The role of women in agriculture

Prepared by the SOFA Team and Cheryl Doss

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Abstract: Agriculture can be an important engine of growth and poverty reduction. But the sector is underperforming in many countries in part because women, who are often a crucial resource in agriculture and the rural economy, face constraints that reduce their productivity. In this paper we draw on the available empirical evidence to study in which areas and to what degree women participate in agriculture. Aggregate data shows that women comprise about 43 percent of the agricultural labour force globally and in developing countries. But this figure masks considerable variation across regions and within countries according to age and social class. Time use surveys, which are more comprehensive but typically not nationally representative, add further insight into the substantial heterogeneity among countries and within countries in women's contribution to agriculture. They show that female time-use in agriculture varies also by crop, production cycle, age and ethnic group. A few time-use surveys have data by activity and these show that in general weeding and harvesting were predominantly female activities. Overall the labour burden of rural women exceeds that of men, and includes a higher proportion of unpaid household responsibilities related to preparing food and collecting fuel and water. The contribution of women to agricultural and food production is significant but it is impossible to verify empirically the share produced by women. Women's participation in rural labour markets varies considerably across regions, but invariably women are over represented in unpaid, seasonal and part-time work, and the available evidence suggests that women are often paid less than men, for the same work. Available data on rural and agricultural feminization shows that this is not a general trend but mainly a sub-Saharan Africa phenomena, as well as observed in some sectors such as unskilled labour in the fruit, vegetable and cut-flower export sector. This paper re-affirms that women make essential contributions to agriculture and rural enterprises across the developing world. But there is much diversity in women's roles and over-generalization undermines policy relevance and planning. The context is important and policies must be based on sound data and gender analysis.

Key words: Women, gender, agriculture, labour force, employment, production, time-use, demographics, market access.

JEL: J11,J21, J22, J24, J43, Q10

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[1] This paper is based on background research in support of the preparation of FAO's *The State of Food and Agriculture 2010-11: Women in agriculture: Closing the gender gap for development.* The forthcoming report aims to increase understanding of the diversity of women's roles in agriculture, the constraints women face as farmers and rural labourers, the costs of these constraints in terms of agricultural productivity and broader measures of social welfare, and the effectiveness of innovative policies and interventions aimed at promoting the productivity of women in agricultural and rural activities. The report is to be released on March 7 2011 and will be available at http://www.fao.org/publications/sofa/en/.

[2] The Sofa team was lead by Terri Raney and included Gustavo Anríquez, Andre Croppenstedt, Stefano Gerosa, Sarah Lowder, Ira Matuscke and Jakob Skoet

Introduction

The international development community has recognized that agriculture is an engine of growth and poverty reduction in countries where it is the main occupation of the poor.[3] But the agricultural sector in many developing countries is underperforming, in part because women, who represent a crucial resource in agriculture and the rural economy through their roles as farmers, labourers and entrepreneurs, almost everywhere face more severe constraints than men in access to productive resources. Efforts by national governments and the international community to achieve their goals for agricultural development, economic growth and food security will be strengthened and accelerated if they build on the contributions that women make and take steps to alleviate these constraints.

Women make essential contributions to the agricultural and rural economies in all developing countries. Their roles vary considerably between and within regions and are changing rapidly in many parts of the world, where economic and social forces are transforming the agricultural sector. Rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops, tending animals, processing and preparing food, working for wages in agricultural or other rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes. Many of these activities are not defined as "economically active employment" in national accounts but they are essential to the well-being of rural households. This paper contributes to the gender debate in agriculture by assessing the empirical evidence in three areas that has received much attention in the literature:

- How much of the agricultural labour in the developing world is performed by women?
- What share of the world's food is produced by women?
- Do women face discrimination in rural labour markets?

What women do in agriculture and rural employment

Women make important contributions to the agricultural and rural economies of all regions of the world. However, the exact contribution both in terms of magnitude and of its nature is

[3] The 2008 World Development Report presented compelling empirical evidence from a wide range of countries that supports this finding (World Bank, 2007).

often difficult to assess and shows a high degree of variation across countries and regions. This paper presents an overview of the evidence on the roles of women in agriculture and in rural labour markets. It also looks at demographic trends in rural areas with regard to the gender composition of rural populations.

Women in the agricultural labour force[4]

Two types of data can contribute to measuring the contribution of women in the agricultural labour force: statistics on the share of women in the economically active population in agriculture and time use surveys, which document the time spent by men and women in different activities.

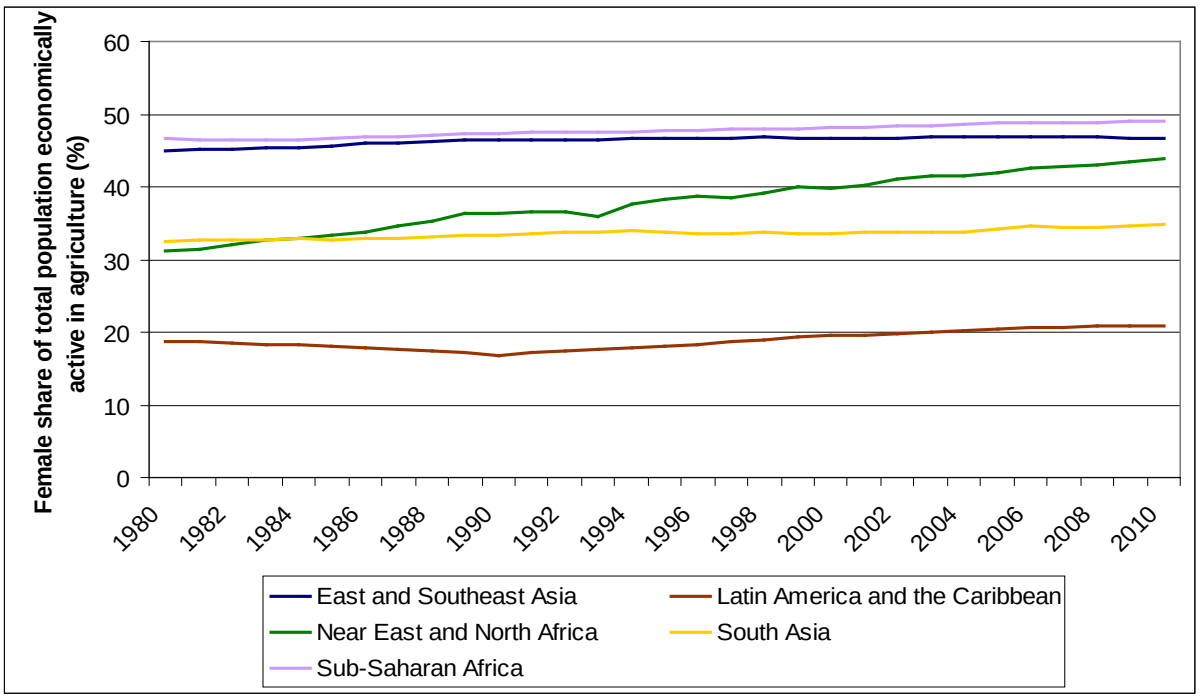
Economically active population in agriculture

Data on the economically active population in agriculture are available for many countries, and provide the most comprehensive measure of the participation of women in agriculture. In this measure, an individual is reported as being in the agricultural labour force if he or she reports that agriculture is his or her main economic activity. However, these data may underestimate female participation in agriculture for reasons discussed below, and caution is advised in interpreting changes over time because improvements in data collection may be responsible for some of the observed changes.

Figure 1 reports weighted averages for the share of women in the agricultural labour force (or economically active in agriculture) in 5 major regions of the world. According to these data, women comprise just over 40 percent of the agricultural labour force in the developing world, a figure that has risen slightly since 1980 and ranges from about 20 percent in the Americas to almost 50 percent in Africa. Even considering these data as lower bounds for the participation of women in the agricultural labour force, they do not support estimates above 60 percent except for a few countries.

Figure 1 Female share of the agricultural labour force

[4] The terms “economically active in agriculture” and “agricultural labour force” are identical concepts. This concept is broader than employment in agriculture because it includes those unemployed but looking for work in the sector.



Source. FAOSTAT. Note: The female share of the agricultural labour force is calculated as the total number of women economically active in agriculture divided by the total population economically active in agriculture. Regional averages are weighted by population.

The global average is dominated by Asia. Within Asia, the sub-regional averages range from about 35 percent in South Asia to almost 50 percent in East and Southeast Asia. The Asian average is dominated by China, where the female share of the agricultural labour force has increased slightly during the past three decades. The female share in India has remained steady at just over 30 percent. These very large countries mask changes in some smaller countries where the female share of the agricultural labour force appears to have increased dramatically, now exceeding 50 percent in Bangladesh. Other Asian countries such as Malaysia have seen declining female labour shares in agriculture.

Women make up almost 50 percent of the agricultural labour force in sub-Saharan Africa, an increase from about 45 percent in 1980. The averages in Africa range from just over 40 percent in Southern Africa to just over 50 percent in Eastern Africa. These sub-regional averages have remained fairly stable since 1980, with the exception of Northern Africa, where the female share appears to have risen from 30 percent to almost 45 percent. The sub-regional data for Africa conceal wide differences between countries both in the share of female labour in agriculture and the trend.

The developing countries of the Americas have much lower average female agricultural labour shares than the other developing country regions at just over 20 percent in 2010, slightly higher than in 1980. The South American countries of Bolivia, Brazil, Colombia, Ecuador and Peru dominate the average and are responsible for most of the rising trend.

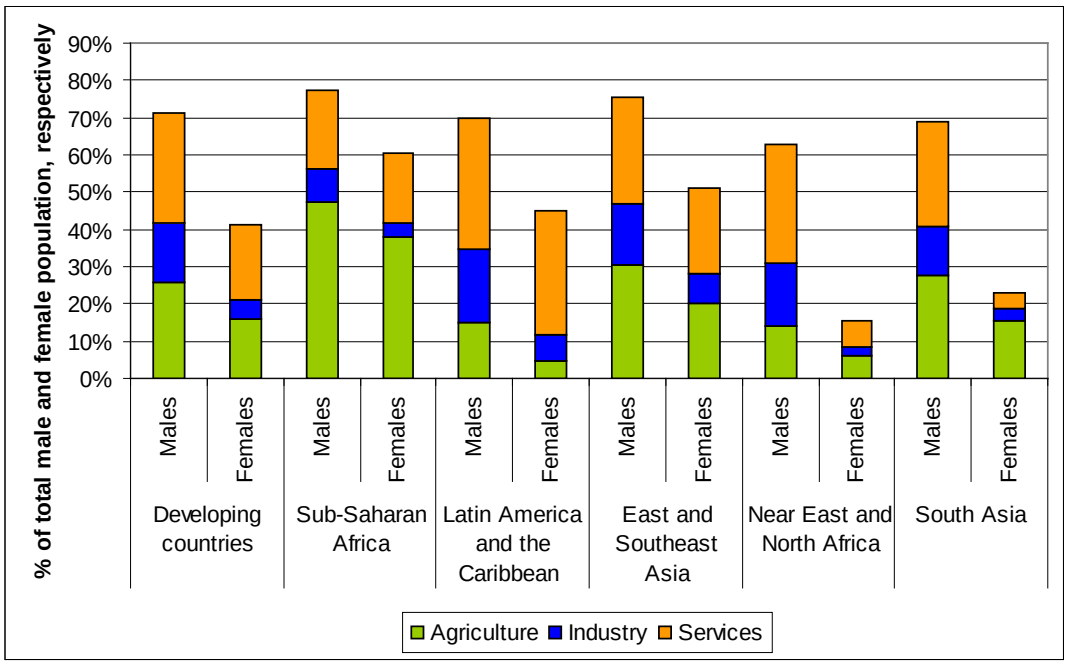
Box 1: Do women make up 60-80 percent of the agricultural labour force?

