricultural goods for own use falls within the SNA production boundary and, hence, ought to be included in GDP in countries where it is thought to be quantitatively important. Conversely, services for own use (such as cleaning or childcare) have always been excluded from the SNA production boundary (and from GDP). This distinction between goods and services for own use has been criticised, particularly (but not exclusively) by feminist economics scholars, who argue that SNA statistics exclude unpaid work performed mostly by women and do not recognise the productive value of these activities (Waring, 1990; Benería, 1999; Goldschmidt-Clermont and Pagnossin-Aligisakis, 1999; Goldschmidt-Clermont, 2000; Young, 2000; Anker, 2011). Even though the topic was debated at two United Nations World Conferences (Swiebel, 1999), the distinction between own-use goods (included in GDP) and own-use services (excluded from GDP) has been maintained in the 2008 SNA (valid to date). However, since the 1993

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6 Under the previous (1982) and revised (2013) standards employment is measured in relation to a short reference period (e.g., the past seven days). Hence, even under previous standards, rural employment ratios fluctuated over the course of the agricultural season, reflecting whether farmers engaged in any agricultural activity over the past seven days or not (Fox and Pimhidzai, 2013). Under the revised standards, employment ratios are affected by an additional margin of variation—changes in farmers' reports on the intended use of their produce.

SNA, countries have been encouraged to measure own-use services under the (wider) SNA *general* production boundary. This information is sometimes compiled in satellite accounts, as an annex to the national accounts (OECD, 2002; Esquivel, 2011).

In the realm of labour force statistics, the 13th ICLS in 1982 defined the 'economically active population' as 'all persons who furnish the supply of labour for the production of economic goods and services as defined by the United Nations systems of national accounts and balances' (ILO, 1982, par. 5). Explicitly included was 'all production and processing of primary products, whether for barter in the market or for own consumption' (ILO, 1982, par. 5). The revised ICLS standards, by narrowing the concept of employment to 'work performed for pay or profit', not only revised previous labour statistics standards but also broke the previous congruence between employment and the SNA production boundary. In addition, the 19th ICLS standards introduced a new concept of 'work', which captures all activities within the SNA *general* production boundary (see discussion below).

2.1.2 Why a new definition of employment?

The 19th ICLS sought to address multiple concerns with the 13th ICLS standards. Amongst them was the notion that the previous definition of employment, by combining work for pay or profit with own-use production work, was too broad and therefore limited the usefulness of employment statistics as an indicator of labour market performance. Similarly, the previous concept of unemployment was perceived as too narrow, because individuals performing own-use production work, by virtue of being considered as employed, were ineligible for classification under unemployment (ILO, 2013a).[7] By narrowing employment to work for pay or profit, the revised ICLS standards are expected to render labour statistics in developing countries more responsive to cyclical fluctuations, economic crises and structural change, which may be a desired feature to guide economic and social policy reforms. A related practical concern with the 13th ICLS standards was that many countries, de facto, did not fully adhere to the standards but excluded some groups of workers (e.g., some own-use production workers, certain volunteer workers) from the employment measure, which impaired cross-country comparability.

The 19th ICLS also addressed the long-standing critique that own-use services (e.g., domestic housework and childcare), disproportionately performed by women and children, were treated differently from own-use goods (such as growing food crops for family use) in labour statistics. Under the revised ICLS standards, *all* activities to produce goods or provide services for own use are excluded from employment and captured under a new category of own-use production work. Hence, while the differential treatment of goods and services for own use still exists in production statistics (i.e., national accounts), production of either one now counts as work (but not employment) in labour statistics.

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7   Under the 19th ICLS standards, own-use production workers qualify for unemployment, conditional on whether they are available and actively searching for employment. It remains to be seen whether many farmers producing for own use will meet these criteria. Other labor underutilization measures, particularly time-related underemployment, may be more relevant for this population group (ILO, 1998, 2013c).

2.1.3   *A new category of work and better measurement of labour underutilization*

To account for own-use production of goods and services, the 19th ICLS introduced a new concept of 'work', and created a corresponding conceptual framework, which captures all activities within the SNA general production boundary.[8] By this definition, farmers mainly or only cultivating for own use would be 'working' but not 'employed', just like someone taking care of his/her children. As described in ILO (2013a), this creates incentives to collect better data on domestic work, which in the past had often been omitted from household surveys. Such data are important, for example, in analysing gender differences in the intra-household allocation of labour, time scarcity, etc. Moreover, the new forms-of-work framework acknowledges that different forms of work may be performed simultaneously during the reference period (ILO, 2013b).

The 19th ICLS definitions are illustrated in Figure 1, in comparison to the pre-2013 definition of employment. Because labour input is commonly measured with reference to the SNA production boundary in economics, neither the new concept of work nor the revised concept of employment, which essentially constitutes a special category of work within the broader forms-of-work framework, are coterminous with labour input in the traditional sense. Economists interested in measuring total labour input into the economy (aligned with the SNA production boundary) would hence need to reconstruct the pre-2013 employment concept to the extent possible, by aggregating over employment, own use production work (related to goods, but not services) and some forms of unpaid work for use by others (e.g., unpaid trainee or volunteering work through an organisation), while being careful to avoid any double counting (as individuals can be engaged in multiple forms of work at the same time).

The 19th ICLS also introduced new measures of labour underutilization, beyond unemployment. These include time-related underemployment (i.e., employed individuals who would want to work additional hours) and the potential labour force (i.e., individuals who are outside of the labour force but maintain a degree of attachment to the labour market).[9]

2.2 Operationalisation challenges of the revised definition of employment

The 19th ICLS resolution contains several ambitious features to capture more dimensions of work. It also creates new challenges, particularly related to the operationalisation of the revised definition of employment in household surveys. Some of these are highlighted below.

2.2.1   *Defining the intended use of output*

The 19th ICLS resolution specifies that the separation between own-use production work and employment should be based on the 'intended destination of output [. . .] established in reference to the specific goods produced or services provided, as self-declared' (ILO, 2013b, par. 22). However, the term 'intended destination of output' lacks a formal definition and could potentially mean, amongst other things, the farmers' desire to sell agricultural output, his/her expectation to sell, etc. The Oxford English Dictionary defines 'intention' as 'a thing intended, an aim or plan'. The Encyclopedia of Philosophy (Borchert, 2006) states that

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8   Because the labor force is defined as the sum of persons in employment and unemployment, being engaged in any form of work other than employment does not count towards labor force participation.

