

# An Evaluation of community-Based Infrastructure Development in North Eastern, Nigeria

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## ABSTRACT

This study is an appraisal of community-based infrastructure development in northeastern Nigeria. Secondary data was gathered from stakeholder departments at both the state and local government levels in the three (3) states of Adamawa, Borno, and Gombe as a representation of the study area. Simple percentage was used in data analysis and results are presented in both graphical and tabular forms. The study found among other things that infrastructure financing has a declining trend in the northeast, especially in Borno and Gombe States where infrastructure provision is concentrated in the state capitals due to insecurity occasioned by the Boko Haram insurgency since 2009. The study recommends increased infrastructure financing and initiation of maintenance plans to ensure sustainability for all projects.

**Keywords:**Community, Infrastructure, Financing, Provision, Development

## I. INTRODUCTION

It is common knowledge that the availability and access to community-based infrastructure is a panacea for a balanced spatial socio-economic growth of communities especially in rural areas. Yet most rural and sub-urban communities are bereaved of these basic amenities. Community-based infrastructures are the complex physical structures or networks within a community upon which socioeconomic activities are carried out (Fishbein, 2001). They include a wide array of physical infrastructure for the provision of energy, transport, information, communications, and other utilities such as roads, water, and sanitation facilities, power supplies, warehouses, storage

facilities, extension services, irrigation networks, schools, health centers, and market, all of which constitute the basic physical facilities needed for the operation of a community be it rural, sub-urban or urban (Memon and El-Bilali, 2019).

Community-based infrastructure provision which usually consists of a large number of comparatively small investments over a geographically large area is needed for the local population to fulfill their basic needs and live a social and economically productive life (ILO, 2018). Investing in feeder roads can contribute to growth, poverty alleviation, and food security (Donges et.al., 2007). The energy which is essential for a wide range of tasks, from operating machinery to powering and lighting facilities to charging communication devices is a game-changer in agriculture. Improved storage infrastructure capacity, quality, and practices are crucial to reducing post-harvest loss (Memon & El-Bilali, 2019). Thus, Turley, and Uzsoki (2019) opined that the provision of roads, storage facilities and localized energy grids will help provide food security for the 821 millions of people living in hunger worldwide. It offers significant potential for the use of local resources including labour and natural resource development, which boosts the production capacity of a population (Olayiwole and Adeleye, 2009). It is, therefore, not a coincidence that this lack of infrastructure is an important reason for a community's vulnerability to hunger. This is due to the fact that it contributes significantly to poverty reduction by enabling increased connectivity, improved livelihoods and greater food and nutrition security (Thakur,

2013). It is, therefore, a core priority for many governments in their efforts to improve the welfare of their populations and increase the productivity and value-added to agriculture and other economic activities.

Despite the foregoing, the provision of reliable and effective infrastructure remains a major challenge in many parts of the world, especially in countries of Africa. It is reported that about one-third of food produced for human consumption is lost or wasted globally, amounting to about 1.3 billion tons per year due to a lack of adequate storage facilities such as grain and rice silos, warehouses, and cold storage for perishable goods, which would play a critical role in ensuring food security and ending hunger (IFAD, 2018). As much as a quarter of the world's population of which almost 85 percent of these people live in rural, dispersed communities across sub-Saharan Africa and South Africa lack access to electricity (Davies et.al. 2019). Furthermore, the lack of access routes to obtain inputs and reach markets, and other food security investments, including technical assistance and access to finance, undermines agricultural productivity resulting from irrigation which would have been more than twice as high on a per-hectare basis than rainfed production. Poor access to reliable water sources negatively contributes to women's empowerment through low asset ownership and poor control over resources, poor sanitation, low local job creation and food insecurity. This is often attributed to the lack of appropriate management tools and insufficient infrastructure financing, which puts local authorities in a poor position to effectively plan and supervise the development of community-based infrastructure (Jahknwa, 2010; Ilesanmi and Linus, 2005; Bashir, 2003).

In Nigeria for example, past infrastructure initiatives often focused on urban and suburban areas while not adequately addressing the unique needs of rural communities (Baba & Mustapha, 2015; Bashir, 2003). Even the communities that were provided with some of these infrastructures, it is observed that due to the absence of any form of maintenance plans, these infrastructures deteriorate, jeopardizing jobs, health and well-being, and overall competitiveness in agriculture and other industries important to the socioeconomic development of the country (Davies et.al., 2019; Jahknwa 2010). The surge in the cases of armed conflicts, banditry and other forms of insecurity especially in the northeastern geopolitical part of Nigeria since 2009 has destroyed most of the

