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Public spending and rural development in Nigeria

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Abstract

The concerns of modern development have been on the need to boost living conditions which involves reducing poverty, unemployment, and inequality. Statistics has proved that these indices are quite high in the rural areas hence, the need to put up the needed actions to facilitate rural development. In this paper, we explored the role of public spending in fostering rural development in Nigeria from 2000 to 2020. The public spending on economic services and that of social and community services were considered, while the key rural development indicators captured were people practising open defecation, access to drinking water (both basic and safely managed), access to sanitation (both basic and safely managed), and access to electricity. The analysis was conducted using the ordinary least squares estimation technique. Findings of the study indicated that public spending on social community services substantially reduced the proportion of rural Nigerians practicing open defecation; and it increases the proportion of rural Nigerians having access to safe drinking water, sanitation, and electricity. This made the study to conclude that public spending is potent in driving rural development in Nigerian hence, the need for increased spending on social and community services in the country.

Keywords: Development; Sanitation; Electricity; Rural Nigeria; Public Spending

1. Introduction

The role of government in a modern society has gone beyond maintenance of law and order to provision of social goods and services which could improve the wellbeing of the people. Apart from such, the government in modern societies make policies and devise strategies towards a better society. Such can be viewed in terms of the various plans and policies like the Vision 2020, the Millenium Development Goals, and the Sustainable Development Goals, which were all geared towards driving developments in less developed countries. These policies set up some targets which if achieved, could improve the wellbeing of the citizens through improvement in education, health, sanitation, and other indicators like reduction in poverty and malnutrition.

For the Nigerian case, the quest for rural development has led to the enactment of various policies and programmes such as the National Accelerated Food Production Programme (NAFPP) of 1972 which focused on the production of hybrid seedlings, stems and vegetables; River Basin Development Authority (RBDA) of 1970 with target on rural farm irrigation; Operation Feed the Nation (OFN) in 1976; Green Revolution (GR) of 1980 with the intention of stirring self-reliance in food production and advancement of rural household small scale farming. Other notable projects were the Agricultural Development Projects (ADP) of 1975; National Directorate of Employment (NDE) of 1986 concentrating on employment generation among grassroots and graduates for the reduction of rural-urban migration; Better Life Programme for Rural Women (BLPRW) in 1987, which was intended to empower women at the local level through mobilization of income generation equipment, establishment of cooperatives to boost access to credit facilities (Oghenekohwo & Berezi, 2017); National Directorate of Food, Roads and Rural Infrastructure (DIFRI) 1987 to opened up rural areas via the construction of rural feeder roads, silos, provision of rural and farming infrastructure; Family

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Economic Advancement Programme (FEAP) in 1997; Poverty Alleviation Programme (PAP) in 2000; and National Poverty Eradication Programme (NAPEP) of 2001 to boost economic liberation of rural household farmers via the provision of subsidized farm inputs among other constituents with increased value chain (Sule, Alinno & Ikwegbe, 2013). These programmes and their structures established parts of the policy devices on sustainable rural economic development (Oghenekohwo & Berezi, 2017).

Rural development can be defined as “the enhancement of rural communities' moral, social, political, and economic potentials in order to increase their self-reliance through the provision of appropriate infrastructure such as pipe-borne water, electricity, good roads, and small-scale industries, increase their political consciousness and participation, and promote their moral and social well-being, which will result in tolerance, good discipline, justice, fairness, kindness, and love” (Nwobi, 2007; Effiong & Okijie, 2022). It is also seen as “a process of making life better-off and meaningful for millions of individuals living in rural areas”. Rural development provides chances for productive work as well as the extension of social services, which can improve the welfare and security of rural residents (Okoje, 1997 cited Filani, 2000; Effiong & Okijie, 2022). Furthermore, rural development is “the self-sufficiency of the rural population through the transformation of the socio-spatial structures of their economic activities” (Lele, 1992 cited in Filani, 2000; Effiong & Okijie, 2022).

Scholars have suggested different ways for achieving rural development. as reflected in Effiong and Okijie (2022), such include the Rural-Urban Interaction, Inter-sectoral/Zonal Coordination, The Package Approach, Reformist Approach, Structural Approach, and Technological approach. Rural-Urban Interaction centres on rural development planning in conjunction with and within the context of the overarching national development plan (Effiong & Okijie, 2022). Rural development action is included in the overall agricultural development agendas of municipal, state, and federal governments (Alkali, 1997). Inter-sectoral/Zonal Coordination entails the synchronisation of formerly incongruent sectoral and zonal development programs. It presupposes that all sectoral/zonal rural development programs are well-conceived, and that efficient coordination would enable them to achieve rural development objectives.

The Package Approach is based on the ‘diffusion theory of development’, which states that “ideas generated from outside are conveyed to rural people by an assumed benevolent change agency” (Alkali, 1997; Effiong and Okijie, 2022). The behavioural modification of rural farmers is emphasized in the “Reformist approach” to rural development. Furthermore, attempts are being made to establish ways and means for farmers to have a more active role in rural development programmes and projects by improving their attitudes toward such programmes. So, the “Reformist approach” to rural development stresses farmers' participation in improving rural areas (Filani, 2000; Effiong and Okijie, 2022). The “Structural approach to rural development” aims at modifying existing economic, social, and political linkages such that individuals who were previously disadvantaged find themselves in better positions. The “Technological approach” focuses on the technological transformation of several sectors of rural society, particularly agricultural aspect. This could imply a shift away from traditional farming implements (crude farm tools) and toward semi-modern technologies (Filani, 2000; Effiong and Okijie, 2022).

