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The Political Economy of Agricultural Statistics: Evidence from India, Nigeria and Malawi

Morten Jerven



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School for International Studies
Simon Fraser University
Suite 7200 - 515 West Hastings Street
Vancouver, BC Canada V6B 5K3



The Political Economy of Agricultural Statistics: Evidence from India, Nigeria and Malawi

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Abstract:

The political economy of agricultural policies – why certain interventions may be preferred by political leaders rather than others – is well recognized. This paper explores a perspective previously neglected: the political economy of the production of agricultural output data. In developing economies the data on agricultural production are weak. Because these data are assembled using competing methods and assumptions, the final series are subject to political pressure. This paper draws on debates on the evidence of a Green Revolution in India, the arguments on effect of withdrawing fertilizer subsidies during Structural Adjustment in Nigeria, and finally the paper presents new data on the effect of crop data subsidies in Malawi. The recent agricultural census (2006/2007) indicates a maize output of 2.1 million tonnes, compared to the previously widely circulated figures of 3.4 million tonnes. The paper suggests that ‘data’ are themselves a product of agricultural policies.

About the author:

Morten Jerven is an economic historian (PhD, LSE 2008) and Assistant Professor of International Studies at Simon Fraser University. His current research, funded by the Social Sciences and Humanities Research Council of Canada, aims to assess the quality of growth data in 11 African countries and to construct a reliable basis to evaluate and interpret long term economic change. Jerven has published in *African Affairs*, *Journal of International Development*, *Journal of Development Studies*, *Economic History of Developing Regions* and *Journal of South African Studies*.

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The Political Economy of Agricultural Statistics: Evidence from India, Nigeria and Malawi

Introduction

One of the most basic questions in development studies is how to raise the productivity of poor rural populations. One straightforward answer has been to provide agricultural inputs and thereby increase agricultural yields, and historically, this has been a popular response. Thus governments of poor (as well as rich) countries have tended to subsidize agricultural inputs such as seeds and fertilizers. The central issue is whether and how these policies work. This has been debated fiercely, and the recent scholarly debate on fertilizers and the use of subsidies to provide them seems symptomatic of the cyclical nature of development ideas (Easterly, 2009: 416). Subsidies were an integral part of the state-led development push in the 1960s and 1970s, but were then scaled down as part of a larger trend of cuts in state spending during the structural adjustment programmes of the 1980s and 1990s. Now, however, subsidies are back on the agenda once again.¹

The theoretical justifications for a fertilizer subsidy remain the same: either variations on the ‘market failure’ argument as taken from microeconomics, or those taken from the classics of development economics, such as the ‘vicious circle of underdevelopment’ (Nurkse: 1953).² The essence of the argument is very similar. There is a potential high return on investment in fertilizer, but this potential is not met because of capital shortage. Low initial capital thus results in underinvestment in agriculture. In turn, this may provide justification for government intervention and/or official development assistance.

The debate over the merits of state intervention in providing agricultural inputs such as fertilizers to increase agricultural yield is often portrayed as bifurcated between those who side with Jeffrey Sachs and his ‘big push approach’ and those who share William Easterly’s

¹ For policy prescriptions on how to break the ‘poverty trap’ in Malawi with interventions such as fertilizer subsidy, see Conroy, Blackie, Whiteside, Malewezi and Sachs (2006).

² Now frequently referred to as ‘poverty traps’ as in for instance (Collier 2007).

scepticism of top-down, aid-financed development schemes. As noted, Easterly proposes that these debates are re-occurring in a pendulum-like fashion (Easterly 2009). Academic debates are not driven purely by policy agendas and fashions; empirics and evidence do sometimes come into play. However, these empirics themselves are at times conflicting.

This paper focuses on these empirics and their attendant conflicts: what do we know about the effects of state intervention in providing agricultural inputs? This question is best addressed by looking at the agricultural output data. Not by a technical comparison of inputs on one side and outputs on the other, but by acknowledging that the data on output are themselves constructions that are subject to political influence.

Recently, Malawi has taken a central role in this public debate. Many scholars have commended the decision of the Malawian government to oppose the World Bank and re-introduce fertilizer subsidies, and often point to its subsequent success in overcoming food shortages since 2005. However, as this paper shows, there remain significant discrepancies in the measurement of the real extent of this success.