existing infrastructures and caused the diversion of requisite funds earlier meant for developmental projects into funding the fight against Boko-Haram insurgency (Ikpe, 2017). Nigeria often uses the population of a community to determine eligibility to be included in the distribution and allocation or delivery of services and infrastructures (Ilesanmi & Linus, 2005). However, some areas are densely populated, and some moderately populated, while others are sparsely populated, with each of these communities having varying needs. This makes the allocation and delivery of services/infrastructure to be spatially unbalanced in the long run. As important as infrastructure provision through adequate financing is to economic growth, yet without adequate evaluation of the availability, adequacy, and accessibility of these infrastructures to a population, leaves a gap that would undermine the planning and budgeting for the provision of such amenities in a balanced manner. Thus, very little is known on needs-based infrastructure provisioning in northeastern part of Nigeria. Even the information contained in the research conducted by Bashir (2003) on the level of development of defunct Gongola State (now Adamawa and Taraba) in northeastern Nigeria is old and was vague on infrastructure provisioning. Similarly, Ilesanmi and Linus (2005) study focused on recreational infrastructure in Numan local government alone and does not reflect a wider array of other infrastructures nor the wider spatial extent of the northeast geopolitical zone. Even the recent study by Jahknwa (2010) only appraised power supply and road transport infrastructures in Adamawa State. It is only the study conducted by Baba and Mustapha (2015) that focused on the entire northeast; they, however, only concentrated on the decaying state of existing infrastructures alluding to a lack of maintenance by the government at all tiers. Davies et.al. (2019) conducted a review on the role of sustainable development goals in infrastructure provisioning. To the best of our knowledge, there is no known research on community-based infrastructure financing and provisioning for the northeast sub-region. Consequently, this paper assesses the level of infrastructure financing and provisioning between 2009 and 2019 in the northeast geopolitical zone.

## II. MATERIALS AND METHODS

### Study Area

The study area is the northeast geopolitical zone of Nigeria located on latitude 13°89'N and longitude 14°68'E (Figure 1). A total of 6 states and 112 local government administrative units make up this zone comprising: Adamawa with 11

local governments, Bauchi with 20, Borno with 27, Gombe with 11, Taraba with 16, and Yobe with 17 local government areas. The population size of the study area is 26, 293, 872 with a population density of 125.6 people per square kilometer (NBS, 2022). The people of the study area make their living through agricultural activities such as farming, commercial fishing, and the forest products industry. As evidenced by their three distinctive vegetation zones—the Sahel, Sub-Saharan, and Northern Guinea Savannah Zones—farming is the primary activity of the local population in this region. Cassava, yam, guinea corn, maize, millet, and rice are some of their food crops, while cotton and groundnuts are often their income crops. A few of the population are into pastoralism while the majority of the hamlet settlements along the rivers' banks are made up of fishermen. A Series of armed conflicts in the form of insurgency by violent Islamic religious extremists and foreign Fulani militia has been ravaging the economy since 2009. This has caused restrictions on movement of people, goods and services along a rise in inflation, rise in energy prices and food products thus undermine economic productivity in general (Ikpe, 2017).

For ease of access to data and convenience, three states comprising Adamawa, Borno and Gombe States were selected for this study. In sample size determination for assessment at the local government councils level, two-third of the local government areas for each state were chosen, which translates into the following: Adamawa – 14, Borno- 18, and Gombe – 7. Accordingly, a total of 39 local government areas were randomly chosen for this study.

Secondary data were sourced from the departments of Works, Water Resources, Agriculture, Health, Education, Commerce and Finance at both the State and Local Government levels of the study area. The data include the statistics and distribution of the community infrastructures, and the disbursement of projects per sector in the states. The data used are statistics on community infrastructures such as the distribution in terms of number of physical and social infrastructures, which include school facilities, health facilities, water supply, transport, electrification, and environmental management project, and other socioeconomic projects. Data were analyzed with the aid Microsoft Excel statistical package and the result are presented as simple percentages in tabular and graphical forms.