9   For more information on the components of labor underutilization, see Benes and Walsh (2018a).
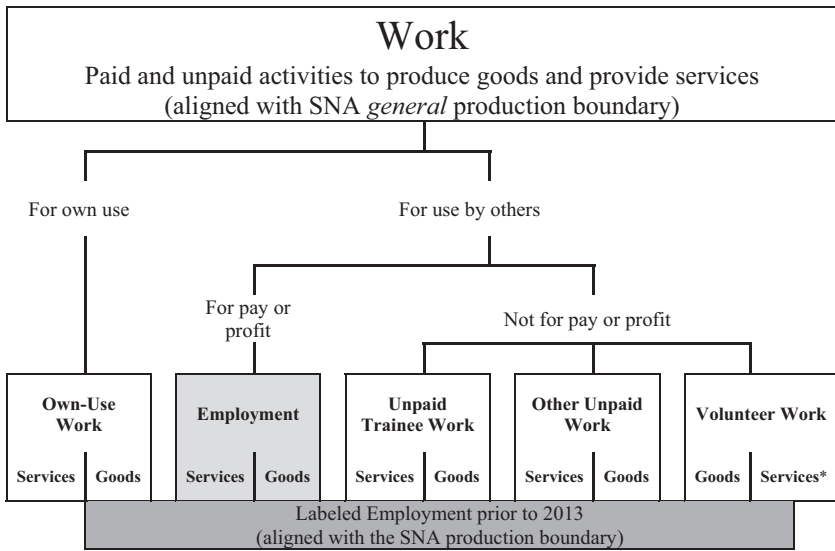
Work
Paid and unpaid activities to produce goods and provide services
(aligned with SNA *general* production boundary)

For own use | For use by others

For pay or profit | Not for pay or profit

Own-Use Work	**Employment**	**Unpaid Trainee Work**	**Other Unpaid Work**	**Volunteer Work**
Services / Goods	Services / Goods	Services / Goods	Services / Goods	Goods / Services*

Labeled Employment prior to 2013
(aligned with the SNA production boundary)

Figure 1: Schematic Overview of the 19th ICLS Forms of Work Framework. *Notes:* 'For pay or profit' refers to work done in expectation of obtaining a remuneration in the form of wages, salaries or profits, whether in cash or in kind. It also does not matter if the remuneration is paid directly to the person performing the work or indirectly to a household or family member, as it is commonly the case for workers contributing to a household enterprise (ILO, 2020). * Direct volunteering (i.e., not through an organisation) to provide services was outside the prior definition of employment. Reproduced from Durazo *et al.* (2021), based on Benes and Walsh (2018a).

intentions not only are closely linked to desires, particularly action-desires (i.e., the desire to do something), but also require an expectation that the desired action will, or at least may, come true. Based on this definition, operationalising the revised standards requires farmers to form an expectation about the eventual use of their agricultural output at the time they work on their plots, which may be several months prior to harvest.[10] Social and cognitive psychological research shows that there can be significant cognitive bias in assessing probabilities and future outcomes (Tversky and Kahneman, 1974; Haselton *et al.*, 2015). Moreover, self-reports of the intended use of output may correlate with specific personality traits (e.g., optimisms) and/or life aspirations, which in turn may differ systematically—all else being equal—between men and women, or across cultural and linguistic contexts. This

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10 In the discussions leading up to the 19th ICLS, the actual destination of output was not considered a viable or desirable option to distinguish between employment and own-use production work. ILO (2013a) argues that 'the self-reported intended destination of the output serves to capture aspects related to the mode of organization of production' and that 'alternative approaches [. . .] that attempt to quantify the proportion of the production destined to, or actually sold in the market in a set reference period' are not suggested 'given their sensitivity to economic and environmental fluctuations.' However, the intended and actual destinations of output cannot be entirely decoupled, as farmers need to form an expectation about the share of produce to be sold to report on the intended use of output.

raises concerns about using farmers' self-declared intended use of output as a meaningful criterion to distinguish between employment and own-use production work.[11]

2.2.2   *Unit of data collection*

Another consideration is the unit at which the intended destination of output is to be measured in household surveys. We compare two broad options for operationalising the 19th ICLS—an activity-level operationalisation and a product-level operationalisation. In the first (*activity-level*) approach, respondents are asked about the intended use of the output obtained from a household member's activity in agriculture. An example would be the question 'Are the products obtained from [NAME's] work in farming, livestock and fishing mainly intended for sale or for family use?'. The second (*product-level*) approach would ask about the intended destination of output of each product produced by a member of the household; for example 'Is this [CROP] mainly intended for sale or for family use?'[12] A possible third (*cluster-level*) approach, would ask about the intended destination of output of each activity cluster (e.g. farming, livestock and fishing) but this is not explored in this paper. The activity-level approach is more suitable for surveys that typically do not collect production data, such as labour force and other non-agricultural surveys. The model LFS questionnaire currently recommended by the ILO has adopted the activity-level approach.[13] Conversely, the product-level approach may be suitable for agricultural surveys that collect data on crop production and disposition. However, crop-level reports on the intended use of output then need to be linked to individual-level labour data to establish whether a household member was employed during the reference period, which can be difficult in practice (see section 4).

2.2.3   *Aggregation across products*

Most farmers in developing countries grow more than one crop and also raise livestock. Since different agricultural products (and by-products) may differ in commercialisation, aggregation is necessary in establishing whether the farmer's overall output is intended only or mainly for sale. If the intention to sell is measured at the activity-level, this aggregation falls onto the respondent. Without guidance from the interviewer, it is unclear how farmers perform such aggregation in their response. In addition, cognitively onerous questions can lead to measurement bias, especially amongst respondents with low education levels (Arthi *et al.*, 2018; Gaddis *et al.*, 2021). Conversely, if the intention to sell is measured at the product-level, aggregation is left to the analyst. Depending on how the data are collected, it may be possible to compute weighted (giving greater importance to 'dominant' products, using labour hours or production quantities/values as weights) and unweighted averages (giving the same importance to each product).

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11   The distinction between own-use and for-profit production work is also difficult to reconcile with a class of agricultural household models that assume separability between production and consumption decisions (Lopez, 1986). These models postulate that agricultural households first maximize profits and then, subsequently, decide on a bundle of consumption goods by maximizing utility subject to a budget constraint (De Janvry and Sadoulet, 2006; Taylor and Adelman, 2003). Hence, all farmers act as profit maximizing producers and there is no *ex ante* distinction between work intended for profit versus for own use.

12   Livestock products and by-products ought to be included, though such data are difficult to collect.

13   https://ilo.org/LFSresources. Version 3 of ILO Model LFS Questionnaire (July 2019).

