

Who Is Employed?

Evidence from Sub-Saharan Africa on Redefining Employment

Isis Gaddis

Gbemisola Oseni

Amparo Palacios-Lopez

Janneke Pieters



WORLD BANK GROUP

Development Economics
Development Data Group
August 2020

Abstract

The 19th International Conference of Labour Statisticians (in 2013) redefined labor statistics standards. A major change was to narrow the definition of employment to work for pay or profit. By the revised standards, farming that is only or mainly intended for own use is no longer considered employment, and such a farmer is no longer considered to be employed or in the labor force. This paper analyzes the implications of the revised standards on measures of employment in Sub-Saharan Africa obtained from multi-topic household surveys. It shows that, in some contexts, 70 to 80 percent of farmers produce only or mainly for family consumption and are therefore, based on this activity, not

considered employed by the revised standards. However, there is wide variation across countries and regions. Moreover, farmers are more likely to report intending 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. The revised standards lead to significantly lower employment-to-population ratios in rural Africa and change the sectoral composition of the employed population toward non-agricultural sectors. The paper concludes with recommendations for data producers and users.

This paper is a product of the Development Data Group, Development Economics. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://www.worldbank.org/prwp>. The authors may be contacted at igaddis@worldbank.org and apalacioslopez@worldbank.org.

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

Who Is Employed?

Evidence from Sub-Saharan Africa on Redefining Employment¹

Isis Gaddis

World Bank and IZA

Gbemisola Oseni

World Bank

Amparo Palacios-Lopez

World Bank

Janneke Pieters

Wageningen University and IZA

JEL: J21, J16, J43, C83

Keywords: Labor statistics, agricultural labor, gender, own-use production work, survey design, Sub-Saharan Africa

¹The authors gratefully acknowledge funding from the U.K. Department for International Development (DFID) under the “Minding the (Data) Gap: Improving Measurements of Agricultural Productivity through Methodological Validation and Research” project and from the William and Flora Hewlett Foundation under the “Improving the Measurement of Subsistence Agriculture in the Framework of ICLS 19 and Its Implications for Gender Statistics” project. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent. We would like to thank Kathleen Beegle, Bénédicte de la Brière, Antonio Discenza, Louise Fox, Caren Grown, Stephan Klasen, Kieran Walsh and Michael Weber for valuable comments on earlier drafts. Of course, all errors are our own.

1 Introduction

In October 2013, the 19th International Conference of Labour Statisticians (ICLS) adopted a new resolution concerning statistics of work, employment, and labor underutilization (ILO 2013b, referred to as the “19th ICLS standards” or the “revised standards”), which supersedes previous international standards for labor statistics (dating back to 1982).¹ An important element of the revised standards is to narrow the definition of employment to work performed for pay or profit, that in the case of agricultural activities is based on the *self-declared main intended use of the output*. Own-use production of goods, such as crop cultivation mainly or only for own/family consumption, is no longer considered employment and, hence, does not count towards employment or labor force participation. Instead, such work is captured as a separate form of work and used to produce the headline indicator of “own-use production work”.² 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 are often engaged in different types of work. These changes have significant implications for the calculation of labor statistics in developing countries, and especially in Sub-Saharan Africa, where a large share of the population is engaged in the production of goods for family use. They also raise important issues with how to measure this definition in a consistent and robust manner.

The operationalization of the 19th ICLS standards requires household surveys that are used to measure labor market engagement – e.g. dedicated labor force surveys (LFS) and multi-topic household surveys – to differentiate between individuals engaged in own-use production work and individuals engaged in employment. While own-use production of goods can take many forms (e.g. collection of firewood or water, food preservation, etc. for family use), the revised standards have the largest implications for the measurement of agricultural work, where surveys need to distinguish between a farmer producing for own/family use or for sale. This, however, is difficult to measure, and historically, there has been scant empirical evidence and 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

¹ The International Conference of Labour Statisticians (ICLS) is a standard-setting body in labor statistics, hosted every five years by the International Labour Organization (ILO). As per the tripartite structure of the ILO, its participants include experts from governments (typically officials from the ministries dealing with labor issues and national statistical offices), employers' and workers' associations.

² The 19th ICLS also introduced a new ‘forms-of-work’ framework.

occupations) and is often left to the discretion of enumerators and data entry personnel, without clear guidance on how to classify farmers.³ Under the 19th ICLS standards, the distinction between own-use and market-oriented work in agriculture has been propelled to the forefront of labor statistics in developing countries.

The present paper analyzes the implications of the 19th ICLS standards on measures of employment obtained from multi-topic household surveys. We focus on Sub-Saharan Africa, where we expect a disproportionately large decline in measured employment using the revised standards, due to the high prevalence of subsistence agriculture in the region.⁴ The main contribution of this paper is as follows: first, we provide a brief history of the evolution of labor statistics standards and the rationale for changing the definition of employment. Second, using multi-topic household survey data sets from three Sub-Saharan African countries, we illustrate how measures of employment of male and female farmers change under the 19th ICLS standards, comparing different measurement approaches, and the implications on country-level headline indicators of employment. 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 labor force surveys (Benes and Walsh 2018). Third, the paper contributes to the broader literature on the sensitivity of labor statistics to survey methodology in developing countries (Bardasi et al 2011; Heath et al, forthcoming; Arthi et al 2018; Gaddis et al, forthcoming).

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, depending on spatial differences in the commercialization of agricultural production. In parts of Malawi and Nigeria 70 to 80 percent of farmers report producing only or mainly for family consumption at the beginning of the agricultural season (i.e. the growing season of the main local crop), which is not considered as employment by the 19th ICLS standards but falls under the new category of own-use production work. However, this share is much lower in parts of Ghana, where only 24 percent of farmers produce for own use. Second, we find that, in contexts where gender differences in the self-reported intended use of output are significant, women are less likely than men to report producing only or mainly for sale. Further in-depth analyses using the data collected in Malawi, which are best suited to analyze male-female differences, shows that the

³ This mirrors difficulties in the agricultural economics literature in defining and measuring subsistence agriculture – a term which is often used in policy circles, but without any generally accepted definition (Wharton 1969; Brüntrop and Heidhues 2002).