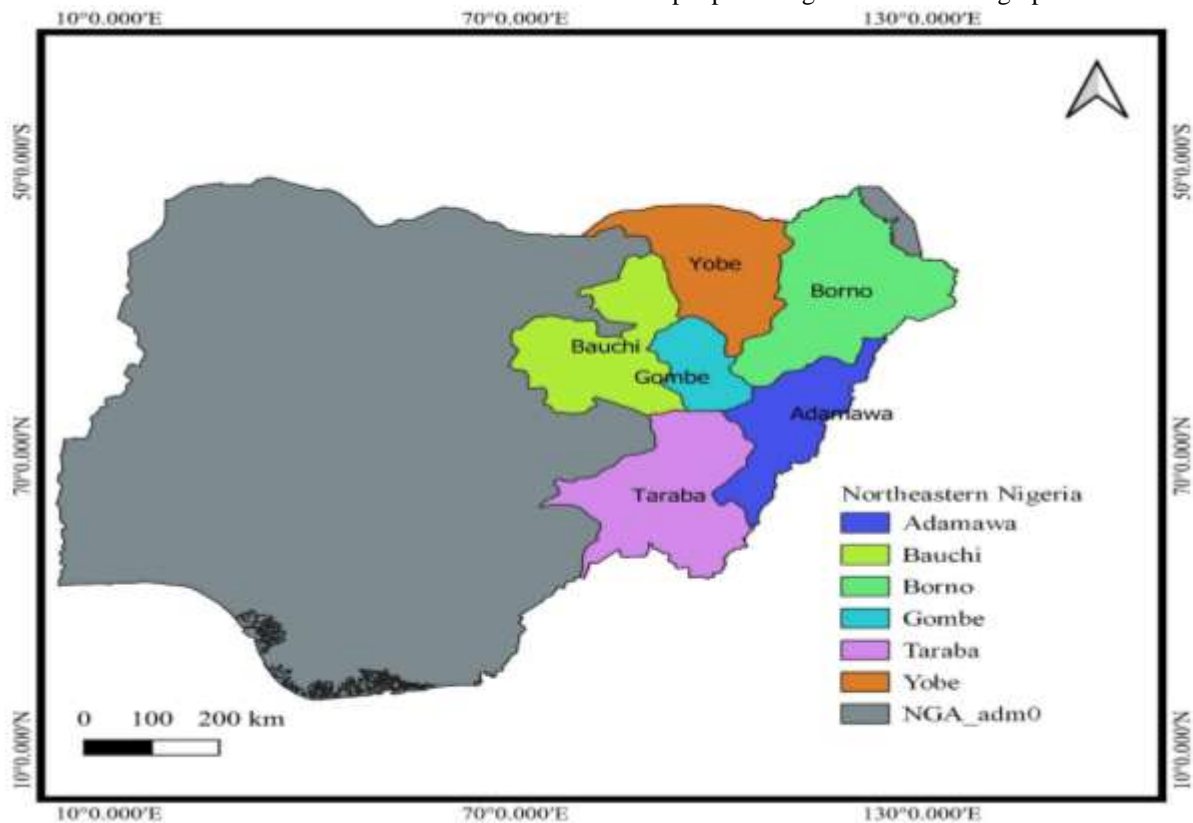


Figure 1: Map of Nigeria showing the Northeast geopolitical zone

### III. RESULTS

#### Trend in infrastructure financing

Community-based infrastructure financing is an indicator of the level of provision of requisite infrastructure to a population. Data from the

relevant ministries, departments and agencies at both the state and local government levels were used in this analysis. The trend in community-based infrastructure financing is presented in Figures 2-4.

