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Effects of Subsidy Rates on Fertilizer Use in Imo State: 1990-2009

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Abstract

This study examined the effects of fertilizer subsidy rates on fertilizer use in Imo State from 1999 to 2009. Time series data used included subsidy rates during this period, fertilizer distributed before 2000 (i.e. from 1990 to 1999) and after 2000 (i.e. from 2000 to 2009) and quantity of fertilizer used before and after 2000. A simple regression tool was used for the analysis. Results showed that there were negative changes in fertilizer use level over time; subsidy has a significant effect on fertilizer use level in Imo State for the period of 1990 to 2009 and use of fertilizer after 2000 is on the increase. It is recommended that effort to make fertilizer readily available and accessible to farmers be emphasized.

Keywords: Fertilizer, Subsidy, Rate, Farmers, Imo State
Introduction
Fertilizer is combinations of the nutrients that plants must have to grow; in a form they can use (FAO, 1999). Fertilizer is a powerful productivity-enhancing input (Yanggen, et al., 2009). There is a widespread agreement that increased use of fertilizer and other productivity-enhancing inputs is a precondition for rural productivity growth and poverty reduction (Ricker-Gilbert and Jayne, 2008). It is the only practical way to provide enough plants’ nutrient to feed Africa and provide organic matter to restore Africa’s nutrient-depleted soils (Africa Fertilizer Summit, 2005). A subsidy on the other hand, is a grant, a subvention, a financial support or assistance paid to a business or economic sector (Amegashie, 2006). In the context of this study, subsidy is seen as a subvention by the government to a sub-sector, to reduce the sales price of the input and therefore cost to farmers and to encourage the activities of that sector. Thus, fertilizer subsidy is the price reduction of fertilizer. If the price of farm produce remains constant, the reduction of fertilizer price would lead to higher savings for farmers (Ahmed, 1987; Bumb and Baanante, 1996; Cleaver, 2003; de Jager et al., 1996; Donovan, 2004; Fosu, 1996; Gladwin, 1992; http://www.bangladeshnews.com.bd/2009/01/16/fertilizer-subsidy-20...). It is expected that cheaper fertilizer will reduce market price of fertilizer, reduce cost of production, increase the use of fertilizer, lead to savings and reduce the price of produce in the market.

Fertilizer use in Nigeria has been low (FAO, 2003). Prior to the fertilizer subsidy era, the use of fertilizer has been less than 10,000 tons per year (Jayne, et al., 2003). The average fertilizer use for 1980-1989 was 8.14kg/ha (FAO, 2003). There is growing evidence that meeting this challenge of increased fertilizer use will require more attention to soil fertility issues (Eric et al., 2006). Nigerian soil have inherent difficulties for agriculture in terms of fertility, acidity, or drainage, and land use practices during past several decades have exacerbated the situation through nutrient mining by crops, leaching, and inadequate erosion control (Buersh et al., 1997; FAO, 2000; Pol, 1992; Sanchez et al., 1997; Scherr, 1999; Smaling et al., 1997; Stoortvogel and Smaling, 1990; UNEP, 1997; Weight and Kelly, 1999). There is therefore the need to increase fertilizer use through several efforts like direct subsidy with the aim of improving soil fertility.

Subsidy on fertilizer was introduced in Nigeria in 1976 (http://pak-nigeria.org/pdf/11-PolicyBrief3.pdf). It has remained since then at different rates except for some years like 1997, 1998 and 2000 where subsidy on fertilizer was removed and which represent without subsidy era. Thus we have a span of 33 years since the introduction of fertilizer subsidy, out of which the study covered 20 years starting from 1990 to 2009. The rationale for this selection is based on the creation of Abia State from Imo State and the transfer of ISADAP to Imo ADP which remain since then at different rates except for some years like 1997, 1998 and 2000 where subsidy on fertilizer was removed and which represent without subsidy era. Thus we have a span of 33 years since the introduction of fertilizer subsidy, out of which the study covered 20 years starting from 1990 to 2009. The rationale for this selection is based on the creation of Abia State from Imo State and the transfer of ISADAP to Imo ADP which

Materials and Methods
The study was carried out in Imo state. Secondary data were used for this study. Imo ADP was purposively sampled for information on quantity of subsidized fertilizer which they distributed through their outlets and quantity used in Imo State. National Bureau of Statistics was sampled for information on subsidy rates used in Imo State. Federal Fertilizer Department was sampled for data on quantity of fertilizer distributed to Imo State. Other relevant text books were also selected for consultation and analysis of their information. The time series data sought include those on; subsidy rates during this period, fertilizer distributed before 2000 (i.e. from 1990 to 1999) and after 2000 (i.e. from 2000 to 2009) and quantity of fertilizer used before and after 2000. A simple regression tool was used for the analysis.

The model involved the following:

\[ Y_i = a_i + \beta X_i + \epsilon_i, \quad t = 1,2,\ldots,n \]

Where,

- \( Y_i \) = quantity of fertilizer use (*000mt)
- \( X_i \) = subsidy rates (%)
- \( a \) = intercept
- \( \beta \) = slope
- \( \epsilon_i \) = error term
- \( t \) = time (years)
Since subsidy is viewed in this work as subvention by government to a sub-sector, in order to cut the cost of production and to encourage the activities of that sector, it is expected that its increase will encourage the use of fertilizer in the state. Thus, the higher the rate of subsidy, the higher the quantity of fertilizer used. Where the prices of fertilizer have risen, subsidy will help maintain its cost and level of usage.