2.2.4 *Defining a threshold*

Summarising a continuous variable, such as the share of output intended for sale, into a binary indicator of own-use or market-oriented agriculture requires a threshold at which the market portion of output becomes large enough to classify the agricultural activity as employment. Although the 19th ICLS resolution does not specify a threshold, its emphasis on 'mainly intended for sale' suggests a threshold of at least 50% (of total farm output).[14] While own-use production work in the 19th ICLS is not synonymous with subsistence agriculture, similar questions arise in distinguishing subsistence from non-subsistence agriculture.[15] The 2008 World Development Report on Agriculture, for example, uses subsistence thresholds ranging from 10% to 50% of agricultural production to delineate subsistence- from market-oriented producers (World Bank, 2007). Others use an absolute threshold based on minimum physiological needs, like a poverty line anchored in nutrition, or estimate a threshold empirically (Wharton, 1969; Cadot *et al.*, 2010).

3. Data

This paper pulls together data from four multi-topic household surveys from three countries collected under the umbrella of the World Bank's Living Standards Measurement Study (LSMS). The 2015 Ghana and 2016/17 Malawi Agricultural Labor Surveys (AgLSs) are specialised agricultural surveys conducted as part of the LSMS's programme of survey methodological research. Both surveys piloted questions about the intended use of farmers' output to facilitate the operationalisation of the 19th ICLS standards. In addition, we draw on the 2016/2017 Malawi Integrated Household Survey (IHS-4) and the 2015/2016 Nigeria General Household Survey Panel (GHS-Panel-3), which were the first two nationally representative LSMS surveys to adapt the revised standards (see Table A1, Appendix).

The 2015 Ghana AgLS interviewed 719 households, in 20 enumeration areas (EAs) in four districts located in Ghana's Ashanti and Brong Ahafo regions.[16] Only households cultivating at least one plot at the time of the survey were sampled. Households were visited prior to the beginning of land preparation and again, at the end of the agricultural season.[17] In Ghana, as in the other two countries, maize is the main staple crop and survey activities were timed as per the maize production cycle. The household member roster captured, amongst other things, information about each household member's current occupation and the intended

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14   The 19th ICLS threshold of production being *mainly* intended for the market is also not aligned with the threshold used to define the informal sector, which refers to *some* market production. This inconsistency is currently discussed by the working group for the revision of the statistical standards of informality, which advises the ILO in the preparation of a draft resolution to replace the current statistical standards of informality (for consideration at the 21st ICLS in 2023) (ILO, 2019b).

15   As per the 19th ICLS, subsistence foodstuff producers constitute a subgroup of persons in own-use production work. Additional work is planned to operationalise the concept of subsistence in labor statistics.

16   The data were collected by the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana. The four districts covered are Mampong Municipal, Ejura Sekyedumasi, Nkoranza South and Pru.

17   A subsample of households was visited weekly during the agricultural season to assess recall bias in farm labor (Gaddis *et al.*, 2021). This arm is not used in this paper.

use of the products obtained from the activity, that is, only for own use, mainly for own use, mainly for sale or only for sale. The end-of-season survey also included a standard labour module which asked each household member engaged in agriculture over the past 7 days about the intended use of the products obtained from the activity, using the same four response categories described above. These questions in the roster and labour module are examples of an *activity-level* operationalisation of the revised standards. In addition, the pre-planting survey included a crop intention module, which asked a single (knowledgeable) member of the household to report on the expected harvest and intended sales of each crop the household was expected to grow over the upcoming season, akin to a *product-level* operationalisation of the revised standards with a focus on crops (i.e., no livestock products). The plot characteristics module also collected data on which household members were expected to work and the crops to be planted on each plot, which makes it possible to link crop-level intended use of output to the household members' labour input.

The 2016/2017 Malawi AgLS interviewed about 850 households in 20 EAs in the Ntcheu and Zomba districts of Malawi. Like the Ghana AgLS, households were visited prior to the beginning of land preparation and at the end of the agricultural season.[18] In this paper, we focus on the comparison of two randomly assigned groups of households. Both groups were administered short labour modules (modelled after a standard LSMS survey) that ask about each household members' engagement in various types of economic activities over the past 7 days. The two groups differ, however, with respect to how they capture the intended use of output for household members engaged in agriculture. In group one, the intended use of output was captured at the activity level ('Are the products obtained from [NAME's] farming/ fishing or livestock activity mainly intended for sale/ barter or for family use?'), while in group two, household members were first asked to identify all crops/animals on which they had worked over the past 7 days, and then to specify the intended use of output for each crop/animal (product-level operationalisation).

The 2016/2017 Malawi IHS-4 is a nationally representative household survey conducted by Malawi's NSO. The survey interviewed about 12,480 households in 780 EAs between April 2016 and April 2017. Unlike the other data sets described in this section, the Malawi IHS-4 interviewed each household only once. Similar to the second group of the 2016/2017 Malawi AgLS (which was fielded at approximately the same time) the IHS-4 opted for a product-level operationalisation of the intended use of output; asking household members engaged in agriculture over the past 7 days to first identify all crops they had worked on, and then indicate the intended use of output of each crop. However, unlike in the Malawi AgLS, this information was only collected for crops and not for livestock.

The 2015/2016 Nigeria GHS-Panel-3 is a nationally representative household survey implemented by the Nigeria National Bureau of Statistics. Households were visited twice— after the planting season, between August and October 2015, and at the end of the agricultural season, between February and April 2016. Labour-related questions were asked at the individual level in the labour module for both visits. All individuals participating in

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18   Like the Ghana AgLS, a subsample of households was visited weekly (related to another part of the experimental design). The sample size differs across rounds due to the inclusion of replacement households in the pre-planting survey and the addition of another random sample of households in the end-of-season survey. The data were collected by Wadonda Consult Limited.

agriculture were asked about the intended use of the products from their agricultural activity (activity-level operationalisation).

In all four surveys, enumerators were instructed to interview age-eligible household members individually about their labour input and the intended destination of output of the products they worked on (i.e., as self-respondents), though proxy respondents were permitted whenever a member of the household was unavailable or refused to be interviewed.

Table A2 (Appendix) shows summary statistics for the four data sets (and, for the Malawi AgLS, for the activity-level and product-level operationalisation subsamples). The Malawi IHS-4 and Nigeria GHS-Panel-3 are further disaggregated by urban/rural locality to facilitate the comparison to the (rural) Ghana and Malawi AgLSs. We start with a comparison of the rural samples. The upper panel shows demographic characteristics. The average age of household members ranges between 22 (Malawi) and 24 years (Nigeria) and most household members (aged ≥15 years) are married in all four data sets. Between 24% (Malawi) and 54% (Nigeria) of members aged ≥15 years have completed primary education. The bottom panel shows additional information for agricultural households (i.e., households with at least one member engaged in farming). The average size of landholdings varies between 1.5 acres in the Malawi IHS-4 and approximately 8.7 acres in the Ghana AgLSs.[19] Maize is an important crop in all samples, grown by between 49% (Nigeria) and higher than 90% (Malawi AgLS) of agricultural households. Between about 12% (Malawi AgLS) and 31% (Nigeria) of agricultural households grow beans, and between 50% (Ghana) and about 80% (Malawi AgLS) own livestock. In the urban samples, respondents are less likely to be married and more likely to have completed primary education than in the rural samples. Comparatively few urban households engage in agriculture, and their average landholdings are signficantly smaller than in rural areas.