The results from the most recent agricultural census, published in 2010, indicate that the maize crop output for 2006/2007 was 2.1 million metric tonnes. This compares with the previously reported 3.4 million metric tonnes, thus implying that the total output of the main food crop in Malawi was only 60 percent of what was previously thought. This remarkable discrepancy provides the motivation for the paper: how should we evaluate agricultural politics in developing economies? It is argued that in order to get an answer to that question, one has to first ask where these data come from and how good they are. Previous debates on the virtue of subsidizing fertilizers and the role of evidence in these debates are illuminating. We also know a lot about the political economy of policy interventions (Bates 1981). This paper offers a perspective on the political economy of data about the agricultural economy. When creating datasets the same principle applies: *Cui bono?*

For some, the lack of reliable evidence is a problem. For governments however, it also provides an opportunity to ensure that the evidence that does exist supports their policies! Statisticians are vulnerable to this pressure because the data basis itself is weak, thus making it

impossible for any statistician to claim that the data speak for themselves. Any data series covering developing countries rests on questionable assumptions, especially those regarding food production. A suggested solution to this problem has been the use of randomized trials, thus countering what Banerjee calls “the resistance to knowledge” (2007: 16).

The issue of fertilizer subsidies has been subject to such randomized trials by Duflo *et al.* (2008). Set in Kenya, the study conducted some demonstration experiments in which treatment and control plots were randomly selected. Unsurprisingly, it was found that “fertilizer, when used in appropriate quantities, is highly profitable” (Duflo *et al.*, 2008: 487). Thus this study gives a valuable answer to the debate referred to above, with the central question: is use of fertilizer profitable? In turn, the answer to this question can guide us in judging whether a fertilizer subsidy is justified or necessary, or even point us to how much one should subsidize.

These well promoted, randomized laboratory-like studies reveal no understanding of how the political dimensions of provision affect agricultural production in the aggregate or how the returns to fertilizer are distributed. It is useful to know whether the fertilizer package works or not, and to have an idea about the returns to such investments. However, it is argued here that the central issue is how the political system will respond to and manage a fertilizer subsidy programme. Studying these issues in laboratory-like experiments may misguide scholars and policymakers – arguably it is the differences not the similarities between the political economy and the laboratories that are most important. This article provides a study of how the statistical systems in India, Nigeria and Malawi respond to agricultural input policies. The manner in which the governments have manipulated the process shows how messy the real world is – and the paper makes the argument that it is precisely these lessons that we need to be most keenly aware of when agricultural input subsidies are discussed.

The Politicization of Agricultural Data: Case Studies

The argument put forward here is that the state provision of subsidies and inputs is embedded in political economies marked by weak evidence across locations but where political priorities vary. Given the weakness of the evidence, there is ample room for a negotiation of the agricultural data. Pressures from above to ‘cheat’ are strong if politicians need to justify their

policies. The causation does not only run from top to bottom. The very existence of subsidies, particularly in the form of per capita vouchers, does provide an incentive for the agricultural sector to expand spontaneously. It is in the interest of peasants and agricultural extension officers to 'increase' the numbers of farming households, not only to please superiors, but also because the vouchers themselves have a market value. The case studies presented here display these different dynamics at work. In the case of India in the early 1960s and 1970s, political pressure was applied to ensure that the Green Revolution was visible in aggregate output statistics. In Nigeria during the period of structural adjustment, policy choice was confused because of the existence of competing datasets regarding trends in agricultural yields. The example from Malawi shows how the re-introduction of agricultural subsidies from 2005 onwards created a perpetual political demand for high growth rates, which was spontaneously met by peasants who oversubscribed to fertilizer vouchers.

India: Green Revolution

Discussions of the prospect of a Green Revolution in Sub-Saharan Africa invariably make reference to the experience of India and South Asia from the late 1960s (Hunt and Lipton: 2011).³ Their focus is on the potential of replication, and on which lessons from India are transferrable to African agricultural economies. One aspect that has not received much attention is the importance of agricultural statistics and the politicization that necessarily follows their provision. From the case of India, some general lessons can be taken regarding the political importance of yield numbers, and in particular, the difficulty of independent monitoring.