The statement is often seen that women constitute 60 to 80 percent of the agricultural labour force in developing countries. This statistic seems to have originated in an early study from the United Nations Economic Commission for Africa which states: "Few persons would argue against the estimate that women are responsible for 60-80 percent of the agricultural labour supplied on the continent of Africa…." (UNECA, 1972). A decade later, a number of country statements in a report from the Food and Agriculture Organization reported that women constitute between 70 and 90 percent of the agricultural labour force in many sub-Saharan African countries (FAO, 1984). Similar statements are still being made today for all developing countries (Action Aid; Gates Foundation fact sheet). Although the available data show that women play a significant – although highly varying - role in the agricultural labour force, the estimates reported above do not represent current conditions in the group of developing countries as a whole.

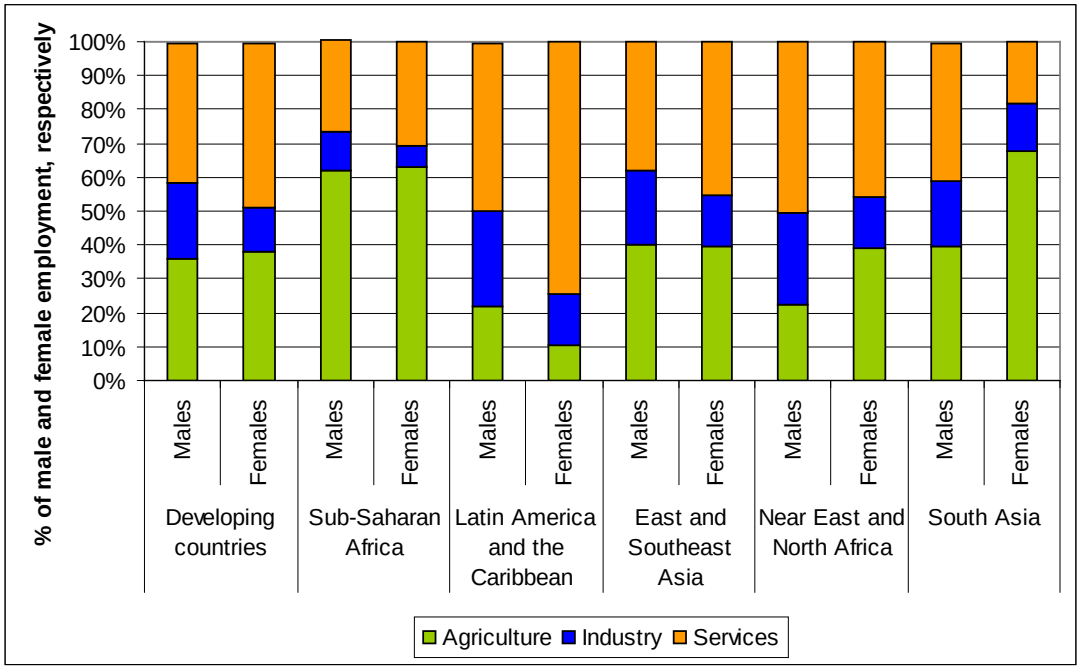
Figure 2 shows that agriculture is, relative to manufacturing and services, the most important source of employment for women by a wide margin in South Asia and in sub-Saharan Africa. It is also the most important sector for women in East Asia and South-East Asia but nearly equally so with services. Agriculture is much more important for women than for men in terms of employment in South Asia and the Middle East. It is somewhat more important for women than for men in East Asia, North Africa and sub-Saharan Africa. In Central and South Eastern Europe and in Latin America women are much more concentrated in the service sector. The figure shows that both the level of employment and the distribution of employment in different sectors vary substantially across regions. However there is always a significant gap between the level of male and female employment and for women the service and/or agriculture sectors are relatively more important than the manufacturing sector.

Figure 2 Employment by sector, region and gender

2a Employed population as a share of total adult population, by sex and sector



2b Distribution of Male and Female Employment, by Sector



Note: The ILO, KILM data covers only a subset of the countries in each region. Definitions of adult labour force differ by country, but usually refers to the population aged 15 and above.
Source: ILO, Key Indicators of the Labour Market (KILM, 6th Edition).

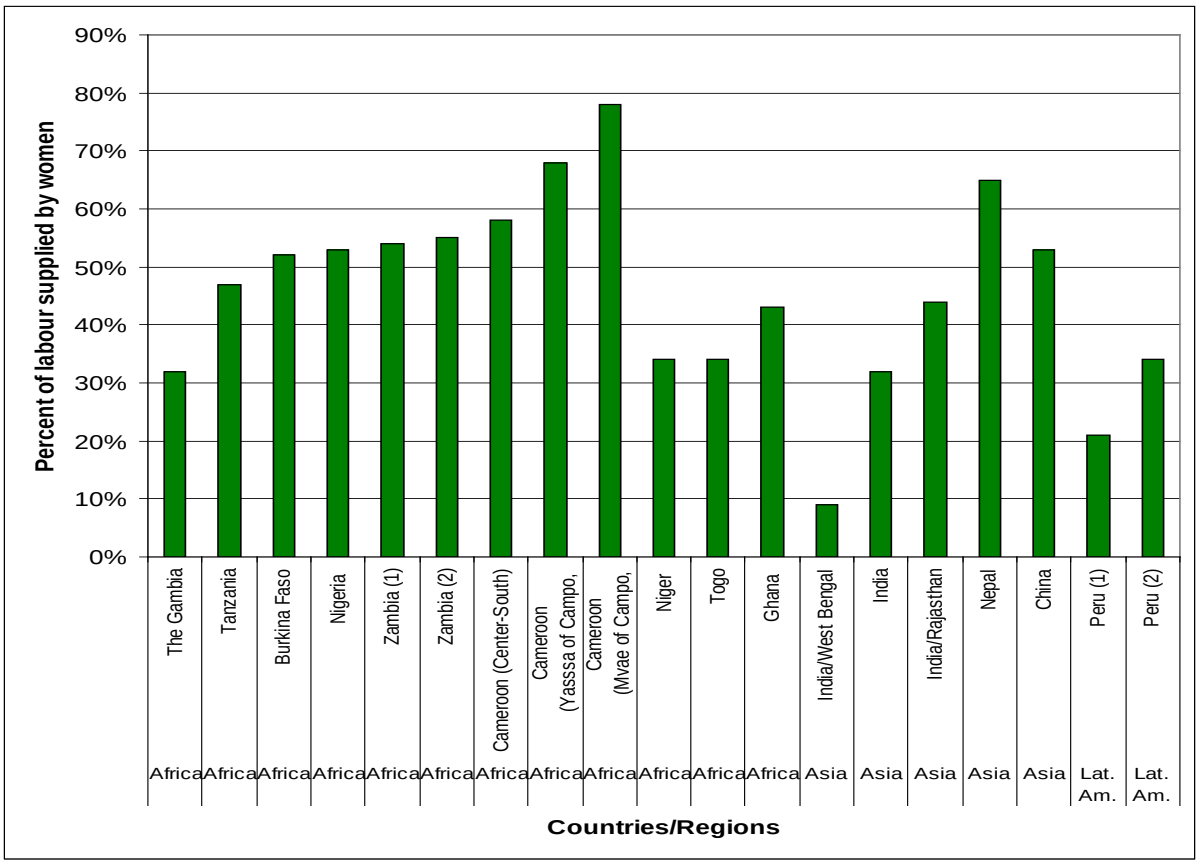
Many researchers have questioned the gender patterns that emerge from the employment data presented here and above (see for example Beneria, 1981). Deere (2005) identifies a number of potential sources of underestimation of female employment in labour markets, and in agriculture in particular. She notes that rural women in Latin America are likely to reply that "their home" is their primary responsibility, even if they are heavily engaged in agriculture. Other difficulties arise because censuses tend to emphasize income-generating activities - therefore underestimating subsistence production - and because agricultural production is often defined as fieldwork. Activities such as rearing small livestock, kitchen gardening, and post-harvest processing are often undercounted. Deere focuses on critiquing the numbers for Latin America, but similar criticisms are also valid for other regions, like South Asia.

Time spent in agricultural activities

Time use surveys attempt to provide a more complete account of time use by men and women than are available from the labour force statistics reported above. Such studies usually are not nationally representative and are not directly comparable because they usually cover small samples, report on different types of activities (that are not always clearly specified) and use different methodologies. Despite these caveats, a summary of the evidence from studies which specify time use by agricultural activity suggests interesting patterns.

Time-use surveys that cover all agricultural activities (Figure 3) reveal considerable variation across countries, and sometimes within countries, but the data are broadly similar to the labour force statistics discussed above. In Africa, estimates of the time contribution of women to agricultural activities ranges from about 30 percent in The Gambia to 60-80 percent in different parts of Cameroon. In Asia, estimates range from 32 percent in India to over 50 percent in China. The range is lower in Latin America, but exceeds 30 percent in some parts of Peru. Two separate studies are reported each for Zambia and Peru, and differences reflect different time periods and locations within the countries.

Figure 3 Proportion of labour in all agricultural activities that is supplied by women



Sources and notes: Only the survey for India is nationally representative. Sources (from left to right): The Gambia: von Braun and Webb (1989); Tanzania: Fontana and Natali (2008); Burkina Faso: Saito, Mekonnen and Spurling (1994); Nigeria: Rahji and Falusi (2005); Zambia (1): Saito, Mekonnen and Spurling (1994); Zambia (2): Kumar (1994); Cameroon (Center-South): Leplaideur (1978), cited by Charmes (2006): Cameroon (Yasssa of Campo, Southwest): Charmes (2006) based on Pasquet and Koppert (1993 and 1996); Cameroon (Mvae of Campo, Southwest): Charmes (2006) based on Pasquet and Koppert (1993 and 1996); Niger: Baanante, Thompson and Acheampong (1999); Togo: Baanante, Thompson and Acheampong (1999); Ghana: Baananate, Thompson and Acheampong (1999); India (West Bengal): Jain (1996); India: Singh and Sengupta (2009); India (Rajasthan): Jain (1996); Nepal: Joshi (2000); China: De Brauw et al (2008); Peru (1): Deere (1982); Peru (2): Jacoby (1992)

A striking degree of within-country variation is shown by time-use data for India. While the nationally representative data indicates that the national average for women's share of total time-use in agriculture is 32 percent, data for West Bengal and Rajasthan reports women's share as from less than 10 percent to more than 40 percent, respectively.[5] But in both areas, younger women contribute a higher share of the total time provided in agriculture by their age group than older women do in theirs (Figure 4). In Rajasthan, for example, girls between 14

[5] We note that the difference between Rajasthan and West Bengal could be due to a difference in the total number of hours provided by women or due to a difference in the total number of hours provided by men.