4. Employment of male and female farmers

The revised ICLS standards require combining data on a person's activity with the intended use of the output produced in the activity, if the activity is farming or fishing, to determine employment status.[20] This section shows how employment levels of farmers change under the 19th ICLS standards—comparing activity-level and crop-level approaches to measure the intended destination of output.[21]

4.1 Activity-level operationalisation

Three of the four surveys described in section 3—the Ghana and Malawi AgLSs and the Nigeria GHS-Panel-3—asked household members engaged in agriculture (farming, livestock

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19 There is a large difference in average landholdings between the Malawi AgLS and the Malawi IHS-4. Multiple factors may explain this—including differences in regional coverage, question phrasing and the timing of data collection. Moreover, while the IHS-4 visited households only once, the Malawi AgLS interviewed households repeatedly over the course of the season, which can lead to better capture of marginal plots and increase measured land holdings (Gaddis *et al.*, 2021).

20 Farming here includes animal rearing. While the distinction between own-use production work and employment also arises in other sectors, such as hunting, gathering or food preservation, mixed production (for own use and profit) is most common in agriculture.

21 All analyses in this paper report on individuals aged 15 years and older.

Table 1: Share of farmers producing only or mainly for sale—activity level

	Ghana (4 districts)			Malawi (2 districts)			Nigeria (national)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Start of season	0.79	0.72***	0.76	0.21	0.22	0.22	0.29	0.29	0.29
	(0.02)	(0.02)	(0.01)	(0.03)	(0.03)	(0.021)	(0.0)	(0.01)	(0.01)
n	649	605	1254	172	197	369	3752	2509	6261
End of season	0.82	0.82	0.82	0.58	0.41***	0.48	0.42	0.39*	0.41
	(0.01)	(0.02)	(0.01)	(0.04)	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)
n	674	645	1319	144	200	344	2583	1754	4337

Note: Standard errors in parentheses; * denotes the male–female difference is significant at 10%, *** at 1% level. Estimates for Ghana refer to individuals whose main occupation is in agriculture, while estimates for Malawi and Nigeria refer to individuals who worked at least one hour in agriculture during the reference week (see footnote 22). Based on the Ghana and Malawi AgLSs and Nigeria GHS-Panel-3.

rearing and/or fishing) whether the products obtained from their agricultural activity are intended for sale or family use. This question was asked at the beginning and at the end of the growing season for maize, the staple crop in all three countries.[22]

Table 1 shows a large variation in the intended use of farmers' output, both across countries and over time.[23] In Ghana, 75% of farmers report producing only or mainly for sale at the start of the season, which increases to 82% at the end of the season. Only these farmers are considered employed by the 19th ICLS standards. The corresponding figures for Malawi and Nigeria are much lower—22% (Malawi) and 29% (Nigeria) at the start of the season, increasing to 48% (Malawi) and 41% (Nigeria) at the end of the season.[24] In all three countries, fewer farmers are considered employed under the revised standards at the start than at the end of the season, though the increase over time is much larger in Malawi and Nigeria than in Ghana. Women appear to be less likely than men to report producing only or mainly for sale and are therefore disproportionately classified as own-use production workers. However, gender gaps are only significant in Ghana at the beginning of the season, and at the end of the season in Malawi and Nigeria.

These gender patterns are consistent with the notion that female farmers in Africa are disproportionately engaged in subsistence production (Darity, 1995; Warner and Campbell, 2000; Doss, 2002; Carr, 2008; Arora and Rada, 2017). They could, however, also highlight

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22 The start- and end-of-season surveys were fielded, approximately, 6 to 9 months apart (Table A1, Appendix).

23 In Malawi and Nigeria, the estimates refer to individuals (>15 years) who had worked at least 1 hour on the family farm during the reference period (based on the surveys' labor modules). In Ghana, the estimates refer to individuals ((>15 years) who stated that their *main occupation* was working in agriculture (based on the household roster). We obtain similar results for Ghana if we use the labor module, but these data are only available post-harvest.

24 Because the estimates for Ghana and Malawi are not nationally representative, differences across countries are partly driven by the purposive selection of the districts (which were more commercialized and connected to markets in Ghana than in Malawi).

the differences in how men and women respond to questions about the intended use of their output; a distinction that will be revisited later in this section.[25]

The increase in farmers' employment between the start and the end of the season (reported in Table 1) may reflect changes in the self-reported intended use of output. However, because not all individuals were farming in both survey rounds, it could also reflect changes in sample composition. Table 2 shows start-to-end transition matrixes in the intended use of farmers' output for individuals farming in both rounds.[26] In all three countries, farmers are more likely to report producing for sale at the end than at the start of the season. This confirms that the over-time variation highlighted in Table 1 reflects changes in the self-reported intended use of output and is not primarily driven by sample composition. To put it differently, farmers are more likely to respond yes on producing for sale after harvest, rather than when they are beginning to plant (Ghana, Malawi) or just finished planting (Nigeria). If these patterns are generalizable to other contexts, they suggest that rural employment ratios and labour force participation rates may be highly sensitive to the timing of data collection under the revised standards, even in periods of high agricultural activity.

Beyond these changes in aggregate employment, there is even more churning at the individual level. Almost a third of farmers in Ghana and Nigeria, and half of the farmers in Malawi, 'update' their reports about the intended use of output between the start and the end of the season, and these transitions go in both directions (see Table 2, cells shaded in grey). In other words, even though there is a general trend of farmers being more likely to report producing for sale at the end than at the beginning of the season, many farmers who initially report producing for sale report later that their products are intended for family consumption.[27]

4.2 Product-level operationalisation

The AgLSs in Ghana and Malawi also implemented variants of the product-level operationalisation approach. In Ghana, all households were administered a crop-intention module at the start of the season, which asked to list all the crops that would be cultivated during the upcoming season, and to indicate the intended use of each crop. The survey also gathered

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25 To further explore demographic predictors of the intended use of output we regress a binary indicator, which equals unity if the farmer produces mainly or only for sale, on seven binary indicators—female sex, age group (26–40, 41–55 and >55 years—with 25 years and below as reference category), completed primary education or above, female head of household and an interaction term between female head of household and sex. The regressions are run separately for each of the three surveys reported in Table 1 and for the start- and end-of-season data. The results (available on request) suggests that both female farmers and farmers in female-headed households are less likely to report producing for sale, but with some contextual variation and without further interaction. Education and age variables are not significant, except for Nigeria, where older farmers are more likely to report for sale (more so at the start of the season).

