

AGRICULTURE IN AFRICA TODAY - TELLING FACTS FROM MYTHS

REVISITING THE BASICS ABOUT AGRICULTURAL INPUT USE IN AFRICA

Conventional wisdom holds that Sub-Saharan African farmers use few modern inputs, namely improved seed, fertilizers and other agro-chemicals, machinery, and irrigation. Yet, following several years of high food prices, concerted policy efforts to intensify fertilizer and hybrid seed use, and increased public and private investment in agriculture, how low is modern input use in Africa really? A new paper by Megan Sheahan and Christopher B. Barrett revisits claims made about Africa’s agricultural input landscape by exploiting the unique, nationally representative, agriculturally intensive, and cross-country comparable Living Standard Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA) covering six countries in the region (Ethiopia, Malawi, Niger, Nigeria, Tanzania, and Uganda). Using data from over 22,000 households and 62,000 plots, the authors present ten new or newly verified facts about modern input use.

**1** While many African smallholders still use rudimentary technologies on farms, modern agricultural input use, particularly of inorganic fertilizer and agro-chemicals, has picked up to a significant level in some countries. Over three-quarters of all cultivating households in Malawi, half in Ethiopia, and around 40 percent in Nigeria, use inorganic fertilizer with average application rates well above FAO’s widely quoted 13 kg/ha statistic. Further, over 30 percent of households in Ethiopia and Nigeria use agro-chemicals like pesticides and herbicides.

**2** The prevalence of irrigation and tractor use is negligible. One to three percent of land cultivated by smallholders is under irrigation, and no more than 10 percent of households have any form of water control on agricultural plots. Tractor ownership is similarly miniscule, although tractor and oxen utilization in Ethiopia, Niger, and Nigeria is not as insignificant, implying that community rental or sharing schemes help to facilitate mechanization.

**3** Within-country input use patterns vary strikingly across sub-national regions, agro-ecological zones, and underlying soil types, as well as according to the characteristics of individual

households and plots.

**4** Even when households use several modern agricultural inputs on the farm (such as inorganic fertilizer, modern inputs, and water control), which does not happen very often to begin with, they rarely concentrate them all on single plots, thereby foregoing important agronomic and biophysical synergies. This behavior has gone largely unstudied and raises important questions about untapped productivity gains from coordinated modern inputs use.

**5** Modern input use rates are generally higher on plots where maize is the dominant crop, suggesting more widespread participation by maize farmers in modern input systems than has been widely recognized. Average fertilizer application rates are higher on plots where maize is grown than on ones where it is not. Twenty-five to forty percent of maize cultivating households purchased new maize seeds in the last main agricultural season, while nearly one-quarter of maize cultivating households in Ethiopia and over half in Malawi used improved varieties.

**6** There exists a consistent inverse relationship between farm and plot size and input use intensity. The fact that

this relationship is, in most cases, even more exaggerated at the plot level, means that household-level factors like the household-specific price of inputs and outputs, distance to market, etc., cannot explain the relationship, raising novel puzzles about farmers’ behaviors that have yet to draw much research attention.

**7** Plots considered ‘average’ or ‘poor’ in quality by respondents are more likely to receive inorganic fertilizer applications than are plots categorized as ‘good’ quality; however, these variables explain only a tiny amount of within-household fertilizer allocation decisions, and this relationship does not hold over self-reported erosion status. This surprising finding may signal a knowledge gap among farmers and raise important questions about the accuracy and drivers of farmer perceptions about soil quality.

**8** In all countries, except Ethiopia, less than one percent of cultivating households used credit — either formal or informal — to purchase these inputs, corroborating evidence about the weakness of agriculture input credit markets in the region. Much scope remains for deepening rural financial markets, despite recent advances in money transfer systems based on mobile phone platforms, the proliferation of microfinance institutions, etc.

**9** Male-headed households apply, use, and own more modern agricultural inputs than do female-headed ones. Similarly, plots owned or managed by women, who control less than a quarter of all cultivated plots, are less likely to receive modern agricultural inputs and use lesser amounts when applied. These gender differences, both among and within households, merit more attention as they may lead to needless productivity losses and food insecurity.

**10** Most of the variation in binary use decisions of inorganic fertilizer and agro-chemical use comes from the country level even after controlling for a range

of important household-level and agro-ecological variables. This is an especially striking finding that signals the importance of the policy environment and underscores the significance of processes such as the Comprehensive Africa Agriculture Development Programme.

Sheahan, M., & Barrett, C. B. (2014). "Understanding the Agricultural Input Landscape in Sub-Saharan Africa: Recent Plot, Household, and Community-Level Evidence." World Bank Policy Research Paper 7014. Washington, DC: World Bank.

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## DETERMINANTS OF HOUSEHOLD ROAD TRAVEL DEMAND: EVIDENCE FROM KAMPALA

A study on urban travel in Kampala conducted by Visiting Fellow, Susan Watundu, indicates an expected increase in future travel demand and observes that solutions from both the supply and demand side are required for sustainable travel demand management.

Road transport is the major travel mode used in Uganda, carrying over 90 percent of the transit and traffic in the country, and 99 percent of the traffic in Kampala city. Unbearable levels of road traffic congestion have been observed on Kampala's streets. Whereas road traffic congestion may be attributed to increased development in Kampala and, in turn, increased rural-urban migration, it still remains a negative externality that is undesirable. Time lost from long and frequent traffic jams results in high economic costs in terms of lost productivity in all sectors. Other effects include pollution, high fuel consumption, and fatigue to drivers, a direct cost of wear and tear (and a cause of unnecessary accidents).

Though it is clear that traffic congestion arises from an imbalance between supply and demand of road infrastructure, previous studies emphasize that for long-term solutions and in situations of limited supply, sustainable demand management policies are required; hence the need to understand travel demand via the link between social dynamics and mobility. Thus far, the solutions provided are all from the supply side. They include construction of the Northern Bypass to divert upcountry traffic that would pass through the city center; reorganizing the road network by creating one way routes; traffic control signals at junctions; and the introduction of buses on some major routes. This study explores the demand-side, assessing the determinants of household road travel demand in Kampala, using survey data.

Results indicate a significant influence

of structural and demographic factors on travel. Travel demand is inversely related to the cost of travel and, in terms of trip volume, becomes more elastic at higher trip costs. Likewise, demand for travel in terms of distance travelled becomes more elastic with an increase in cost per kilometer travelled. This explains why most households in Kampala stay closer to the city center (irrespective of household size).

As expected, travel demand is positively related to average monthly income. Although one might expect that effect to depend on the employment sector of the household head, the study results indicate no significant difference between sectors. In fact, households whose heads are in the public sector travel more compared to those in the private sector, possibly because public sector employees have an obligation to appear for work while the informal nature of much of the private sector may require less car travel.

Trip volumes increase and the average daily distance travelled decreases with household size, that is, many shorter trips are taken for larger households. Despite the ambiguity of the effect of age in previous studies, this study finds higher trip volumes with older household heads. This may be due to the fact that most heads in urban centers are still in the active age group that is in search of improved economic opportunities. With age come more family responsibilities, given societal norms, which include the care of extended family members. However, distance travelled by a household is inversely related to age, which conforms to other studies that find