According to Omale (2005), rural development is the process of bringing about a change in the status of “things” or “situations” in small-population regions that are isolated from metropolitan areas, have basic professions, and have inadequate service provision. As Tenuche (1992) and Tenuche (2005) studied, mobilizing, and allocating resources available in rural regions for the benefit of rural residents and the overall improvement of their standard of living constituted rural development. Furthermore, according to Ogeidefa (2010), rural development is an integrated approach to food production, the provision of institutional, social, and physical infrastructures, and the goal of bringing about sustainable agriculture, affordable and high-quality education, a good healthcare delivery system, and so on. In a nutshell, rural development is the construction of infrastructure to raise the level of living in the villages (Paul et al., 2014).

The focus of this paper is on the structural approach to development. This approach is taken because it has greater relevance on the need for a paradigm shift in terms of the availability of necessary facilities that will improve the well-being of the rural dwellers. As such, the paper is concerned about viewing rural development based on access to electricity, water, and sanitation services. As such, rural development requires that there is a substantial reduction in the number of people practising open defecation, there should be an increased proportion of the rural dwellers having access to electricity, safely managed water, and safely managed sanitation services. These facilities are crucial as they have a greater spillover effect on the health, nutrition, learning outcomes of children, social, and economic status of the rural communities (see UNICEF, 2015).

Going with the idea of Obot (1987), rural development may be judged in terms of “roads, water supply, housing, electricity, model community development, access to quality education, enhanced health care delivery, and food and

agricultural product availability for rural settlers” (Mammud, 2019). As highlighted by Ogbazi (1992), the goal of the ‘National Policy on Rural Development’ is to achieve an ideal scenario of acceptable development in rural areas. These goals can be summarized as follows:

- Elevation of rural people's social, cultural, educational, and economic well-being.
- Advancement of sustained and orderly development of vast resources in rural areas for the benefit of rural people.
- Increase and diversification of career options, plus income growth in rural areas.
- Mobilization of the rural dwellers for self-help and self-sustaining development programmes; and
- Advancement of technologically based industries in remote areas.

It is worth noting that up till date, the rural communities still account for a greater proportion of the total population of Nigeria, standing at 50.48% in 2017 before the urban area took a greater share of 51.96% in 2020. The Nigerian society has been characterised by increasing population which is associated with the prevailing high fertility rate in the country (Effiong, Udonwa & Ekpe, 2022). This is followed by high polarization between the rural and urban areas, with more developmental projects situated in the urban centres. Consequently, indicators of developments in urban areas have been on the rise while that of the rural areas has been meagre (Effiong & Okijie, 2022). Given this divergence from a more rural population to an emerging greater urban population, could it be that the urban rural areas have been transformed to some urbanized areas where the needed facilities for a better standard of living are provided? The answer to this question is not far-fetched. The rural communities are still fraught with high polarity when compared with the urban centres. There is poor road infrastructure, poor electricity in some areas, poor housing, poor education and health care services, low or zero gainful employment opportunities, among others.

Irrespective of these underdevelopments facing the rural communities in Nigeria, the government have been spending massively on economic services as well as on social and community services. A total of ₦1,519.121 billion was spent on social and community services as of 2020 while ₦522.187 billion was spent on economic services in the same period. The proportion of people practising open defecation in rural Nigeria stood at 29.68% while proportion of rural Nigerians having access to electricity was 24.58%. Further, people using safely managed drinking water was 17.65% of the rural population, while people having access to safely managed sanitation services was 25.59% of total rural population in 2020. This therefore portrays that despite the huge public spending on the aforementioned components, basic development of the rural areas is still an issue. Consequently, this paper seeks to examine the influence of public spending on rural development in Nigeria from 2000 to 2020.

2. Effects of Rural Underdevelopment

Paul et al. (2014) has described the effect of rural underdevelopment in three perspectives, namely: Rural-Urban Migrations, Poverty and Underdevelopment, and Incessant Insecurity.

2.1. Rural-Urban Migrations

The claim made by Adefolalu (1977) in Okhankhuele and Opafunso (2013) that Nigeria's rural areas are suffering from several incapacities at varying degrees of severity, including: remoteness, isolation, underdevelopment, poverty, drabness, boredom, ignorance, depopulation, hunger, and all types of illnesses, is a manifestation of the country's long history of not implementing programs for rural development. There is broad agreement among authors that the number of people migrating from rural to urban areas increases thereby reducing rural population, which negatively impacts rural agricultural output and slows down the rate of development in the rural areas (Okhankhuele and Opafunso, 2013; Paul et al., 2014).

Youth migration destroys the dazzling social life in rural communities, leaving the place desolate. Since farming is their primary source of income, the young people leave the villages with their vitality and energy, leaving behind the weak elderly people, women, and children to toil on the farms. This has resulted in decreased funding for development, a decline in rural residents' income and level of living, underdevelopment, and complete abandonment of rural regions. All of these factors have a negative impact on the country's gross domestic product. Nigerian rural regions lack motorable roads, industry, high-paying jobs, pipe-borne water, power, and other socioeconomic amenities. They experience several deprivations. All these have pushed the rural areas in Nigeria to a vicious circle of poverty (Paul et al., 2014).

