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Changes in Poverty and Female-Headed Households in Africa

In Africa poverty is falling faster for households headed by women than for those headed by men

Today in Africa, a very sizable minority of households are headed by women—26 percent according to data from the latest Demographic and Health Surveys. While there are differences across countries, both the share of the population living in female-headed households and the share of households headed by women have been rising over time. The data show quite clearly that the probability that a woman age 15 or above heads a household (controlling for her age) has been increasing over time in all regions and across the entire age distribution.

What explains this? Milazzo and van de Walle investigate this question in a recent paper using the full series of Demographic and Health Surveys fielded in Africa over the past 25 years and covering 89 percent of Africa's population. Their results suggest that economic growth brings lower female headship—presumably in part because of lower work-related migration by men, associated with a growing local economy. Yet as the data show, female headship has been rising during a period of growth. This seeming paradox is resolved by the fact that other things are changing across Africa.

Changes in demographic and population characteristics, social norms, education, and the nature of the family all appear to be encouraging female headship. An extra year of schooling (for men or women) produces a 3 percentage point increase in the share of the population living in female-headed households. A one-year rise in women's average age at first marriage leads to a 2.5 percentage point increase in the population share living in female-headed households—an effect almost as strong as that of an extra year of schooling. Higher overall life expectancy also has a positive effect—equal to a 0.5 percentage point boost per extra year. This presumably reflects the natural survival advantage of women that is revealed with higher life expectancy and the resulting prevalence of widow-headed households. Conflict and HIV also raise a country's share of population in female-headed households.

Thus the prevalence of female-headed households has been rising while poverty has been falling. Past literature has been generally suggestive that female-headed households tend to be poorer. But does this imply that female-headed households have been left behind by recent improvements in living standards? Female heads of household are a diverse group. Some—such as married women with a nonresident (polygynous or migrant) husband, or educated women who may choose, and can socially and economically afford, not to be married or remarried—can be expected to be relatively well-off. Others—war or AIDS widows, separated or abandoned women, and single mothers who have not "chosen" headship but simply have no options—are frequently found to head disadvantaged households.

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Growth and Capital Inflows in Africa

Questions about the relationship between growth and capital inflows have become increasingly important for Sub-Saharan Africa

Does economic growth in developing countries attract more capital inflows? And do capital inflows in turn foster further economic growth? These are important questions for many developing countries. If the answer to both is yes, economic growth and capital inflows could form a positive feedback cycle in which one reinforces the other.

This issue is becoming important for Sub-Saharan Africa in light of the region's strong economic growth and increasing capital inflows in recent years. Foreign direct investment (FDI) into the region has grown from less than 1 percent of GDP in the 1990s to as much as 4 percent of GDP in recent years. Meanwhile, sovereign debt inflows have grown from almost nothing in the early 2000s to about 1 percent of GDP.

It is commonly believed that longer-term inflows, such as FDI, aid, or sovereign debt, have positive effects on the receiving economy. Theory suggests that this could be the case because long-term capital inflows help countries ease their capital constraints and also provide capital for investment. FDI or aid inflows could also bring foreign know-how and technologies or encourage better governance and support human capital development. In addition, long-term capital inflows could insulate countries from the inherent volatility associated with short-term capital flows.

Empirically, however, the relationship between capital flows and growth is less clear because of the endogeneity issues. The first endogeneity bias is reverse causality: we cannot tell whether a positive relationship between capital inflows and growth means that capital inflows cause growth, that growth attracts capital inflows, or that both phenomena are simply happening at the same time. The second endogeneity bias comes from the omitted variables problem: we do not know whether growth and capital inflows are both driven by a third factor, such as global growth or global interest rates. It is reasonable to believe that global growth provides capital to a developing country and at the same time helps boost the country's growth through other channels (such as exporting). The literature on aid effectiveness is well aware of the endogeneity problem and has tried to address it, with mixed results.

In a recent paper Calderón and Nguyen revisit the causal relationship between economic growth and three types of capital inflows—aid, FDI, and sovereign borrowing—using a two-step approach to address reverse causality and omitted variables issues.

In the first step, using rainfall as an instrument for growth, the authors find that for a set of 38 developing countries in Sub-Saharan Africa, for the period 1979–2012, economic growth does not attract aid, FDI, or sovereign lending. This result suggests that capital flows to Sub-Saharan Africa are driven either by noneconomic factors (such as political factors) in the recipient countries or by "push" factors in the investing countries. In other words, the flows could be driven by economic conditions in the investing countries and not by those in the recipient countries.

In the second step the authors find that aid and, to a lesser extent, FDI have a positive effect on economic growth. This is after controlling for global factors, commodity prices, and growth of Sub-Saharan African countries' main trade partners.

Aid seems to matter most to growth: a 1 percent increase in inflows of official development assistance (ODA) increases growth by 0.025 percentage points. This finding helps confirm the role of aid in assisting poor countries.

FDI inflows also seem to support a country's growth, though by a much smaller magnitude (about one-tenth as much as aid). This result is nevertheless consistent with the finding of the literature that FDI inflows are generally good for growth.

By contrast, sovereign borrowing shows no impact on growth. This finding is interesting, because developing countries are often praised for being able to raise money from the international financial markets. Doing so is considered a new way for countries to help finance their investment needs without depending on aid. But the authors' finding casts doubt on this belief. It suggests that sovereign borrowing might not be deployed most effectively. Unlike aid, which comes with clear purposes and stricter monitoring, capital raised through sovereign borrowing is usually more freely spent. The authors speculate that sovereign debt inflows could be more prone to corruption, vested interests, and irresponsible investment decisions.