⁴ The operationalization of the 19th ICLS standards provided an opportunity for enhanced methodological testing. This has led to a redesign of labor force surveys and labor modules in multi-topic household surveys and an ambitious agenda of survey methodological research by the ILO and World Bank under the Women’s Work and Employment Partnership, of which this paper is a product. Due to the co-occurrence of these changes in survey design with the rollout of the 19th ICLS standards, some countries may see an increase in employment, especially for females, where traditional surveys often failed to capture certain types of informal employment. This paper is concerned with the rollout of the 19th ICLS standards in isolation, i.e. comparing employment ratios under the 19th ICLS standards with previous (1982) standards for the same household survey.

gender gap in the intended use of output is not primarily an artifact of the way the data were collected (i.e. via self-reports) but rather, a reflection of the differences in male and female farmers' labor allocation across crop and, particularly, livestock products, which differ in their intended use of output. Third, in all three countries included in this study, farmers are less likely to report producing only or mainly for sale at the beginning of the agricultural season than at the end. In Malawi, the differences in the intended destination of output between the beginning and the end of the season are mostly driven by farmers' reallocation of labor across agricultural products, particularly between subsistence crops and livestock, where the latter is more commercialized. However, changes in the self-reported intended use of output also play a role, as farmers are more likely to report a given crop as being intended for sale at the end of the agricultural season than at the beginning. Though caution is warranted when generalizing to other countries, this suggests that, under the revised standards, rural employment ratios in Sub-Saharan Africa may be higher at the end than at the beginning of the agricultural season, at least in countries with agricultural production systems that are similar to the ones reported on in this paper.⁵ This heightened sensitivity of agricultural employment to the timing of data collection also poses challenges to comparisons of rural labor market indicators, especially when the underlying surveys are fielded at different points during the agricultural calendar.

The revised standards have significant implications for measures of rural employment in Sub-Saharan Africa, in terms of its prevalence and sectoral distribution, and these can be illustrated for the two countries, Malawi and Nigeria, for which we have nationally representative data. Measured male and female rural employment-to-population ratios drop by 18 percentage points for males and 12 percentage points for females in Nigeria, and by 12 and 19 percentage points, respectively, in Malawi (corresponding to relative declines of approximately 20 to 30 percent in both countries). In Malawi, the decline in rural employment is larger for females than for males, while it is the opposite pattern in Nigeria. The magnitude of the decline in rural employment-to-population ratios not only reflects the share of farmers re-classified under the revised standards but also the prevalence of farming in the total population and the extent to which those farmers are also engaged in non-farm household enterprises and/or wage work. In other words, many farmers who produce only or mainly for family consumption remain employed under the revised standards because they are engaged in these other, mostly non-agricultural, activities (for at least one hour during the

⁵ It is important to note that while rural employment in developing countries has always displayed some seasonal variation, this will most likely be amplified under the 19th ICLS standards. Under both the previous (1982) and the revised (2013) labor statistics 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 (in Sub-Saharan Africa) often fluctuated over the course of the agricultural season, due to whether farmers were engaged in any agricultural activity over the past seven days or not (Fox and Pimhidzai 2013). Under the revised ICLS standards, however, rural employment ratios are affected by an additional margin of variation – i.e. changes in farmers' reports on the intended use of their produce – which is expected to lead to even larger seasonal fluctuations.

reference week). Not surprisingly, under the revised standards, the measured share of agricultural employment in overall rural employment is significantly smaller than under the previous standards. This also highlights the need for household surveys to collect data on multiple, potentially overlapping, activities.

The remainder of this paper is organized as follows. Section 2 provides some background on the 19th ICLS standards. Section 3 describes the data sources. Section 4 uses multi-topic 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 to be employed by the revised standards under different measurement approaches, paying specific attention to gender differences. In addition, the section explores the over-time variability in reports about the intended use of output. Section 5 compares male and female employment-to-population ratios under the previous (1982) and revised (2013) standards. Section 6 discusses implications for labor statistics in developing countries and concludes the paper.

2 The 19th ICLS resolution and its operationalization in household surveys

2.1 Background

Own-use production in national accounts and labor 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 the context of national accounts and labor force statistics. Historically, national income accounting emphasized 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 formalized 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 – at least in countries where it is thought to be quantitatively important. Conversely, services for own use (such as cleaning, childcare, and meal preparation) have always been excluded from the SNA production boundary (and from GDP). This distinction between goods and services for own use has been extensively criticized, particularly (but not exclusively) by feminist economics scholars, who argue that national accounts statistics hide unpaid work performed mostly by women and do not recognize the productive value of these activities (Waring 1990; Benería 1999; Goldschmidt-Clermont and Pagnossin-Aligisakis 1999; Young 2000; Goldschmidt-Clermont 2000; Anker 2011). Even though the topic was debated at two United Nations World Conferences (Swiebel 1999), the broad distinction between own-use goods (included in GDP) and own-use services (excluded from GDP) has been maintained in the 2008

SNA, which is valid to date. However, since the 1993 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 labor force statistics, the 13th ICLS in 1982 defined the “economically active population” as “all persons who furnish the supply of labor 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 labor 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 below for further discussion).

Why a new definition of employment?

The 19th ICLS sought to address multiple concerns with the 13th ICLS standards. Among 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 labor market performance. Similarly, the previous concept of unemployment was perceived as too narrow, since farmers producing for family use and other individuals performing own-use production work, by virtue of being considered as employed, were ineligible for classification under unemployment (ILO 2013a).⁶ By narrowing employment to work performed for pay or profit, the revised ICLS standards are expected to render employment and unemployment 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, etc.) from the employment measure, which impaired cross-country comparability of labor statistics.

The 19th ICLS also addressed the long-standing critique that own-use services (domestic housework and childcare, as examples), which are disproportionately performed by women and children, were treated

⁶ Because the new ICLS standards limit employment to work performed for pay or profit, own-use production workers now qualify for unemployment, conditional on whether they are available and actively searching for employment. However, it remains to be seen whether many farmers producing mainly or only for own use will meet the ‘actively searching for employment’ criterion. Other measures of labor underutilization, particularly time-related underemployment, may be more relevant for this population group (see ILO 1998, 2013c for more details).

differently from own-use goods (such as growing food crops for family use) in official labor 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 labor statistics.

A new category of work and better measurement of labor 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.⁷ 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), a potential advantage of classifying own-use production of goods and services as work is that it will create incentives to collect better data on domestic work, which in the past had often been omitted from labor force surveys and other household surveys. Such data are of critical importance, for example, in analyzing gender differences in the intra-household allocation of labor and time scarcity as a constraint to (female) labor force participation, etc. Moreover, the new forms-of-work framework acknowledges that different forms of work may be performed simultaneously during the reference period (ILO 2013b).