2.2. Poverty and Underdevelopment

Furthermore, rather than being concentrated in a few key regions, rural poverty in Nigeria is spread equally throughout the nation. The situation in parts of the northern regions bordering Niger is deteriorating; these regions are bare, not suitable for agriculture, have environmental degradation, and are intensively inhabited (Arhewe, 2014). Among the poorest in the nation are the fishing villages that reside in the mangrove swamps and on the Atlantic coast. In general, there is a seasonal demand for labour in rural Nigeria, where most of the impoverished rural population depends on agriculture for both food and income. Small-scale farmers who cultivate meagre parcels of land and rely on rainfall rather than irrigation systems generate around 90% of Nigeria's food. The inequalities in income levels between rural and urban regions, as well as unemployment and underemployment, have led to widespread poverty among rural Nigerians (Paul et al., 2014).

2.3. Incessant Insecurity

It is crucial to remember that the underdevelopment of rural regions is a major contributing factor to the high threat of insecurity (Paul et al., 2014). Clinton's (2013) assertion that prosperity has always been centred in and around metropolitan areas lends credence to this claim. Despite the nation's reported economic progress, the government is failed to adequately promote social and infrastructural development. It may thus be reasonably stated, according to Koko (2012), that the State has not established the institutional structure necessary for the administration, upkeep, and promotion of security as well as the supply of public goods.

3. Public Spending in Nigeria

The Federal Government of Nigeria over the years have been embarking on massive expenditures on both economic services and social and community services as could be noted from the rising trend in recent times (see Figure 1).

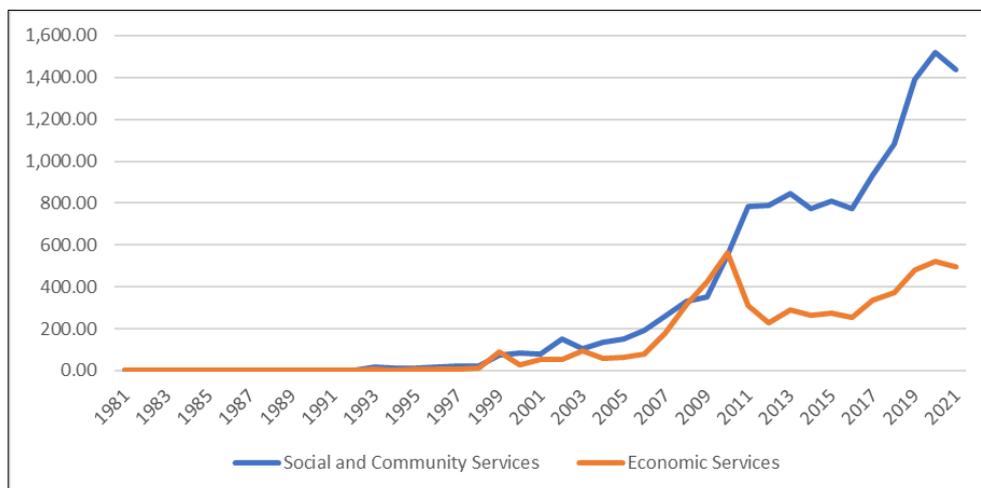


Figure 1 Trend of public spending on economic services and social and community services

The expenditure on social and community services includes public spending on education, public spending on health, and public spending on other social and community services. These expenditures are presented in Table 1 for selected years. As could be noted from Table 1, the total public spending increased from ₦84.79 billion in 2000 to ₦151.700 billion in 2005. This was accompanied with a further increase to ₦550.90 billion and ₦844.10 billion in 2010 and 2013 respectively. Though this expenditure component declined to ₦807.59 billion in 2015, it increased significantly to ₦1,519.12 billion in 2020 but declined slightly to ₦1,438.07 billion in 2021. In 2022, total public spending on social and community services stood at ₦1,628.99 billion which represents a 13.27% growth rate from the previous period. Total public spending on social and community services accounted for 12.09% of total public expenditure in Nigeria as of 2000 and increased to 16.19% in 2015 but declined substantially to 6.67% in 2022 indicating a substantial decline in the share of social and community services on total public spending in recent times.

For public expenditure on education, it increased from ₦57.96 billion in 2000 to ₦163.98 billion in 2008 with a further increase to ₦390.40 billion in 2013. The value declined to ₦325.19 billion in 2015 but maintained a rising trend thereof, reaching ₦646.79 billion and ₦702.98 billion in 2020 and 2022 respectively. public spending on education accounted for 68.36% of total spending on social and community services in 2000, but this figure has declined to 43.15% in 2022

due to increased spending on other social and community services. As a share of total public expenditure, public spending (recurrent) on education accounted for only 8.28% of total public spending in 2000 and has declined drastically to 2.88% in 2022.

Table 1 Public Spending on Social and Community Services (₦ billions)

Year	Education	Health	Other Social and Community Services	Total
2000	57.957	15.218	11.610	84.785
2003	64.782	33.268	4.557	102.608
2005	82.800	55.700	13.200	151.700
2008	163.977	98.219	70.729	332.926
2010	170.800	99.100	281.000	550.900
2013	390.400	180.000	273.700	844.100
2015	325.190	257.700	224.700	807.590
2020	646.793	423.359	448.969	1,519.121
2021	620.591	386.244	431.239	1,438.074
2022	702.979	437.521	488.490	1,628.990

Source: CBN (2022).