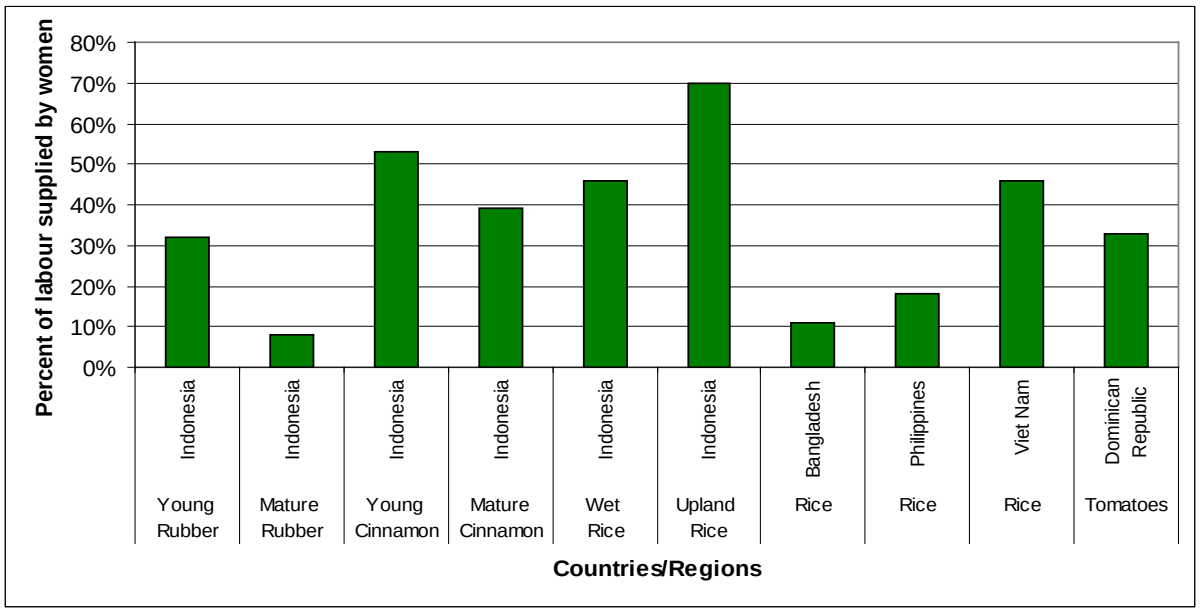
and 19 years of age contribute up to 60 percent of the total time spent on agriculture by their age group (Jain, 1996).

Figure 4 Proportion of total time in agricultural activities contributed by women in Rajasthan and West Bengal (India), by age group

Source. Jain (1996)

Time-use studies also reveal that female time-use in agriculture varies widely depending on the crop and the phase of the production cycle, the age and ethnic group in question, the type of activity and other factors (Figure 5). Data from Indonesia reveals greater involvement of women in upland rice than wet rice and in the management of young plantation crops such as cinnamon and rubber rather than the same crops at maturity.

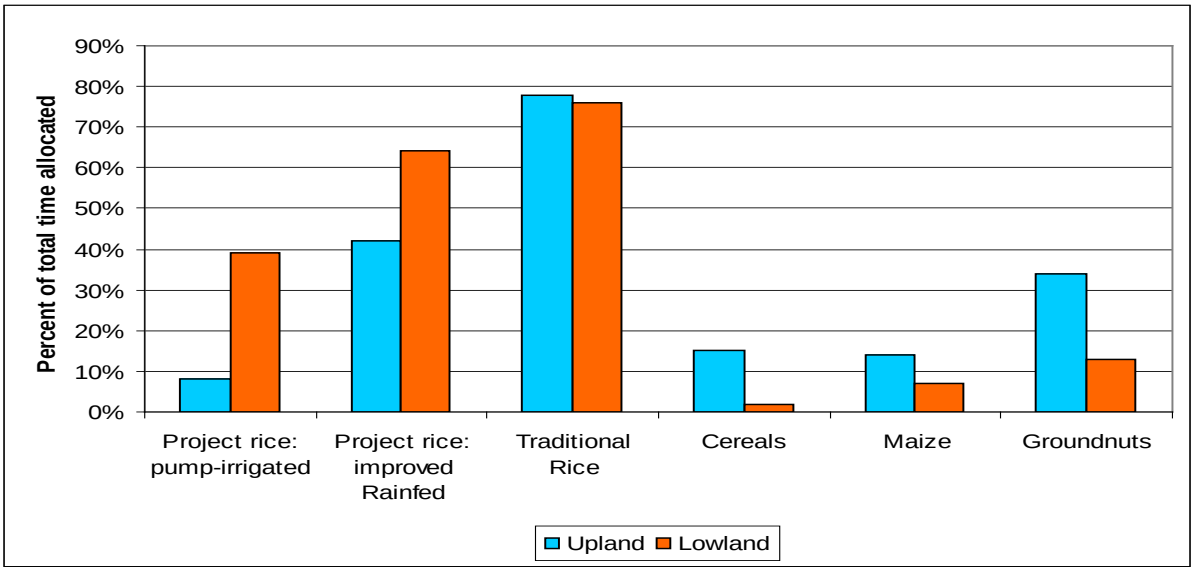
Figure 5 Proportion of labour for selected crops that is supplied by women



Sources (from left to right): Indonesia (Young Rubber): Quisumbing and Otsuka (2001a); Indonesia (Mature Rubber): Quisumbing and Otsuka (2001a); Indonesia (Young Cinnamon): Quisumbing and Otsuka (2001a); Indonesia (Mature Cinnamon): Quisumbing and Otsuka (2001a); Bangladesh: Thompson and Sanabria (2010); Philippines: Estudillo, Quisumbing and Otsuka (2001); Indonesia (Wet Rice): Quisumbing and Otsuka (2001a); Indonesia (Upland rice): Quisumbing and Otsuka (2001a); Viet Nam: Paris and Chi (2005); Dominican Republic: Raynolds (2002).

Time-use studies also reveal that female time-use in agriculture can also vary widely within one country, depending on the crop, the technology other factors (Figures 6).

Figure 6 Proportion of labour supplied by women in upland and lowland Gambia



Source: Webb (1989)

Time-use studies permit a rich analysis of what men and women do in agriculture and how their roles may differ by crop, location, management structure, age and ethnic group. They

offer policy-relevant information about where, when and how to target interventions aimed at women and how to bring men into the process constructively. Given the variability in gender roles in agriculture, generalizations about time use from one region to another are not appropriate. Studies that consider the gender roles within their specific geographic and cultural context can provide practical guidance for policy makers and practitioners involved in technology investments, extension services, post-harvest activities and marketing interventions.

A few of the time use studies present the precise breakdown of time use by farming activity. Five of the studies, covering six cases,[6] have information on five common categories: land preparation, fertilizer application, weeding, harvesting and storage. All studies with the exception of Bangladesh (where, for rice, women's time is nearly entirely spent on post-harvest activities) found weeding to be a predominantly female activity, followed by harvesting (in 3 studies) and fertilizer application (2 studies). Women were typically involved in all other activities (except for ploughing) but did not provide a majority of labour.

Finally, we note that the time-use studies that collected the relevant data confirm the popular perception that women overwhelmingly provide the greatest proportion of household time spent on food processing and preparation. If these aspects of food preparation are included, women's labour share could well exceed 60 percent in many African countries and could approach 60 percent in many Asian ones.

Women's contribution to agricultural production

As seen above, women play a significant role in the agricultural labour force and in agricultural activities, although to a varying degree. Consequently their contribution to agricultural output is undoubtedly extremely significant, although difficult to quantify with any accuracy. It has often been claimed that women produce 60-80 percent of food (see Box 2). However, assigning contributions to agricultural outputs by gender is problematic because in most agricultural households both men and women are involved in crop production. It can be attempted to allocate output by gender by assuming that specific crops are grown by women and others by men and then aggregating the value of women's and men's crops to determine the share grown by women. Researchers have occasionally used this approach,

[6] Bangladesh (Thompson and Sanabria, 2010), Ghana, Togo (Baanante et al., 1999), Vietnam (Paris and Chi, 2005), India (GOI, 2006) and Nepal (Joshi, 2000). Also for the case of tomato contract farming in the Dominican Republic harvesting is a predominantly female activity.

especially in West Africa, where there are distinguishable cropping patterns by gender (Hoddinott and Haddad, 1995; Duflo and Udry, 2001). Yet, a careful analysis of agriculture in Ghana finds that while there are gendered patterns of cropping, the distinctions between men's and women's crops do not hold up well enough to use them to make inferences about men's and women's relative contribution to production. In addition, gendered patterns of cropping may change over time (Doss, 2002).

A direct comparison of production is possible between male- and female-headed households, but since the latter tend to have smaller farms and use fewer purchased inputs (see Chapter 3), their output is naturally smaller. Table 1 presents a limited sample from a selected set of countries for which data is available (Doss, 2009). Female-headed households represent between 3 and 38 percent of all households and produce between 2 and 17 percent of the value of food produced. These data suggest that female-headed households produce less than their share would predict if resource use and productivity were equal with male-headed households.

Table 1 Share of crops produced by female-headed household (FHH).

Country	% of rural households headed by women	% of total value of food produced by rural FHHs
China	3.1	2.1
Bosnia-Herzegovina	25	13.2
Ghana	33	12
Nicaragua	38	17

Source Calculated by author from data reported in DeBrauw et al, (2008) and from the Bosnia and Herzegovina Living Standards Measurement Study (LSMS) survey, the Nicaraguan Programa para el Mejoramiento de las Encuestasy la Medición de Condiciones de Vida (MECOVI) survey and Ghana Living Standards Survey (GLSS).

Box 2 Women's contribution to food production.

The claim is often heard that women produce 60 to 80 percent of food in most developing countries and half of the world's food supply (Momsen, 1991; Mehra and Rojas, 2008). Sometimes the statement is qualified in various ways, specifying that it refers to local food production or a particular geographic region, and it is often phrased poetically: "… in developing countries, between 60 and 80 percent of food crops grow from seeds that are planted by a woman's hand…" (Gupta, 2009). These sources do not explain the methodology used in arriving at the estimate, although it may be have been derived from the estimates of the labour contribution discussed in Box 1. A rare sceptic notes: "It is interesting that this statement is so enduring, so effective—and so wrong…" Jackson (2005).