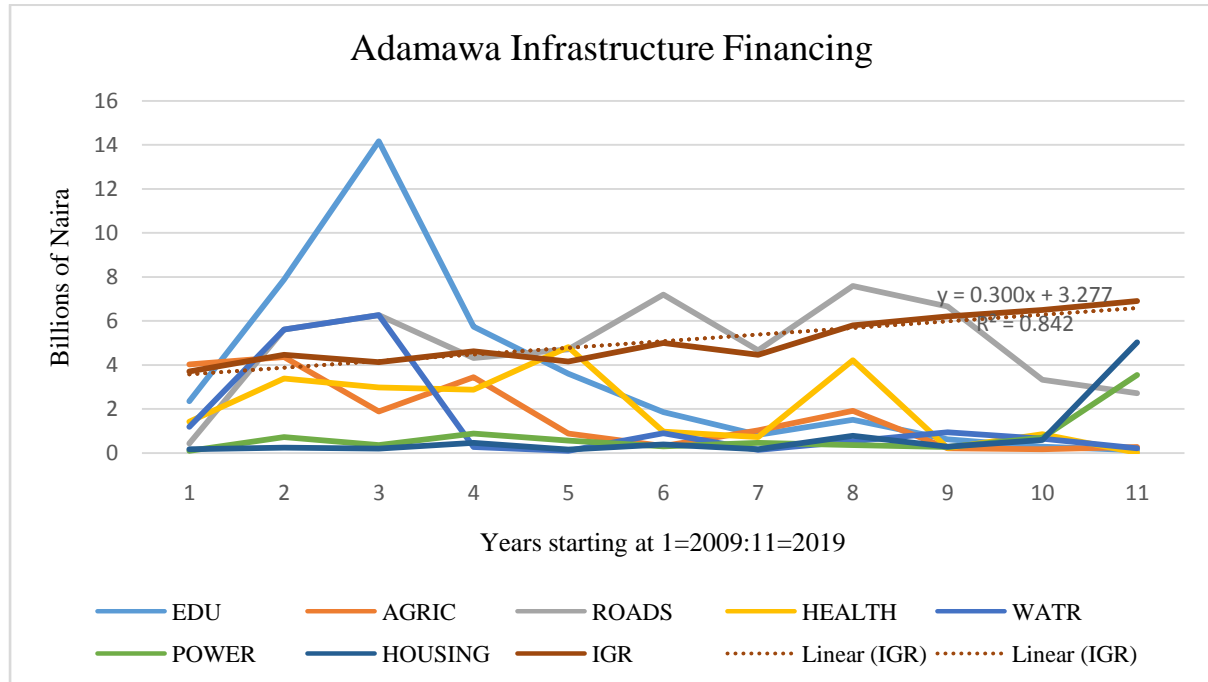


Figure 2: Community-Based Infrastructure Financing in Adamawa

Figure 2 shows that infrastructure financing in Adamawa state follows a declining trend in general. Power (electricity supply) infrastructure financing shows no change in trend from 2009 to 2018, but recorded a sudden rise in 2019, coinciding with a policy shift in governance. Housing infrastructure financing recorded a declining trend in general. Water infrastructure financing rose between 2009 and 2011 and fell to near zero value in 2012 to 2018, only to record a sharp rise in 2019. Health infrastructure financing shows a low gradient rising trend from 1 billion naira to 4.3 billion naira between 2009 and 2013, sharp drop to near zero values between 2014 and 2015, sharp rise to 4 billion naira in 2016, another dropped to near zero value from 2017 to 2019. Water infrastructure financing seem to show some form of seasonality, rising from near zero values in 2009 to 6 billion naira in 2011, then declining to 4 billion in 2012 and 2013 and rising to 6.5 billion in 2014, declining to a little above 4 billion in 2015, rising to near 7 billion naira values in 2016 before showing a continuous declining trend from 2017 to

2019. Road infrastructure financing however shows a rising trend from near zero values in 2009 to an all-time high value of near 8 billion in 2016 before showing a declining trend to about 3 billion in 2019. Agriculture infrastructure financing also shows a general decline from 4 billion to near zero values in 2019. Education infrastructure financing shows a sharp rise from 2 billion to 14 billion between 2009 and 2011, then recording a sharp and then continuous decline from 2014 to near zero values in 2019. The foregoing indicates that only housing and power are received attention of late, with other sectors showing a declining trend. In contrast to the pattern of investments in community infrastructure, the Internally Generated Revenue (IGR) shows a low gradient rising trend from 4 billion to 7 billion between 2009 and 2019 an indication that it would have been more if adequate financing in a more balanced manner is made to all other sectors, thus underscoring the importance of infrastructure financing in the study area.