26 Due to this sample restriction, the number of observations is smaller in Table 2 than in Table 1.

27 Proxy respondent effects could also play a role. Even though enumerators were instructed to interview household members about their own labor supply, the teams relied on proxy respondents (i.e., other household members) if an age-eligible household member could not be interviewed. Proxy reports on the intended use of output are, however, not necessarily less reliable than self-reports, as the decision to market a product is not necessarily made by the household member producing it.

Table 2: Start- to end-of-season transitions in intended use of farmers' output

| *Ghana* | *End of season:* | | |
Start of season:	For sale	For own use	Total
For sale	62.4	13.6	76.0
For own use	18.0	6.0	24.0
Total	80.4	19.6	100 (N = 1015)
Malawi	*End of season:*		
Start of season:	For sale	For own use	Total
For sale	16.0	13.6	29.6
For own use	34.3	36.1	70.4
Total	50.3	49.7	100 (N = 169)
Nigeria	*End of season:*		
Start of season:	For sale	For own use	Total
For sale	20.5	9.5	30.0
For own use	20.8	49.2	70.0
Total	41.3	58.7	100 (N = 3492)

Notes: Estimates for Ghana refer to individuals whose main occupation is in agriculture at the start and end of the season. Estimates for Malawi and Nigeria refer to individuals who worked at least 1 hour in agriculture at the start and end of the season. Based on the Ghana and Malawi AgLSs and Nigeria GHS-Panel-3.

information on which household members work on each plot and the crops grown on them. Hence, using the plot as the link, individuals can be matched to crop-level data on the intended use of output. We assume that household members listed as workers on a plot contribute labour to each crop cultivated on that plot because crop-specific labour input is unavailable.[28] In Malawi, the product-level operationalisation took a somewhat different approach. A random subsample of households was administered a labour module during both visits, which asked all household members that reported work in agriculture during the past 7 days to list the products (crops, livestock) that they had been working on, and the intended use of each product. Because these data are collected at the person-product level, no further assumptions are needed to match household members to crops. Moreover, unlike in Ghana, both crop and livestock products are included.

Table 3 shows the share of farmers classified as employed based on the intention to sell at least 50% of output (calculated as an unweighted average across products).[29] In Ghana, about 80% of male and 78% of female farmers are employed under the product-level approach (only available for the start of the agricultural season). For females, this estimate is somewhat higher than the activity level estimate (Table 1), but it is very similar for males. In Malawi, the product-level estimates (Table 3) are almost identical to the activity-level estimates in Table 1 at the start of the season, but higher at the end of the season.[30] Despite

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28 Unlike in the Malawi AgLS, the questions about the household members' labor allocation across plots in the Ghana AgLS did not refer to a specific reference period.

29 We also computed weighted averages, using crop values as weights in Ghana and working hours in Malawi. Weighted and unweighted estimates are similar.

30 Mechanically, male–female differences are muted in Ghana compared to Malawi. This is because in Ghana, one household respondent was asked about the intended use of output of all the crops

Table 3: Share of farmers producing only or mainly for sale – product level

	Ghana (4 districts)			Malawi (2 districts)		
	Male	Female	Total	Male	Female	Total
Start of season	0.80	0.78	0.79	0.22	0.23	0.22
	(0.01)	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)
n	726	605	1331	174	204	378
End of season				0.75	0.55***	0.64
				(0.03)	(0.04)	(0.03)
n				172	206	378

Notes: Standard errors in parentheses; *** denotes the male–female difference is significant at 1%. Based on the Ghana and Malawi AgLSs.

these differences in Malawi at the end of the season, further investigated below, there is an encouraging correspondence between the activity-level estimates in Table 1 and the product-level estimates in Table 3.[31] This suggests that farmers understood the questions about the intended use of their output broadly in the way they were intended, that is, they assessed whether their combined products, on average, are more likely to be sold or to be used for family consumption.

The large increase over time in the share of farmers producing for sale in Malawi calls for further investigation. Table 4 examines the proximate factors that may explain this increase, that is, changes in the crops/animals that household members were working with during the reference week versus an increase in the share of each crop/animal intended for sale, by showing start- and end-of-season descriptive statistics for the subsample of household members engaged in farming at both points in time.

The results show that the main driver of changes over time are the products that these household members were working on (Table 4, upper panel): there is much less time spent in the past 7 days on the cultivation of crops at the end of the season, especially of maize, which is largely intended for own use (79% at the start versus 7% at the end of the season). Conversely, there is more livestock activity at the end of the agricultural season; this includes rearing of goats, which are mainly intended for sale. Some shifts may be expected since the end-of-season survey was (mostly) conducted after the main harvest. However, the magnitude of labour reallocations is surprising, considering that farmers also grow other crops with a somewhat different production calendar. In addition, the bottom panel of Table 4 shows that household members are more likely to report some of their products (i.e. maize, goats and chickens) as being intended for sale at the end than at the beginning of the season.[32]

produced by the household, whereas in Malawi each individual working in agriculture could report on the intended use of output of each product s/he produces (thus allowing for intra-household variation). Moreover, the product-level estimates in Ghana do not consider livestock, only crops.

31   There is a similar correspondence at the individual level. For all adults with both activity-level and crop-level status available in the Ghana AgLS (*n* = 1077), 64.5% produce for sale according to both and 7.7% produce for own use according to both. For 27.8% of adults, the two measures do not correspond (roughly equally divided between the two off-diagonal cells in the transition matrix). The numbers are similar for men and women.

32   The opposite trend occurs for Irish potatoes, but they are not farmed as widely.

Table 4: Changes in labour allocation across products and their intended use over the season, Malawi

	Start of season	End of season	*n* (combined)
Products worked on during past 7 days			
Any crop	0.90	0.51***	386
	(0.02)	(0.04)	
Maize	0.79	0.07***	386
	(0.03)	(0.02)	
Irish potato	0.09	0.10	386
	(0.02)	(0.02)	
Pigeon pea	0.43	0.21***	386
	(0.04)	(0.03)	
Any livestock	0.46	0.73***	386
	(0.04)	(0.03)	
Goats	0.20	0.33***	386
	(0.03)	(0.03)	
Chicken	0.27	0.45***	386
	(0.03)	(0.04)	
Any fish	0.02	0.03	386
	(0.01)	(0.01)	
Fraction of output intended for sale			
Maize	0.11	0.21*	167
	(0.02)	(0.09)	
Irish potato	1.00	0.83***	36
	(0.00)	(0.03)	
Pigeon pea	0.40	0.44	124
	(0.04)	(0.05)	
Goats	0.75	0.88**	103
	(0.05)	(0.03)	
Chicken	0.20	0.31**	139
	(0.03)	(0.04)	

Notes: Only products for which at least 10 respondents report the intended use at the start and end of season are reported. Standard errors in parentheses; * denotes the start- versus end-of-season difference is significant at 10%, ** at 5%, *** at 1%. Based on the Malawi AgLS.