Doss (2009) provides a detailed analysis of the conceptual and empirical challenges involved in estimating the share of food produced by women. Challenges include, among others, (i) defining and

measuring food production, (ii) defining the resources to be included in the calculation and (iii) designating those resources according to the gender of the person who controls them. A summary of the available evidence, using a variety of definitions and methodologies, finds that the contribution of women in agriculture is probably substantial but cannot be estimated with any degree of analytical rigor. It is unlikely to approach the levels so frequently cited.

Food production can be defined in many different ways: primary crop production, food crop production, crop and livestock production, food processing and preparation, etc. It can be measured by weight, value, caloric content, etc. Each definition and metric gives a different picture of the contribution of women. Furthermore, food production requires a combination of different capital assets, including labour, land and finance, as well as intermediate goods and services, such as animal and mechanical power, seeds, fertilizer and water. A simple comparison is often made between the amount of time men and women work in agricultural production, yet in order to understand the contribution women make to food production it is necessary to consider a more complete range of inputs. Determining the gender of the person who controls these resources is far from simple: if a crop is grown on land owned by an extended family, ploughed by a man, planted by a woman, weeded by their children and harvested collectively, what share can be attributed to the woman?

In reality in most situations the question of women's contribution to agricultural and food production cannot be answered with any degree of accuracy. Women do not usually produce food separately from men. Most food is produced with labour contributions of both men and women in a collaborative process. Quantifying the share of food produced by women involves making arbitrary assumptions about gender roles in the production process, which are not likely to hold universally. For example, if men typically provide the labour to clear the field and women plant and weed the crops, both men and women are involved in harvesting. In these and other similar cases it becomes impossible to separate output by gender.

Nonetheless, all the indirect evidence presented above in terms of labour participation and output by varying definitions of gender indicates that it is unlikely that women produce as much as 60 to 80 percent of the food in developing countries. Women play a fundamental role in all the stages of the food cycle in all regions, but these roles differ by region. Taking account of the heterogeneity of their contribution is essential if policies and interventions are to be effective.

Women as livestock keepers[7]

Within pastoralist and mixed farming systems, livestock play an important role in supporting women and in improving their financial situation, and women are heavily engaged in the sector. An estimated two-thirds of poor livestock keepers, totalling approximately 400 million

[7] The material in this section was prepared by FAO's Animal Production and Health Division.

people, are women (Thornton et al, 2002). They share responsibility with men and children for the care of animals, and particular species and types of activity are more associated with women than men. For example, women often have a prominent role in managing poultry (FAO 1998; Guèye 2000; Tung 2005) and dairy animals (Okali and Mims 1998; Tangka, Jabbar and Shapiro, 2000) and in caring for other animals that are housed and fed within the homestead. When tasks are divided, men are more likely to be involved in constructing housing and herding of grazing animals, and in marketing of products if women's mobility is constrained. The influence of women is strong in the use of eggs, milk and poultry meat for home consumption and they often have control over marketing and the income from these products. Perhaps for this reason poultry and small scale dairy projects have been popular investments for development projects aiming to improve the lot of rural women. In some countries small-scale pig production is also dominated by women. Female-headed households are as successful as male-headed households in generating income from their animals, although they tend to own smaller numbers of animals, probably because of labour constraints. Ownership of livestock is particularly attractive to women in societies where access to land is restricted to men (Bravo-Baumann 2000).

While the role of women in small-scale livestock production is well recognized, much less has been documented about the engagement of women in intensive production and the market chains associated with large commercial enterprises. Demand for livestock products has grown much faster than the demand for crop staples during the past 40 years, fuelled by rising incomes, particularly in Asia and Latin America, and this trend is expected to continue. While pastoralist and small scale mixed farming systems continue to be important in meeting the needs of rural consumers, the demands of growing urban populations are increasingly supplied with meat, milk and eggs from intensive commercial systems. This has important implications for the engagement of women in the livestock sector because of the different roles, responsibilities and access to resources that are evident within different scales of production system and at different points on the production and marketing chain.

The available evidence suggests that the role of women in meeting these changing demands may diminish, for two reasons. The first is that when livestock enterprises scale up, the control of decisions and income and sometimes of the entire enterprise often shifts to men. This is not a universal phenomenon – for example, in Viet Nam, many medium-sized duck-breeding enterprises are managed by women – but it is common and can be explained by the limited access that women have to land and credit. The second important factor is that all

smallholders face challenges when the livestock sector intensifies and concentrates and many go out of business. This is particularly evident for pig and poultry owners (Rola et al. 2006) but not confined to those species. Given the more limited ability of women to start their own businesses, this implies that they will tend to become employees rather than self-employed. In specialised activities like production of day-old chicks, in the provision of services, and in slaughtering, processing and retail, women are visible wherever painstaking semi-skilled work is to be done, but very little information is available about the extent of their involvement compared to that of men, or their control over resources.

Women in fisheries and aquaculture[8]

In 2008, nearly 45 million people world-wide were directly engaged, full-time or part-time, in the fishery primary sector (FAO fishery database). In addition, about 135 million people are estimated to be employed in the secondary sector, including post-harvest activities. While comprehensive data are not available on a sex-disaggregated basis, case studies suggest that women may comprise up to 30 percent of the total employment in fisheries, including primary and secondary activities.

Information provided to FAO from 86 countries indicates that in 2008, 5.4 million women worked as fishers and fish farmers in the primary sector.[9] This represents 12 percent of the total. In two major producing countries, China and India, women represented a share of 21 percent and 24 percent, respectively, of all fishers and fish farmers.

Women have rarely engaged in commercial offshore and long distance capture fisheries because of the vigorous work involved but also because of women's domestic responsibilities and/or social norms. Women are more commonly occupied in subsistence and commercial fishing from small boats and canoes in coastal or inland waters. Women also contribute as entrepreneurs and provide labour before, during and after the catch in both artisanal and commercial fisheries. For example, in West Africa, the so called "Fish Mamas" play a major role. They usually own capital and are directly and vigorously involved in the coordination of the fisheries chain, from production to sale of fish.

[8] The material in this section was prepared by FAO's Fisheries and Aquaculture Division.

[9] FAO Fisheries and Aquaculture Department regularly collects employment statistics in fisheries and aquaculture only related to the primary sector, therefore excluding post harvest activities.

Studies of women in aquaculture, especially in Asia where aquaculture has a long tradition, indicate that the contribution of women in labour is often greater than men's although there is almost a complete absence of macro-level aquaculture-related sex- disaggregated data. Women are reported to constitute 33 percent of the rural aquaculture workforce in China, 42 percent in Indonesia and 80 percent in Viet Nam (Kusabe and Kelker, 2001).

The most significant role played by women in both artisanal and industrial fisheries is at the processing and marketing stages, where they are very active in all regions. In some countries, women have become important entrepreneurs in fish processing; in fact, most fish processing is performed by women, either in their own household-level industries or as wage labourers in the large-scale processing industry.

Female participation in rural labour markets

Women and unpaid household responsibilities

Women are generally less able than men to participate in economic opportunities because they face a work burden that men do not. In most societies, women are responsible for most of the household and child-rearing activities as well rearing of small livestock, although norms differ by culture and over time. This additional work burden is unpaid and limits women's capacity to engage in income-earning activities, which often require a minimum fixed time before being profitable. Furthermore, the nature of tasks, such as caring for children and elderly household members, requires women to stay near the home, thus limiting options to work for a wage. Time scarcity forces many women to start-up cottage industries, such as handicrafts, which are often characterized by low returns and limited potential for expansion (Lanjouw and Lanjouw, 2001).[10]

Gender differences become clearer when looking at women's workloads. It is estimated that women provide 85 to 90 percent of the time spent on household food processing and preparation across a wide range of countries (Fontana and Natalia, 2008; Jain, 1996; Acharya and Bennett, 1982; Wrangham, 2009). Women are also usually responsible for child care and household chores. Depending on the household structure and size, these tasks may be extremely time intensive. Time-allocation studies have shown that women work significantly

[10] As household chores are generally regarded as female tasks, the current opportunity cost of girls' schooling time is higher compared to boys, provided that boys do not help out on the farm.

more than men if care giving is included in the calculations. (Ilahi, 2000; Kes and Swaminathan, 2006; Budlender, 2008). Sharma et al (2007) find that girls do significantly more work in household chores and on the farm as compared to boys in Himachal Pradesh, India.

Ghanaian women carry a much heavier burden for household chores despite working outside the home almost as much as men (Brown, 1994). In Uganda, Ellis et al (2006) report that women, when asked about the causes of labour constraints, cited the time they spent looking after their families, working in their husbands' gardens and producing food for their households as reasons for their inability to expand production in the market. Men, on the other hand, simply noted that they had no money to hire labour.

Fontana and Natali (2008) find a marked gender bias in most unpaid work in Tanzania. Women, and in particular women from low-income groups and living in areas with limited facilities, spend long hours on water and fuel collection, food preparation and other domestic and child care activities to compensate for poor infrastructure. Malmberg-Calvo's (1994) study of household surveys from Ghana, Tanzania and Zambia, shows that women (and daughters) are responsible for about 65 percent of all transport activities in rural households, including travel for firewood, water and transport to the grinding mill.

Due to the gender-specific assignment of tasks, any changes affecting the family or the environment often have different implications for men and women. HIV/AIDS, for example, has caused a significant increase in the time needed to care for sick family members or the orphaned children of relatives (Addati and Cassirer, 2008). Deforestation leads women to collect firewood from increasingly further distances from the homestead (Kumar and Hotchkiss 1988, Nankhuni 2004). Fontana and Natali (2008) calculate that time-savings from unpaid-work reducing infrastructure for water collection and food preparation as equivalent to 466 thousand and 4,590 thousand full-time jobs, respectively.

Gender differences within rural labour markets

In addition to differences in male and female labour participation rates noted earlier, there are also major gender differences in employment patterns within labour markets for several reasons which hold across cultures and regions. Most importantly, as a result of household and child-rearing, women are not only much less likely to participate in the labour force, those who do are also much more likely to engaged in self-employment activities rather than

higher-paying wage employment. Due to child care responsibilities economically active women often leave the labour market and thus accumulate less work experience. As a result of time constraints women are also more likely to work in part time jobs and in informal arrangements that pay less and/or provide fewer benefits, but provide more flexibility. Women are also more concentrated in certain phases or activities of the supply chain (e.g. packaging, post-processing). Occupational segregation into low-technology occupations limits the opportunities to generate new skills and capabilities, thus hindering future professional development and reinforcing the discrimination towards these sectors as low-pay and low-status occupations. Finally, there is a well documented pay gap in urban labour markets - likely to exist in rural labour markets as well – in that women are paid less even for equivalent jobs and comparable levels of education and experience. Wage gaps between men and women are further discussed below.