In addition, the 19th ICLS also introduced new measures of labor underutilization, beyond unemployment. These include time-related underemployment (i.e. employed individuals who would want to work additional hours) and the potential labor force (i.e. individuals who are outside of the labor force but maintain a degree of attachment to the labor market).⁸

2.2 Operationalization challenges of the revised definition of employment

The 19th ICLS resolution contains several ambitious features to capture more dimensions of work – particularly its focus on the measurement of all forms of work, including unpaid domestic work, and additional measures of labor underutilization. At the same time, however, the 19th ICLS standards bring

⁷ Since the labor force continues to be defined as the sum of persons in employment and unemployment (i.e. not in employment but available and actively searching for employment), being engaged in any form of work other than employment, does not count towards employment ratios or labor force participation rates.

⁸ More specifically, the potential labor force includes the following two subgroups (neither of which qualifies as unemployed): (i) unavailable job seekers, i.e. individuals seeking employment but currently unavailable to take up employment and (ii) available potential job seekers, i.e. individuals who would want to be employed and are available to take up employment, but who did not carry out any job search efforts during the reference period. For more details, see https://www.ilo.org/global/statistics-and-databases/statistics-overview-and-topics/WCMS_470306/lang--en/index.htm.

new challenges, particularly related to the operationalization of the revised definition of employment in labor force and multi-topic household surveys. Some of these are highlighted below.

(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” is somewhat ambiguous, as it lacks a formal definition and could potentially mean, among 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 intentions 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, operationalizing the revised ICLS 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.⁹ Social and cognitive psychological research shows that there can be significant cognitive bias in assessing probabilities and future outcomes (e.g. 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. optimism) 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 raises concerns about using farmers’ self-declared intended use of output as a meaningful criterion to distinguish between employment and own-use production work.¹⁰

⁹ 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) states that “the self-reported intended destination of the output serves to capture aspects related to the mode of organization of production”. It further argues 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.” As noted in the introduction to this paper, this approach is also consistent with earlier standards, particularly ISCO-08. However, based on the above definition, the intended destination of output cannot be entirely decoupled from its actual destination, as farmers need to form an expectation about the share of produce to be sold in order to report on the intended destination of output.

¹⁰ From a theoretical perspective, the distinction between production work intended for own use and production work intended for pay or profit is difficult to reconcile with a class of agricultural household models assuming 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 (Janvry and Sadoulet 2003; Taylor and Adelman 2003). If production decisions are separable from consumption decisions, all farmers act as profit maximizing producers and there is essentially no ex-ante distinction between work intended for pay or profit and work intended for own use.

(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 operationalizing the 19th ICLS – an activity-level operationalization and a product-level operationalization. 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 of this approach 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?”¹¹ A possible third (*cluster-level*) approach, would ask about the intended destination of output of each activity cluster (e.g. farming, livestock and fishing), an approach that is not explored in this paper. The activity-level approach is more suitable for surveys that typically do not collect production data, such as labor force and other non-agricultural surveys. For example, the model LFS questionnaire currently recommended by the ILO has adopted the activity-level approach.¹² Conversely, the product-level approach may be suitable for agricultural surveys that already collect crop-level data on agricultural production and disposition. However, since the 19th ICLS resolution requires the intended destination of output to be “established in reference to the specific goods produced”, crop-level reports on the intended use of output then need to be linked to individual-level labor data in order to establish whether a specific household member was employed during the reference period, which can be difficult in practice (more on this in section 4).

(3) Aggregation across products

Most farmers in developing countries grow more than one crop and often also raise livestock. Since different agricultural products (-and by-products-) may differ in their level of commercialization, some form of 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 further guidance on the part of the interviewer, it is unclear a priori how farmers perform such aggregation in their response. In addition, survey research shows that cognitively onerous questions can lead to bias in the data, especially among respondents with low levels of education (Arthi et al 2018; Gaddis et al, forthcoming). 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

¹¹ In cases of mixed agriculture, livestock products and by-products also ought to be included, though such data are even more difficult to collect than crop-level data.

¹² <https://ilo.org/LFSresources>. Version 3 of ILO Model LFS Questionnaire (July 2019).

both weighted averages (giving greater importance to ‘dominant’ products, using labor hours or production quantities/values as weights) and unweighted averages (giving the same importance to each product).

(4) Defining a threshold

Summarizing 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. Though the ICLS resolution does not clearly specify a threshold, its emphasis on “mainly intended for sale” suggests a threshold of at least 50 percent (of total farm output). While own-use production work in the 19th ICLS framework is not synonymous with subsistence agriculture, similar questions have arisen in the applied economics literature in distinguishing subsistence agriculture from non-subsistence agriculture.¹³ The 2008 World Development Report on Agriculture, for example, uses subsistence thresholds ranging from 10 to 50 percent of agricultural production to delineate subsistence-oriented producers from market-oriented producers (World Bank 2007). Others use an absolute threshold based on minimum physiological needs required for survival, like a poverty line anchored in nutrition, or empirically estimate a threshold (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) project. The 2015 Ghana and 2016/17 Malawi Agricultural Labor Surveys are specialized agricultural surveys conducted as part of the LSMS’s program of survey methodological research. Both surveys were designed, among other objectives, to pilot questions about the intended use of farmers’ output to facilitate the operationalization of the 19th ICLS standards. In addition, we draw on the 2016/17 Malawi Integrated Household Survey (IHS4) and the 2015/16 Nigeria General Household Survey Panel (GHS-Panel Wave 3), which are the first two nationally representative LSMS-ISA surveys that adopted the revised standards. The following paragraphs describe each data set (see Table A1, Appendix, for a summary description and additional information on each survey).

¹³ As per the 19th ICLS, subsistence foodstuff producers constitute a subgroup of persons in own-use production work. Additional work is planned to operationalize the concept of subsistence in labor statistics.

The 2015 Ghana Agricultural Labor Survey interviewed 719 households, in 20 enumeration areas in four districts located in Ghana’s Ashanti and Brong Ahafo regions.¹⁴ A major criterion for households selected was that they had at least one plot being cultivated at the time of the survey. Households were visited prior to the beginning of land preparation and again, at the end of the agricultural season.¹⁵ In Ghana, as in the other two countries, maize is the most important staple crop and survey activities were timed as per the maize agricultural production cycle. The household member characteristics module (roster) captured, among other things, information about each household member’s current occupation and the intended 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 LSMS labor module which asked each household member engaged in agriculture over the past seven days about the intended use of the products obtained from the activity, using the same four response categories described above. These questions in the member characteristics and labor modules are both examples of an *activity-level* operationalization of the revised standards. In addition, the pre-planting survey included a short crop intention module, which asked a 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. This is akin to a *product-level* operationalization of the 19th ICLS standards, with a focus on crops (i.e. no livestock products). The plot characteristics module also collected data on which members of the household were expected to work on each plot and the crops to be planted on each plot, which makes it possible to link crop-level reports on the intended use of output to the household members’ labor input.