Public spending on health also reflected a rising trend throughout the periods under consideration, as it increased from ₦15.22 billion in 2000 to ₦55.70 billion in 2005. It further increased to ₦99.10 billion and ₦257.70 billion in 2010 and 2015 respectively, with a further increase to ₦437.52 billion in 2022 (CBN, 2022). Public spending on health accounted for about 17.95% of total spending on social and community services and has increased steadily to 26.86% in 2022. Further, public spending on education (recurrent) as a share of total spending was 2.17% in 2000 and has declined to 1.79% in 2022. This indicates a declining patronage of education and health in the public spending pattern of the Federal Government of Nigeria which creates a rising concern over the survival of these critical sectors.

Table 2 Public Spending on Economic Services (₦ billions)

Year	Agriculture	Road & Construction	Transport & Communication	Other Economic Services	Total
2000	6.336	4.991	3.035	14.230	28.592
2003	7.537	16.951	22.679	48.903	96.071
2005	16.300	17.900	8.000	22.000	64.200
2008	65.399	94.464	67.386	86.502	313.751
2010	28.218	57.091	42.406	435.039	562.753
2013	39.431	92.190	18.515	141.099	291.200
2015	41.270	114.600	24.385	95.100	275.355
2020	76.606	206.125	44.421	195.035	522.187
2021	72.272	192.865	41.703	188.485	495.325
2022	81.867	218.469	47.239	213.508	561.083

Source: CBN (2022).

Turning our focus to public spending on economic services which includes expenditure on agriculture, road and construction, transport and communications, and other economic services, data indicates a rising trend in public spending on economic services in most of the periods under consideration. For instance, Table 2 indicates that the expenditure on economic services rose from ₦28.592 billion in 2000 to ₦64.20 billion in 2005 with a further substantial

increase to ₦562.753 billion in 2015. In 2015, the public spending on economic services (recurrent) stood at ₦275.355 billion which was a decline from ₦291.20 billion in 2013, indicating that expenditures on economic services declined drastically in these two periods compared to 2010. However, a rising trend returned in 2020 as expenditures on economic services reached ₦522.187 billion with a further increase to ₦561.083 billion in 2022 against ₦495.325 billion in 2021. While public spending on economic services as a share of total public spending was 4.08% in 2000, it increased substantially to 13.42% in 2010 but declined sharply to 5.52% in 2015 with a further decline to 2.30% in 2022. This also indicates, just like in the case of social and community services, the declining patronage of the Federal Government of Nigeria in spending on the economic services in the country.

Under the agriculture sub-head, the spending on this sub-component has not been smooth given the rising and declining pattern observed in Table 2. The value stood at ₦6.34 billion in 2000 and rose substantially to ₦65.40 billion in 2008 before declining to ₦28.22 billion in 2010. Afterwards, the expenditure on this sub-component maintained a smooth rising trend up to ₦41.27 billion 2015 and then to ₦81.87 billion in 2022. Under road and construction, expenditures have been on the rise from 2000 where the government spent ₦4.99 billion to ₦94.46 billion in 2008 before it plummeted to ₦57.09 billion in 2010. This was accompanied with a rising trend to ₦92.19 billion and then to ₦206.13 billion in 2013 and 2020 respectively. Though it declined to ₦192.87 billion in 2021, there was an increased spending to the tune of ₦218.47 billion in 2022.

Public spending on transport and communication (recurrent) recorded a value of ₦3.04 billion in 2000 but increased to ₦67.39 billion in 2008 after a meagre ₦8.00 billion in 2005. However, it declined to ₦42.41 billion and then to ₦18.515 billion in 2010 and 2013 respectively. An increase to the tune of ₦24.42 billion was recorded in 2015 with a further increase to ₦47.24 billion in 2022. As a share of total economic services, public spending on transport and communication 10.61% in 2000 but declined to 7.53% in 2010. It increased to 8.86% in 2015 with a slight decline to 8.42% in 2022. In general, and as could be noted from Figure 1, public spending on social and community services outweighs that of economic services in recent times. As such, one could wish to examine whether such spending could have some significant influence on the development of rural communities in Nigeria. This will be explored in subsequent section of the paper where we explored some empirical analysis.

4. Indicators of Rural Development

The rural development indicators so captured in the study include access to electricity, access to drinking water services, access to sanitation, and access to toilet facilities. These indicators are explored in different tables and graphs forthwith.

4.1. Access to Electricity

Table 3 Access to Electricity in Rural Nigeria

Year	Access to electricity, rural (% of rural population)	Year	Access to electricity, rural (% of rural population)
2000	21.27	2011	31.02
2001	21.67	2012	27.73
2002	22.06	2013	31.63
2003	32.70	2014	27.37
2004	22.82	2015	25.90
2005	23.19	2016	33.97
2006	23.54	2017	29.72
2007	25.28	2018	29.24
2008	25.62	2019	29.71
2009	24.63	2020	24.58
2010	23.54		

Source: World Bank (2021).

The availability of electricity supply in rural areas is likely to boost their economic and social lives of the people as it propels the proper functioning of these activities. Data have shown that not up to 50% of rural areas in Nigeria have access to electricity. This is captured in Table 3 for the period 2000 to 2020.

