

Challenges to the Reliability of Officially Published Statistics for Extension Work

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Abstract

The crucial importance of secondary data for socio-economic analysis cannot be overemphasised. The results of research are only as good as the quality of data used: garbage in, garbage out. This paper questions the reliability of officially published statistics. Aggregate maize production data was collected from the official publications of the Central Bank of Nigeria based on the National Bureau of Statistics, for the period 1972-2007. This form our first set of data: published data. Literature on annual growth rate for maize in developing countries was reviewed, from which it was found that the highest ever recorded annual rate of growth for maize, over a period of 10 years was 4.84%; and 3.83% for a 40 years period. The sub-Saharan African average (less South Africa) was 1.93% and 1.04% for the 10-year and 40-year periods respectively. Based on this, an annual growth rate of 7.5%, about twice the highest rate for developing countries, was assumed for maize in Nigeria from 1972-2007. Taking 1972 as the baseline year, our second set of data was generated: expected data. Descriptive graph and the Student's t Test technique for comparison of means of independent samples was then used to test the postulated hypothesis; the hypothesis was rejected indicating that the maize production figures given in our published statistics differ significantly from the corresponding set of expected figures. The paper concluded that data from officially published statistics differs significantly from expected data based on experience elsewhere. Thus, Nigerian published statistics may not be reliable.

Keywords: Reliability, Officially published, Statistics, Nigeria.

Introduction

The success of any socio-economic analysis, which is what agricultural economics and extension analysis is about, ultimately depends on the availability of appropriate, relevant and reliable data. Sources of secondary data used for agricultural economics and extension analysis in Nigeria include governmental agencies: National Bureau for Statistics (NBS), Central Bank of Nigeria (CBN), National Agricultural Extension and Research Liaison Services (NAERLS) etc.; international agencies: World Bank, IMF, FAO, IFDC etc.; and several Non-Governmental Organizations, NGOs. Each of these agencies collects data for one purpose or the other. Most of the data is ultimately published and thus, made available for economics and extension research.

From the foregoing, the crucial importance of secondary data for socio-economic research and analysis cannot be over-emphasized. Suffice it to say that the results of research are only as good as the quality of data used: garbage in

garbage out. An aspect of development in Nigeria since independence is the absence of hard facts (Stolper, 1966). Data are difficult to obtain because of poor record keeping (Ogunfowora, 1993). In most cases, where the data were obtainable, their accuracy is doubtful (Morgan, 2008). Consequently, data collection efforts, and the data itself, are clouded with uncertainty.

This paper set out to question the *reliability* of officially published statistics in Nigeria. If the paper succeeds only in creating doubts in the minds of the readers on the reliability of indices of growth published in Nigeria, it will have achieved its purpose, as its significance lies in initiating debate on the reliability of such data and its implications on agricultural economics and extension practices in Nigeria.

Definition of Terms

For the purpose of this paper, the following terms are operationally defined as follows:

Published data: Collected time-series data on maize production in Nigeria (1972-2007) as published by Central Bank of Nigeria (CBN, 2007).

Expected data: Data maize production in Nigeria (1972-2007) generated for the purpose of this study, based on an assumed annual growth rate of 7.5%, by adding 7.5% of the previous year's figure to the present with 1972 taken as base year.

Reliability: Reliability of published data in Nigeria refers to the degree to which the published data statistically conforms to the expected data. Mathematically, Published data \leq expected data.

Methodology

Secondary data on annual aggregate maize crop production in Nigeria was collected from the official publications of the Central Bank of Nigeria based on the National Bureau of Statistics for the years 1972-2007. This form our first set of data: *published data*. Literature on annual growth rate for maize in developing countries was reviewed, from which the highest ever recorded annual rate of growth for maize, over a period of 10 and 40 year period was found, and based on it an annual growth rate for maize in Nigeria was assumed for the period 1972-2007, and used to generate our second set of data: expected data. A graphical comparison of the 2 sets of data was prepared; and the Student's *t* test technique for comparison of means of independent samples was then used to statistically compare the 2 sets of data, at the 5% level of significance. For a description of the Student's *t* test technique see Hogg and Craig (1995); Lehmann (1991); and Keller and Warrack (2003).