The 2016/17 Malawi Agricultural Labor Survey interviewed about 850 households in 20 enumeration areas in the Ntcheu and Zomba districts of Malawi. Similar to the Ghana Agricultural Labor Survey, households were visited prior to the beginning of land preparation and again, at the end of the agricultural season.¹⁶ For the purpose of this paper, we focus on the comparison of two randomly assigned groups of households. Both groups were administered short labor modules (modeled after a standard LSMS survey) that ask about each household members’ engagement in various types of economic activities over the past seven days. The two groups differ, however, with respect to how they capture the intended use of output for household members engaged in agriculture over the preceding seven days. In group one, the intended use of output was captured at the activity level (“Are the products obtained from [NAME's] farming/ fishing

¹⁴ 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.

¹⁵ A subsample of households was visited weekly during the agricultural season. These weekly visits, which collected data on plot-specific farm labor, were used to assess recall bias in farm labor data and are not used in this paper (see Gaddis et al, forthcoming).

¹⁶ Like the Ghana Agricultural Labor Survey, a subsample of households was visited weekly (the weekly visits were related to another part of the experimental design). The actual sample size differs across rounds due to the inclusion of replacement households in the pre-planting survey (to reduce possible attrition) and the addition of another random sample of households in the end-of-season survey. The data were collected by Wadonda Consult Limited.

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 (i.e. livestock) on which they had worked over the last seven days before the interview, and then to specify the intended use of output for each crop/animal (product-level operationalization).

The 2016/17 Malawi IHS-4 is a nationally representative household survey conducted by Malawi’s National Statistical Office. The survey interviewed approximately 12,480 households in 780 enumeration areas over a period of 12 months, from April 2016 to April 2017. Unlike the other data sets used in this section, the Malawi IHS-4 interviewed each household only once. Similar to the second group of the 2016/17 Malawi Agricultural Labor Survey (which was in the field at approximately the same time) the IHS-4 opted for a product-level operationalization of the intended use of output; asking household members engaged in agriculture over the past seven days to first identify all crops they had worked on, and then inquiries were made about the intended use of output of each crop. However, unlike in the Malawi Agricultural Labor Survey, this information was only collected for crops and not for livestock.

The 2015/16 General Household Survey-Panel (GHS Panel Wave 3) is a nationally representative household survey implemented by the Nigeria National Bureau of Statistics. Households were visited twice – the first visit occurred after the planting season, between August and October 2015, and the second visit at the end of the agricultural season, between February and April 2016. In this survey, the intended use of output was captured at the activity level. Labor-related questions were asked at the individual level in the labor module for both post-planting and end-of-season visits. All individuals participating in agriculture were asked about the intended use of the products from their agricultural activity.

Table A2 (Appendix) shows summary statistics for the four data sets (and, for the Malawi Agricultural Labor Survey, separately for groups one and two, i.e. the activity-level and product-level operationalization subsamples). The upper panel shows basic demographic characteristics. In Malawi and Nigeria, there are slightly more females than males, while the opposite is true for Ghana. The average age of household members is between 22.4 years (Malawi IHS-4) and 24.5 years (Nigeria) and most household members (aged 15+) are married in all four data sets. Between 23 percent (Malawi Agricultural Labor Survey) and 62 percent (Nigeria) of household members aged 15+ have completed primary education. It should be noted that these differences are partly a function of the geographic coverage of the different surveys. The agricultural labor studies in Ghana and Malawi were conducted exclusively in rural areas, whereas the two nationally representative surveys collected between 72 percent (Nigeria GHS Panel Wave 3) and 82 percent (Malawi IHS-4) of individual-level observations in rural areas, the rest being urban. The bottom panel shows additional information for agricultural households (i.e. households with at least one household member engaged in farming). The average size of landholdings varies between 1.4 acres in the Malawi

IHS-4 and approximately 3 acres in the Ghana and Malawi Agricultural Labor Surveys.¹⁷ Maize is an important crop in all samples, grown by between 50 percent (Nigeria GHS Panel Wave 3) and above 90 percent (Malawi Agricultural Labor Survey) of agricultural households. Between approximately 12 percent (Malawi Agricultural Labor Survey) and 29 percent (Nigeria GHS Panel Wave 3) of agricultural households grow beans, and about 50 percent (Ghana) to approximately 80 percent (Malawi Agricultural Labor Survey) own some livestock.

4 Employment of male and female farmers

The new 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.¹⁸ 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.¹⁹

Activity-level operationalization

Three of the four surveys described in section 3 – the Ghana and Malawi Agricultural Labor Surveys and the Nigeria GHS Panel Wave 3 – asked household members engaged in agriculture (farming, livestock rearing and/or fishing) whether the products obtained from their agricultural activity are mainly intended for sale or for family use. This question was asked at the beginning and at the end of the growing season for the main local crop, which in the three countries is maize.²⁰

Table 1 shows a large variation in the intended use of farmers' output, both across countries and over time.²¹ In Ghana, 75 percent of farmers report producing only or mainly for sale at the start of the season,

¹⁷ There is a surprisingly large difference in the average size of landholdings between the Malawi Agricultural Labor Survey and the Malawi IHS-4. Multiple factors may explain this – including the different levels of regional coverage (see Table A1), differences in question phrasing, slight differences in the timing of data collection, etc. In addition, unlike the IHS-4, which visited households only once, the Malawi Agricultural Labor Survey interviewed households repeatedly over the course of the season (i.e. all households were administered a pre-planting and end-of-season survey and a sub-sample of households received additional weekly interviews). As discussed in Gaddis et al, forthcoming, repeated interviews lead to increased capture of marginal plots and hence increase total measured land holdings at the household level.

¹⁸ Farming here includes animal rearing. In theory, the distinction between own-use production work and employment can also arise in other sectors, such as hunting, gathering, food preservation, etc. However, in developing countries, mixed production (for both own use and profit) is most common in agriculture, and employment estimates are most sensitive to farmers' classification as employed or in own-use production work.

¹⁹ In all the analysis in this paper, we only report on individuals aged 15 years and above.

²⁰ The start-of-season and end-of-season surveys were fielded, approximately, six to nine months apart (see Table A1).