The scholarship and research on agricultural data from India is far more comprehensive and sophisticated in comparison with most other developing economies. While data on food production from Sub-Saharan Africa are either lacking (for the colonial period) or dismissed as too weak and/or unreliable (for the post-colonial period), the issue of trends in Indian agricultural production has been the subject of intense research and debate (for both the pre-colonial and

³ For a basic introduction to the various phenomena under the label Green Revolution, see Vaidyanathan (2010).

colonial periods).⁴ This may reflect a higher technocratic competency in India and the relative strength of that country's agricultural economics and statistics disciplines. The higher availability of data in India is also due to the relative importance of land taxation in the country, an institution that historically has been much weaker in Sub-Saharan Africa. This comparatively healthy situation has resulted in vigorous debate, and some aspects and findings from such debates will be drawn upon here.

In an article written for a special issue of the *Journal of Development Economics* concerning the reliability of economic statistics and the data base for development, Srinivasan draws on examples from India and stresses that these relatively favourable characteristics still do not guarantee reliable data series for agricultural production. Since India's independence, such data series result from a process in which first "the land revenue authority completely enumerates agricultural plots" in all states with the exception of three (1994: 6). This provides a basic multiplier needed to aggregate the final estimates. In order to reach annual totals of production for different crops, the area devoted to each crop in each season is multiplied with the average yields for that crop in the area. In order to determine these important components, 'eye-estimation' or harvest sample surveys are used. "Over time 'eye-estimation' has largely been replaced by sample survey of plot harvests for many of the crops. Replacement is nearly complete for many crops but eye estimation is still the rule for many of the crops" (1994: 6). It is also noted that the data from the resulting official series do not match those reported by traders. In conclusion, Srinivasan argues that "the coverage and reliability of the data have been changing in an unknown fashion over time" (1994: 6). Some of the resulting data series can be cross-checked with other data:

In the fifties there were three estimates of the production of food crops: the official estimate based on complete enumeration of area (except for three states) and a combination of sample harvests and eye-estimates for yield per unit area; National Sample Survey (NSS) estimates based on sample survey for crop area as well as yields; and an indirect estimate derived from the NSS surveys of household consumption (1994: 23).

⁴ The classic study of colonial output trends was provided by Blyn (1966). For a review of some the debates surrounding the data series, see for example Tomlinson (1993, p. 33-91).

These three series disagreed over levels and trends, and these discrepancies were discussed in official committees. However, neither the sources of disagreement nor the direction of bias were agreed upon. Consequently, the final, rather arbitrary decision held that there should be only one series, and that this one series should rely entirely on the total enumeration multiplied by observations of acreage and yields from samples and eye-estimates.

In a series of volumes published in the early 1970s, entitled *Data Base of Indian Economy*, the role of political pressure in the provision of final output estimates is more directly commented upon.⁵ In a study of agricultural statistics, it was noted that since 1967-68, “there seems to have been an attempt on the part of the Ministry of Agriculture to vet the final estimates as given by the States before publishing the all India figures” (Srinivasan and Vaidyanathan, 1972: 49). Furthermore, it was argued that these attempts went beyond any adjustments made with the goal of reaching reliable estimates, and were instead made “to arrive at an estimate by negotiation on the basis of what are essentially preconceptions as to the impact of increased absorption of various inputs including high yielding varieties, is on much shakier ground” (Srinivasan and Vaidyanathan, 1972: 49).

In their conclusion, Srinivasan and Vaidyanathan questioned whether the data series had any bearings on the formulation of agricultural policy: “For instance, had the final estimates of food grains output in 1970-71 been different by, say, 5 million tonnes in what way the short term policy would have been different?” (1972: 55). It seems, however, that causality ran the other way. In a section recording the discussion on agricultural statistics it was noted that Minhas and Srinivasan “were critical of the manner in which the production estimates forwarded by the States were amended by the Ministry of Agriculture for the years 1966-67 to 1969-70 and wanted to know if there was any sound basis for doing so” (1972: 62). Responding directly to this question, Sarma explained that “there was an underestimation judged from the indirect evidence available with the Ministry on a number of related items.” Among these items were data

⁵ The initiative to the volume is explained by C. R. Rao in the foreword, who said it was put together after an econometric conference on ‘war on poverty’ held in Hyderabad in 1972 where participants “were extremely critical of certain official statistics” and it had been argued that “any economic analysis based on such defective data may be misleading” (Rao, 1972, foreword).

demonstrating an increased usage of improved seeds, fertilizer, irrigation, and improved practices (1972: 64-65).