Overall, the findings provide evidence to support advocating for aid to poor countries such as those in Sub-Saharan Africa. Aid could flow directly toward poverty reduction, social programs such as education and health care, and infrastructure—all of which benefit growth. By contrast, the finding on sovereign borrowing suggests that poor countries might want to scale back their access to private international financial markets. Low institutional and investment management quality in these countries could make greater access to private finance counterproductive.

César Calderón and Ha Nguyen. 2015. "Do Capital Inflows Boost Growth in Developing Countries? Evidence from Sub-Saharan Africa." Policy Research Working Paper 7298, World Bank, Washington, DC.

Are Public Works Working in Malawi?

Malawi's public works program aims to increase food security and the use of fertilizer. Evidence suggests that it is falling short

Labor-intensive public works programs are common social protection tools in low-income settings. These programs require that beneficiaries work in order to receive a cash payment or in-kind transfer. Among the most widely known are the National Rural Employment Guarantee Act in India and the Productive Safety Net Project in Ethiopia. Such programs are widespread in Sub-Saharan Africa, though on a smaller scale: 39 of 48 countries in the region have government-supported public works programs. In Malawi the program doubled in size in 2012 to cover about 500,000 households annually.

Several studies of cash-for-work programs have focused on their potential effects in crowding out other work (with people working less on their own farms, for example) or on the extent of self-targeting (which people choose to work at the wage rate offered). Yet there is limited evidence about how such programs affect consumption and food security. This will depend on such design features as the size of the transfer, the season in which the program operates (an aspect associated with opportunity costs especially in rural areas, where it may compete with smallholder farming), and the mode of payment (whether a lump sum payment or multiple payments).

Using a randomized controlled trial, a recent study by Beegle, Galasso, and Goldberg evaluated Malawi's public works program. The study introduced two variants relative to the standard model of the program as implemented in 2012/13: the timing and the payment schedule (lump sum or split payments). There were two levels of randomization: across villages and across households in participating villages. The study examined whether changes to the timing of the program increase its effect on food security, potentially at the cost of investment in fertilizer.

The program offers households the opportunity to earn about $22 at planting season and another $22 later in the year (in a country with a per capita income of only $320). But results show that it does not have a measurable short-term effect on lean season food security for participating (treated) households. Nor does rescheduling the second work cycle from the harvest season to the lean season generate measurable improvements in food security.

The failure of Malawi's public works program to improve food security in either the short run (through consumption support) or the longer run (through greater use of fertilizer) is troubling because it is the largest social protection scheme in one of the world's poorest countries. Public works programs in other countries differ in some elements of their structure—for example, Ethiopia's program offers more income—and have been more effective. That 24 extra days of work during the lean season in Malawi do not significantly improve food security may be because of the low daily wage in the public works program. Longer duration and more flexible schedules are avenues for future investigation.

Malawi's public works program is timed to coincide with the planting season to promote take-up of the country's fertilizer subsidy scheme. But the study's results do not support the hypothesis that the two programs are complementary. While households participating in the public works program are more likely to receive fertilizer coupons (consistent with the policy of linking this participation with the fertilizer subsidy) and thus pay less for the fertilizer they use, they do not use more fertilizer.

The study found no evidence that the program increased the ownership of durable goods. Nor did it find evidence that the program affected prices by injecting cash into the economy, or that it led to labor market tightening through reduced labor supply or increased reservation wages.

While the study can rule out significant improvements in the two outcomes specifically targeted by the program—food security and the use of fertilizer—there may have been small, diffuse increases in these or other outcomes that are too small to detect. For example, changes in weekly spending (the interval captured in the survey period) might be too small to detect if households spread consumption across the program period (four or eight months, depending on treatment group) or saved for even longer durations—especially since extra spending may have been spread across many different categories of goods. This interpretation allows for the possibility that the program was welfare-improving for households that chose to participate and thus is consistent with their revealed preferences, while still ineffective in achieving its main policy objectives.

The indirect effects of the public works program are small and, surprisingly, negative. In Northern and Central Malawi food security of untreated households in participating villages is not only lower than food security among their treated neighbors, it is also lower than food security in nonparticipating (control) villages. This is in contrast to expectations and to the effects of other large-scale transfer programs (such as Oportunidades in Mexico). An explanation for this unexpected finding has proven to be elusive.

Kathleen Beegle, Emanuela Galasso, and Jessica Goldberg. 2015. "*Direct and Indirect Effects of Malawi's Public Works Program on Food Security*." *Policy Research Working Paper* 7505, *World Bank*, *Washington*, DC.

Vulnerability to Climate Change in Coastal Bangladesh

In coastal regions of Bangladesh rising salinity from climate change poses serious threats to the health and livelihoods of poor people

In a changing climate Bangladesh is exceptionally vulnerable to sea-level rise—because two-thirds of its territory is less than 5 meters above sea level. Sea-level rise is virtually certain to continue beyond 2100, even in the most optimistic emissions scenarios, so Bangladesh needs to anticipate potential impacts and plan for adaptation. Most research has focused on the long-run effects of progressive inundation from sea-level rise and losses from heightened cyclone-induced surges. Less attention has been paid to salinity from saltwater intrusion, along with its impact on livelihoods and adaptation alternatives, though soil and water salinity monitors indicate increasing salinization in many coastal areas. A set of recent papers explored issues relating to saltwater intrusion in coastal Bangladesh, focusing on the effects on poor people.