Findings

Secondary data, our published data, on annual aggregate maize crop production in Nigeria was collected from the joint official publications of the Central Bank of Nigeria based on the National Bureau of Statistics for the years 1972-2007. Literature on annual growth rate for maize in developing countries was reviewed, from which it was found that the highest ever recorded annual rate of growth for maize, over a period of at least 10 years, was 4.84%; and 3.83% for a 40 years period. The sub-Saharan African average (less South Africa) was 1.93% and 1.04% for the 10-year and 40-year period respectively (Table 1). Based on this, a generous annual growth rate of 7.5%, about twice the highest rate for developing countries, was assumed for maize in Nigeria from 1972-2007. Our second set of data, expected data, was

generated by adding 7.5% of the previous year's figure to the present with 1972 taken as base year.

Table 1: Annual Rate of Growth on Yield for Maize in Developing Countries

Region/Country	1956- 1995 (%)	1956- 1965 (%)	1966- 1975 (%)	1976- 1985 (%)	1986- 1995 (%)
South, East, and South-East Asia, less China	1.70	1.23	1.43	2.96	2.26
West Asia and North Africa	2.75	3.74	1.85	2.52	2.28
Sub-Saharan Africa less South Africa	1.04	0.41	1.93	-0.26	0.17
China	3.83	0.09	4.10	4.84	3.30
Brazil	1.68	0.68	1.47	2.62	4.29
Argentina	2.61	0.29	2.43	2.29	3.58
South Africa	1.81	1.08	4.67	-3.46	-2.27

Source: Pingali and Heisey (1999).

Table 2: Published and Expected Maize Production Data in Nigeria.

Year	Maize Output Published (‘000 MT) ^a	Maize Output Expected (‘000 MT) ^b	Year	Maize Output Published (‘000 MT) ^a	Maize Output Expected (‘000 MT) ^b
1972	639	639	1990	5768	2525.02
1973	808	738.45	1991	5810	2714.4
1974	528	793.83	1992	5840	2917.98
1975	1332	853.37	1993	6290	3136.82
1976	1068	917.37	1994	6902	3372.09
1977	650	986.18	1995	6931	3624.99
1978	658	1060.14	1996	6217	3896.87
1979	488	1139.65	1997	6285	4189.13
1980	612	1225.12	1998	6435	4503.32
1981	720	1317.01	1999	6515	4841.07
1982	766	1415.78	2000	6491	5204.15
1983	594	1521.97	2001	8188.5	5594.46
1984	2058	1636.12	2002	8527.9	6014.04
1985	1190	1758.82	2003	8685.1	6465.09
1986	1336	1890.74	2004	9503.4	6949.98
1987	4612	2032.54	2005	10369.6	7471.22
1988	5268	2184.98	2006	11087.4	8031.57
1989	5008	2348.86	2007	11520	8633.93

Source: ^aCBN (2007). ^bEstimated by adding 7.5% of the previous year's figure to the present with 1972 taken as base year.

Figure 1 below, gives a graphic representation of how the 2 sets of data employed in this study, as contained in Table 2, compare over the period 1972-2007. It appears that the 2 sets of data are different. To ascertain whether the 2 sets of data are statistically significantly different we go on to test our hypothesis.