**Results and Discussion**

The year 1990 recorded 18,472mt with 82% subsidy rate (Table 1). The table shows that fertilizer use trend in Imo State is not stable. Highest fertilizer use was recorded in 1991 with a use level of 19,208mt and subsidy rate of 74%. It is observed that the years 1995, 1992 and 1990 with subsidy rates of 87%, 86% and 82% did not record the highest fertilizer use level. Subsidy rate increased from 65% in 1994 to 87% in 1995 with a slight increase in use level of 450mt. But a reduction of subsidy rate from 87% in 1995 to 74% in 1996 gave a decrease of 9,510mt. However, the rate was reduced to 25% in 2001 and maintained at 25% till 2009 yet with an increase in use of 11,050mt and average use of 4,168mt.

Lowest fertilizer use level recorded was in 2001 (330mt) at subsidy rate of 25%. This was followed by 870mt (1999), 1,360mt (2003) and 1,760mt (2005). Subsidy was given for these years at the rate of 25%. In 2001 with fertilizer subsidy of 25%, fertilizer use level recorded a difference of -1,980mt as against the preceding year when fertilizer subsidy was not given. Based on these, the following deductions are made; highest fertilizer subsidy given did not give highest fertilizer use level, increase in fertilizer subsidy rate did not give increase in use level, reduction in subsidy rate gave decrease in fertilizer use level, steady subsidy rate gave increase in fertilizer use level and lowest fertilizer use level was recorded in a 25% subsidy year that proceeded a zero subsidy year.

The variations in use level with regard to subsidy rates within the period of study show that subsidy is not the only factor affecting fertilizer use. This is in agreement with Nigerian Policy Brief 3 that unavailability of fertilizer, wide price variation across states, wastage due to poor and inadequate storage facilities, fertilizer sold above government approved prices, inadequate supply of fertilizer by quota allocated state and interference with the distribution mechanism by well connected people were problems affecting the use of fertilizer in Nigeria.

There were negative changes in fertilizer use level over time (Fig.2). It shows that for every change in time, there were 0.625 decreases in the fertilizer use level. The coefficient of determination (r²) of fertilizer use over time was 0.367 showing a weak relationship between fertilizer use and time. Figure 2 shows that subsidy rate decreased by 3.513 over time. The coefficient of determination (r²) of subsidy rate over time was 0.470. This implies that our variable accounted for 47% of the variance of the dependent variable.

The derived hypothesis “subsidy does not have any significant effect on fertilizer use level” was realized with the use of a simple regression analysis. The result shows high significance at 1% level. This is in agreement with Bumb (2008) when he noted that subsidy improves incentive for fertilizer use and thereby help in promoting food production and agricultural growth, reduces risk in the use of a new product and helps poor farmers in the learning process. Thus, we reject the null hypothesis and conclude that subsidy has a significant effect on fertilizer use level in Imo State for the period of 1990 to 2009.

**Conclusion and Recommendation**

This study showed that fertilizer subsidy has a positive effect on fertilizer use in Imo State and affected it tremendously. Thus, it should be maintained. It also revealed that when subsidy is maintained at the rate of 25%, it resulted to higher use of fertilizer. Therefore, it is recommended that fertilizer subsidy be maintained at the rate of 25%. The analysis showed that a statistical significant effect exists between fertilizer use and subsidy rate in Imo State. The study revealed that there was an upward trend in the use of fertilizer after 2000. This implies that the use of fertilizer after 2000 is on the increase. Thus, it is recommended that effort to make fertilizer readily available and accessible to farmers be emphasized. This will increase its usage and resultant increase in food production.

**References**


fertilizer Summit/IFDC/NEPAD.


Policy Brief No. 3: Nigeria’s Budget for Fiscal Centre for the State. www.csafrica.org/index.php?option=com_docmam...91...


Table 1: Fertilizer use and subsidy rate in Imo State: 1990-2009

<table>
<thead>
<tr>
<th>Year</th>
<th>Subsidy rate (%)</th>
<th>Fertilizer use ('000mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>82</td>
<td>18.472</td>
</tr>
<tr>
<td>1991</td>
<td>74</td>
<td>19.208</td>
</tr>
<tr>
<td>1992</td>
<td>86</td>
<td>15.46</td>
</tr>
<tr>
<td>1993</td>
<td>77</td>
<td>6.71</td>
</tr>
<tr>
<td>1994</td>
<td>65</td>
<td>14.28</td>
</tr>
<tr>
<td>1995</td>
<td>87</td>
<td>14.73</td>
</tr>
<tr>
<td>1996</td>
<td>74</td>
<td>5.22</td>
</tr>
<tr>
<td>1997</td>
<td>0</td>
<td>5.58</td>
</tr>
<tr>
<td>1998</td>
<td>0</td>
<td>5.78</td>
</tr>
<tr>
<td>1999</td>
<td>25</td>
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</tr>
<tr>
<td>2000</td>
<td>0</td>
<td>2.31</td>
</tr>
<tr>
<td>2001</td>
<td>25</td>
<td>0.33</td>
</tr>
<tr>
<td>2002</td>
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</tr>
<tr>
<td>2007</td>
<td>25</td>
<td>8.60</td>
</tr>
<tr>
<td>2008</td>
<td>25</td>
<td>3.61</td>
</tr>
<tr>
<td>2009</td>
<td>25</td>
<td>11.38</td>
</tr>
</tbody>
</table>


Figure 1: Subsidy rates and fertilizer use in Imo State