In one paper Dasgupta, Kamal, Khan, Choudhury, and Nishat assessed the vulnerability of coastal Bangladesh to saltwater intrusion by 2050, using information from monitoring stations, hydrological models, and forecasts of rainfall, temperature, and sea-level rise for alternative climate change scenarios. Their analysis focused on the southwest coastal region, which already has a salinization problem that will only worsen as climate change continues. Scientists have not reached consensus on the timing and spatial impacts of climate change, so the study used alternative climate scenarios to predict low- and high-salinity trends from a March 2012 baseline. It concluded that by 2050 salinization of river water in coastal Bangladesh will pose major risks to drinking water quality, irrigation water for dry-season agriculture, and coastal aquatic ecosystems.

Rising salinity has particularly serious implications for poor people. In densely populated, land-scarce Bangladesh poor households face disadvantages in accessing land and are forced to settle in low-lying regions close to the coast. A poverty map developed by the Bangladesh Bureau of Statistics, the World Food Programme, and the World Bank identifies a high incidence of poverty in the southwest coastal region, home to 9.9 million poor people in 2010. Alarmingly, this figure includes 5.9 million extremely poor individuals who cannot afford even the basic-needs food expenditure. Living conditions are harsh; the area is prone to tidal surges and cyclones; and residents have already experienced widespread inundation and salinization of soil and water. GIS overlays of poverty and salinity maps show that salinization is already affecting 2.5 million poor residents, including 1.4 million who are extremely poor. By 2050 these numbers rise to 2.9 million and 1.7 million in the best-case climate scenario, and 5.2 million and 3.2 million in the worst-case scenario.

Empirical research on the implications for livelihoods is progressing as better data become available. In a second paper Dasgupta, Huq, Mustafa, Sobhan, and Wheeler studied the impact of salinization on the habitats of fish species that are important sources of protein and market revenue for tens of thousands of poor people in the coastal region. Progressive salinization will affect freshwater fish species in several ways, including reproductive cycles, reproductive capacities, spawning areas, and migration patterns. The study focused on 83 species consumed by households in the region.

Using species-specific salinity tolerance ranges and poverty maps, the study estimated that salinization-induced species losses will outnumber gains by a factor of six in high-poverty areas. In Bangladesh chronic and acute malnutrition levels are already higher than the World Health Organization's thresholds for public health emergencies. This finding therefore has potentially serious implications for food security and malnutrition, since the studied species can be purchased in affordable quantities by the rural poor and shared more equitably among household members, including women and children.

Health risks from drinking water salinity are also significant. Earlier research in coastal Bangladesh indicated links between drinking water salinity and maternal hypertension during pregnancy. In a third paper Dasgupta, Huq, and Wheeler extended the analysis by studying the postnatal impact of prenatal salinity exposure in coastal Bangladesh. After controlling for many other determinants, they found that saline water ingestion during the final month of pregnancy significantly affects mortality risk for infants less than two months old. The estimated impact is comparable in magnitude to the estimated effects of traditionally cited determinants of infant mortality, such as maternal age and education, gender of the household head, household wealth, toilet facilities, drinking water sources, and cooking fuels.

Worldwide, about 600 million people inhabit low-elevation coastal zones that will be affected by progressive salinization. Recent research suggests that the sea level may rise by one meter or more in the 21st century, which would increase the vulnerable population to about one billion by 2050. Experience with salinization in Bangladesh therefore offers a cautionary case from a global perspective. Many countries still lack systematic research on the impacts of saltwater intrusion on livelihoods and adaptation options. The estimated magnitudes of these impacts in Bangladesh suggest that such research is urgently needed in other poor countries with low-lying coastal areas.

Susmita Dasgupta, Mainul Huq, Md. Golam Mustafa, Md. Istiak Sobhan, and David Wheeler. 2016. *"The Impact of Aquatic Salinization on Fish Habitats and Poor Communities in a Changing Climate: Evidence from Southwest Coastal Bangladesh." Policy Research Working Paper* 7593, *World Bank, Washington*, DC.

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Improving Agricultural Data for Better Policies

By supporting better policies, better agricultural data could improve the lives of poor people, especially in Sub-Saharan Africa

In Sub-Saharan Africa, where most people in extreme poverty live in rural areas and are engaged largely in agricultural activities, the development of agriculture, particularly smallholder agriculture, remains a critical driver of poverty reduction. Yet despite the key role of agriculture, serious weaknesses persist in the measurement of agricultural outcomes and in our understanding of the factors hampering growth in smallholder agriculture.

Past investments and technical assistance in the area of agricultural statistics have failed to produce sustainable systems, and existing statistics continue to suffer from poor quality, lack of relevance, and limited use in national policy dialogues. Further compounding the problem is that the poorest countries often have the poorest data. These countries, for which agriculture can be most critical as a source of livelihood, are least able to direct their limited resources to improving the quality of agricultural statistics.

In a recent paper Carletto, Jolliffe, and Banerjee address the challenge of improving agricultural statistics that come from household surveys. Taking a targeted and selective approach, they investigate a number of issues that are the focus of a recent World Bank initiative, the Living Standards Measurement Study–Integrated Surveys on Agriculture (LSMS-ISA).