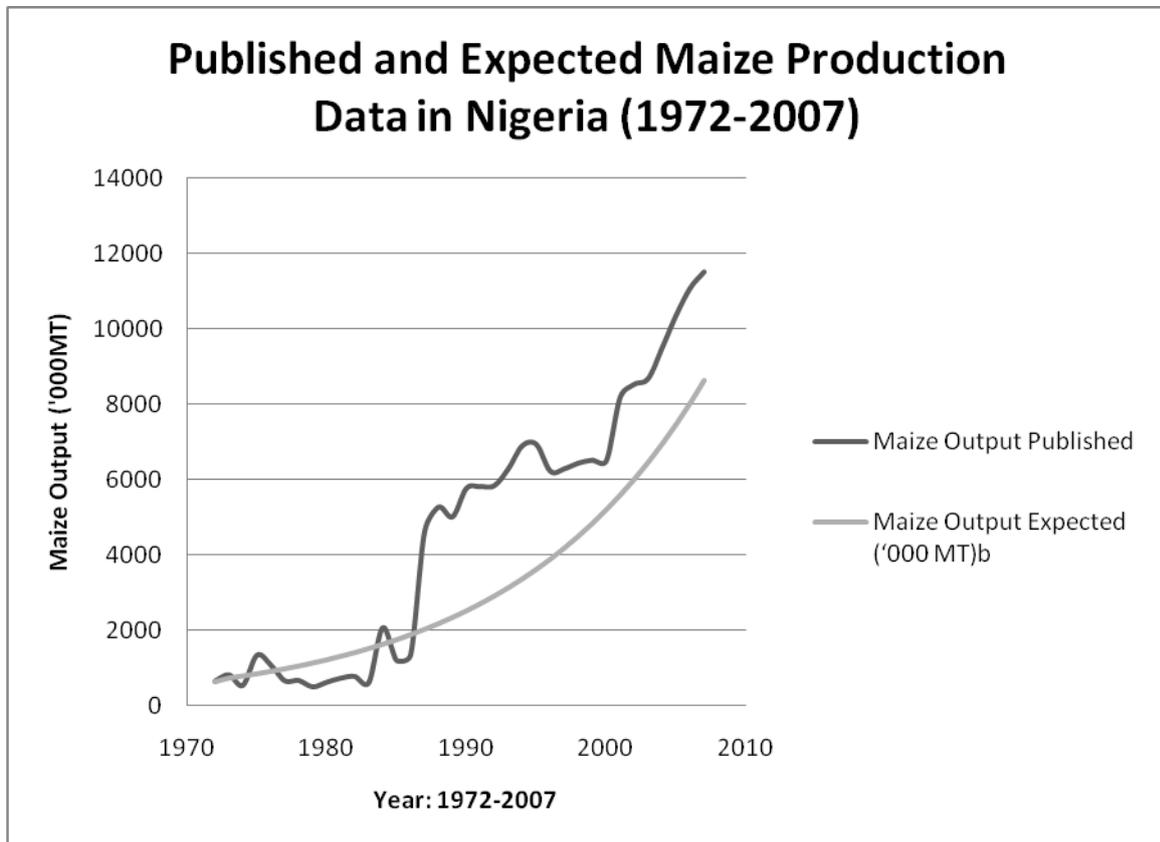


Fig. 1: Published data and Expected data (1972-2007) compared.

The hypothesis formulated and tested in this study is that there is no significant difference between published data and expected data. From the results of the Student's *t* test, the calculated *t* value of 2.024 is found to be significant when viewed in relation to the computed *p*-value of 0.047, hence the null hypothesis is rejected and it is thus concluded that there is a significant difference between maize growth indices published in Nigeria and the expected data. The mean difference of 1420.9678 indicates that the officially published maize statistics is greater than the expected data with a mean of 1421 MT.

Table 3: Results of the Student's *t* test.

Parameter	Value
N	72
DF	70
T value	2.024 ^a
Mean Difference	1420.9678
Standard Error Difference	702.16219

^a= (*p*<0.05)

Conclusion

The crucial importance of secondary data for socio-economic research and analysis cannot be over-emphasized. This paper questions the reliability of published statistics in Nigeria. It argued that indices of agricultural growth published in Nigeria, taken maize production as an instance, are statistically significantly higher than almost twice that reported in other developing nations of the world: thus, Nigerian published statistics may not be reliable. The paper recognizes its limitations in that it only made observations which are not substantiated by primary research, thus, the observations of the paper are suggestive and not conclusive.

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