Table 2 illustrates gender differences in participation in full-time and part-time wage employment for selected countries from the RIGA database[11] The two columns on the left show the previously discussed difference in participation rates; in all of the fourteen countries female participation in rural wage labour markets is lower. The remaining part of the table shows how women who participate in salaried labour markets (with the exception of Nicaragua and Panama in this sample) also tend to be found more frequently in part-time jobs than men. Additionally (but not shown in the table), in all eleven countries where the surveys allowed for the distinction to be made, a larger proportion of female than male employment is found in seasonal jobs rather then usually better paid year-round jobs which also tend to include additional non-salary benefits.

[11] The Rural Income Generating Activities (RIGA) is a FAO project that has created an internationally comparable database of rural household income sources from existing household living standards surveys for more than 27 countries. Most of the surveys used by the RIGA project were developed by national statistical offices in conjunction the World Bank as part of its Living Standards Measurement Study (LSMS). For more information see HTTP://WWW.FAO.ORG/ES/ESA/RIGA/ENGLISH/INDEX_EN.HTM.

Table 2 Participation and type of contract held in rural wage employment

Participation in rural wage labour markets (%)			Type of contract held by participants in rural wage labour markets (% of Participants)			
	Male	Female	Male		Female	
			Full-time	Part-time	Full-time	Part-time
Africa						
Ghana 1998	14.6	3.8	63.6	36.4	40.7	59.3
Malawi 2004	25.8	16.6	33.4	66.6	10.9	89.1
Nigeria 2004	3.6	1.4	72.9	27.1	72.1	28.0
Asia						
Bangladesh 2000	24.2	3.1	85.1	15.1	69.2	30.9
Indonesia 2000	18.1	8.6	74.4	25.6	63.8	36.3
Nepal 2003	21.2	12.5	53.6	46.4	28.2	71.9
Tajikistan 2003	19.4	13.4	18.9	81.1	16.4	83.6
Vietnam 1998	17.0	11.5	69.3	30.7	63.2	36.8
Europe						
Albania 2005	11.5	2.4	89.4	10.6	88.8	11.3
Bulgaria 2001	23.8	23.2	85.6	14.4	84.2	15.8
Latin America						
Ecuador 1995	28.7	8.7	66.9	33.2	63.6	36.2
Guatemala 2000	30.9	7.8	86.9	13.1	75.3	24.8
Nicaragua 2001	24.9	7.8	80.3	19.7	80.6	19.4
Panama 2003	27.8	9.9	81.5	18.5	81.9	18.0
AVERAGE	20.8	9.3	75.4	35.7	66.3	46.1

Source. FAO Riga-team. Notes: Includes only individuals who are of working age (between 15 and 60 years of age). Participation rates are weighted to be nationally representative.

Frequently women are confined to working in particular sectors and in certain jobs, often as a result of their disadvantaged position with respect to human capital and bargaining power. On the basis of national-level case studies in Latin America, Katz (2003) concludes that, within the non-farm sector, wage employment is almost universally dominated by men and self-employment by women. Furthermore, even when women find formal sector employment, they do not easily advance into managerial positions. In Colombia's flower-cutting industry, for example, between 60 and 80 percent of the unskilled workers are women, while they have a much lower share of managerial or professional jobs (Meier, 1999). Moreover, in sectors producing primarily for the export sector – such as textiles, electronics or some food processing industries – women tend to be replaced by males, as profits increase (Fontana, 2003).

Intra-household inequality can also weaken a woman's position also outside of the home (Kapadia, 1993 and 1995). Women are over-represented in jobs characterized by low wages, high job insecurity and generally poor labour standards. When women have limited decision-making ability within the household or low access to resources and household income, they are more likely to accept lower wages. Kantor (2008) notes that, for most women in northern India, labour market participation is a survival strategy for the household, not a means of improving standards of living or voice in the household.

Evidence confirms that women tend to cluster in lower-paying jobs. Hertz et al. 2009, explore the issue of job distribution according to pay in rural areas. They acknowledge that non-agricultural jobs tend to pay on average more than agricultural jobs. Based on this, they define three categories of jobs: (i) low wage jobs, which pay less than the median agricultural wage; (ii) medium wage activities, which pay more than the median agricultural wage, but less than the median non-agricultural wage; and (iii) high wage jobs, which pay more than the median non-agricultural wage. Applying this categorization to data from 14 countries from the RIGA database, reveals that in all countries, with the exception of Panama the distribution of women tends to be skewed much more than that of men towards lower-paid jobs (see Table 3). The inequality is found in both agricultural (with the additional exception of Ghana) and non-agricultural activities.

Table 3 Participation in rural wage employment by wage levels and gender

	All participants in rural wage employment						Participants in agricultural wage employment						Participants in non-agricultural wage employment					
	Males			Females			Males			Females			Males			Females		
	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
Africa																		
Ghana 1998	30.4	19.0	50.6	50.6	16.3	33.1	51.0	22.1	27.0	50.3	16.7	33.1	25.5	18.3	56.2	50.6	16.3	33.1
Malawi 2004	37.0	28.0	35.0	61.4	20.8	17.8	41.8	28.6	29.6	63.5	20.7	15.8	21.2	25.9	52.9	45.1	21.1	33.8
Nigeria 2004	28.7	25.6	45.7	31.7	28.7	39.6	48.1	21.8	30.1	56.2	21.1	22.8	21.5	27.1	51.5	23.2	31.4	45.4
Asia																		
Bangladesh 2000	39.8	29.5	30.8	80.8	7.4	11.8	56.0	32.7	11.4	91.5	7.4	1.1	20.6	25.8	53.6	73.8	7.5	18.8
Indonesia 2000	32.1	20.9	47.1	54.1	16.3	29.7	43.1	21.1	35.8	64.1	16.8	19.1	25.8	20.7	53.4	46.0	15.8	38.2
Tajikistan 2003	29.0	39.0	32.0	52.7	35.4	11.9	38.8	41.1	20.1	57.1	33.7	9.2	8.8	34.6	56.6	30.8	43.7	25.5
Nepal 2003	26.9	40.1	33.0	57.1	38.7	4.1	47.2	39.8	13.0	61.4	37.7	1.0	10.0	40.4	49.6	32.1	44.8	23.1
Vietnam 1998	*47.5*	-	*52.5*	*67.1*	-	*32.9*	*39.4*	-	*60.6*	*67.7*	-	*32.3*	*52.9*	-	*47.1*	*66.6*	-	*33.5*
Europe																		
Albania 2005	*83.2*	-	*16.8*	*98.0*	-	*2.0*	*43.3*	-	*56.7*	*68.9*	-	*31.1*	*88.9*	-	*11.0*	*99.3*	-	*0.7*
Bulgaria 2001	*48.6*	-	*51.4*	*52.5*	-	*47.5*	*46.3*	-	*53.8*	*54.3*	-	*45.7*	*49.4*	-	*50.6*	*52.0*	-	*48.0*
Latin America & the Caribbean																		
Ecuador 1995	38.8	26.1	35.2	60.2	17.3	22.5	54.1	26.0	19.9	72.0	18.5	9.5	19.1	26.2	54.7	53.8	16.6	29.6
Guatemala 2000	43.8	22.4	33.8	59.3	18.5	22.1	57.9	23.0	19.1	67.9	19.7	12.4	23.1	21.5	55.4	54.9	17.9	27.2
Nicaragua 2001	36.0	31.3	32.7	39.1	23.0	37.9	49.3	32.7	18.1	57.3	26.5	16.2	16.7	29.4	53.9	34.9	22.2	43.0
Panama 2003	32.3	31.6	36.1	29.7	25.5	44.9	47.6	35.2	17.3	36.0	35.6	28.4	29.2	24.8	46.0	31.8	26.7	41.5
AVERAGE	39.6	28.5	38.0	56.7	22.5	25.6	47.4	29.5	29.5	62.0	23.1	19.8	29.5	26.8	49.5	49.6	24.0	31.5

Source. FAO Riga-team. Notes: (1) Low productivity = below median agricultural wage; median productivity = between the medians of agricultural wage and non-agricultural wage; high productivity = above median non-agricultural wage (2) We do not report on Vietnam98, Albania05 and Bulgaria01's median productivity because the median of agricultural wages is higher than that of non-agricultural wages. Thus, we set the threshold at the median of agricultural wages.

Women also suffer from wage gaps, although data documenting this in rural settings is limited (Tzannatos, 1999; Fontana 2009). Wage inequalities are typically due to: i) contractual arrangements that differ for men and women, with women usually having worse conditions of employment, and; ii) typically women receive lower wages for the same work. Evidence from a sample of 14 countries shows that on average women are paid 28 percent less than males in rural areas, with the notable exception of women in rural Panama that are paid 11 percent more than men (see Table 4) (Hertz et al., 2009). These wage gaps, tend to be higher in rural than in urban areas for half of the countries sampled. Table 4 also gives a decomposition of the wage gap in rural areas into: a) that part that is explained by the difference in asset endowment (education, age, years of experience, industry of employment, etc) and; b) that part which is due to differences in payment received for those assets – an indicator, albeit imperfect, of discrimination. The results show that the differences in asset ownership explain a much lower fraction of the wage inequalities. It is notable that in rural Latin America women are better endowed with assets but, with the exception of rural Panama, are still paid less.

Table 4 Wage gaps in rural labour markets

Country	Wage gap between men and women		Part of the rural wage gap explained by	
	Urban	Rural	Assets and attributes	"Discrimination"
	Percentage		Percentage	
Africa				
Ghana	31	58	26	32
Malawi	18	35	8	26
Nigeria	30	14	- 18	31
Asia				
Bangladesh	21	4	2	2
Indonesia	37	43	2	40
Nepal	9	4	2	2
Vietnam	23	20	4	15
Tajikistan	48	61	28	33
Europe				
Albania	29	40	15	25
Bulgaria	15	9	- 3	12
Latin America				
Ecuador	36	38	2	36
Guatemala	23	27	- 10	37
Nicaragua	11	6	- 9	15
Panama	12	- 11	- 25	14

Source. Hertz et al (2009).
Note : the wage gap is calculated as the difference between average male and female wages as a percentage of the average male wage. A positive wage gap means men are paid more than women. "Discrimination" is calculated as the difference in the returns to the assets and attributes of male and female workers. A positive "discrimination" value means that women are paid less than men for the same level of education, work experience and other attributes.

While women continue to face occupational segregation and discrimination in rural labour markets, some new forms of organization in supply chains for export-oriented crops and agro-processing have created better-paying employment opportunities for women in many countries than existed before. Wages are typically higher and working conditions better than in traditional agricultural employment. The large-scale incorporation of women in the packing stage of non-traditional agro-export production may be one of the most important developments for female employment over the last few decades (Deere, 2005).