This change in the self-reported intended use of output for specific products contributes to the increase in the share of farmers producing for sale over the season, though it is less important than farmers' labour reallocation across products.

This analysis also sheds light on why women are less likely than men to report producing for sale at the end of the season. Table A3 (Appendix) shows that gender differences in the self-reported use of output are mostly insignificant, but there are important differences in male and female farmers' labour reallocation.[33] At the start of the season, more than 90%

33   We assessed whether the few male–female differences in the intention to sell are due to differences in reporting between men and women living in the same household (working on the same crop) and the role of proxy reporting. We identified all households in which male and female members worked on the same crop or livestock. In almost all these households, we find no male–female difference

of male and female farmers produce crops, especially maize (around 84%), and there are no significant gender differences. The only significant gender difference in labour allocations at the start of the season is chicken farming, which is more prevalent amongst women and mostly for own consumption. At the end of the season, both male and female farmers have pulled out of crop farming (with only 50% of farmers being engaged in crop farming, and only around 8% in maize farming) and are increasingly engaged in livestock production. However, men are disproportionately rearing goats at the end of the season, while women are more likely to tend to chicken. Because goats are more often than chicken intended for sale (87% vs 32% at the end of the season), this explains the larger increase in the share of male versus female farmers producing for sale.

The apparent seasonality in household members' engagement in livestock farming is somewhat puzzling, as livestock is not considered a seasonal activity. There are several potential explanations. First, livestock farming may be more labour intensive at some times of the year than at others. De Janvry et al. (2022) find, for Malawi, little evidence of seasonality in labour input devoted to livestock overall but argue that working hours may increase around the harvest period, when livestock is herded away from crops. Other studies have documented seasonality in livestock work related to seasonal grazing patterns (e.g., Sraïri and Ghabiyel, 2017, for Morocco). Second, children are often engaged in livestock activities (e.g., goat herding) (FAO, 2013). If child labour substitutes for adult labour in livestock production during peak crop production, this could explain the patterns documented in Table 4 (which refer to household members aged ≥15 years). Finally, there may be recall bias, with livestock farming being more salient (and hence more likely to be reported) when labour input into crop production is minimal (Zezza et al., 2016).

5. Employment-to-population ratios and the sectoral distribution of employment

While the previous section reported the share of farmers employed under the 19th ICLS standards, this section explores how the revised standards impact urban and rural employment-to-population ratios and the sectoral distribution of employment. The employment-to-population ratio is a widely used labour market indicator and closely related to the labour force participation rate (though the latter also includes the part of the labour force that is currently unemployed). The sectoral distribution of the employed population is used for a variety of purposes, for example, as an indicator of structural change, to compute macro-estimates of sectoral productivity or to assess gender segregation in the labour market.

There are two main reasons why the share of farmers re-classified by the new standards does not necessarily translate into changes in the employment-to-population ratio. First, even if most farmers are re-classified as own-use production workers under the revised standards, the effect on the employment-to-population ratio will be muted in contexts where agriculture only constitutes a small share of total employment. Second, farmers who are no longer considered as employed in their main occupation (farming) may still be considered as employed if they perform secondary activities (e.g., non-farm enterprise or wage work)

in the reported share of output intended for sale, even if the male and female household member both self-reported their intended use of output. Hence, any gender differences in the share of output intended for sale are due to differences between men and women in different households.

that meet the criteria of employment (i.e., the activity was performed for at least one hour during the reference week). If secondary activities are prevalent, the 19th ICLS standards may have a larger effect on the sectoral distribution of the employed population than on the employment-to-population ratio.

To illustrate the effects of the adoption of the 19th ICLS standards on headline labour indicators, we rely on nationally representative household surveys from the two early adapters, that is, the Nigeria GHS-Panel-3 (activity-level operationalisation) and the Malawi IHS-4 (product-level operationalisation).[34] Because the Malawi IHS-4 only collected the intended use of output for crops, we assume that livestock products are for sale, even though we know from the previous section that some livestock (especially chicken) are often reared for own consumption. In Nigeria, the analysis is based on the end-of-season survey, which, as discussed earlier, shows a higher share of farmers producing for sale than the start-of-season survey. The estimates in this section should therefore be seen as a lower bound of the implications of the 19th ICLS standards on employment measures.

Table 5 shows a large reduction in male and female employment-to-population ratios in rural areas of both countries under the 19th ICLS standards and a much smaller reduction in urban areas. In Malawi, employment declines disproportionately amongst women, while in Nigeria, the decline is larger for men. The latter result may be surprising, given that Table 5 is based on the same end-of-season data for Nigeria used in Table 1, which shows women farmers being more likely to be classified as own-use production workers than male farmers. However, there is also a comparatively higher incidence of non-farm enterprise work amongst Nigerian women, which mitigates the impact of the 19th ICLS standards on female (relative to male) employment. Conversely, in Malawi, women are less likely than men to work in the non-farm enterprise and wage sectors, which contributes to a disproportionate decline in female employment (Palacios-Lopez and Lopez, 2015).

There is further a large drop in the measured share of agricultural employment in total rural employment, which declines by about 50% in Nigeria and by about 10% in Malawi.[35] This is a considerable change, especially for Nigeria, which, if taken at face value, would paint the picture of a rural population that is much less reliant on agricultural activities and much further along in the process of structural change than previously thought. However, caution is warranted when jumping to such a conclusion, as agriculture may still be the primary means of livelihood for many of the individuals that are classified as employed in a non-agricultural sector under the 19th ICLS standards. Though not shown in this paper, this should be reflected by many employed individuals simultaneously engaged in own-use production work in agriculture, which highlights the importance of considering employment

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34 We do not report data from the Ghana and Malawi AgLSs in this section, because neither data set is nationally representative.

35 The change in Malawi is most likely underestimated because many Malawian workers primarily engage in casual or ganyu labor. We assigned these workers to the agricultural sector because their sector of work is not recorded. This not only increases the share of agricultural employment in total employment under both definitions but also affects the difference between the two. Of the roughly 10,000 sample individuals who farm for own use (and are therefore employed in agriculture by the previous standards), about 40% are no longer employed by the new standards, while almost 10% are reclassified as casual/ganyu workers. Some of these would likely be reclassified as non-agricultural workers if their sector of work had been recorded.