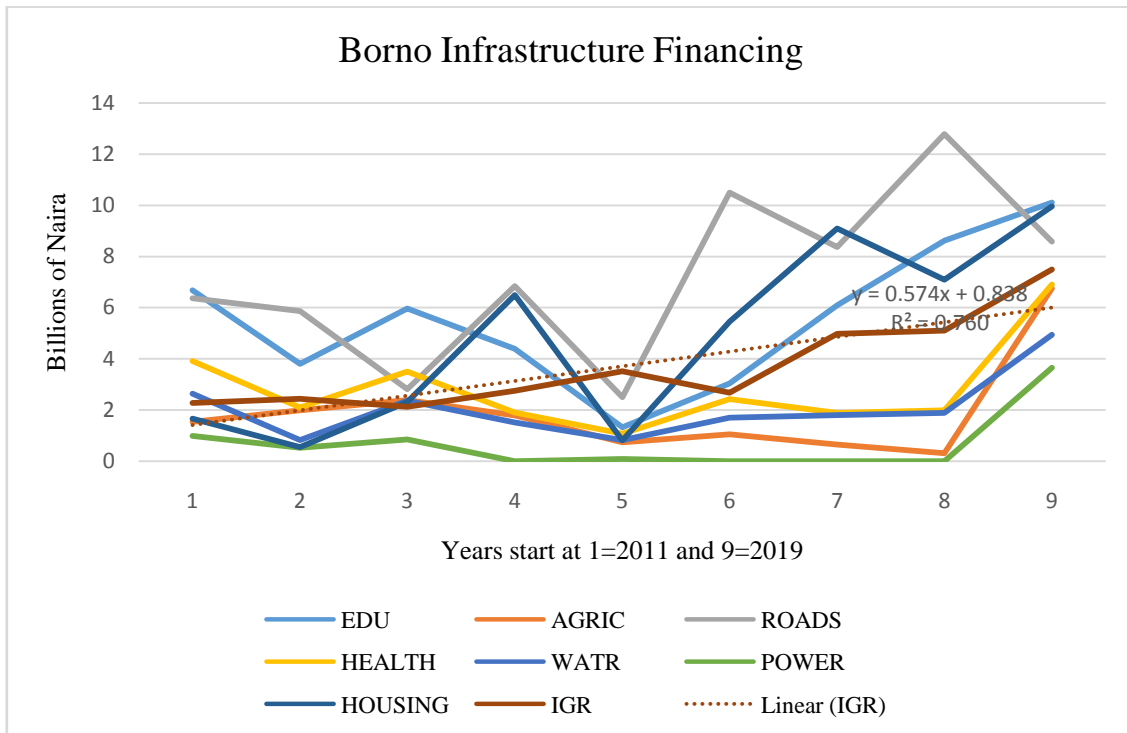


Figure 3: Community-Based Infrastructure Financing in Borno

Figure 3 shows that infrastructure financing in Borno state follows a rising trend in general. Education infrastructure financing a declining trend from over 6 billion in 2011 to less than 3 billion in 2015 before showing a rising back to about 7 billion in 2019. Agriculture infrastructure financing also shows a slow rise from over 1 billion in 2011 to 2 billion in 2013 before showing declining trend tens of millions in 2018 and a sudden rise over 5 billion in 2019. Road infrastructure financing shows an earlier seasonal fluctuation but a general rising pattern by recording a declining trend from over 6 billion in 2011 down 3 billion in 2013, rising to 5 billion in 2014, falling back to 3 billion in 2015 before showing a rising trend to over 12 billion in 2018. Health infrastructure financing also shows a fluctuating seasonality but a general declining from 4 billion in 2011 to 2 billion in 2018 before a sudden rise to over 7 billion in 2019. Water infrastructure also

shows some form of seasonal fluctuation but general decline from 3 billion in 2011 to 1 billion in 2015 before showing a gradual rising pattern to about 5 billion naira in 2019. Power infrastructure showed a decline from about 1 billion in 2011 to zero-naira financing in 2014, a trend that continued to 2018 only to be given a boost to over 4 billion in 2019. Housing infrastructure financing shows seasonal fluctuating but general rising trend from about 3 billion in 2011 to 10 billion in 2019. In general, Figure 3 shows a general decline in financing from 2011 to 2015 (with the exception of power) before showing a rising trend to 2019. The year 2019 shows a general rise in financing for power, agriculture, water, and health. Internally Generated Revenue (IGR) shows a low gradient rising trend from 2 billion to about 8 billion between 2011 and 2019 serving as a dividing line between power, agriculture, water and health below, and housing, education and roads above.