As of 2000, only 21.27% of the total rural population could have access to electricity which amounts to 16,947,970 having access to electricity out of a total rural population of 79,680,159 in that year. This increased to 32.70% in 2003 which was followed with a sharp decline to 22.82% in 2004. This upward and downward trend could be observed in whereby recent value indicates a decline in the proportion of rural Nigerians having access to electricity. As of 2010, 23.54% of the total rural population in Nigeria could have access to electricity, and this implies that only 21,088,547 out of 89,586,010 rural Nigerians could have access to electricity as of 2010. This value increased to 33.97% in 2016 but declined to 24.58% in 2020, implying that only 24,342,454 out of a total of 99,033,580 rural population could have access to electricity as of 2020.

4.2. People Practicing Open Defecation

Open defecation is a condition where human faeces are disposed of in fields, forests, open bodies of water, beaches or other open spaces or disposed with solid waste (UNICEF, 2015). As of 2018, the Federal Government launched the nationwide “Clean Nigeria: Use the Toilet” campaign. This was followed by the development of a National Roadmap to achieve an open-defecation-free (ODF) Nigeria in the 2025. Further, the SDG 6.2 stipulates that by 2030 nations should end open defecation and provide access to sanitation and hygiene. As reported by the 2021 Washington report, about 48 million Nigerians continue to engage in open defecation and just about 8% are involved in proper handwashing practices (UNICEF, 2015). Meanwhile, the goal as enshrined in WHO/UNICEF JMP report of 2017 stipulates that by 2021, the proportion of population practicing open defecation is to reduce from 25.4% (which is about 122 million) to about 15.5% (about 88 million). Taking the rural Nigeria into consideration, the number of Nigerians practicing open defecation has been on the decline. However, such a declining trend does not reach the targeted 15.5% for the rural part of the country.

The proportion of rural Nigerians practising open defecation was 33.41% in 2000 (about 26,621,141 rural Nigerians) and declined to 32.48% (27,479,671 rural dwellers) in 2005 with a further decline to 31.55% (28,264,386 rural dwellers) in 2010. This was followed by a decrease to 30.62% (28,931,282 rural dwellers) in 2015 with a further decline to 29.68% (29,393,167 rural dwellers) in 2020. The value of the proportion of the rural population practicing open defecation is presented in Table 4 for the period 2000 to 2020.

Table 4 People Practicing Open Defecation in Rural Nigeria

Year	People practicing open defecation, rural (% of rural population)	Year	People practicing open defecation, rural (% of rural population)
2000	33.41	2011	31.36
2001	33.22	2012	31.17
2002	33.04	2013	30.99
2003	32.85	2014	30.80
2004	32.66	2015	30.62
2005	32.48	2016	30.43
2006	32.29	2017	30.24
2007	32.11	2018	30.06
2008	31.92	2019	29.87
2009	31.73	2020	29.68
2010	31.55		

Source: World Bank (2021).

Given the declining trend in the proportion of rural Nigerians practising open defecation over the years, it is worthy to note that in real sense, the number of rural Nigerians practising open defecation has been on the rise due to the increasing rural population. This can be seen from the increase from about 26.6 million in 2000 to about 27.5 million in

2005 and then to about 28.3 million and 28.9 million in 2010 and 2015 respectively. However, it declined slightly to 29.4 million in 2020 likely due to the efforts from the 2015 N’Gor declaration for sanitation and hygiene.

4.3. People using at Least Basic Drinking Water Services

The rural Nigeria also has a rising proportion of its population having at least basic drinking water services with evidence from data. The rising trend is captured from 30.43% in 2000 to 37.83% in 2005. It further increased to 45.55% in 2010 with a further increase to 53.49% and 61.66% for 2015 and 2020 respectively. Table 5 presents the value for the proportion of rural Nigerians with at least basic drinking water from 2000 to 2020.

Table 5 People Using at least Basic Drinking Water Services in Rural Nigeria

Year	People using at least basic drinking water services, rural (% of rural population)	Year	People using at least basic drinking water services, rural (% of rural population)
2000	30.43	2011	47.12
2001	31.82	2012	48.70
2002	33.31	2013	50.29
2003	34.81	2014	51.89
2004	36.31	2015	53.49
2005	37.83	2016	55.11
2006	39.36	2017	56.73
2007	40.89	2018	58.37
2008	42.44	2019	60.01
2009	43.99	2020	61.66
2010	45.55		

Source: World Bank (2021).

It is worth noting that the proportion of people having access to at least basic drinking water services has increased substantially over the years. By converting these proportions to the actual number of people in the rural Nigeria, it can be stated that people having access to at least basic drinking water also exhibited a rising trend from 24,246,672 in 2000 to 32,006,033 in 2005 with a further increase to 40,806,428 and 50,539,983 in 2010 and 2015 respectively. The figure increased to 56,772,725 in 2018 and then to 61,064,105 in 2020.

4.4. People using Safely Managed Drinking Water Services

Regarding the proportion of people having access to safely managed drinking water in rural Nigeria, the percentage has been quite meagre though it exhibits a rising trend. It rose from 9.55% in 2000 to 11.64% in 2015 with a further increase to 12.87% and 13.68% in 2008 and 2010 respectively (see Table 6).

