



Research Paper

Effect of Water Supply and Health Infrastructure on Agricultural Development in Konshisha Local Government of Benue State, Nigeria

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ABSTRACT

The state of rural agricultural production and how water supply and health facilities on ground helped in improving agricultural sector was studied. Konshisha Local Government which is one of the rural Local Government areas in Benue State was chosen as the study area. The infrastructural facilities that were assessed based on their relationship with agriculture were: water supply system and health facilities. Descriptive design was used while stratified sampling technique was employed as each ward was considered a stratum. Purposive sampling technique was also adopted based on homogeneity of the population. Key informant interview was conducted in the selected locality considering the respondents in-depth knowledge of the area. Data was collected using primary sources which were: researcher's personal interview; observations and photographs were also used to support and further explain the observations. The theoretical framework of this study was the integrated rural development strategy (IRDS). From the survey conducted, water supply and health facilities were in very deplorable state, and therefore incapable of boosting agricultural productivity in the area. Given the interrelationship among the infrastructural facilities as regards agriculture, attention given to only one of them will not produce the desired agricultural improvement. Adequate water supply across the local government area is recommended as this will help to reduce the risk of water borne diseases, as well as time consumed in search of water. Therefore IRDS is suggested to government of Benue State in order to bring the rural Konshisha Local Government Area out of this low agricultural production state.

KEYWORDS: Water supply, infrastructure, agriculture, rural development, health facilities

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I. INTRODUCTION

Most Third World Countries (TWCs) of Africa, Asia and Latin America are still faced with the problem of food insecurity despite the fact that over 70% of their population still live in the rural areas with a large portion of cultivable land at their disposal. This situation has been traced to the colonial era. The colonial intervention in African countries, particularly Nigeria has had a tremendous effect on the institutional arrangements as regards development.

In Nigeria however, several efforts have been made to address the food insecurity challenges, yet none seems to yield any appreciable result. This is because agriculture is growing but the growth is unsustainable. Agriculture also continues to suffer from the inertia associated with policies and programmes intervention and reformation that pervaded Nigeria especially in the post-colonial era [1].

The policy and programme changes undergone by the Nigerian agricultural sector is as a result of or a mere reflection of changes in government or administration [2]. This is because these policies vary only in nomenclature and organizational network. They emphasize almost same objectives such as provide food for the inhabitants of the nation (food security and sufficiency), export excess to other countries as well as provide rural dwellers and farmers with extension services, agricultural support and rural development services [1].

Despite all the laudable policies and programmes, Nigeria is yet to achieve food security and sufficiency as always designed. For this to be achieved in Nigeria, reforms and agricultural programmes need to be backed up or initiated through good policies coupled with increased and better coordinated technical and

financial assistance. It should also be a programme selected based on a rational, national and institutional structure that come from a national consensus on how best to achieve sustainable and equitable rural and agricultural development.

A policy is a guideline consisting of principles and rules governing the behaviour of persons in an organization. Asiabaka [3] prescribes how people in an organization should act or behave. This differs from rule of laws because while law can compel or prohibit behaviour, policy merely guides actions towards those that are most likely to achieve desired outcome [4] as cited in Iwuchukwu and Igbokwe [1]. Agricultural policies can thus be explained to mean a statement of action consisting of guiding principles and fundamental tools employed to aid the achievement of agricultural development.

Agriculture and infrastructure have a symbiotic relationship; in order to pursue and achieve better agricultural programs, the government must use a different approach in the development of infrastructure, particularly physical infrastructure such as technology, electricity, water supply systems, and road networks, all of which are critical to long-term agricultural development. The integration of all these can enhance productivity in agriculture and go a long way to curtail the wastage which is generally associated with duplication of programmes on agriculture without alternative infrastructural back up.

Development in human societies has always been a subject of great importance and concern. It is unfortunate however, that not all societies that aspire for development have achieved it. Rodney [5] asserts that, even those societies that have achieved development, the rate of attainment varies. That is why some countries are referred to as developed, less developed or developing. Rodney [5] also observed that the differences in the rates of development among societies can be explained in terms of environmental and institutional structure. On the environment, the quanta of mineral resources that are endowed by God to be harnessed by man are very significant in determining the level of development attained by such a society. This is not to say that the availability of mineral resources is an automatic guarantee for development. The institutional structures involve the form of social relations, government, patterns of behaviour as well as belief system. To Rodney, the level of attainment of development recorded by any given society especially if allowed to develop without interruption depends on the positive interplay between the environment and the institutions. Thus development comes from carefully, deliberately planned and consciously executed programme of activities.

On this premise, Todaro [6] views development as a process involving the re-organization and re-orientation of the entire economy and social system, which entails improvement in income and output, radical changes in institutional, social and administrative structures as well as popular attitudes, customs and beliefs.

Development plans and policies have been the major focus of successive governments in Nigeria since independence in 1960. Some of which were meant to conform to special conditions and circumstances. There are numerous sectors in Nigeria that require government attention to develop. The focus of this research project is on infrastructural development and how this affects agricultural productivity in Benue State.

The Development of infrastructure by indigenous administrations in Nigeria can be traced back to the end of civil war in 1970. During this time, the regime of General Yakubu Gowon embarked on the policy of 3Rs which were the Reconstruction, Rehabilitation and Reconciliation. The aim of the policy was to revitalize those areas destroyed by the war, rejuvenate the economy and the entire social life of the people affected by the war. It was at this period that most physical infrastructures in Nigeria such as bridges, schools and roads with some industries were established. It is therefore unfortunate that this infrastructural distribution was lopsided as it focused on the urban centers leaving behind the rural areas which should be the basis for development. This has been one of the causes of the poor state of agriculture in Nigeria which has brought the present food insecurity challenge. These infrastructural situations in the urban centres negate the role of agriculture in national development. The consequence of this is the migration of the energetic youth who are employees of labour for agriculture in the rural areas to urban centres, leaving agricultural labor to the aged who strive in a subsistence manner.