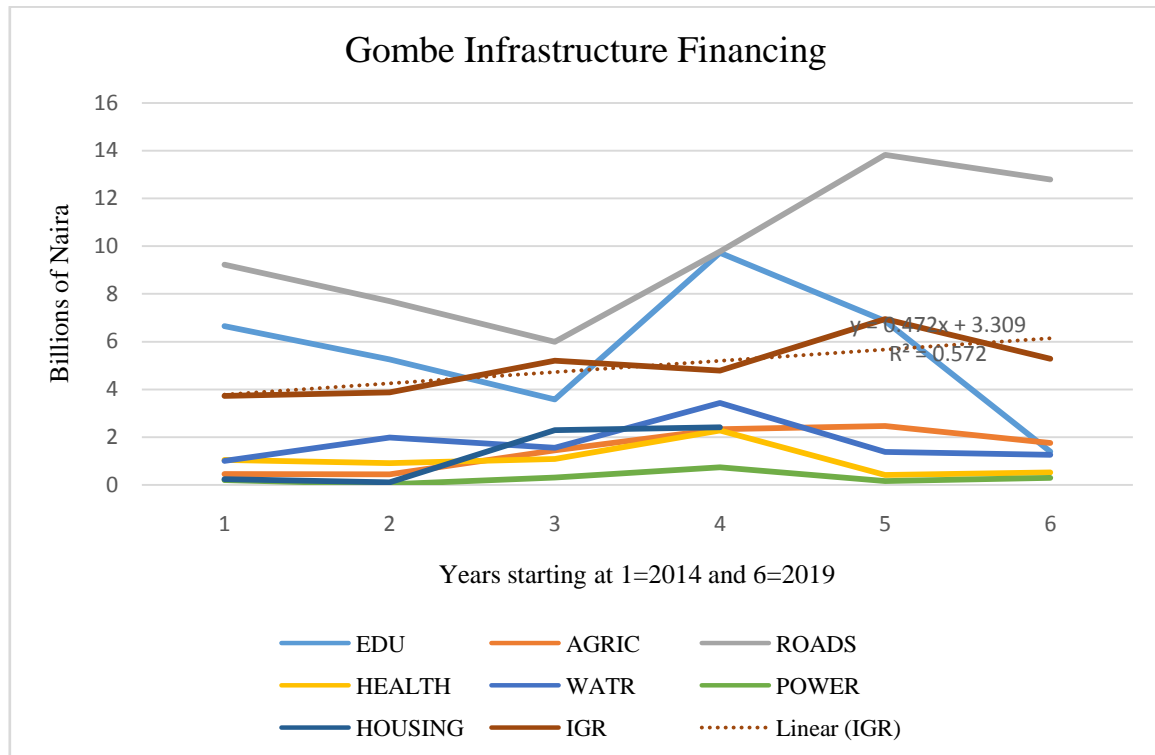


Figure 4: Community-Based Infrastructure Financing in Gombe

Figure 4 shows that infrastructure financing in Gombe state follows a rising trend from 2014 to 2018 from which it begins a downward spiral in general. The IGR not only shows a rising trend but marks the dividing line between education and agricultural financing at the top from water, health, agriculture, housing and power at the bottom. Roads shows a declining trend from over 9 billion in 2014 down to less than 6 billion in 2016 from which it shows a continuous rising trend. Education infrastructure financing exhibits a declining trend from over 6 billion in 2014 to less than 4 billion in 2016 from which it rises to about 10 billion in 2017 and then shows a downward trend to less than 1 billion in 2019. Water shows a rising trend from 1 billion in 2014 to more than 3 billion in 2017 before declining to 1 billion again in 2019, which is a fairly periodic fluctuation. Health, Agriculture and Housing financing also show a similar pattern to that of water; while power shows very poor financing with no significant change. Internally Generated Revenue (IGR) shows a low gradient rising trend from 2 billion to about 8 billion between 2009 and 2019 serving as a dividing line between power, agriculture, water and health below, and housing, education and roads above.

#### Types of infrastructure

Types of existing community-based infrastructures range from feeder roads, to primary healthcare facilities, electricity, schools and communication masts. The proliferation of communication masts for mobile telephoning is the largest investment and so perhaps because it is private sector driven. Primary healthcare facilities of an average of 10 capacity beds in the form of dispensaries and clinics are located within a range of one to three kilometer radius to cater for a minimum population of over 120 persons. Sixty-five percent (65%) of the communities are connected to the nation electricity grid with an average of 5 hours of supply per day, which makes most communities to depend on alternative energy supply for fuel driven generators that add to the cost of services and products supply and thus cost of living in general. Modern storage facilities are absent, and communities are still using the old system of storage that renders perishable goods useless in a few days due to the vagaries of the weather. There are no housing infrastructure provision in rural communities and power supply infrastructure has been down for most communities that were devastated by the Boko-Haram insurgency since 2014 in northern Adamawa and Borno.

**Distribution pattern of infrastructures**

Available data shows that infrastructure are classified into three categories: first order, second order and third order. First order category includes all infrastructure that are highly capital intensive such as electricity, municipal water treatment plants, trunk A tarred roads and referral health facilities, to which priority is given to urban communities in the cities. Second order infrastructure category includes basic amenities such as electricity, trunk B tarred roads, water distribution tanks supplemented by industrial boreholes, secondary health facilities such as cottages and general hospitals and housing development to which priority is given to urban and suburban communities. Third order infrastructure category includes basic infrastructure such as boreholes and wells, rural feeder roads, primary healthcare facilities such as dispensaries and clinics, with or without electricity supply, primary and secondary education at most cases and agricultural extension services provision to which priority is given to rural communities. Table 1 shows the distribution pattern of infrastructure in percentage. It shows that rural communities have only 13% of education infrastructure mainly in the form of primary schools; suburban communities which are mainly district capitals have 22% of

education infrastructure in the form of primary and secondary schools; while urban communities, which are mainly local government capitals have 65% of education infrastructure in the form of primary and secondary schools and colleges. In terms of agricultural infrastructure, there are no modern storage facilities, especially for perishable goods; Table 4 shows that priority is given to rural communities with 56%, while suburban and urban communities have 25% and 19% respectively. For road infrastructure provision, rural communities have 15%, suburban communities have 33% and urban communities have 52%. For health infrastructure, rural communities have 12%, suburban communities have 29%, and urban communities have 59%. In terms of water supply infrastructure, rural communities have 10%, suburban communities have 17%, and urban communities have 73%. Power in the form of electricity infrastructure has the following distribution pattern: rural (7%), sub-urban (27%), and urban (66%). In terms of housing, the table shows that rural communities are the most neglected with 0%, and only the suburban (15%) and the urban (85%) communities benefit. In general, infrastructure provision is biasedly skewed towards the urban and sub-urban communities compared to rural communities.