The debate did not end there. As Baker recounted, the controversy over the Green Revolution in India focused not only on the distributional consequences in the rural sector, but also on the “contention that the Green Revolution never happened” (1984: 37). One can debate whether there really was evidence of a “dramatic shift in trend around the magic year of 1966-67”,⁶ but if timing remains an issue, in the long term there is no doubt that the aggregate yields in Indian agriculture did eventually increase. The official statistics on land yields do show that they have increased, as one would expect, resulting from increased capital and labour inputs to land.⁷

A revolution would imply a sudden spurt of growth, but if such an event is visible in the growth statistics it was the result of official tampering.⁸ Chambers noted that, in hindsight, it was a mistake to believe that the high yielding varieties could have caused such dramatic rises in output, but that this belief was sustained by misleading statistics. He argued that agricultural extension officers were given ambitious targets and “reported these [targets as] achieved when the reality lagged far behind”. He also provided sources showing that the official statistics for some areas with high-yielding varieties were overstated by 3 to 5 times (1984: 362). This indicates that the production of official statistics on output, as established by the Ministry of Agriculture, was carried on in such a way as to reflect its own exaggerated statistics on uses of inputs. Thus, the Green Revolution was not only overstated in statistics, it was artificially created before it really happened.

⁶ For a detailed discussion of the fiercely contested rate of growth in the period leading up to this ‘magic year’ see Rudra (1982, ch. 11).

⁷ For a view on how the official long term land yield statistics look, see for instance Basu and Maertens (2010, pp. 596–597).

⁸ One of the more famous revisions of statistics that undermined the label of ‘revolution’ was done by Crafts who showed that, contrary to previous, misleading time series, the first industrial revolution in England in the 17th and 18th century was in fact slow, and not explosive as previously thought (2004). Incidentally, the same logic applies for both high yielding varieties and steam engines; the adaptation was slow and the aggregate growth rate will react very slowly because of the dominance of the economy where new technology has not yet been adopted.

Nigeria: Structural Adjustment

In 1985 Nigeria agreed to undertake structural adjustment programmes. Important components in the package included the removal of fertilizer subsidies and the liberalization of agricultural marketing. The former was reversed when it was claimed that fertilizer was too expensive and that agricultural growth was falling as a result. In an article called 'Policy Making without Facts', Mosley describes the conflicting stories about agricultural growth during this critical period, with explicit reference to the different datasets (1992).⁹ It was reported that there were four sources of data on food crops, but that they frequently showed enormous discrepancies. Data were provided by the Federal Office of Statistics (FOS), the United States Department of Agriculture, the FAO and the Central Bank of Nigeria. Only the first series was derived directly from field surveys. The datasets from the Central Bank were arrived at by adjusting the estimates from the Office of Statistics with additional information made available by the Ministry of Agriculture for food crops, while the data concerning commercial crops were scaled up by 30 percent in order to allow for parallel marketing.

The FAO and USDA series are both indirect estimates which take into account estimated trends in consumption and imports, yielding production as a residual. Not being firmly based on observed production, they both convey an implausible impression of stability; but they may offer a better guide to the long-term trend of production than the field-based series (Mosley, 1992: 240).

Mosley also compared the datasets. According to the data approved by the Federal Office of Statistics, which were based on field surveys, there was negative growth in food production after structural adjustment programmes. The other dataset, approved by the FAO and the Central Bank of Nigeria, showed very rapid growth in food production. The policy implications of these two different datasets were completely opposite: the first implied that structural adjustment policies did not work, while the second implied that they were indeed effective. The problem was further compounded by the fact that both conclusions could make economic sense through two different interpretations. One could plausibly argue that a liberalization of internal food prices, together with less competition from imports, led to a positive supply response. Another

⁹ The title is a reference to Stolper's book on development planning in Nigeria following independence (1966).

equally plausible interpretation would be that the removal of fertilizer subsidies caused a negative production response.

Mosley describes how some of the structural adjustment reforms were reversed shortly after they were introduced. In both cases, it was data that formed the basis of the decisions that were made. Mosley argued that the data from Federal Office of Statistics were most likely to be the more reliable, since they were based on field surveys and physical data (1992: 240). Four years earlier, in 1988, Collier had examined available datasets on food production in Nigeria. He noted that in the 1970s and 1980s “a combination of complex events and weak data” had yielded incompatible analyses (1988: 762). In his examination the series based on assumed relationships between food production, income and imports was preferred.