Women are clearly an important part of the agricultural labour force, but agriculture and agricultural value chains are equally important to women as a source of employment.

Commercial value chains for high-value products such as fresh fruit, vegetables, flowers and livestock products are growing rapidly to supply urban supermarkets and export markets. The growth of modern value chains and the broader structural transformation of the agricultural sector in many developing countries have major implications for women's employment, but the impact of these trends for women has received relatively little analytical attention (Maertens and Swinnen, 2009).

Women dominate employment in many of the high-value agricultural commodity chains in sub-Saharan Africa and Latin America (Table 5). New jobs in export-oriented agro-industries may not employ men and women on equal terms, however they often provide better opportunities for women than exist within the confines of traditional agriculture and can also be instruments of change with significant implications for women and rural development (Maertens and Swinnen, 2009; Deere, 2005).

Table 5 Employment in selected high-value agro-industries

Country	Commodity	Year of survey	Number of employees in the agro-industry	Share of Female Employees
Cameroon	Banana	2003	10,000	..
Côte d'lvoire	Banana and pineapple	2002	35,000	..
Kenya	Flowers	2002	40,000 – 70,000	75%
Senegal	French beans	2005	12,000	90%
	Cherry tomatoes	2006	3,000	60%
Uganda	Flowers	1998	3,300	75%
Zambia	Vegetables	2002/3	7,500	65%
	Flowers	2002/3	2,500	35%
South Africa	Deciduous fruit	1994	283,000	53%
Mexico	Vegetables	1990s	950,000	90%
Colombia	Flowers	mid-90s	75,000	60-80%
Chile	Fruits	1990s	300,000	ca 46%
Dominican Republic	Fruits, vegetables, flowers, plants	1989-90	16,955	ca 41%

Source. For Africa: Maertens and Swinnen (2009: Table 1), based on several sources. For South America: Deere (2005: Appendix II), based on several sources.

The flower industry in Latin America provides an interesting case in contrasting points of view. In Colombia, for example, Friedemann-Sanchez (2006) finds that 64 percent of the workforce directly growing fresh-cut flowers for export are women and consider this type of agro-industrial work skilled, while others consider it unskilled (Meier, 1999). While women do have supervisory jobs among those directly involved in cultivation activities, they have a much lower share of managerial or professional jobs in other aspects of the sector (Friedemann-Sanchez, 2006). Similarly, Fontana (2003) finds that in sectors producing primarily for the export market, women tend to be replaced by males as profits increase.

The arrival of the flower industry in the Ecuadorian town of Cayambe in the late 1980s (in combination with other household and individual factors) affected time use patterns in some surprising ways (Newman, 2002). The total time spent by women in paid and unpaid work did not increase, contrary to a frequent criticism of agricultural export development which maintains that women are unduly burdened by work in the industry. Indeed, the most compelling evidence of the industry's impact was on men's increased participation in housework. In Cotocachi, Ecuador, in contrast, women were not prepared to move or even commute to work in the flower industry despite the higher wages offered there. The women did not view flower employment as an option, indicating either that their husbands would not allow them to work or that the work would be detrimental to family relations (Newman, 2002).

In Senegal, the growth of modern horticulture supply chains has been associated with direct beneficial effects for rural women and reduced gender inequalities in rural areas (Maertens and Swinnen, 2009). That study also finds that women benefit more from employment in large-scale estate production and agro-industrial processing than from high-value smallholder contract-farming in which they often provide unpaid family labour (see Box 3)

Box 3 Women farmers in modern contract farming

The emergence of modern supply chains is profoundly changing the way food and high-value agricultural products are produced and traded in developing countries, with important effects for rural women. While export-oriented value chains offer important employment opportunities for women (see rural labour market section below) female farmers are largely excluded from contracting with agro-industrial firms for the delivery of high-value produce.

Women comprise less than 10 percent of the farmers involved in smallholder contract-farming schemes in the Kenyan fresh fruit and vegetable export sector (Dolan, 2001). Eaton and

Shepherd (2001) find that in large contract-farming schemes involving many thousands of farmers in China, contracts were exclusively with men. In the French bean export sector in Senegal, only 1 out of the 59 contracted farmers is a woman. The exporting companies confirm that they strongly prefer contracting with men because women lack secure access to productive resources and so cannot guarantee delivery of a reliable flow of produce. For example, women lack statutory rights over land and have less authority over family labour compared to their husband and male siblings.

High-value contract-farming has direct implications for the allocation of productive resources within the household. It has been argued that contract-farming with the modern agroindustry – and the exclusion of women from contracts – could give rise to intra-household conflicts over the allocation of land and labour resources between contract requirements and women's priorities with regard to food production (Sing, 2003). High-value contract-farming might result in decreased access to resources for female farmers concerned with subsistence food production, and ultimately lead to the deterioration of the food security situation of rural women and children (Bravo-Baumann, 2000).

Convincing quantitative evidence on this issue is lacking. What is available from descriptive studies is mixed and yields no consensus. Several authors point to the fact that – while men control the contracts as contracting party – the majority of the farm work done on contracted plots is performed by women as family labourers and necessarily reduces labour for food production. For example, Porter and Philips-Horward (1997) observe that in 70 percent of the cases of sugar contract-farming in South Africa the principal farmer working all year round on the sugar cane plots is a woman. Sing (2002) reports that women work longer hours than men in vegetable contract-farming schemes controlled by male farmers in the Indian Punjab. Eaton and Shepherd (2001) observe that in a large contract-farming scheme involving thousands of farmers in China women – while being completely excluded from signing contracts themselves – perform the bulk of the work related to contract farming. Qualitative studies also report cases were contracted tobacco production in East Africa conflicts with the cultivation of millet and sorghum, basic food crops, by female farmers. Dolan (2001) argues that specifically the growth of high-value horticulture supply chains has been detrimental for rural women in Kenya because land and labour resources that were traditionally used by women to cultivate vegetables for home consumption and sale in local markets have been appropriated by men for export vegetable production under contract.

Other studies do not find conflicts over productive resources between high value contract production controlled by men and basic food production by women, or that this reallocation of resources – especially female labour – leads to adverse food security effects and deteriorated child nutrition. On the contrary, Minten, Randrianarison and Swinnen (2009), although not explicitly addressing gender issues, find that high-value vegetable contract-farming in Madagascar leads to improved productivity for food (rice) production through technology spillovers, thereby improving the availability of food in the household and shortening the lean period or "hunger season".

Analysis of the French bean export sector in Senegal also suggests that gender conflict over land and labour resources is quite limited. Beans are exported from Senegal to the EU only during the off-season (from November till April) and households only allocate part of their land and labour resources to contracted bean production and only during a confined period which does not coincide with the main "rainy" agricultural season when staple food crops and other subsistence crops are cultivated.

Source: Maertens and Swinnen (2009)

The gender demographics of agriculture and rural areas

The preceding sections discussed gender differences in labour market participation and type of employment in agriculture and in rural areas, with the data available revealing a significant amount of regional diversity. This section concentrates on demographic gender imbalances in rural areas. In this respect numerous studies find that agriculture and rural areas are becoming "feminized" (Lastarria-Cornhiel, 2006; Deere, 2005). Not all authors have the same understanding of the meaning of this word, although two concepts are generally considered: women predominate in the agricultural sector or women are rapidly gaining a predominant position.

Table 6 presents average female share of the working age population (aged 15-49) of all major regions of the world, by urban and rural areas. Only in the rural areas of sub-Saharan Africa are there more women than men. The opposite is true in Latin America, Eastern Asia and countries in developed regions. These patterns reflect different economic and social norms, which have produced different migration trends for men and women. Table 6 shows that rural areas, with the exception of Africa, have not become feminized. We note that feminization is also frequently observed in certain sectors such as unskilled labour in the fruit, vegetable and cut-flower export sector.

Table 6 The female share of the adult population (aged 15-49) (in brackets the corresponding ratio of women per 100 men), by region

	Urban	Rural	National
Africa	50.0 (103.7)	52.4(110.1)	51.7 (107)
Sub-Saharan Africa	49.5 (98)	52.5 (110.5)	51.7(107)
Latin America & Caribbean	51.5(106.2)	48.6(94.6)	50.9(103.7)
Central Asia	50.8 (103.3)	49.7 (98.8)	50.1 (100.4)
Eastern Asia, excl. Japan	48.8(95.3)	48.6 (94.6)	48.7 (94.9)
South Eastern Asia	50.7 (102.8)	50.2(100.8)	50.4(101.6)
Western Asia	48.9(95.7)	49.6(98.4)	49.2(96.9)
Countries in developed regions	50.0(100)	48.7(94.9)	49.7(98.8)
World	49.6(98.4)	49.2(96.9)	49.4(97.6)

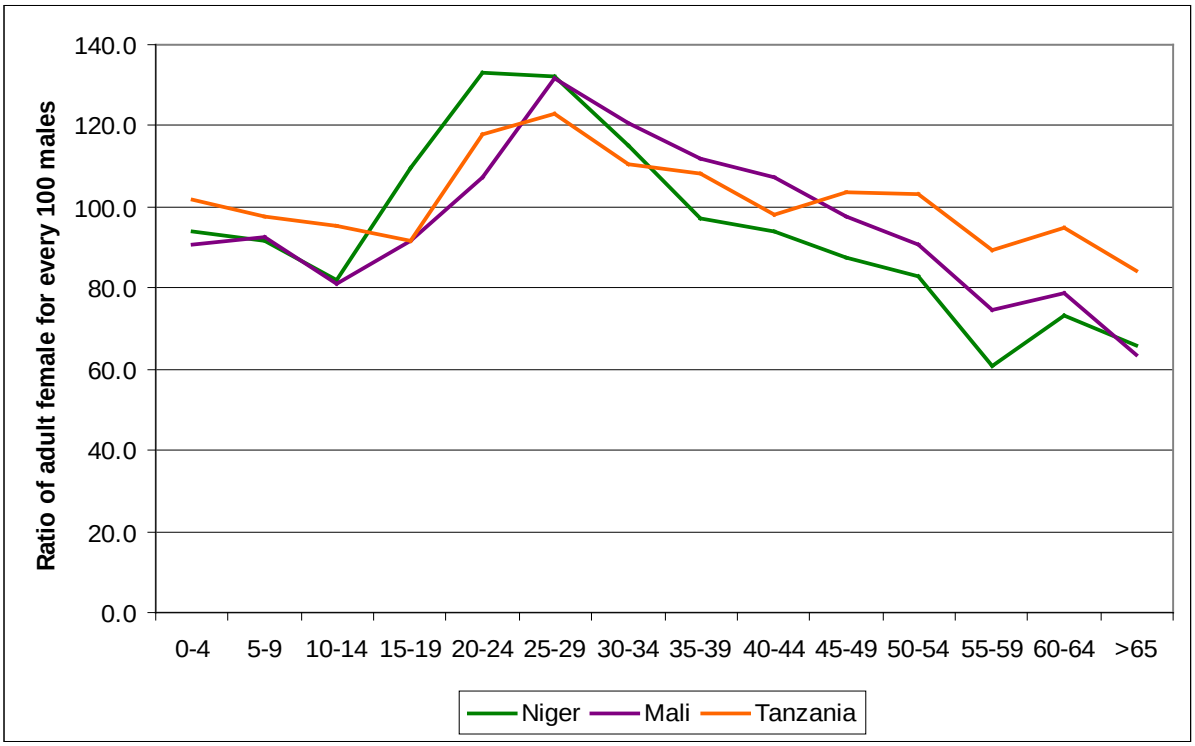
Source. Author's calculations from a database of Census Sex/Age/Location Tables for the period 1980-2003 containing a total of 223 surveys.