Table 6 People using Safely Managed Drinking Water Services in Rural Nigeria

Year	People using safely managed drinking water services, rural (% of rural population)	Year	People using safely managed drinking water services, rural (% of rural population)
2000	9.55	2011	14.08
2001	9.98	2012	14.49
2002	10.40	2013	14.89
2003	10.81	2014	15.29
2004	11.23	2015	15.68

2005	11.64	2016	16.08
2006	12.05	2017	16.47
2007	12.46	2018	16.87
2008	12.87	2019	17.26
2009	13.27	2020	17.65
2010	13.68		

Source: World Bank (2021).

The proportion increased to 14.49% in 2012 with a subsequent increase to 15.68% and 16.87% in 2012 and 2015 respectively. As of 2020, the proportion of people in rural Nigeria having access to safely managed drinking water services was 17.65% which is about 17,479,427 people out of the total rural population of 99,033,580 as of the same period.

4.5. People using at least Basic Sanitation Services

To promote sanitation and hygiene, the Federal Government of Nigeria have set up policies and strategies over the years. Such include National Water Supply and Sanitation Policy, 2000; National Environmental Sanitation Policy, 2005; National Health Promotion Policy, 2006; and Strategy for Scaling up Rural Sanitation and Hygiene to meet MDG, 2007. Despite these policies and strategies, sanitation condition in the rural Nigeria has been worrisome since data have shown that not even up to 50% of the rural population have access to at least basic sanitation services (see Table 7).

Table 7 People using at least Basic Sanitation Services in Rural Nigeria

Year	People using at least basic sanitation services, rural (% of rural population)	Year	People using at least basic sanitation services, rural (% of rural population)
2000	28.05	2011	30.71
2001	27.99	2012	30.97
2002	28.27	2013	31.23
2003	28.54	2014	31.49
2004	28.82	2015	31.75
2005	29.09	2016	32.01
2006	29.36	2017	32.27
2007	29.64	2018	32.52
2008	29.91	2019	32.78
2009	30.17	2020	33.03
2010	30.44		

Source: World Bank (2021).

As of the year 2000, people using at least basic sanitation services in rural Nigeria was 28.05% of the rural population and this increase to 29.09% in 2005 with a further increase to 30.44% in 2010. The figure continued the rising trend to 31.75% in 2015 with a further increase to 33.03% in 2020. By translating the proportion to actual population, it is evident that out of 79,680,159 rural dwellers in Nigeria as of 2000, only 22,350,285 could have access to at least basic sanitation services in 2000. This number has increased to 24,611,565 (out of 84,604,898) in 2005, 27,269,981 (out of 89,586,010) in 2010, 29,998,962 (out of 94,484,919) in 2015, and 31,630,101 (out of 97,263,534) and 32,710,791 (out of 99,033,580) for 2018 and 2020 respectively.

4.6. People using Safely Managed Sanitation Services

Regarding people with safely managed sanitation services, Table 8 presents the proportion of rural Nigerians who have access to safely managed sanitation services over the years.

Table 8 People using Safely Managed Sanitation Services in Rural Nigeria

Year	People using safely managed sanitation services, rural (% of rural population)	Year	People using safely managed sanitation services, rural (% of rural population)
2000	21.93	2011	23.87
2001	21.86	2012	24.06
2002	22.05	2013	24.26
2003	22.25	2014	24.45
2004	22.46	2015	24.65
2005	22.66	2016	24.84
2006	22.87	2017	25.03
2007	23.07	2018	25.21
2008	23.27	2019	25.40
2009	23.47	2020	25.59
2010	23.67		

Source: World Bank (2021).

Table 8 presents the rising trend in the proportion of people using safely managed sanitation services in rural Nigeria. The number increased from 21.93% in 2000 to 22.66% in 2005, representing an increase from 17,473,859 people to 19,171,470 between the two periods. It further increased to 23.64% (21,205,009 rural dwellers) in 2010 and then to 24.64% (23,290,533 rural dwellers) and 25.59% (25,342,693) in 2015 and 2020 respectively.

Given the improvements in the rural development as reflected in the declining trend in open defecation, increasing trend in access to sanitation (basic and safely managed), increase trend in access to drinking water (basic and safely managed), and increase in access to electricity, could it be that public spending have been potent in driving such trends? The subsequent segment of this work assesses this perspective empirically.

4.7. Some Empirical Validations

The empirical analysis is conducted to ascertain the influence of public spending on rural development in Nigeria. The analysis is based on each of the rural development indicators reflected in the study and are regressed on government expenditure on social and community services as well as on government expenditure on economic services.

4.7.1. Model Specification

In modelling the influence of public spending on people practicing open defecation, we the model specified as follows:

$$RDEV_t = \delta_0 + \delta_1 GEES_t + \delta_2 GSCS_t + \mu_{1t} \quad (1)$$

Where RDEV represents a vector of rural development indicators given as:

$$RDEV_t = \begin{bmatrix} ODEF \\ BDWS \\ SMDW \\ BSAS \\ SMSS \\ ACEL \end{bmatrix}$$

Where ODEF represents proportion of people practicing open defecation in rural Nigeria (% of rural population), BDWS indicates the proportion of people using at least basic drinking water services in rural Nigeria (% of rural population), SMDW represents the proportion of people using safely managed drinking water services in rural Nigeria (% of rural population), BSAS represents the proportion of people using at least basic sanitation services in rural Nigeria (% of rural population), SMSS represents people using safely managed sanitation services in rural Nigeria (% of rural population), and ACEL represents access to electricity in rural Nigeria. GEES represents government expenditure on economic services, GSCS represents government expenditure on social and community services. δ_0 is the constant (intercept) term; δ_1 and δ_2 are the parameters to estimated, while μ_{1t} is the error term.