Where do agricultural data come from? They generally come from different institutional sources, a situation that typically results in conflicting estimates. Virtually all countries have routine data systems based on resident or local extension officers employed by the ministry of agriculture. A second source of agricultural data is the agricultural census, also usually implemented by the ministry of agriculture, sometimes in collaboration with the national statistics office. Sample surveys such as farm surveys are a third source of agricultural data. These surveys, the backbone of agricultural statistics in Africa, vary greatly in content, frequency, and quality. In many countries farm surveys are often complemented by other types of household surveys that capture some data on agriculture, usually conducted by the national statistics office or by private firms.

What are some of the current problems with agricultural data? Lack of institutional links is a common issue; in many countries the data collected by the ministry of agriculture are underutilized and are not analyzed in conjunction with data available from the national statistics office or from other line ministries. In addition, the data often have limited policy relevance because of their failure to capture a comprehensive set of information on rural households—information that is crucial for understanding the links between agriculture and such aspects of well-being as health, nutrition, and food security.

Methodological standards for measuring agricultural productivity are particularly weak. There are challenges in quantifying both agricultural production and land area. Those in quantifying agricultural production include difficulties in recall for extended-harvest crops, use of nonstandard units, lack of information on the state of the crop, difficulties in valuing own production, lack of adequate price data, and the practice of intercropping, to name a few. Challenges in quantifying land area include known inaccuracies of self-reporting by farmers, current limitations of satellite imagery, and use of nonstandard units. Another is the time-consuming and costly nature of techniques such as traversing (based on the use of compass and tape), often considered the gold standard for measuring land area.

How can we improve the ways that we collect agricultural data, particularly data on agricultural productivity? The LSMS-ISA initiative offers a number of suggestions. Countries could take a tremendous step forward if they were to regularly collect reliable, nationally representative agricultural data through a multitopic, multisector household survey instrument that accounts for differences across individuals within households. Another important improvement would be the construction of comprehensive libraries for all possible nonstandard units in each specific region of a country—something that should be carried out to the extent possible for all countries in Sub-Saharan Africa. And as GPS technology becomes more accurate, affordable, and user-friendly, GPS-based area measurement can provide a practical alternative to self-reporting by farmers. This approach is being increasingly applied in surveys worldwide.

Knowledge gaps in agricultural statistics remain prevalent, and the challenges ahead are daunting. Given the importance of agriculture in promoting growth and poverty reduction, improving the quality, availability, and policy relevance of agricultural data is of paramount importance—particularly for African countries, which lack fundamental information to inform the design of effective policies. Doing so will require a concerted effort by individual countries and stakeholders to develop and implement global standards and best practices in agricultural statistics. A strategy centered on improving methodologies, building capacity, and strengthening institutions could lead to better-informed agricultural policies with the potential to improve the lives of the millions of people involved in the agricultural sector worldwide.

Gero Carletto, Dean Jolliffe, and Raka Banerjee. 2015. "*From Tragedy to Renaissance: Improving Agricultural Data for Better Policies.*" *Policy Research Working Paper* 7150, *World Bank, Washington*, DC.

Enhancing Transparency of Large-Scale Land Acquisition

Reliable data on commercial farms could support policy actions aimed at improving performance and investment levels in the sector

The 2007/08 commodity price boom triggered a global "land rush," with investors seeking to acquire agricultural land in Sub-Saharan Africa. Nearly a decade later, there appears to be agreement on some stylized facts about this phenomenon. One is that weak or fragmented institutions compromised countries' ability to channel this demand toward areas where it would yield the highest returns or to reject nonviable proposals from inexperienced investors. As a consequence, the benefits have been less than were expected and a sizable share of investors either went out of business or failed to fully utilize all the land that was allocated to them.

Another of these stylized facts is that while the demand for land has retreated from the 2008 levels, it is expected to continue, though at levels much lower than those observed at the height of the land rush. Indeed, if guided by a coherent and enforceable policy, responsible agricultural investment could provide countries whose economy depends on agriculture with opportunities to add value and generate local benefits.

To realize these benefits will require policy decisions on a number of issues, including the following: First, where in the value chain—upstream in agroprocessing, in mixed nucleus estate models with outgrowers, or fully own production—investment would be most desirable and what complementary public inputs may encourage such investment. Second, how well land that has been transferred to investors is utilized and, if poorly, what remedial action (for example, canceling licenses) may be needed or appropriate. And third, how performance compares between local producers and outside investors and what this implies for regulating the sector.

Policy decisions on these as well as private investment will require regular access to up-to-date information. Yet few countries have developed the systems to regularly provide the data needed. Even much of the empirical literature is still based on case studies whose representativeness is difficult to establish, often focusing on process rather than on quantification of outcomes. Lack of reliable and regular information will make it difficult to manage investment risks or country risks, enforce laws, and document compliance with global standards so as to attract capable and responsible (institutional) investors.

In a recent paper Ali, Deininger, and Harris explore ways of satisfying such information needs sustainably and effectively. In doing so, they draw on a nationally representative large-farm survey in Ethiopia conducted between 2010/11 and 2013/14. Ethiopia is an interesting case because it has a long tradition of collecting systematic data on the performance of large (state) farms—data that, because of poor quality, were often not reported or whose collection was even intermittently stopped.

Data collected with an improved survey instrument allow the authors to draw interesting conclusions on commercial farming in the country. First, even at the peak of the land rush the vast majority of land transferred to investors in at least partly operational commercial farms went to Ethiopians rather than to foreigners. Second, about 55 percent of the land transferred remains unutilized, with the main constraints to expansion relating to technology and labor. Third, with one permanent job per 20 hectares plus some temporary jobs, commercial farms fail to generate much employment. Finally, for most crops the yields of commercial farms are roughly twice those of smallholders; however, the highest yields are normally obtained by those in the 10- to 20-hectare category, which often also managed to expand their cultivated area quite rapidly.