**Table 1: Infrastructure distribution pattern in the study area**

Basic Infrastructure Type	Percentage Distribution (%)		
	Urban	Sub-urban	Rural
Education	65	22	13
Agriculture	19	25	56
Roads	52	33	15
Health (Primary Health Care and Cottage Hospitals)	59	29	12
Water (Safe water supply)	73	17	10
Power	66	27	7
Housing	85	15	0

The foregoing report is supported by the following responses in Table 2 from respondents in each of the study units. Table 5 shows that 28% and 3% of the respondents respectively opined that they have Primary Health Care facilities and rural water supply projects in their villages; 20% have basic education infrastructure; 15% have feeder roads; 25% have access to agricultural facilities and only 7% and 2% have access to power supply and

housing infrastructure respectively. This suggests that despite the huge budgets on infrastructure financing in the past ten years, yet infrastructure adequacy remains a challenge as many rural dwellers shown by the responses in this survey claim poor to no access to basic community-infrastructure that would ensure livelihoods and thus socio-economic productivity in the sub-region.

**Table 2: Rural Access to Community-based Infrastructure**

Basic Infrastructure Type	Percentage of Respondents with access (%)
Education (Primary and Secondary)	20
Agriculture (inputs and storage facilities)	25
Roads (Rural Feeder Roads)	15
Health (Primary Health Care and Cottage Hospitals)	28

Water (Safe water supply)	3
Power	7
Housing	2
	100

### Perception of Changes in Access to Infrastructures by Category

Table 3 shows the result of respondent's perception of the changes in access to infrastructure in their communities.

**Table 3:** Changes in Access by category in the Rural Areas.

Sectors	Number of Respondent	Percentage (%)
Basic Education	300	60
Power supply	0	0
Primary Health Care	340	68
Water	110	22
Rural transport	30	6.0

**Source:** Field Work, 2021

**Table 3** shows that the total sampled population of 500, 60% of the respondents reported increased in school enrolments, due to completion of some education infrastructures in their villages. However, for rural power supply infrastructure, the respondents are of the view that there was no significant increase in the access to electricity due to fact that a number of the projects were not completed and were completed there is hardly electricity supply of more than 3 hours daily. On health infrastructure, 68% of the respondents opined that there was increase in access to primary health care services, after completion of some community health care facilities in their villages. In terms of water supply infrastructure, 22% of the result of respondent's perception of the effect of infrastructure provision on poverty reduction.

respondents claim that the provision of water boreholes has improved their access to safe water .While for rural transport infrastructure, 6.8% of the respondents reported that there was some decimal increase in connection of feeder roads linking between their rural communities and to the market centers due to completion of some projects. This goes to show that community-based infrastructure provisioning has improved the lives of the population.

### Perception of the effect of Infrastructure Provision on Poverty Reduction

Table 4 shows the

**Table 9** Respondent and assessment of poverty reduction in the study area.

Item	Number who agreed	Percentage of respondent (%)	Number who disagreed	Percentage of respondents (%)
Increase in income	100	20	400	80
Increase in ownership of household properties	100	20	400	80
Increase in self-reliance	80	16	420	84

**Source:** Field Work, 2021-.

Table 4 shows that only 20% of the respondents indicated increase in incomewhile 80% of the respondents opined that there is no significant increase in their own income. Furthermore, only 20% respondents specified

increase in their household properties, while 80% indicated that there was no increase household property ownership. Also 16% of respondents agreed with significant increase in self-reliance job opportunities against 84% who did not agree with



the motion. This result indicate that infrastructure provision has had no significant impact on poverty reduction in the study area. This may be attributed to the lack of maintenance of existing infrastructure alluded to by Baba and Mustapha (2015).