²¹ In Malawi and Nigeria, the estimates refer to all individuals (15+) who had worked at least one hour on the family farm during the reference period (based on the surveys' labor modules). In Ghana, the estimates refer to all individuals (15+) who stated that their *main occupation* was working in agriculture (based on the question in the household member characteristics module). We obtain very similar results for Ghana if we consider individuals who had worked at least one hour on the family farm during the reference period (based on the labor module), but this information is only available for the post-harvest survey.

which increases to 82 percent at the end of the season. Only these farmers are considered employed by the 19th ICLS standards, while the remaining farmers are considered as own-use production workers. The corresponding figures for Malawi and Nigeria are much lower – 22 percent (Malawi) and 29 percent (Nigeria) at the start of the season, increasing to 48 percent (Malawi) and 41 percent (Nigeria) at the end of the season.²² 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. Moreover, whenever we find a significant difference in the intended use of output between male and female farmers, 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 foodstuff production (Darity 1995; Warner and Campbell 2000; Doss 2002; Carr 2008; Arora and Rada 2017). They could, however, also highlight 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.

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 (0.02)	0.72*** (0.02)	0.76 (0.01)	0.21 (0.03)	0.22 (0.03)	0.22 (0.021)	0.29 (0.0)	0.29 (0.01)	0.29 (0.01)
N	649	605	1254	172	197	369	3752	2509	6261
End of season	0.82 (0.01)	0.82 (0.02)	0.82 (0.01)	0.58 (0.04)	0.41*** (0.04)	0.48 (0.03)	0.42 (0.01)	0.39* (0.01)	0.41 (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 5%, *** at 1% level. The estimates for Ghana refer to individuals whose main occupation is in agriculture, while the estimates for Malawi and Nigeria refer to individuals who worked at least one hour in agriculture during the reference week (see footnote 14). Based on the Ghana and Malawi Agricultural Labor Surveys and Nigeria GHS Panel Wave 3.

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, since not all individuals were

²² It should be noted, however, that the estimates for Ghana and Malawi are not nationally representative – so the 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).

engaged in 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, restricting the analysis to individuals who were engaged in farming in both survey rounds.²³ In all three countries, farmers are more likely to report producing only or mainly for sale at the end rather than at the start of the season, which 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 effects. 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 labor force participation rates may be highly sensitive to the timing of data collection under the revised standards, even in periods of high agricultural activity.

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

Ghana		<i>End of season:</i>		
<i>Start of season:</i>	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		<i>End of season:</i>		
<i>Start of season:</i>	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		<i>End of season:</i>		
<i>Start of season:</i>	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: The estimates for Ghana refer to individuals whose main occupation is in agriculture at the start and at the end of the season. The estimates for Malawi and Nigeria refer to individuals who worked at least one hour in agriculture at the start and end of the season. Based on the Ghana and Malawi Agricultural Labor Surveys and Nigeria GHS Panel Wave 3.

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, a significant

²³ Due to this sample restriction, the number of observations is smaller in Table 2 than in Table 1.

proportion of farmers who initially report producing for sale later report that their products are intended for family consumption.²⁴

Product-level operationalization

The agricultural labor experiments in Ghana and Malawi also implemented variants of the product-level operationalization 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 by the household during the upcoming season, and to indicate the intended use of each crop. In addition, the survey also gathered information on which household members work on each plot and the crops grown on them. Hence, using the plot as the link, individual household members 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 labor to each crop cultivated on that plot, since crop-specific labor input is not available.²⁵ In Malawi, the product-level operationalization took a somewhat different approach. A random subsample of households was administered a labor module at the start and end of the season, which asked all household members that reported any work in agriculture during the past seven days to list the products (crops, livestock) that they had been working on, and the intended use of each product.²⁶ Since this data is effectively 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 percent of output (calculated as an unweighted average across products).²⁷ In Ghana, about 80 percent of male farmers and 78 percent 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

²⁴ Proxy respondent effects could also play a role. Even though enumerators were instructed to interview household members about their own labor supply as much as possible, the teams had to rely on proxy respondents (e.g. other household members) in cases where not all eligible household members were available for the interview. It is important to note, however, that proxy responses are not necessarily less ideal than self-reporting when it comes to measuring the intended use of output, as the decision to market a specific product is not necessarily made by the household member working on the product during the reference week.

²⁵ Moreover, unlike in the Malawi agricultural labor experiment described next, the questions about the household members' labor allocation across plots in the Ghana agricultural labor experiment did not refer to a specific reference period. Hence the product-level estimates in Ghana are only indicative and we focus on Malawi in this section.

²⁶ Households in this subsample were only administered the labor module using the product-level operationalization. The labor module that uses the activity-level operationalization was administered to a different subsample.

²⁷ We also computed weighted averages, using prices as weights in Ghana and working hours in Malawi. These weighted estimates are similar to the unweighted estimates.

at the end of the season.²⁸ Despite these differences in Malawi at the end of the season, which are investigated further below, there is an encouraging degree of correspondence between the activity-level estimates in Table 1 and the product-level estimates in Table 3, both in levels and in trends.²⁹ This is reassuring and suggests that farmers understood the questions about the intended use of their output broadly in the way they were intended, i.e. they assessed whether their combined products, on average, are more likely to be sold or to be used for family consumption.

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 (0.01)	0.78 (0.02)	0.79 (0.01)	0.22 (0.03)	0.23 (0.03)	0.22 (0.02)
N	726	605	1331	174	204	378
End-of-season				0.75 (0.03)	0.55*** (0.04)	0.64 (0.03)
N				172	205	377

Notes: Standard errors in parentheses; * denotes the male-female difference is significant at 10%. ** at 5%. *** at 1%. Based on the Ghana and Malawi Agricultural Labor Surveys.

The large increase over time in the share of farmers producing only or mainly for sale in Malawi calls for further investigation. Table 4 examines the proximate factors that may explain this increase, i.e. changes in the crops/animals that household members were working during the reference week vs. 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 last seven days on the cultivation of crops at the end of the season, especially of maize, which is largely intended for own use (79 percent at the start of the season vs 7 percent 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

²⁸ Mechanically, the estimates for Ghana will show fewer male-female differences than the estimates for Malawi. This is because in Ghana, one respondent in the household was asked about the intended use of output of all the crops 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 products, only crops.

²⁹ There is also a degree of correspondence when the analysis is done at the individual level. For all adults with both activity level and crop level status available (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.

intended for sale. To some extent, these shifts may be expected, since the end-of-season survey was (for the most part) conducted after the main harvest. However, the magnitude of labor reallocations is still surprising, considering that farmers also grow other crops which follow 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 rather than at the beginning of the season.³⁰ 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 course of the agricultural season, though, clearly, it not as important a factor as farmers' labor reallocation across products.

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

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

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

³⁰ The opposite trend occurs for Irish potatoes, but they are not farmed as widely as the other products in the study area.