Beyond providing analytical insights that are of interest in their own right, having reliable data on outcomes by commercial farms can generate feedback loops for policy formulation. In Ethiopia these include a continued impetus to improve the survey instruments used, efforts to better link to existing data (such as on investment licenses and survey plans) that are issued and maintained by the Investment Agency and regional land authorities, and exploration of techniques (such as yield monitoring based on remotely sensed data) that could help complement, cross-check, and eventually even partially replace survey information.

While the descriptive evidence reported in the study only scratches the surface, it provides an interesting basis for future research. For example, the commercial-farm survey could be linked more directly to ongoing data collection efforts in the smallholder sector to look at the interaction between large farms and neighboring smallholders—particularly the potential spillover effects and the channels through which they materialize. Also interesting would be to investigate the determinants of entry and exit for commercial farms and, more generally, the dynamics of firm performance over time.

Daniel Ali, Klaus Deininger, and Anthony Harris. 2015. "Using National Statistics to Increase Transparency of Large Land Acquisition: Evidence from Ethiopia." Policy Research Working Paper 7342, World Bank, Washington, DC.

Explaining the Gender Gap in Agricultural Productivity

Women play a vital part in Ugandan agriculture, yet have much lower productivity than men. What could help close this gap?

Women make up about half the agricultural labor force in Sub-Saharan Africa. But evidence shows that plots managed by women are 20–30 percent less productive on average than those managed by men. This agricultural productivity gap contributes to income inequality between women and men. In some cases the productivity gap is also accompanied by an inefficient over-allocation of inputs to male-managed plots, resulting in large aggregate productivity losses for the agricultural sector.

Estimates from the Food and Agriculture Organization of the United Nations have shown that closing the agricultural productivity gap globally could increase agricultural output in lower-income countries by 2.5–4 percent—enough to reduce the number of people who are undernourished by 12–17 percent, or by 100–150 million. Thus the size of a country's gender gap in agricultural productivity, and the factors that drive it, are of great interest to policy makers.

Using national data from the Uganda National Panel Survey for 2009/10 and 2010, a recent paper by Ali, Bowen, Deininger, and Duponchel estimates the gender gap in agricultural productivity in Uganda. The analysis also unpacks this gap into portions accounted for by differences in household, plot-manager, and parcel characteristics and in returns to these characteristics. Overall, the results show that output per unit of land is 17.5 percent lower on female-cultivated than male-cultivated plots.

Although men have greater access to inputs, input use is so low and inverse returns to plot size so strong in Uganda that smaller female-managed plots have a net endowment advantage of 12 percent, revealing a larger unexplained gap of 29.5 percent. Two-fifths of this unexplained gap is attributed to differential returns to the child dependency ratio and one-fifth to differential returns to transport access. This implies that women's greater child-care responsibilities and their greater difficulty accessing input and output markets from areas without transport are the largest drivers of the gap. Others include differences in the uptake of cash crops and differences in the uptake of and returns to improved seeds and pesticides.

These findings have far-reaching policy implications. One implication is that low-cost interventions designed to ease child-care constraints on female plot managers have the potential to substantially improve equality in the distribution of resources between male and female managers within Ugandan households. Community-based child-care interventions are one possibility, though there is little existing evidence of their efficacy.

Given the disproportionate travel costs faced by female farmers, interventions that bring extension services closer to dwellings, provide access to market information through mobile phones, or provide better access to transport may help close the productivity gap. Another possibility would be to promote use of existing women's groups for commercial purposes, such as collective access to input and output markets.

The use of inputs (improved seeds, chemical fertilizer, and pesticides) is not widespread enough to contribute substantially to the aggregate productivity gap. But the extremely large difference between male and female farmers in the use of physical inputs, and the statistically significant contribution of such inputs to the productivity gap, suggest that programs to encourage their adoption should incorporate elements to ensure equal adoption by male and female farmers. For example, programs could be explored that finance the purchase of inputs through such mechanisms as vouchers, loans, or transfers that are aligned with farmers' cash flow cycle.

Programs designed to encourage women to plant high-value cash crops could also be explored. But such programs should carefully assess the risk that male farmers might claim a stake in plots on which cash crops are planted, resulting in heavy leakage of benefits from female to male farmers. Such programs also should carefully ensure access to adequate output markets before the switch to a new crop and provide complementary inputs and extension services critical to its success.

Female farmers' limited use of hired labor provides weak evidence that they face constraints in hiring workers. Evaluating projects that provide agents to help women farmers find, supervise, and finance payment of hired labor could offer useful insight.

Daniel Ali, Derick Bowen, Klaus Deininger, and Marguerite Duponchel. 2015. "Investigating the Gender Gap in Agricultural Productivity: Evidence from Uganda." Policy Research Working Paper 7262, World Bank, Washington, DC.

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Vulnerability to Climate Change in Coastal Bangladesh

Susmita Dasgupta, Mainul Huq, and David Wheeler. 2015. "Drinking Water Salinity and Infant Mortality in Coastal Bangladesh." Policy Research Working Paper 7200, World Bank, Washington, DC.

Susmita Dasgupta, Farhana Akhter Kamal, Zahirul Huque Khan, Sharifuzzaman Choudhury, and Ainun Nishat. 2014. "River Salinity and Climate Change: Evidence from Coastal Bangladesh." Policy Research Working Paper 6817, World Bank, Washington, DC.