The Nigerian case is instructive in that there was a clear-cut policy choice: to remove or keep fertilizer subsidies. In the end, the removal of subsidies was reversed, although the government could have chosen to use a different dataset that supported the opposite action. According to Mosley the crucial ‘fact’ was that in 1987 it was reported that the utilization of fertilizers “in the Agricultural Development Project Areas – the showpiece areas from which technology was expected to diffuse to less-favoured regions—had fallen” (1992: 232). This example shows how ‘evidence based policy’ may be an illusion; it was still up to the government to decide which version of the evidence should take supremacy.

Malawi: Fertilizer Subsidies

The current debate over the merits of state intervention – in particular on the use of fertilizer subsidies – centers on the case of Malawi and the government’s decision to break with the IMF and the World Bank by re-introducing fertilizer subsidies. According to Jeffrey Sachs, writing in the *New York Times*, President Bingu wa Mutharika of Malawi “broke old donor-led shibboleths by establishing new government programs to get fertilizer and high-yield seeds to impoverished peasant farmers who could not afford these inputs. Farm yields soared once nitrogen got back into the depleted soils” (Sachs, 2010). It is widely acknowledged that the change from recurring famines to more recent relative affluence is due to an increase in land

yields which has been helped by the increased use of subsidized agricultural inputs (Lea and Hanmer, 2009: 8).¹⁰

In Malawi, the success of President Mutharika is intimately linked with this agricultural success story. He proposed the fertilizer subsidy programme as part of his larger Malawi Economic Growth Strategy during the election campaign in 2004. Indeed, it is thought that this contributed significantly to his electoral victory. In 2009, Mutharika was re-elected to the Presidency, obtaining 66 percent of the popular vote, and arguably his continued success is due in large part to the agricultural focus of his development agenda – an agenda that targets smallholders and therefore generates broad support among the electorate (Cherwa *et al.*, 2006).

This has become even more important politically because Malawi and Mutharika have seemingly succeeded in changing the World Bank's stance on the issue. The 1997 World Bank Country Report for Malawi targeted the removal of input subsidies. By contrast, the Bank now states on its website that it “strongly supports Malawi's efforts to improve smallholder production. The national input subsidy has made an important contribution to this objective” (World Bank web post).

The impressive growth data reported from Malawi in recent years has been supported by crop data collected by the Ministry of Agriculture and published in the *Malawi Annual Economic Report*. These reported crop data were based on the last census, in 1992/1993, and the annual projections of agricultural production were built up by using yield and acreage observations from agricultural extension officers (Malawi, 2009). A National Census of Agriculture and Livestock was undertaken in 2006/2007, but the report was not released until 2010. The census was funded by the Norwegian Agency for Development Cooperation (NORAD) and was conducted by the National Statistical Office (NSO). The delay itself was an issue of concern (Malawi, 2009), and when it was finally published, the results were not accepted by the Ministry of Agriculture.¹¹ The problem was that the census showed remarkably lower figures for the total output of all crops, including the prestigious maize crop. Notably, the maize figures reported from the census are

¹⁰ In addition to better weather conditions.

¹¹ This information was obtained during interviews conducted at the National Statistical Office, the IMF Office, the Norwegian Agency for Development Cooperation and at the Reserve Bank Malawi in Lilongwe, Malawi in November 2010.

much closer to national food needs, while the official figures in 2006/2007 would imply that either huge stockpiles of maize accumulated around the country or a significant portion of the population was getting fat, neither of which are evident. Indeed, the caloric output of the official numbers would imply that the average Malawian consumes something in excess of 4000 calories a day, compared to the commonly assumed figure of around 1500 to 2000 (personal communication IMF, 2010).

Table 1: Census data and Ministry of Agriculture data compared, 2006/2007 crop estimates (metric tonnes)

Crop	Census data	Ministry of Agriculture data
Maize	2,116,650	3,444,655
Rice	68,053	113,166
Sorghum	13,256	63,698
Millet	7,609	32,251
Cassava	407,167	3,285,127
Sweet potato	247,000 (1)	2,307,354
Pulses etc.	250,000 (2)	415,551 (3)

(1) Figure cited in NACAL p xii; note that tables 3.8 and 3.9 show identical figures for sweet potato and groundnuts, so there is an error somewhere.