#### IV. CONCLUSION

Community based infrastructure provision has over the years impacted positively on the development of some rural communities in north-eastern in Nigeria. Improved access to basic education, healthcare, transport and electricity facilitated by the decimal effort in infrastructure financing and provisioning has brought about improved living conditions in rural and suburban communities of the northeast Nigeria. Infrastructure financing is a critical component which needs to be on the rise to meet with population growth. The absence of any maintenance and sustainability plans of projects has however undermined the impact of existing community-based infrastructure significantly. It is clear that infrastructures deterioration in rural communities in developing countries could be improved if the beneficiaries themselves participated in the development process. It was argued that for effective performance of community participation in rural development project, the people in the communities need to adopt the true principle of participatory planning approach in the implementation of the rural development project. This approach helps to establish a complete understanding of requirements of the community development project. The strategic guidelines of the participatory planning approach include diverse contribution and co-operation, among members of the community with presentation of their active commitment role for transparency, and accountability while dealing with implementation of the community development project. The rural development project will be improved through exhibiting transparency, sharing of power and responsibility among beneficiaries of the project. The communities should be given the right to monitor, and evaluate the progress of the infrastructure projects, at all stages of the implementation, without undue interference from the project managers. This will go a long way in that standards are not compromised in both the short and the long run.

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#### REFERENCES

- [1]. Baba, I. and M. Abubakar (2015). Decaying Nature of Facilities and the Need for Infrastructural Development in North-east Nigeria. *Universal Journal of Industrial and Business Management* 3(2): 37-45, 2015, DOI: 10.13189/ujibm.2015.030201, available at <http://www.hrpub.org>
- [2]. Bashir, A. (2003) Regional planning and urban infrastructure development in the Gongola region, North Eastern Nigeria (1), *Global Journal of Social Sciences* 2(1) January 2003, DOI: 10.4314/gjss.v2i1.22768
- [3]. Davies, I. E. E., C O Nwankwo, O M Olofinnade, and T A Michaels (2019). Insight review on impact of infrastructural development indriving the SDGs in developing nations: a case study of Nigeria. 1st International Conference on Sustainable Infrastructural Development IOP Conf. Series: Materials Science and Engineering 640 (2019) 012112, IOP Publishing, doi:10.1088/1757-899X/640/1/012112
- [4]. Donnges, Ch., Edmonds, G., and BJohannessen (2007) Rural Road Maintenance –Sustaining the Benefits of Improved Access (SETP 19) Bangkok, International Labour Office, 2007  
Fishbein, Robert. 2001. Rural Infrastructure in Africa: Emerging Strategies. Africa Region Findings & Good Practice Infobriefs; No. 191. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/9799> License: CC BY 3.0 IGO.
- [5]. [https://www.ifad.org/documents/38714174/42157091/Targeting\\_in\\_rural\\_infrastructure\\_investments.pdf/e193bad4-2446-8bf8-71d1-c4d1aa504a0b](https://www.ifad.org/documents/38714174/42157091/Targeting_in_rural_infrastructure_investments.pdf/e193bad4-2446-8bf8-71d1-c4d1aa504a0b)
- [6]. [https://www.ilo.org/asia/WCMS\\_099466\\_2022/lang--en/index.htm](https://www.ilo.org/asia/WCMS_099466_2022/lang--en/index.htm)
- [7]. Ikpe, E. (2017). Counting the development costs of the conflict in North-Eastern Nigeria: the economic impact of the Boko Haram-led insurgency. September 2017 Conflict Security and

- Development 17(5):381-409, DOI: 10.1080/14678802.2017.1371987
- [8]. Illesanmi F.A. and G.M. Linus (2005) Sustainable recreational infrastructural facilities development in Numan-Nigeria: Inventory, Perceived Needs, Patronage and other planning issues. In J. Uyanga, M. Galtima and M. Ono (Eds.) Towards a sustainable environmental management, Yola-Nigeria: ParacletePublishers, pp105-119
- [9]. Jahknwa C. J. (2010). An appraisal of some infrastructures in rural Adamawa State. *International Journal of Geography and Regional Planning*, Volume 2, No.1, 2010:112-118
- [10]. Memon, J.A., and El Bilali, H. (2019). Rural Infrastructure and Food Security. In: Leal Filho, W., Azul, A., Brandli, L., Özuyar, P., Wall, T. (eds) *Zero Hunger. Encyclopedia of the UN Sustainable Development Goals*. Springer, Cham. [https://doi.org/10.1007/978-3\\_319\\_69626-3\\_44-1](https://doi.org/10.1007/978-3_319_69626-3_44-1)
- [11]. Olayiwola, L. and O.A.Adeleye, (2005). Rural Infrastructural Development in Nigeria: Between 1960 and 1990 – Problems and Challenges. *Journal of Social Sciences*. 11.91-96. 10.1080/09718923.2005.11892499.
- [12]. Thakur, D. K. (2012). Rural Infrastructure: A New Vision for Poverty Reduction. *World Affairs: The Journal of International Issues*, 16(4), 78–89.<https://www.jstor.org/stable/48566256>
- [13]. Turley, L. and D. Uzsoki (2018) Financing Rural Infrastructure: Priorities and pathways to ending hunger. © 2018 The International Institute for Sustainable Development. Available at IISD.org