4.7.2. Nature and Sources of Data

The data employed in the study are time series in nature, covering the period 2000 to 2020. The data which are secondary in nature were gotten from the World Bank and Central Bank of Nigeria. In particular, data on rural development indicators were obtained from World Bank database featuring on World Development Indicators while data on public spending were obtained from the Central Bank of Nigeria Statistical bulletin.

4.7.3. Analytical Technique

The study utilizes the ordinary least squares (OLS) technique of estimation in estimating the numerical estimates of the model. The choice of this technique is based on the fact that it produces BLUE (best, linear, unbiased, efficient) estimates which can be used in making adequate inferences.

4.7.4. Empirical Findings

The empirical findings on the influence of public spending on rural development is obtainable based on the specified models. For open defecation, the result in Table 4.1 presents the estimates of the model.

Table 9 Ordinary Least Squares Estimate for People Practicing Open Defecation (ODEF) in Rural Nigeria

Dependent Variable: ODEF				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Probability
GEES	-0.000834	0.000759	-1.098540	0.2864
GSCS	-0.002267	0.000285	-7.958070	0.0000*
C	33.06120	0.144455	228.8684	0.0000*
R-squared	0.914865	F-statistic		96.71476
Adjusted R-squared	0.905406	Prob(F-statistic)		0.0000*

Note: * denotes significance at 1% level.; Source: Researcher Computation.

As obtainable in Table 9, government expenditure on economic services could not exert any significant effect on ODEF and its effect is negative as expected. This implies that GEES could not in any way substantially reduce ODEF in rural Nigeria during the study period. However, government expenditure on social and community services (GSCS) exerts a negative and significant effect on ODEF. Thus, a 1% increase in government expenditure on social and community services will lead to a 0.0023% decrease in the proportion of people practicing open defecation in the rural areas. Consequently, GSCS is potent in reducing the proportion of people practicing open defecation in the rural areas of Nigeria. The R-squared indicates that about 91% of the total variations in ODEF can be explained as being attributed to the variations in public spending hence, the model is a good fit. The significance of the F-statistic at the 1% level is an indication that the overall model is statistically significant.

In Table 10, it can be observed that public spending (both GEES and GSCS) exerted positive effect on people using at least basic drinking water services though only the effect of GSCS is statistically significant. Thus, a 1% increase in GSCS will lead to about 0.0193% increase in the proportion of rural Nigerians having access to at least basic drinking water services. Thus, public spending on social and community services aids in promoting rural development through its impact on improved access to at least basic drinking water. The R-squared of 0.9194 signifies that public spending accounts for about 91% of the total variations in the proportion of people having access to at least basic drinking water

in rural Nigeria. The overall model is statistically significant given that the F-statistic of 102.9799 is statistically significant at the 1% level.

Table 10 OLS Estimates of People using at least basic drinking water services (BDWS) in Rural Nigeria

Dependent Variable: BDWS				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Probability
GEES	0.006388	0.006209	1.028834	0.3172
GSCS	0.019292	0.002329	8.284379	0.0000*
C	33.00563	1.181048	27.94605	0.0000*
R-squared	0.919413	F-statistic		102.6799
Adjusted R-squared	0.910458	Prob(F-statistic)		0.0000*

Note: * denotes significance at 1% level; Source: Researcher Computation.

Table 11 OLS Estimate People using safely managed drinking water services (SMDW) in rural Nigeria.

Dependent Variable: SMDW				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Probability
GEES	0.001913	0.001679	1.139244	0.2695
GSCS	0.004883	0.000630	7.755807	0.0000*
C	10.36035	0.319333	32.44371	0.0000*
R-squared	0.911823	F-statistic		93.06783
Adjusted R-squared	0.902026	Prob(F-statistic)		0.0000*

Note: * denotes significance at 1% level; Source: Researcher Computation.

For the result in Table 11, it is observed that both GEES and GSCS exert positive effect on proportion of people in rural Nigeria having access to safely managed drinking water services. Meanwhile, only government expenditure on social and community services exerts a significant effect on SMDW. Thus, a 1% increase in public spending on social and community services will lead to a 0.0049% increase in the proportion of rural Nigerians having access to safely managed drinking water services. It therefore signifies that increased spending on social and community services will boost rural access to safely managed water in Nigeria. The R-squared indicates that public spending accounts for about 91% of the total variations in the proportion of people having access to safely managed drinking water services in rural Nigeria. The F-statistic of 93.0678 which is significant at 1% level is an indication that the overall model is statistically significant.

Table 12 OLS Estimate of People using at least basic sanitation services in rural Nigeria.

Dependent Variable: BSAS				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Probability
GEES	0.001163	0.001056	1.101029	0.2854
GSCS	0.003194	0.000396	8.065255	0.0000*
C	28.29948	0.200861	140.8910	0.0000*
R-squared	0.916754	F-statistic		99.11378
Adjusted R-squared	0.907505	Prob(F-statistic)		0.0000*

Note: * denotes significance at 1% level; Source: Researcher Computation.