Changing Patterns of Growth and Poverty Reduction in India

As the structure of India's economy has changed, urban growth has become the new engine of poverty reduction in the country

India's economic take-off during the 1990s and early 2000s is now part of the country's economic folklore. After 1991 per capita income grew nearly two and a half times as fast in real terms as in the preceding three and a half decades. During this time poverty also fell more quickly. But did the faster pace of poverty reduction after 1991 simply reflect faster growth, or did poverty become more responsive to growth? And did the changing pattern of India's growth matter?

Datt, Ravallion, and Murgai investigate these questions in a recent paper. The authors begin with the question of whether India's growth has become more pro-poor. One measure of the extent to which growth is pro-poor is the elasticity of poverty reduction to growth—in other words, by how much poverty declines for every 1 percent increase in per capita income or consumption. Thus the question of whether poverty in India has become more responsive to growth can be rephrased as whether the elasticity of poverty reduction to growth has increased.

It turns out that the answer to this question depends to some extent on how growth is measured. If it is measured by mean changes in per capita consumption derived from household surveys, there is strong evidence that growth in the post-1991 period was not only faster but also more pro-poor: the elasticity of the headcount index to growth increased from 1.5 (before 1991) to 2.7 (after 1991). If growth is measured by per capita income or consumption from the national accounts, the evidence still points to a higher elasticity for the headcount index after 1991. For poverty measures that take the depth or severity of poverty into account, the evidence is mixed: higher elasticity of poverty reduction after 1991 holds only if growth is measured using the household surveys, but not if it is measured using the national accounts.

Did the changing pattern of India's growth affect the pace of poverty decline—and if so, in what way? The authors' research shows that during the past two decades the poor gained more from urban than from rural growth, marking a change in the earlier relationship between the pattern of growth and poverty reduction. Before 1991 rural growth largely determined poverty reduction in the country because traditionally the vast majority of poor Indians lived in rural areas and depended on the rural economy for sustenance. While urban growth reduced urban poverty, it contributed little to national poverty reduction.

Since the early 1990s, however, this pattern has undergone a striking change. Urban growth has now emerged as a major driver of national poverty reduction. Since 1991 urban growth has been responsible for about 80 percent of the total decline in poverty. This happened directly, through urban growth having a larger impact on *urban poverty*—but even more important, it also happened indirectly, through urban growth having a substantial impact on *rural poverty*. This indicates that the growth of urban areas, which have both bigger populations and higher productivity, has been good for poverty reduction as a whole in India.

The authors next investigate which sectors have emerged as the primary drivers of India's growth. Before 1991 rural growth, especially in the farm sector, mattered most for poverty reduction. But in recent times it has become more difficult to attribute poverty reduction to any specific sector. Since 1991 all sectors have contributed to reducing poverty. Indeed, with the greater integration of the Indian economy, growth in one sector has begun to transmit gains elsewhere to a greater extent than before, and the imbalance in the growth process has ceased to matter.

Because the primary sector (mainly agriculture) has declined in size, its overall contribution to the decline in poverty has also dwindled. Whereas before 1991 the primary sector accounted for about two-fifths of the total decline in poverty, after 1991 its contribution fell to less than 10 percent of the total—and larger—decline in poverty.

At the same time, the contribution of the other sectors to poverty reduction has risen substantially. While growth in the secondary sector (mainly manufacturing and construction) accounted for about 25 percent of the fall in poverty after 1991, the tertiary sector alone (mainly services) contributed more than 60 percent of the decline. Since 2000 India's construction boom—which has made intensive use of low-skilled labor—has helped secondary sector growth become more pro-poor.

In short, the Indian economy is changing, and so is the relationship between economic growth and poverty reduction in the country. The process of structural transformation of the economy has intensified, displacing the traditional sources of both economic growth and poverty reduction. As this process continues, the country can be expected to increasingly turn to growth in its urban and nonagricultural sector to drive future poverty reduction.

Gaurav Datt, Martin Ravallion, and Rinku Murgai. 2016. "Growth, Urbanization, and Poverty Reduction in India." Policy Research Working Paper 7568, World Bank, Washington, DC.

Land Market Restrictions and Rural Labor Markets

Restricting land sales can slow the shift of labor out of agriculture, reduce rural wages, and increase women's labor force participation

Many developing countries impose restrictions on sales and rentals of agricultural land. One rationale for doing so is to promote own farming: self-farming is considered conducive to increasing agricultural productivity, since the owner of a farm has a self-interest in conserving the quality of the land and investing in its improvement. Another rationale is to guard against landlessness—reflecting a concern that in the face of income and consumption shocks, poorer farmers may be forced to sell their land at unfavorable prices, depriving them of their most valuable asset.

Emran and Shilpi examine the longer-term consequences of land market restrictions on rural labor markets in two recent papers. The authors address two main questions: Do land market restrictions affect the structural transformation from agriculture to nonagriculture (manufacturing and services) in rural areas? And how do these restrictions affect rural labor market outcomes for women? Both issues have important bearings on economic welfare and development. Recent studies have found that labor productivity is significantly higher in nonagricultural activities than in agriculture and concluded that a structural transformation from agriculture to nonagriculture is desirable for economic growth and poverty reduction. If land market restrictions tie the rural labor force, particularly women, to low-paid agricultural jobs, they may lead to adverse poverty outcomes—contrary to their policy objectives.