De Brauw et al. (2008) do not find much evidence of feminization of agriculture in China; rather, even after the high rate of migration out of rural China to its urban areas, the share of women-managed farms rose only from 13.5 percent between 1990 and 1995 to 15 percent

between 1995 and 2000. They argue that, although there may be no general move towards agricultural feminization in rural China, such a trend is observable among middle-aged women. Whereas young men and women appear to obtain off-farm jobs in similar numbers, middle-aged men are far more likely than similarly aged women to have non-agricultural employment. Mu and van de Walle (2009) argue that the aggregate transformation of work during China's rapid economic development is leading to a substantial re-allocation of traditional farm labour among women ─ the young farming much less and older women much more.

In Africa, data for Niger, Tanzania and Mali reveal an over-representation of females in working-age populations in rural areas (Figure 7). Females are under-represented both in lower and higher age groups but over-represented in the central part of the age structure, which results in an inverted U-shaped femininity ratio with a maximum of 133 percent for the 20-24 age group.

Figure 7 Number of women per 100 men in rural areas in Niger, Mali and Tanzania



Source. Mali Agricultural Census, 2004/05; Niger Agricultural Census 2005/07, Tanzania Agricultural Census 2002/03.

Feminization of rural areas may also vary over time. For example, during the economic reform period in Viet Nam, which stared in 1986, male migration from rural areas initially led to a rise in female participation in agriculture. Later, from 1992–97, women migrated in large numbers to take advantage of opportunities in new factories and export processing zones. As a result, the proportion of female workers in agriculture then fell from 68 percent to 56 percent, while that in non-farming occupations increased from 22 percent to 39 percent (Long et al., 2000).

While global data and national data for most countries do not reveal a general pattern of increasing female dominance in agriculture, evidence clearly supports the conclusion that females are over-represented in rural areas of some countries and regions. Patterns vary considerably by age cohort and can change rapidly as economic opportunities and social norms accommodate freer movement of women between urban and rural settings.

Another demographic phenomenon is that of the female-headed household. These are a significant portion of rural households in many countries in the world, although their share shows significant variation (Appendix 1). Most countries have between 10 and 30 percent

female-headed households and there are some regional patterns: southern African countries, for example, tend to have a very large proportion of female-headed households.

As a group these households are important for agricultural policy makers because many of them will be involved in farming and they share some defining characteristics. For one, as the companion working paper "Gender differences in assets" documents, they are nearly always disadvantaged in terms of access to land, credit and other productive resources. They also have less labour available because they have fewer male members, which also helps explain why they very often support a higher dependency ratio, in particular of older family members.

But not all female-headed households are the same. When the husband has migrated for work the households are labelled *de facto* female-headed. On the other hand when the female-head of the household is divorced, separated or widowed the household is referred to as *de jure*. The distinction is important because *de facto* FHHs may be receiving remittances which allow them to mitigate the effect of an absent male. However this is possible mainly in situations where remittances are regular and substantial enough to allow hiring in labour and/or investment in farm machinery and inputs. Of course, when agro-climatic conditions are poor, infrastructure is weak and agriculture gives a comparatively poor return on investment then households do not invest remittances in agricultural activities.

Most FHHs appear to be *de jure*. Data is scarce but for Malawi, Uganda, and Panama about 70, 63 and 83 percent of all female-headed households fall into that category, respectively (Chipande, 1987; Appleton, 1996; and Fuwa, 2000. Also in Cambodia the vast majority of FHHs are widows or separated/divorced (FAO/GSO/MOP, 2010). In Laos widowhood is the main reason for female-headedness and about one-fifth of such households are *de facto* due to migration (FAO/MAF, 2010). Morada et al (2001) report that 68.5 percent of FHHs are *de jure* in the Philippines.

It is commonly suggested that female-headed households are poorer and more vulnerable than others and that their prevalence is growing, making poverty an increasingly female phenomenon. The following quote is typical of this concern: "...the global economic downturn has pressed most heavily on women-headed households, which are everywhere in the world, the poorest of the poor" (Tinker, 1990). Evidence presented in Box 4 does not indicate that this is universally true. However, their special situation, their role in agriculture

as well as the particular disadvantages that they may face, deserve attention, especially because they represent such an important proportion of households in many countries.

Box 4 Women and rural poverty

It has been claimed that 60 to 70 percent of the world's poor are women (UNDP, 1995; UNIFEM, 1995; United Nations, 1996).[12] However, this assertion does not stand up to careful analysis. Because poverty is measured at the household level, and because most households are comprised of both male and female members, including children, such an imbalance in the poverty rates would require an implausible gender distribution within households (Marcoux, 1998). Studies that have explored the question empirically find that in most cases, there is no statistical difference between the poverty levels faced by men and women (Anriquez, 2010).

Whether households headed by women are poorer than those headed by men is a different question. In a survey of the available literature, Buvinic and Gupta (1997) found that female-headed households were over-represented among the poor in 38 out of 61 studies reviewed. Quisumbing, Haddad and Pena. (2001) found that female-headed households were over represented among the poor in only 3 of 10 household surveys. Most recently, Anriquez (2010) examined the evidence from 33 nationally representative household surveys from 18 different countries. Female-headed households were more likely to be poor in 10 of the 33 surveys, male-headed households were more likely to be poor in 16 of the studies and there was no statistical difference between male and female-headed households in the remaining surveys. This study also found that rural female-headed households were more likely to be poor than urban female-headed households, but it did not support the statement that female-headed households are everywhere and always the poorest of the poor.

Agricultural transformation and access to markets

Economic development has and will continue to transform the agricultural sector in many developing countries. The process includes greater commercialization, urbanization and integration into the global economy. These trends and changes bring with them challenges and opportunities, some with a distinct gender dimension.

Economic development and rising incomes lead to greater demand for high-value commodities, processed products, and pre-prepared foods. In turn, food supply chains become increasingly vertically integrated, linking input suppliers, producers, processors, distributors and retailers. Supermarkets are part of this vertical chain because they are convenient, meet diversifying tastes, and set standards for quality and safety. The penetration of supermarkets

[12] For and extensive review of these claims see Chant (2003).

is most pronounced in Latin America and parts of Asia, but is increasing in parts of Africa as well (Reardon and Berdegué, 2006; Tschirley et al., 2004; Traill, 2006) (Table 8).

Table 8 Supermarket penetration in selected developing countries

Country/Share of Supermarkets in retail food market (c. 2002) in %

Latin America		Africa		Asia	
Chile	62	South Africa	55	China	11
Costa Rica	55	Egypt	10	India	2
Argentina	54	Kenya	10	Bangladesh	1
El Salvador	54	Morocco	5	Pakistan	1
Panama	50	Tunisia	5	Turkey	37
Brazil	49				
Colombia	47				
Mexico	45				
Honduras	42				
Guatemala	35				
Paraguay	35				

Source. Traill (2006)

Small-holder production systems in rapidly growing areas are facing increasing pressure to commercialize, diversify and expand. Increasing scales of production are being observed particularly in the livestock sector, which attempts to supply rapidly growing markets for meat, milk and eggs. Small-scale producers face particular pressures as size and private health and safety standards set by large retailers and wholesale buyers become increasingly important (de Haen et al, 2003).

Studies cited in Reardon and Berdegue (2006) show that, in general, farmers who produce for supermarkets are larger, more educated, have more access to information, are able to hire-in labour, have greater access to irrigation and are closer to transport infrastructure. It is frequently assumed that small farmers will be marginalised by these trends, and that women farmers will be more severely penalized because of their smaller scale, lower education levels and limited access to resources (for more evidence on the gender gaps in access to resources see the companion working paper “Gender differences in assets”). However, a number of studies suggest that this may not always be the case. In Eastern Europe and Central Asia, Swinnen (2004) finds that transaction costs and investment constraints are important and that companies prefer to work with few, large and modern suppliers, but they also find that small

farms play a much larger role in actual supermarket contracting than would be expected. Zhang et al (2005) find that in Sichuan, China, small farms continue to supply fresh produce. Box 5 suggests that female farmers can compete in high-value cash crops but illustrates some of the constraints they face.

BOX 5 PRODUCING COCOA IN GHANA[13]

Cocoa production is an engine of growth for Ghana's economy; it provides livelihoods for more than 700,000 smallholders. Cocoa has traditionally been considered a "man's" crop because it requires a large amount of hard physical work and because it generates high returns, which typically imply a strong gender differentiation in their appropriation. Despite gender differences, male and female cocoa farmers were equally productive on their land. In 2004 the productivity of hired workers on land run by women was almost double that of workers on land run by men.

Cocoa smallholders typically own the land they cultivate to that crop and women usually cultivate smaller plots than men (5.4 ha vs. 7.9 ha). Labour on cocoa farms is clearly gender differentiated. Men are typically engaged in the more physically demanding work such as clearing and tree felling and women perform the less physically demanding tasks, such as weeding and harvesting. Women farmers face greater time constraints than do men because they spend more time than men do on domestic work (on average 1.5 times as many hours). Farmers need male labour for strength-demanding tasks such as tree felling, consequently, female farmers in the lower wealth ranks who have no other means of procuring male labour have to rely on wage or annual labour.

Female cocoa farmers from Ghana differ from their male counterparts in other important respects. They are usually older, less educated, more cash constrained, and use less farming inputs (such as fertilizer, insecticide, and agricultural equipment). Between 2002 and 2004, cocoa farmers (both female and male) increased the amount of fertilizer used by a factor of nine, but the percentage of women using fertilizer went up only 25 percent, compared to 42 percent for men.

In summary, the Ghana case study on women farming cocoa provides four important lessons about gender differences in high value cash crops. First, while most smallholders engaged in the cultivation of these crops are male, there are some clear signals that women are becoming more involved in cocoa farming. Secondly, female-managed farms are just as productive as those managed by males. Thirdly, due largely to cash constraints, women rely on labour intensive, low-tech production technologies and use non-labour inputs sparingly. Fourth, women who do not have male labour readily available must hire wage labourers; this is of course a serious constraint for the poorest female farmers.