The result in Table 12 signifies the existence of positive effect of public spending on proportion of rural Nigerians having access to at least basic sanitation services. It is observed that while the effect of public spending on economic services is positive but insignificant, expenditures on social and community services exerts a positive and significant effect. It follows that a 1% increase in public spending on social and community services will lead to a 0.0032% increase in the proportion of rural Nigerians having access to at least basic sanitation services. Consequently, public spending on social and community services is potent in improving access to at least basic sanitation services in rural Nigeria. the R-squared indicates that public spending accounts for about 92% of the total variations in the proportion of people having access to at least basic sanitation services in rural Nigeria. The F-statistic of 99.1138 which is significant at the 1% level portrays that the overall model is statistically significant.

Table 13 OLS Estimates of People using safely managed sanitation services in rural Nigeria.

Dependent Variable: SMSS				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Probability
GEES	0.000858	0.000781	1.098551	0.2864
GSCS	0.002369	0.000293	8.092320	0.0000*
C	22.08372	0.148474	148.7379	0.0000*
R-squared	0.917179	F-statistic		99.66761
Adjusted R-squared	0.907976	Prob(F-statistic)		0.0000*

Note: * denotes significance at 1% level; Source: Researcher Computation.

The result in Table 13 also portrays the importance of public spending on rural development in general and on access to safely managed sanitation services in particular. It is observable that only government spending on social and community services exerts a positive and significant influence on access to safely managed sanitation services in rural Nigeria. The coefficient signifies that a 1% increase in government spending on social and community services will lead to a 0.0024% increase in the proportion of people having access to safely managed sanitation services in rural Nigeria. Though public spending on economic services exerts a positive effect, such effect is statistically insignificant at the 1% level. the R-squared indicates that public spending accounts for about 92% of the total variation in the proportion of people having access to safely managed drinking water in rural Nigeria. The overall model is statistically significant at the F-statistic of 99.6676 is statistically significant at the 1% level.

Table 14 OLS Estimates of Access to electricity in rural Nigeria.

Dependent Variable: ACEL				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Probability
GEES	-0.003933	0.007447	-0.528162	0.6038
GSCS	0.075445	0.012793	5.897366	0.0001*
C	24.37919	1.416548	17.21027	0.0000*
R-squared	0.255260	F-statistic		13.084758
Adjusted R-squared	0.172511	Prob(F-statistic)		0.0006*

Note: * denotes significance at 1% level; Source: Researcher Computation.

In Table 14, the empirical result indicates that while government spending on economic services exerted a negative but insignificant influence on access to electricity in rural Nigeria, public spending on social and community services exerts a positive and significant effect. This means that an increase in public spending on social and community services will lead to an increase in the access to electricity in the rural Nigeria. A 1% increase in public spending on social and community services will cause a 0.0754% increase in the proportion of people having access to electricity in rural Nigeria. The R-squared indicates that public spending accounts for about 26% of the total variations in access to

electricity in rural Nigeria. The overall model is statistically significant given the significance of the F-statistic at the 1% level.

5. Discussion of Major Findings

The result of this study clearly indicates that public spending on social and community services helps in propelling rural developments. It does so by reducing open defecation, increasing access to drinking water, increasing access to sanitation, and increasing access to electricity within the rural Nigeria. The potency of public spending on social and community services in fostering rural development is because it consists key expenditure components that could have direct effect on the rural communities in Nigeria. Such components include expenditure on education and health along with other social and community services that could boost the development of the Nigerian society.

6. Conclusion

The availability of basic developmental projects in the rural communities is the panacea for improved living standards in the rural communities. Such will also boost economic activities and curb rural-urban migration which is highly prevalent in recent times. The provision of these developmental projects is anchored on government's willingness to vote resources towards its provision and maintenance. Consequently, the focus of this paper has been to explore the influence of public spending (expenditures on economic services and on social and community services) as they affect the rural development in Nigeria. The study covers the period of 2000 to 2020 and the data was analysed using the ordinary least squares (OLS) technique of estimation. The findings of the study are highlighted as follows:

Government expenditure on social and community services have a negative and significant influence on the proportion of people practicing open defecation in rural Nigeria. This implies that to achieve open-defecation-free rural communities, more resources on the part of the government needs to be voted in to the provision of safe public toilets at strategic places in the rural communities.

Government expenditure on social and community services exerts a positive and significant effect on the proportion of people having access to electricity in rural Nigeria. Thus, increased public spending on social and community services towards rural electrification projects will aid in making a greater proportion of the rural communities to have access to electricity which will stimulate economic activities within the rural areas.

Government expenditure on social and community services have a positive and significant effect on both basic and safely managed sanitation services in rural Nigeria. This portrays that increased spending on environmental sanitation agencies will aid in the provision of sanitation services that will ensure efficient and effective sewage and refuse disposal within the rural communities.

Government expenditure on social and community services exerts a positive and significant influence on the proportion of people having access to drinking water (both basic and safely managed) services in rural Nigeria. Consequently, increased spending on water projects will facilitate the provision of safe drinking water across rural communities which will solve the problem of water scarcity and the attendant effect of water borne diseases in the rural communities in Nigeria.

Government expenditure on economic services is observed not to in any way significantly influence rural development during the study period.

Given the above major findings and their implications, the study concludes that public spending on social and community services is potent in driving rural development in Nigeria. As such, the paper recommends that there is need to increase the proportion of expenditure on social and community services in the budget since this component is vital in the development of the rural communities in the country.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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