Many economic studies show that land market restrictions can affect economic outcomes through their effects on the insecurity of property rights and the collateral value of land. The papers by Emran and Shilpi focus on a different mechanism: an increase in the costs of migration out of villages due to inability to sell the land. The increase in migration costs results from the fact that a household loses its income stream from the land when it decides to leave the village. The papers develop theoretical models to investigate the effects of increasing migration costs arising from land market restrictions on structural shifts from agriculture to nonagriculture and on female labor force participation and wages.

In the case of the structural transformation of rural employment, the theoretical model finds that land market restrictions reduce rural-urban migration and increase the employment share of agriculture—under the assumptions that agriculture is more labor intensive than nonagriculture and that demand for locally produced nonfarm goods and services is income inelastic. Under these two assumptions, sales restrictions in land markets may result in a "reverse structural change" in the rural economy, with the labor share in agriculture increasing in response to the restrictions.

In the case of female labor force participation, the theoretical model shows that women face higher migration costs than men because of their higher productivity in the provision of home goods (child and family care). As a consequence, female participation in the village labor force can increase as a result of land market restrictions.

Considering other channels through which land market restrictions work, the authors argue that the "reverse structural change" can also occur if the restrictions destroy the collateral value of land and thus act as impediments to entrepreneurship in nonagricultural activities. How lower collateral value affects female labor force participation depends on the substitutability of labor and capital. If land market restrictions lead to insecurity of property rights, they can decrease female labor force participation, though the effects on employment transformation are ambiguous.

Both theoretical models indicate a way to discriminate among different channels. If labor is mobile, rural wages will remain largely unaffected by land market restrictions if either collateral value or insecurity of property rights is the main channel of causation. In contrast, wages will be lower in areas with a higher proportion of land under restrictions if migration costs are the primary channel through which the restrictions affect the rural labor market and the structural transformation of employment.

To provide empirical evidence on the effects of land market restrictions, Emran and Shilpi take advantage of a historical natural experiment in Sri Lanka, where malaria played a unique role in land policy during precolonial times. After people fled malaria-afflicted areas, the government took ownership of abandoned land under the Crown Lands Ordinance of 1840. After Sri Lanka's independence in 1948, these lands were distributed among households under settlement programs following the imposition of sales and rental restrictions. The identification strategy relies on the fact that malaria was eradicated from Sri Lanka by 1951 and that eradication was made possible by an exogenous breakthrough in technology (the introduction of the pesticide DDT). Both papers thus rely on the incidence of malaria more than half a century ago to identify the effects of land market restrictions. The strength of the identification scheme also derives from the fact that, unlike China and Vietnam, Sri Lanka imposes no formal restriction on the geographic mobility of households.

The empirical results show that land market restrictions significantly reduce the probability of participation in nonagricultural activities: starting from its mean value, a one percentage point increase in the share of land under restrictions reduces this probability by 1.38 percent. At a more disaggregate level, the adverse effects are more pronounced for employment

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Deforestation Prevention Programs and Community-Managed Forestry

Evidence from Nepal suggests that community-managed forests can be an effective part of deforestation prevention programs like REDD+

Most deforestation today is occurring in developing countries. But the consequences are global, with forest degradation accounting for 11–20 percent of annual greenhouse gas emissions. Curbing deforestation and forest degradation is believed to be a highly cost-effective way to address climate change and also support adaptation. One approach aimed at reducing deforestation and forest degradation in developing countries is to provide payments for ecosystem services—such as through the REDD+ (Reducing Emissions from Deforestation and Forest Degradation) program created under the United Nations Framework Convention on Climate Change. In addition to sequestering carbon, REDD+ may bring important benefits to developing country households and communities through poverty reduction.

About 18 percent of forests worldwide, and 25 percent of those in developing countries, are controlled by communities either by law or in practice, and this share is rapidly increasing with ongoing forest decentralization. The effectiveness of programs like REDD+ in preventing deforestation is linked to their adoption by communities with community-controlled forests. For these communities, the decision to accept REDD+ contracts depends on incentives, benefit-sharing arrangements, the opportunity costs of carbon sequestration, the allocation of forest management decision-making rights, and community interactions.

Yet there is limited evidence-based knowledge about community and household preferences and the opportunity costs of carbon sequestration in developing countries in the context of community-managed forests for initiatives such as the REDD+ program. Very basic knowledge is needed even about how such contracts should be structured. For example, would community members prefer that REDD+ payments go to forest user groups for community projects or to households? What direct-use ecosystem services are most costly for villagers to give up? And how does community-level enforcement affect acceptance of REDD+ contracts?

In a recent study Dissanayake and nine coauthors attempted to fill the gaps in knowledge through a choice experiment carried out in rural Nepalese communities. The goal of this experiment was to understand respondents' preferences on the institutional structure of REDD+ contracts. Specific objectives included identifying household preferences on the attributes of REDD+ contracts, estimating the opportunity costs faced by households when participating in REDD+, and evaluating the impact of belonging to legally sanctioned community-managed forest groups on these preferences and opportunity costs. To address the last objective, the study split the sample into households that are members of the legally recognized Nepal Community Forestry Program (CF) and those that are not part of that program (non-CF).

In both CF and non-CF communities the study found that households prefer higher REDD+ payments and would rather not take on REDD+ obligations or reduce firewood collection and grazing without adequate compensation. On the key policy question of how to divide up REDD+ payments, the study found that respondents prefer that more of the payments go to communities rather than to households. This result indicates a high degree of trust in forest user group communities, mirroring the study's focus group findings. As REDD+ contract requirements become more stringent, respondents would like to be sure that their households receive more direct benefits in exchange for those sacrifices.