This analysis can also shed light on why we see women being less likely than men to report producing for sale at the end of the season. As shown in Table A3 (Appendix) gender differences in the self-reported use of output are for the most part insignificant, but there are important differences in the way male and female farmers reallocate their labor over the course of the agricultural season. At the start of the season, more than 90 percent of male and female farmers are engaged in crop production, especially maize farming (around 84 percent), and there are no significant gender differences. The only significant gender difference in labor allocations at the start of the season is chicken farming, which is more prevalent among 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 percent of farmers being engaged in crop farming, and only around 8 percent in maize farming) and are increasingly engaged in livestock production. However, men are disproportionately engaged in goat rearing at the end of the season, while women are more likely to tend to chicken. Since there is a much higher intention to sell goats than chicken (87 vs 32 percent at the end of the season), this explains the larger increase in the share of male versus female farmers producing for sale.

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 labor market indicator and closely related to labor force participation (though the latter also includes the part of the labor force that is currently unemployed).³¹ The sectoral distribution of the employed population is used for a variety of purposes, e.g. as an indicator of structural change, to compute macro-estimates of sectoral productivity, to assess gender segregation in the labor market, etc.

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 a large proportion of 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 countries (or sub-regional 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 household enterprise or wage work) that meet the criteria of employment (i.e. the activity was performed for at least one hour during the reference week). If such secondary activities are

³¹ A person is defined as unemployed if they are not employed but available and actively searching for employment (ILO 2013b).

very 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 labor indicators, we rely on nationally representative household surveys from the two early adopters, i.e. the Nigeria GHS Panel Wave 3 (activity-level operationalization) and the Malawi IHS-4 (product-level operationalization).³² Since 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 in the previous section, 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 measures of employment.

Table 5 shows that in both countries, there is a large reduction in male and female employment-to-population ratios in rural areas under the 19th ICLS standards, and a much smaller reduction in urban areas. In Malawi, employment declines disproportionately among 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 household enterprise work among Nigerian women, while more men than women work on the farm, 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 household enterprise and wage sectors, which is one of the factors explaining a disproportionate decline in female employment (Palacios-Lopez and Lopez 2015).

Besides these changes in employment-to-population ratios, there is a large drop in the measured share of agricultural employment in total rural employment, which declines by about 50 percent in Nigeria and by about 10 percent in Malawi.³³ 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

³² We do not report data from the Ghana and Malawi agricultural survey experiments in this section, because neither data set is nationally representative, and the samples include only rural households.

³³ The change in Malawi is most likely underestimated, since a substantial share of workers in Malawi is primarily engaged in casual or ganyu labor. We assigned these workers to the agricultural sector, since their sector of work is not recorded in the data. This 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 mainly farm for own use (and are therefore in agriculture by the previous standards), about 40 percent are no longer employed by the new standards, while almost 10 percent 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 in the data.

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 a large number of employed individuals simultaneously engaged in own-use production work in agriculture, which highlights the importance of considering employment 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.

Table 5: Employment statistics, Nigeria and Malawi

	Nigeria				Malawi			
	Urban		Rural		Urban		Rural	
	Male	Female	Male	Female	Male	Female	Male	Female
<i>Employment-population ratio</i>								
Previous standards	0.569 (0.01)	0.528 (0.01)	0.617 (0.01)	0.528 (0.01)	0.667 (0.01)	0.442 (0.01)	0.687 (0.01)	0.608 (0.01)
19 th ICLS standards	0.542 (0.01)	0.508 (0.01)	0.440 (0.01)	0.411 (0.01)	0.642 (0.01)	0.401 (0.01)	0.563 (0.01)	0.417 (0.01)
N	2,193	2,365	5,160	5,504	2,835	3,061	11,195	12,807
<i>Share of employment in agriculture</i>								
Previous standards	0.115 (0.01)	0.075 (0.01)	0.597 (0.01)	0.420 (0.01)	0.291 (0.01)	0.345 (0.02)	0.819 (0.01)	0.900 (0.00)
N	1,246	1,250	3,172	2,951	1,852	1,427	7,854	7,881
19 th ICLS standards	0.046 (0.01)	0.023 (0.00)	0.325 (0.01)	0.191 (0.01)	0.261 (0.01)	0.275 (0.02)	0.766 (0.01)	0.837 (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 the Malawi IHS-4 data, the majority of people doing wage work are in casual or ganyu labor, and do not report their sector of work. These workers were assigned to the agricultural sector. According to previous standards, 17 percent of urban workers and 23 percent of rural workers primarily engaged in casual or ganyu labor. Following the 19th ICLS standards, this increases to 19 percent of urban workers and 37 percent of rural workers.

6. Conclusion

This paper explores the implications of the 19th ICLS standards on measures of employment in Sub-Saharan Africa obtained from multi-topic household surveys. It shows that there is a large geographic variation in the share of farmers classified as employed under the revised standards, reflecting differences in agricultural production systems. In parts of Malawi and Nigeria, only one in five farmers report producing for sale at the beginning of the agricultural season, while in parts of Ghana approximately four out of five

farmers intend to sell their produce at the start of the season. We also find that farmers are less likely to report producing only or mainly for sale at the beginning than at the end of the agricultural season. In Malawi, these changes over time in the intended destination of output are mostly driven by labor re-allocations across agricultural products, particularly between subsistence crops and livestock — where the latter is more commercialized. However, changes in the self-reported intended use of output also play a role, as farmers, in the country contexts analyzed in this study, were more likely to report a given crop as being intended for sale at the end than at the beginning of the agricultural season. In addition, women appear to be less likely than men to report producing only or mainly for sale. In-depth analysis using the data from Malawi suggests that this primarily reflects differences in male and female farmers' labor allocation across crop and, particularly, livestock products, which differ in their intended use of output. Last but not least, 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, i.e. 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 characterization of rural employment in Sub-Saharan Africa, in terms of its prevalence and sectoral distribution. 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 percent. In Malawi, the decline in rural employment is larger for the females than for males, while the opposite pattern holds true in Nigeria. The extent of the decline in the rural employment-to-population ratio partly reflects the extent to which male and female farmers are engaged simultaneously in non-farm household enterprises and/or wage work. In other words, many farmers who produce only or mainly for family consumption remain employed under the revised standards because they are engaged in these other, mostly non-agricultural, activities (for at least one hour during the reference week). Not surprisingly, under the revised standards, the share of rural 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 Sub-Saharan Africa and other developing regions, indicators and statistics on employment and labor force participation will change, sometimes drastically and particularly in rural areas, 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 labor force participation as the headline indicators of labor supply and towards a full set of indicators outlined in the 19th ICLS resolution (besides

employment, especially indicators of own-use production work).³⁴ A continued narrow focus on employment and labor force participation would risk underestimating the importance of agriculture for rural livelihoods and undercount women's work in agriculture.