Being able to produce for the market will be increasingly important for farmers. But the ability to engage in output markets depends on the size of the farm, the quality of the produce and the farmer's capacity to process and market output at low cost. As two seminal studies show (Fafchamps, 1992; Key, et al., 2000), scale becomes important for cash crop production as a result of: (i) the price risk inherent in exchanging cash crops for cash and cash for food,

[13] Based on Hill and Vigneri (2009).

and; (ii) the fixed costs involved in transacting with markets. Fafchamps (1992) argues that food price volatility, resulting from poorly integrated food markets, can make it quite risky being a net buyer of food. This is compounded by cash crop price volatility. Households that produce surpluses in food crops are more likely to engage in cash crop production. Farm size, and thus gender of household head, is an important factor in this regard. Box 6 illustrates marketing constraints faced by women farmers.

BOX 6 CASE STUDY: MARKETING COFFEE IN UGANDA[14]

Coffee is Uganda's largest export, providing employment directly and indirectly to an estimated 5 million people (Bank of Uganda, 2001; Kempaka, 2001). Coffee produced by smallholders is usually intercropped with staples such as matooke (a banana-like staple), beans, sweet potatoes and maize. To produce coffee; purchased inputs such as fertilizer or pesticides are used minimally, and modern farming methods, such as irrigation, are not widely used.

A study by Hill and Vigneri (2009) draws on a sample of 300 coffee farming households that were surveyed in 1999 and 2003. Twenty-three percent of the households surveyed were headed by females (mainly widows, but also unmarried, separated and divorced women). Female-headed households had on average less labour, land and coffee trees than male-headed households; they also had lower levels of wealth and education. Women household heads tended to be older. As a result of these basic differences in scale, liquidity and human capital, we may expect crop choice, production methods and access to markets to be quite different for male- and female-headed households.

The share of labour allocated to coffee production and the proportion of trees harvested were comparable between male-and female-headed households, as was the yield per producing tree. However, because female-headed households farmed on a much smaller scale, women sold smaller amounts than men (only 47 kg on average compared to 151 kg for men).

The majority of smallholders sold their coffee in the form of dry cherries locally known as kiboko, which are then milled by the traders who buy the coffee. Some farmers transported their coffee to market, which allowed them to sell it at a higher price. Members of male-headed households were more likely than those of female-headed households to travel to market to sell their coffee. Fifteen percent of the transactions made by male-headed households took place in the nearby coffee market, while only 7 percent of transactions by women did. This may be because men were more likely to own a bicycle and could therefore travel to the market more easily than women. Farmers received a higher price for their coffee if they chose to mill it at the market before selling it. Only 3 percent of transactions were for milled coffee, all of which were made by male-headed households.

The study by Hill and Vigneri (2009) concludes that gender differences in marketing are largely explained by the fact that women market smaller quantities of coffee and do not own bicycles. They also find that a major constraint facing women is their relative difficulty in accessing marketing channels that allow added value. By engaging in marketing channels in which they add value male headed households received 15 USD? cents per kilo of kiboko whereas female-headed households received less (14 USD cents per kilo).

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[14] Based on Hill and Vigneri (2009).

Conclusion

In this paper we collate the empirical evidence on women's roles in agriculture, setting the stage for subsequent analysis on gender differences in agriculture and the potential gains from removing these gender differences. The main findings are:

Women comprise about 43 percent of the global agricultural labour force and of that in developing countries, but this figure masks considerable variation across regions and within countries according age and social class. Women comprise half or more of the agricultural labour force in many African and Asian countries, but the share is much less in some.

Time use surveys, which provide a more comprehensive assessment of how men and women spend their time, further emphasise the heterogeneity among countries and within countries in women's contribution to agriculture. The labour burden of rural women exceeds that of men, and includes a higher proportion of unpaid household responsibilities related to preparing food and collecting fuel and water.

The contribution of women to agricultural and food production is clearly significant. However, it is impossible to verify empirically the share produced by women because agriculture is usually a venture among household members and involves a range of resources and inputs that cannot be readily assigned by gender.

Women's participation in rural labour markets show much heterogeneity at the regional level, but women are over represented in unpaid, seasonal and part-time work, and the available evidence suggests that women are often paid less than men, for the same work.

We conclude that accurate, current, regionally specific information and analysis is necessary for good gender-aware agricultural policy making. Data collection has improved substantially over the last decades, as has our understanding of the complexity of women's roles and the need to collect data not only on primary activities but on all women's activities. Data are needed to better understand gender roles in agriculture and how they change over time and in response to new opportunities.

We have shown that women's roles are diverse and that they vary across regions and countries. These roles cannot be understood properly, and interventions targeting cannot be designed effectively, without also understanding their differential access to land, capital, assets, human capital, and other productive resources.

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	Share of rural households that are female headed (percent)	
	Most recent observation	Earliest observation
World		
Countries in developing regions		
Africa	**25.5**	
Eastern Africa	**29.9**	
Burundi	..	..
Comoros	31.9	..
Djibouti	..	..
Eritrea	43.2	25.9
Ethiopia	20.1	21.3
Ethiopia PDR	..	..
Kenya	33.8	35.3
Madagascar	20.6	20.8
Malawi	26.3	26.1
Mauritius	..	..
Mozambique	26.3	28.2
Réunion	..	..
Rwanda	34.0	20.8
Seychelles	..	..
Somalia	..	..
Uganda	29.3	23.8
United Republic of Tanzania	25.0	17.2
Zambia	25.4	18.7
Zimbabwe	42.6	39.4
Middle Africa	**21.6**	
Angola	21.8	..
Cameroon	22.9	16.8
Central African Republic	18.8	..
Chad	19.1	21.5
Congo	23.4	..
Democratic Republic of the Congo	20.0	..
Equatorial Guinea	..	..
Gabon	25.4	..
Sao Tome and Principe	..	..
Northern Africa		
Algeria	..	..
Egypt	12.0	10.9
Libyan Arab Jamahiriya	..	..
Morocco	12.0	13.3
Sudan	..	..
Tunisia	..	..
Western Sahara	..	..
Southern Africa	**46.5**	
Botswana	..	..
Lesotho	36.3	..
Namibia	47.4	30.6
South Africa	50.0	..
Swaziland	52.1	..
Western Africa	**19.2**	**14.6**
Benin	21.1	14.2
Burkina Faso	7.5	5.0
Cape Verde	..	..
Côte d'Ivoire	13.3	13.2
Gambia	..	..
Ghana	30.8	34.6
Guinea	15.8	10.8
Guinea-Bissau	..	..
Liberia	26.6	28.8
Mali	11.5	7.0
Mauritania	31.7	..
Niger	18.8	8.5
Nigeria	18.6	12.9
Saint Helena	..	..
Senegal	10.7	10.5
Sierra Leone	20.7	..
Togo	22.1	..

	Share of rural households that are female headed (percent)	
	Most recent observation	Earliest observation
Americas excluding Northern America		
Caribbean		
Anguilla	..	..
Antigua and Barbuda	..	..
Aruba	..	..
Bahamas	..	..
Barbados	..	..
British Virgin Islands	..	..
Cayman Islands	..	..
Cuba	..	..
Dominica	..	..
Dominican Republic	29.7	18.0
Grenada	..	..
Guadeloupe	..	..
Haiti	38.6	32.9
Jamaica	..	..
Martinique	..	..
Montserrat	..	..
Netherlands Antilles	..	..
Puerto Rico	..	..
St. Kitts & Nevis	..	..
Saint Lucia	..	..
Saint Vincent and the Grenadines	..	..
Trinidad & Tobago	..	..
Turks and Caicos Islands	..	..
United States Virgin Islands	..	..
Central America		
Belize	..	..
Costa Rica	..	..
El Salvador	..	..
Guatemala	16.1	18.0
Honduras	20.2	..
Mexico	..	..
Nicaragua	19.3	20.0
Panama	..	..
South America		
Argentina	..	..
Bolivia (Plurinational State of)	17.1	17.3
Brazil [(1)]	13.7	16.8
Chile	..	..
Colombia	21.7	16.7
Ecuador	..	..
Falkland Islands (Malvinas)	..	..
French Guiana	..	..
Guyana	..	..
Paraguay	13.4	..
Peru	16.3	13.3
Suriname	..	..
Uruguay	..	..
Venezuela (Bolivarian Republic of)	..	..
Asia excluding Japan		
Central Asia	**17.6**	
Kazakhstan	22.0	23.4
Kyrgyzstan	18.0	..
Tajikistan	..	..
Turkmenistan	18.6	..
Uzbekistan	11.6	..
Eastern Asia excluding Japan	**..**	**..**
China	..	..
China, Hong Kong SAR	..	..
China, Macao SAR	..	..
China, mainland	..	..
Democratic People's Republic of Korea	..	..
Mongolia	..	..
Republic of Korea	..	..

	Share of rural households that are female headed (percent)	
	Most recent observation	Earliest observation
South -Eastern Asia		
Brunei Darussalam	..	..
Cambodia	23.0	25.0
Indonesia	12.3	12.8
Lao People's Democratic Republic	..	..
Malaysia	..	..
Myanmar	..	..
Philippines	14.4	12.1
Singapore	..	..
Thailand	..	..
Timor-Leste	..	..
Viet Nam	22.4	20.7
Southern Asia		
Afghanistan	..	..
Bangladesh	13.2	8.7
Bhutan	..	..
India	14.9	9.1
Iran (Islamic Republic of)	..	..
Maldives	..	..
Nepal	24.0	12.4
Pakistan	11.0	6.8
Sri Lanka	..	..
Western Asia		
Armenia	33.1	25.1
Azerbaijan	24.4	..
Bahrain	..	..
Cyprus	..	..
Georgia	..	..
Iraq	..	..
Israel	..	..
Jordan	10.9	9.0
Kuwait	..	..
Lebanon	..	..
Occupied Palestinian Territory	..	..
Oman	..	..
Qatar	..	..
Saudi Arabia	..	..
Syrian Arab Republic	..	..
Turkey	9.1	8.6
United Arab Emirates	..	..
Yemen	9.5	12.8
Oceania excluding Australia and Japan		
American Samoa	..	..
Cook Islands	..	..
Fiji	..	..
French Polynesia	..	..
Guam	..	..
Kiribati	..	..
Marshall Islands	..	..
Micronesia (Federated States of)	..	..
Nauru	..	..
New Caledonia	..	..
Niue	..	..
Northern Mariana Islands	..	..
Palau	..	..
Papua New Guinea	..	..
Samoa	..	..
Solomon Islands	..	..
Tokelau	..	..
Tonga	..	..
Tuvalu	..	..
Vanuatu	..	..
Wallis and Futuna Islands	..	..

Source: Macro International Inc, 2010. MEASURE DHS STATcompiler. Available at http://www.measuredhs.com. (Column 1 & 2).

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