(2) Figure cited in NACAL pg. xii for beans, pulses, and groundnuts.

(3) Figure in MEPD report for pulses alone.

When the average yield figures from the two reports are compared, they show only a marginal discrepancy. The significant difference derives from how the data are aggregated. The issue of disagreement is the number of agricultural households, where the Ministry of Agriculture used a figure nearly 1 million higher than that used by the census. Statistical officers diplomatically stated that this may have been due to the different definitions of the household being employed (NSO, personal communication, 2010). In other circles it was hinted that some farmers might have been invented in some cases in order to qualify for subsidies (NORAD, IMF personal communication, 2010).

Although there is no direct evidence of tampering, the indications are strong, as were the incentives. The President and the Ministry desired good, consistent performance in order to keep the electorate convinced of the continued success of the agricultural development strategy. Perhaps more importantly, they needed to be able to convince donors that the fertilizer and seed

programmes were working, thus ensuring that financial support would be forthcoming. The fertilizer subsidy programme totalled 4.6 percent of GDP in 2008/2009, or approximately one-third of the aid inflows (Lea and Hanmer, 2009). It was also in the interest of peasants and agricultural extension officers to ‘increase’ the numbers of farming households, not only to please superiors, but also because the vouchers themselves have a market value. There is some evidence and growing concern that the vouchers are not reaching the right recipients, and that officials and local authorities are able to profit from them (Africa Research Institute, 2007; International Food Policy Research Institute, 2009). These worries aside, the situation of agricultural data in Malawi fits into an established pattern of strong executive pressure on statistical authorities to get the particular data that the leadership needs, where the motivation is not to monitor the economy, but to affirm success (personal communication, Malawi Reserve Bank, NSO).

Discussion

The political economy of agricultural policies—why certain interventions may be preferred by political leaders rather than others—is well recognized. This paper explores a perspective previously neglected: the political economy of the production of agricultural output data. In developing economies the data on agricultural production are weak. Because these data are assembled using competing methods and assumptions, the final series are subject to political pressure.

In his classic work, Bates argued that governments prefer to tax the agricultural sector and then selectively subsidize it by providing inputs to production, in order to ensure that they are able to manipulate political support (1981). It has also been argued convincingly by Bates and others that small-scale peasants find it more difficult to mobilize politically, and therefore they tend to be marginalised in policy making, resulting in what has been called ‘urban bias’ (Lipton, 1977). This paper has examined these questions from a different perspective: what is the political economy of agricultural data?

The investigation tends to support the general argument that agricultural policies fit into patron–client relationships, and that politicians, local authorities and agricultural extension

officers will not always act in a technocratic manner, but rather in accordance with what is politically beneficial. It also suggests a significant revision: if peasants are not politically important, why are governments concerned with the statistics of agricultural performance? In the Indian and Malawian cases there is evidence that governments went to considerable lengths to ‘prove’ that the policies were working. In the Nigerian case, the implications are less clear. It does indicate, however, that policymakers did react politically and even attempted to justify that reaction with reference to data on agricultural production. In a distorted way the ‘feedback mechanism’ does work. When the information in the mechanism does not fit the aims of political leaders, it is occasionally tampered with, while at other times there is conflicting information that may support different conclusions, and political leaders can choose which information they will act upon.

This study of the role of evidence in agricultural policy formulation has important implications for the potential Green Revolutions in Sub-Saharan Africa. The catchphrase ‘evidence based policy’ assumes that evidence and policy are somehow independent. To the contrary, this study has shown how evidence is deeply embedded in policy structures. Failure to understand that data are social products and that the relations of power condition the production of them may lead researchers and donors to place undue confidence in datasets (Herring, 2001: 151). Thus, a policy recommendation is to use qualitative methods and ethnographers to study not only how agricultural policies affect agricultural producers, but also how the different collection methods affect what kind of data are collected.¹² Problems related to the collection of reliable data exist and may be challenging. However, this does not mean we can sidestep the issue. The ‘data’ are themselves a product of agricultural policies and research employing mixed methods is required to meet this challenge.

¹² For instance, Dorward and Chirwa (2010) found that when agricultural extension officers spend more time with producers the resulting yield estimates are biased upwards.

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