Table 5: Employment statistics, Nigeria and Malawi

	Nigeria				Malawi			
	Urban		Rural		Urban		Rural	
	Male	Female	Male	Female	Male	Female	Male	Female
Employment−population ratio								
Previous standards	0.569	0.528	0.617	0.528	0.667	0.442	0.687	0.608
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
19th ICLS standards	0.542	0.508	0.440	0.411	0.642	0.401	0.563	0.417
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
n	2,193	2,365	5,160	5,504	2,835	3,061	11,195	12,807
Share of employment in agriculture								
Previous standards	0.115	0.075	0.597	0.420	0.291	0.345	0.819	0.900
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)
n	1,246	1,250	3,172	2,951	1,852	1,427	7,854	7,881
19th ICLS standards	0.046	0.023	0.325	0.191	0.261	0.275	0.766	0.837
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
n	1,184	1,184	2,186	2,182	1,773	1,283	6,301	5,212

Notes: Based on the Nigeria GHS Panel Wave 3 and Malawi IHS-4. In Malawi IHS-4, casual or ganyu workers do not report their sector of work. These workers were assigned to the agricultural sector.

and own-use production work together under the revised standards. Even in urban areas, the measured share of agricultural employment in total urban employment declines significantly, albeit from a much lower level. Hence, even though the 19th ICLS standards may not lead to a substantial decline in urban employment, due to the prevalence of secondary activities in urban areas, they may still alter the sectoral distribution of urban employment.

6. Conclusion

This paper explores the implications of the 19th ICLS standards on measures of employment in Africa. It documents large geographic variation in the share of farmers classified as employed under the 19th ICLS standards, reflecting differences in agricultural production systems. Farmers are less likely to report producing for sale at the beginning than at the end of the agricultural season, and women appear to be less likely than men to report producing for sale. In-depth analysis for Malawi suggests that both gender and over-time differences can be explained by male and female farmers' labour allocations and re-allocations across crops and, particularly, livestock products, which differ in their intended use of output. The correspondence between the activity-level and product-level estimates suggests that farmers understood the questions about the intended use of their output broadly in the way they were intended; that is, they assessed whether their combined products, on average, are more likely to be sold or to be used for family consumption, despite the potential for cognitive bias inherent to such questions.

The revised standards have significant implications for our characterisation of employment in Africa, in terms of its prevalence and sectoral distribution, especially in rural areas. In the two countries for which we have nationally representative data (Malawi and Nigeria), measured rural employment-to-population ratios drop by about 20% to 30%. However, many farmers producing for family consumption remain employed under the revised standards because they are engaged in other, mostly non-agricultural, activities that still count towards employment. Therefore, under the revised standards, the share of employment in agriculture is significantly smaller than under the previous standards.

This work shows that as the 19th ICLS standards are being rolled out in household surveys in Africa and other developing regions, labour market indicators and statistics will change, sometimes drastically, for reasons that are purely or primarily related to the introduction of new statistical concepts and definitions. Moreover, the new standards create an imperative to move away from employment and labour force participation as the headline indicators of labour supply and towards a full set of indicators outlined in the 19th ICLS resolution (besides employment, especially own-use production work), to avoid underestimating the importance of agriculture for rural livelihoods and undercounting women's work in agriculture.

The new standards also raise difficult issues for the macro measurement of aggregate and sectoral labour productivity, typically estimated as the ratio of GDP to total employment and the ratio of a sector's GDP to the sector's employment. Under the 19th ICLS standards, agriculture for own consumption counts towards production in national accounts (and is hence included in GDP) but not towards agricultural employment. As a result, aggregate and sectoral ratios of GDP to employment could be severely biassed, with an overestimation of labour productivity overall and in agriculture and an underestimation of labour productivity in non-agricultural sectors. This inconsistency between different parts of the statistical system is a serious dilemma, which might warrant re-constructing and disseminating a parallel labour statistics series, which is aligned with the SNA production boundary, as a measure of total labour input into the economy. Such a series could also be used to track changes in employment and labour force participation over time, at least in an interim period.

This paper highlights the need for NSOs to design communication strategies to explain the revised definitions to data users. In addition, careful attention must be paid to the timing of data collection. The variability of farmers' self-reports of their intended use of output over the course of the agricultural production cycle poses serious challenges for cross-country and cross-survey comparisons of rural employment statistics if the data are collected at different points in time during the agricultural year. Our results suggest that end-of-season surveys may lead to higher employment ratios and labour force participation rates than start-of-season surveys, but these patterns are not necessarily generalizable to all of Africa. Moreover, labour input during the season may not trend linearly up- or downwards. Future methodological studies should investigate these issues to provide guidance on the timing and length of data collection. NSOs can pursue different strategies to mitigate seasonality issues (Desire and Costa, 2019), for example, continuous surveys that interview households over a 12-month period (like the Malawi IHS-4); quarterly surveys (common for LFSs) or surveys with multiple visits (e.g., post-planting and post-harvest). However, funding or capacity constraints can limit the ability of NSOs to pursue these strategies, especially in the poorest countries.

Finally, data users must be sensitised to the fact that the revised concept of employment is no longer a measure of total labour input as per the SNA production boundary and

exercise caution when drawing on national labour market data and publications or cross-country databases (e.g., the ILO's ILOSTAT database or the World Bank's WDI). Consider the example of Rwanda, which transitioned to the revised standards in 2017, as documented in its 2017 LFS report (NISR, 2018). As a result, the WDI indicator 'Employment to population ratio, 15+, total (%) (national estimate) (SL.EMP.TOTL.SP.NE.ZS)' shows a significant decline from 82.6 percent in 2014 to 42.9 percent in 2017. Conversely, the WDI indicator 'Employment to population ratio, 15+, total (%) (modelled ILO estimate) (SL.EMP.TOTL.SP.ZS)' does not decline (i.e., 83% in 2014, compared to 82.9% in 2017).[36]

This is because the ILO modelled estimates do not yet apply the 19th ICLS employment definition for countries in which it would generate a methodological break as there are not enough data points based on the revised standards to produce global and regional estimates (ILO, 2019a). Moreover, while the change in definition of the national employment estimate is documented in WDI metadata ('footnotes'), it could easily be missed by data users who are not sensitised to the change in definitions. Academics and policy makers ought to be aware of where the changes in series originate from and avoid attributing 'spurious' changes in the level and sectoral composition of employment to policies on the ground.

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Supplementary material

Supplementary material is available at *Journal of African Economies* online.