The new standards also raise difficult issues for the macro measurement of labor productivity. Aggregate labor productivity is typically estimated as the ratio of GDP to total employment, while sectoral labor productivity is estimated as 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 such a farmer is no longer considered employed. As a result, estimates of aggregate and sectoral labor productivity computed as ratios of GDP to employment could be severely biased, with an overestimation of labor productivity overall and in agriculture (where the employment estimate, i.e. the denominator, excludes some workers engaged in the production of output in the numerator) and an underestimation of labor productivity in non-agricultural sectors (where the employment estimate includes some workers who are disproportionately engaged in the production of agricultural output). This inconsistency between different parts of the statistical system is a serious dilemma, which (at least in the short term) could only be redressed by re-constructing and disseminating a parallel labor statistics series, which is aligned with the national accounts production boundary. Such a series could also be used to track changes in employment and labor force participation over time, at least in an interim period.

The analysis in this paper highlights the need for national statistical offices to tread carefully in the implementation of the revised standards. First, special attention has to be paid to the timing of data collection. As this paper shows, farmers' labor allocation across crop and livestock products, and hence their self-reported intended use of output, can vary significantly over the course of the agricultural production cycle, and this poses challenges for cross-country and cross-survey comparability of rural employment statistics, especially 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 labor force participation rates than surveys conducted at the beginning of the season, but these patterns are not necessarily generalizable to all parts of Sub-Saharan Africa. Moreover, there may be important non-linearities over the course of the season, with farmers potentially allocating most of their labor to seasonal crop production during harvest time, followed by a sharp drop-off and reallocation of labor from crops to livestock thereafter. Since the end-of-season data used in this paper were collected, for the most part, after the main harvest they are not well suited to reveal such non-linearities. It would be useful for future

³⁴ How this can be achieved is an open question, especially in the context of academic studies which are used to having a single indicator (e.g. employment or labor force participation) of the extensive margin of labor supply.

methodological studies to investigate these issues to provide guidance on the timing and length of data collection, especially in countries with a large share of employment in agriculture. Second, under the new standards household surveys will have to collect data on multiple activities, including both employment activities and own-use production work. Finally, data producers need to design communication strategies to carefully explain the revised definitions to data users. Both academics and policy makers should 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.

References

- Anker, Richard. 2011. "Estimating a Living Wage: A Methodological Review." *Conditions of Work and Employment Series 29*, International Labour Office, Geneva.
- Arora, Diksha and Codrina Rada. 2017. "A Gendered Model of the Peasant Household: Time Poverty and Farm Production in Rural Mozambique." *Feminist Economics* 23(2): 93-119.
- Arthi, Vellore, Kathleen Beegle, Joachim de Weerd and Amparo Palacios-Lopez. 2018. "Not Your Average Job: Measuring Farm Labor in Tanzania." *Journal of Development Economics* 130: 160-72.
- Bardasi, Elena, Kathleen Beegle, Andrew Dillon and Pieter Serneels. 2011. "Do Labor Statistics Depend on How and to Whom the Questions Are Asked? Results from a Survey Experiment in Tanzania." *World Bank Economic Review* 25(3): 418-447.
- Benería, Lourdes. 1999. "The Enduring Debate Over Unpaid Labour." *International Labour Review* 138(3): 287-309.
- Benes, Elisa M. and Kieran Walsh. 2018. "Measuring Employment in Labour Force Surveys. Main Findings from the ILO LFS Pilot Studies." https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_635732.pdf
- Borchert, Donald. 2006. *The Encyclopedia of Philosophy*. 2nd Edition. Thomson Gale/Macmillan Reference: Detroit, MI.
- Brüntrup, Michael and Franz Heidhues. 2002. "Subsistence Agriculture in Development: Its Role in Processes of Structural Change", Discussion Paper 1/2002, University of Hohenheim, Centre for Tropical Agriculture, Stuttgart.
- Cadot, Olivier, Laure Dutoit and Marcelo Olarreaga. 2010. "The Cost of Moving Out of Subsistence in Madagascar." In: M. Ataman Aksoy and Bernard M. Hoekman (eds.). *Food Prices and the Rural Poor*. World Bank. Washington, DC.
- Carr, Edward R. 2008. "Men's Crops and Women's Crops: The Importance of Gender to the Understanding of Agricultural and Development Outcomes in Ghana's Central Region." *World Development* 36(5): 900-15.
- Darity, William Jr. 1995. "The Formal Structure of a Gender-Segregated Low-Income Economy." *World Development* 23(11): 1963-8.
- Doss, Cheryl R. 2002. "Men's Crops? Women's Crops? The Gender Patterns of Cropping in Ghana." *World Development* 30(11): 1987-2000.
- Esquivel, Valeria. 2011. "Sixteen Years After Beijing: What Are the New Policy Agendas for Time Use Data Collection?," *Feminist Economics* 17(4): 215-38.
- Gaddis, Isis, Gbemisola Oseni, Amparo Palacios-Lopez and Janneke Pieters. Forthcoming. "Measuring Farm Labor: Survey Experimental Evidence from Ghana." *World Bank Economic Review*.
- Goldschmidt-Clermont, Luisella. 2000. "Household Production and Income: Some Preliminary Issues." http://www.ilo.org/global/statistics-and-databases/WCMS_087901/lang--en/index.htm
- Goldschmidt-Clermont, Luisella and Elisabetta Pagnossin-Aligisakis. 1999. "Households' Non-SNA Production: Labour Time, Value of Labour and of Product, and Contribution to Extended Private Consumption." *Review of Income and Wealth* 45(4): 519-529.
- Haselton, Martie G., Daniel Nettle and Damian R. Murray. 2015. "The Evolution of Cognitive Bias." In *The Handbook of Evolutionary Psychology*, edited by: David M. Buss, John Wiley & Sons, Inc., Hoboken, NJ: 968-87.