The study found that community dynamics play a very important part in the adoption of REDD+ contracts. For example, CF households that believe they have equitable access to their CF community forest funds are more likely to accept REDD+ contracts. But respondents are less likely to accept REDD+ contracts if they believe that village authorities engage in more forest monitoring (in contrast to outside enforcement) and if they think that those authorities do not appropriately enforce CF rules and regulations. These results suggest that good governance—including ensuring equitable access to CF funds, preventing the misuse of funds, and ensuring proper monitoring of forests—can support the REDD+ program by reducing costs.

Using the results, the study calculated the opportunity costs of the REDD+ contract obligations. It estimated the costs per ton of carbon at $24.20 for CF communities and $17.90 for non-CF communities. These estimates are consistent with findings in the current literature that the opportunity cost of carbon sequestration in community forests is low compared with other abatement options. But the estimates are higher than many of the other estimates for the avoided costs of deforestation, which are typically based on engineering or land use models and do not account for community- and household-level opportunity costs.

The study shows that community-controlled forests, at least in Nepal, can be an effective part of the REDD+ program. When implementing the contracts, however, it is vital to account for proper enforcement and governance. Most important, given the relatively high opportunity costs, REDD+ deals may need to be more remunerative than previously envisioned.

Sahan T. M. Dissanayake, Prakash Jha, Bhim Adhikari, Rajesh Bista, Randall Bluffstone, Harisharan Luintel, Peter Martinsson, Naya Sharma Paudel, E. Somanathan, and Michael Toman. 2015. "*Community Managed Forest Groups and Preferences for* REDD+ *Contract Attributes*: A *Choice Experiment Survey of Communities in Nepal.*" *Policy Research Working Paper* 7326, *World Bank, Washington*, DC.

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Changes in Poverty and Female-Headed Households in Africa

So what has happened to the living standards of female-headed households in the aggregate? The authors examine this question by calculating country-specific changes in the headcount index of poverty based on real household per capita consumption expenditures, in 2005 dollars adjusted for purchasing power parity, separately for male- and female-headed households. Spells of comparable survey pairs for the same country allow this to be done for 27 spells and 24 countries that account for about 80 percent of Africa's current population.

The results show that poverty declined for both groups of households, but in most countries it fell faster for female-headed households. This is also true when one allows for the diversity among female-headed households—for example, comparing households with widowed and nonwidowed heads, married heads with and without a male adult household member, and the same for nonmarried heads. And the finding that poverty is falling faster for female-headed households is robust to allowing for the generally smaller size of such households and economies of scale in consumption.

The living standards of the different types of female-headed households followed dissimilar paths across countries and periods with no one type consistently outperforming the others, yet with at least one type usually outperforming male-headed households. There is little discernible pattern across countries. One category of female-headed households does well in one country or period while another category does best elsewhere.

A decomposition of the change in poverty indicates that rather than putting a brake on poverty reduction, female-headed households are contributing appreciably to the overall decline in poverty despite their smaller overall share in the population.

But why has poverty fallen faster for female-headed households? Perhaps poor female-headed households face relatively high economic returns to the new opportunities unleashed by growth. Perhaps they have benefited disproportionately from the expansion of social protection in Africa. Or perhaps the group of people living in female-headed households is fundamentally changing over time. A superficial examination does not support any of these explanations, but this new stylized fact about poverty in Africa warrants a closer look.

Annamaria Milazzo and Dominique van de Walle. 2015. "Women Left Behind? Poverty and Headship in Africa." Policy Research Working Paper 7331, World Bank, Washington, DC.

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Land Market Restrictions and Rural Labor Markets

in manufacturing and services, with a particularly large negative effect for services. An increase in the land under restrictions has a positive effect on the probability of being employed in agricultural wage work, but no effect on the probability of being self-employed in nonagricultural activities. Land market restrictions thus hold back the structural change from agricultural to nonagricultural employment in a rural economy.

In investigating the effects on labor market outcomes for women, Emran and Shilpi find that their labor force participation increases in response to land market restrictions: a one percentage point increase in the share of land under restrictions leads to about a 2.3 percent increase in women's labor force participation. But this same increase in the land under restrictions leads to a 1.7 percent decrease in the female wage. The results also suggest a greater burden of land market restrictions on older women and a much smaller effect on men.

Emran and Shilpi also estimate the effect of land market restrictions on overall wages (for both men and women) and per capita household consumption. The results show significant negative effects on both. A one percentage point increase in the share of land under restrictions reduces per capita consumption in a village by 0.084 percent. Overall, the evidence on wages in both papers indicates that the effects of land market restrictions work primarily through the migration cost channel.

While concerns about agricultural productivity and poverty among farmers often underlie the restrictions imposed on land sales and rentals, the studies by Emran and Shilpi show that by increasing migration costs, these restrictions can impose significant costs in rural areas—both through slower transformation from agricultural to nonagricultural activities and through lower wages and lower per capita consumption. The burden of the restrictions falls disproportionately on older women who take up the work left behind by men and younger women. These longer-term costs should be weighed against possible benefits before imposing restrictions on land sales and rentals.

M. Shahe Emran and Forhad Shilpi. 2015. "Do Land Market Restrictions Hinder Structural Change in a Rural Economy? Evidence from Sri Lanka." Policy Research Working Paper 7525, World Bank, Washington, DC.

———. 2015. "Land Market Restrictions, Women's Labor Force Participation, and Wages in a Rural Economy." Policy Research Working Paper 7524, World Bank, Washington, DC.

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