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Appendix

Table A1: Data set overview

	2016/2077 Malawi integrated household budget survey (IHS-4)	2015/2016 Nigeria general household survey panel (GHS-3)	Malawi AgLS		Ghana AgLS
			Activity-level sample	Product-level sample	
Coverage	Nationally representative	Nationally representative	Agricultural households in two districts (Ntcheu and Zomba)		Agricultural households in four districts (Mampong Municipal, Ejura Sekyedumasi, Nkoranza South and Pru)
Timing of data collection	Continuous over 12 months (April 2016–April 2017)	Two rounds during the 2015/2016 agricultural season: post-planting (August to October 2015) and end of season (February to April 2016)	Two rounds during the 2016/2017 agricultural season: pre-planting (September to October 2016) and end of season (June to August 2017)		Two rounds during the 2015 agricultural season: pre-planting (March 2015) and end of season (October to November 2015)
Activity-level operationalisation	No	Yes (in labour module), post-planting and end of season	Yes (in labour module), pre-planting and end of season	No	Yes, pre-planting (only in household member roster) and end of season (in both household member roster and labour module)
Product-level operationalisation	Yes (in labour module); covers only crops (not animals); intended use of output captured at the person-crop level	No	No	Yes (in labour module), pre-planting and end of season; covers crops and animals (livestock, fishing); intended use of output captured at the person-crop level	Yes (in separate crop intention module); only pre-planting; crops can be linked to persons using information on labour allocations and crop cultivation by plot (i.e., using plots as the link)

Table A2: Sample descriptive statistics

	Ghana AgLS			Malawi AgLS Activity-level sample			Product-level sample			Malawi IHS-4 Rural			Urban			Nigeria GHS-Panel-3 Rural			Urban		
	mean	sd	N	mean	sd	N	mean	sd	N	mean	sd	N	mean	sd	N	mean	sd	N	mean	sd	N
Full sample, individuals																					
Male	0.50	0.50	3,852	0.47	0.50	1,591	0.50	0.50	1,627	0.48	0.50	44,203	0.49	0.50	9,682	0.49	0.50	22,806	0.49	0.50	9,333
Age	23.00	19.00	3,852	22.17	19.16	1,591	22.35	18.60	1,627	22.35	19.23	44,203	22.48	16.75	9,681	24.09	19.84	19,176	25.54	20.10	7,695
Married (15+)	0.52	0.50	2,131	0.60	0.49	782	0.60	0.49	779	0.59	0.49	24,002	0.55	0.50	5,895	0.53	0.50	11,002	0.48	0.50	4,661
At least primary education (15+)	0.46	0.50	2,131	0.24	0.42	782	0.23	0.42	778	0.24	0.43	24,002	0.63	0.48	5,893	0.54	0.50	10,403	0.81	0.40	4,443
Rural	1.00	0.00	3,852	1.00	0.00	1,591	1.00	0.00	1,627	1.00	0.00	44,203	0.00	0.00	9,682	1.00	0.00	22,806	0.00	0.00	9,333
Hhs with at least one person engaged in farming																					
Total land (acres)	8.67	7.12	624	3.11	1.96	215	2.70	1.83	220	1.48	1.31	6,209	1.03	1.99	433	2.23	3.40	2,496	0.97	1.90	348
Number of plots	2.89	1.37	624	4.20	2.30	215	3.80	2.20	220	1.61	1.02	6,209	1.10	1.14	433	2.00	1.15	2,496	1.58	1.23	348
Grows maize	0.80	0.40	624	0.97	0.17	215	0.92	0.27	220	0.85	0.36	6,209	0.65	0.48	433	0.49	0.50	2,496	0.35	0.48	348
Grows beans	0.24	0.43	624	0.11	0.32	215	0.13	0.33	220	0.13	0.34	6,209	0.14	0.34	433	0.31	0.46	2,496	0.19	0.39	348
Grows pigeonpea				0.62	0.49	215	0.55	0.50	220	0.25	0.44	6,209	0.14	0.34	433						
Grows khwani				0.62	0.49	215	0.59	0.49	220	0.34	0.47	6,209	0.25	0.44	433						
Own livestock	0.51	0.50	624	0.78	0.41	215	0.83	0.38	220	0.58	0.49	6,209	0.57	0.50	433	0.70	0.46	2,496	0.56	0.50	348

Notes: Unweighted sample means. Missing values for farm variables are replaced by 0. Hh denotes household. Nigeria post-planting data, except for education. Malawi and Ghana AgLSs—post-harvest data. Based on the Ghana and Malawi AgLSs, Nigeria GHS-Panel-3 and Malawi IHS-4.

Table A3: Changes in labour allocation and intended use across products over the season by sex, Malawi

	Start of season				End of season		
	Male	Female	*n*		Male	Female	*n*
Products worked on during past 7 days							
Any crop	0.92	0.92	378		0.50	0.49	378
	(0.02)	(0.02)			(0.04)	(0.03)	
Maize	0.84	0.83	378		0.09	0.07	378
	(0.03)	(0.03)			(0.02)	(0.02)	
Irish potato	0.08	0.08	378		0.10	0.06	378
	(0.02)	(0.02)			(0.02)	(0.02)	
Pigeon pea	0.44	0.44	378		0.16	0.25**	378
	(0.04)	(0.03)			(0.03)	(0.03)	
Any livestock	0.30	0.38	378		0.70	0.71	378
	(0.03)	(0.03)			(0.04)	(0.03)	
Goats	0.13	0.17	378		0.38	0.30*	378
	(0.03)	(0.03)			(0.04)	(0.03)	
Chicken	0.15	0.25**	378		0.31	0.51***	378
	(0.03)	(0.03)			(0.04)	(0.03)	
Any fish	0.02	0.00**	378		0.03	0.00**	378
	(0.01)	(0.00)			(0.01)	(0.00)	
Fraction of output intended for sale							
Maize	0.08	0.09	315		0.30	0.10*	30
	(0.01)	(0.01)			(0.10)	(0.05)	
Irish potato	1.00	0.84**	31		0.83	0.88	30
	(0.00)	(0.06)			(0.04)	(0.02)	
Pigeon pea	0.32	0.35	166		0.37	0.45	79
	(0.04)	(0.04)			(0.06)	(0.04)	
Goats	0.78	0.74	57		0.87	0.87	126
	(0.07)	(0.06)			(0.03)	(0.03)	
Chicken	0.12	0.22*	77		0.32	0.32	158
	(0.03)	(0.04)			(0.05)	(0.03)	

Notes: Only products for which at least 10 respondents report the intended use at the start and end of season are reported. Standard errors in parentheses, * denotes the start- versus end-of-season difference is significant at 10%, ** at 5%, *** at 1%. Based on the Malawi AgLS.