- Heath, Rachel, Ghazala Mansuri, Bob Rijkers, William Seitz and Dhiraj Sharma. Forthcoming. “Measuring Employment: Experimental Evidence from Urban Ghana.” *World Bank Economic Review*.
- ILO (International Labour Organization). 1982. Resolution Concerning Statistics of the Economically Active Population, Employment, Unemployment and Underemployment, Adopted by the Thirteenth International Conference of Labour Statisticians (October). <http://www.ilo.org/public/english/bureau/stat/download/res/ecacpop.pdf>
- . 2013a. *Report II. Statistics of Work, Employment and Labour Underutilization*. ICLS/19/2013/2. International Labour Office. Geneva.
- . 2013b. Resolution I. Resolution Concerning Statistics of Work, Employment and Labour Underutilization. http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_230304.pdf
- Fox, Louise and Obert Pimhidzai. 2013. “Different Dreams, Same Bed. Collecting, Using, and Interpreting Employment Statistics in Sub-Saharan Africa – The Case of Uganda.” Policy Research Working Paper 6436, World Bank, Washington, DC.
- Klasen, Stephan. 2019. “What Explains Uneven Female Labor Force Participation Levels and Trends in Developing Countries?” *World Bank Research Observer* 34(2): 161-97.
- Lopez, Ramon E. 1986. “Structural Models of the Farm Household That Allow for Interdependent Utility and Profit-Maximization Decisions.” In *Agricultural Household Models – Extensions, Applications and Policy*, edited by Inderjit Singh, Lyn Squire and John Strauss, John Hopkins University Press, Baltimore, MD: 306-25.
- OECD. 2002. *Measuring the Non-Observed Economy. A Handbook*. Organisation for Economic Co-operation and Development, Paris.
- Palacios-Lopez, Amparo and Ramon Lopez. 2014. “The Gender Gap in Agricultural Productivity: The Role of Market Imperfections.” *Journal of Development Studies* 51(9): 1175-92.
- Swiebel, Joke. 1999. “Unpaid Work and Policy-Making. Towards a Broader Perspective of Work and Employment.” DESA Discussion Paper 4, United Nations, New York.
- Taylor, J. Edward and Irma Adelman. 2003. “Agricultural Household Models: Genesis, Evolution and Extensions.” *Review of Economics of the Household* 1(1): 33-58.
- Tversky, A. and D. Kahneman. 1974. “Judgment under Uncertainty: Heuristics and Biases.” *Science* 185: 1121-31.
- Young, Sylvester. 2000. “Income from Households’ Non-SNA Production: A Review.” http://www.ilo.org/global/statistics-and-databases/WCMS_087902/lang--en/index.htm
- Waring, Marilyn 1990. *If Women Counted: A New Feminist Economics*. Harper Collins Publishers, San Francisco.
- Warner, James M. and D. A. Campbell. 2000. “Supply Response in An Agrarian Economy with Non-Symmetric Gender Relations.” *World Development* 28(7): 1327-1340.
- Wharton, Clifton R. 1969. “Subsistence Agriculture: Concept and Scope.” In *Subsistence Agriculture and Economic Development*. First paperback printing 2008, edited by Clifton R. Wharton Jr, Transaction Publishers, New Brunswick, NJ: 12-20.
- World Bank. 2007. *Agriculture for Development. World Development Report 2008*. World Bank. Washington, DC.

Appendix

Table A1: Data set overview

	2016/7 Malawi Integrated Household Budget Survey (IHS-4)	2015/16 Nigeria General Household Survey Panel (GHS Panel Wave 3)	Malawi Agricultural Labor Survey		Ghana Agricultural Labor Survey
			Activity-level sample	Product-level sample)	
Coverage	Nationally representative	Nationally representative	Agricultural households in two districts (Ntcheu, Zomba)		Agricultural households in four districts (Mampong Municipal, Ejura Sekyedumasi, Nkoranza South, Pru)
Timing of data collection	Continuous over a period of 12 months (April 2016-April 2017)	Two rounds during the 2015/6 agricultural season: post-planting (Aug.-Oct. 2015) and end-of-season (Feb.-April 2016)	Two rounds during the 2016/7 agricultural season: pre-planting (Sept.-Oct. 2016) and end-of-season (June-Aug. 2017)		Two rounds during the 2015 agricultural season: pre-planting (March 2015) and end-of-season (Oct.-Nov. 2015)
Activity-level operationalization	No	Yes (in labor module), post-planting and end-of-season	Yes (in labor 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 labor module)
Product-level operationalization	Yes (in labor module); covers only crops (not animals); intended use of output captured at the person-crop level	No	No	Yes (in labor 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 labor allocations and crop cultivation by plot (i.e. using plots as the link)

Table A2: Sample descriptive statistics

	Malawi IHS-4			Nigeria GHS Panel Wave 3			Malawi Agricultural Labor Survey						Ghana Agricultural Labor Survey			
	mean	sd	N	mean	sd	N	Activity-level sample			Product-level sample			mean	sd	N	
<i>Full sample, individuals</i>																
Male	0.480	0.500	53,885	0.491	0.500	32,139	0.470	0.499	1,591	0.495	0.500	1,627	0.504	0.500	3,852	
Age	22.37	18.81	53,884	24.50	19.92	26,871	22.17	19.16	1,591	21.28	18.60	1,627	22.97	18.97	3,852	
Married (15+)	0.583	0.493	29,897	0.518	0.500	15,663	0.597	0.491	782	0.597	0.491	779	0.515	0.500	2,131	
At least primary education (15+)	0.318	0.466	29,895	0.622	0.485	14,846	0.235	0.424	782	0.230	0.421	778	0.462	0.499	2,131	
Rural	0.820	0.384	53,885	0.710	0.454	32,139	1	0	1,591	1	0	1,627	1	0	3,852	
<i>Households with at least one person engaged in farming</i>																
Total land (acres)	1.455	1.368	6,642	2.073	3.281	2,844	3.114	1.955	215	2.696	1.827	220	8.673	7.119	624	
Number of plots	1.578	1.033	6,642	1.950	1.168	2,844	4.195	2.300	215	3.800	2.201	220	2.894	1.365	624	
Grows maize	0.834	0.372	6,642	0.469	0.499	2,844	0.972	0.165	215	0.923	0.268	220	0.801	0.399	624	
Grows beans	0.129	0.336	6,642	0.292	0.455	2,844	0.112	0.316	215	0.127	0.334	220	0.236	0.425	624	
Grows pigeonpea	0.245	0.430	6,642				0.623	0.486	215	0.550	0.499	220				
Grows khwani	0.332	0.471	6,642				0.623	0.486	215	0.591	0.493	220				
Own livestock	0.575	0.494	6,642	0.680	0.467	2,844	0.781	0.414	215	0.832	0.375	220	0.508	0.500	624	

Notes: Unweighted sample means. Missing values for farm variables are replaced by 0. Nigeria post-planting data, except for education. Malawi and Ghana Agricultural Labor Surveys - post-harvest data. Based on the Ghana and Malawi Agricultural Labor Surveys, Nigeria GHS Panel Wave 3 and IHS-4.

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

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

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