The rural areas in Nigeria have a large portion of cultivable land which if properly harnessed through integrated infrastructure and employment of labor for agriculture, the food insecurity challenge will become a thing of history. The absence of this integration has brought about poor or low productivity in the agricultural sector due to wastages incurred by farmers as a result of inaccessibility to storage facilities, market for produced crop commodities and generally the low turn up of labor due to primitive farming method.

Agricultural development in Nigeria can be traced to the colonial era during the earliest attempts at rural development. This took a form of community development and later agricultural extension. The community development approach emphasized self-help to improve health, nutrition and community welfare, whereas the agricultural extension approach concerned itself with improving agricultural productivity [7]. These programmes though perceived primarily to have produced primary products for the feeding of European industries, nevertheless formed the basis for agricultural development in Nigeria [8].

The early years of Nigeria's independence witnessed concentration of development efforts on the modern sector of economy thereby neglecting investment in the rural economic base. The problem now has been

how to make rural development sustainable. To this regards, many rural development programmes have been pursued by different administrations in Nigeria. The shortcomings of both remain the limited local community participation in problem identification, project prioritization, design preparation and implementation [7]. Another shortcoming is that most of these development approaches are elitist and urban based. Rural areas are still largely characterized by absence of basic human needs and underdevelopment in agricultural and non-agricultural activities [9]. This is due to the negligence of the rural areas in virtually all ramifications of modernization process. The discussion dwells much on rural development with emphasis on effect of water supply system and health infrastructure on agricultural development in Konshisha Local Government of Benue State, Nigeria.

1. The infrastructural problem and agriculture

Nigeria, since inception has been characterized by agriculture as constituting its major source of livelihood. During colonial incursion, the Europeans met agriculture as the major occupation of the people of the region. Coincidentally, they needed the agricultural raw materials for their metropolitan industries. This urged them to encourage the production of cash crops such as groundnut, oil palm, cocoa, coffee, cotton and rubber. Thus to facilitate export, the Europeans embarked on infrastructural development. This gave rise to the construction of railways (Transport infrastructure) for easy conveyance of raw materials to their home industries. At that time, they also established port authorities. All these were done with total negligence to the production of food crops for domestic consumption.

At independence, agriculture accounted for over half of Nigeria's GDP and was the major source of export earning for public revenue. After 1983, this declined to 1.7% of GDP and 7.9% export with corresponding increase in importation of food [10], [11], [12], [13].

Several development programmes on infrastructure and agriculture have been embarked on by different regimes in Benue state since 1999. Some of these are in Benue Advance Plan (BAP) and Our Benue our Future (OBOF) however, the rural areas in the state have not benefited from these programmes as expected. This has made the rural areas, the supposed power house for generation of food for feeding the nation as well as for export, to be characterized by hunger, poverty, high mortality rate and rural urban migration. The high rate of infrastructural decay as well as food insecurity is experienced in the entire state. It is based on this observation that the study set out to find the root causes of the poor state of infrastructural development and the decline in agricultural productivity with its attendant consequences on food security in Benue State in general and Konshisha Local Government in particular.

II. METHODOLOGY

2.1 Research Design

The nature of this research allows for the use of descriptive design; this is because it involves the development of infrastructure and agriculture over time, as well as the study's segments. Descriptive design is the most commonly used in social science research. This is due to its inclusion of historical, developmental, survey and case studies.

2.2 The Study Area

Konshisha Local Government Area was carved out of Vandeikya local government (Southern part) in 1989. The local government currently shares boundaries with Cross River State, Oju local government, Vandeikya, Gwer East, Gboko, and Ushongo local government respectively. The population of the local government constitutes about 9.8% of the state's total population. Agriculture is the major economic activity in the local government, engaging majority of the inhabitants of the local government. The study concerns itself with only Konshisha Local Government Area.

2.3 Population of the Study

The study covers the entire local government which is made up of eleven (11) council wards. Each council ward therefore comprise of 1 district while a district is made up of five kindred. That is fifty five (55) kindred. The population also covers the seven departments in the local government council with their respective staff strength as follows: Agriculture 93 staff, Education 163 staff, Finance 114 staff, Health 174 staff, Personnel 125 staff, Revenue 127 staff, Works 75 staff, which makes up the total staff population of 869. Therefore the population of this study is 924 (Field Survey, 2016).

2.4 Sample Size and Sampling Technique

The sample for this study was 32 respondents. This sample was drawn from the 55 kindred where two kindred (heads) were purposively selected for the interview from each district which represents 40% of the population of the kindred heads. Ten (10) staff of the local government council were also purposively selected

for interview which were four (4) staff from the local government executive council and six (6) others from two departments; agriculture and works respectively. Key informant interview was therefore conducted to get desired data from the respondents. The availability of relevant materials to be included in the study determined the choice of sample. That notwithstanding, the researcher used stratified sampling. The reason for this was that the local government already exists in a stratified form, (each ward forms a stratum). The sample size was drawn from each of these strata. Stratified sampling is a form of probability sampling which as explained by Ikem, [15] gives every item in the population equal and independent opportunity of being included in the sample. From this, purposive sampling was applied to select the desired responses while key informant interviews were used based on perceived respondents' in-depth knowledge about the study area.

2.5 Sources of Data

Data for this work was collected from two sources namely, primary and secondary. Primary data was collected by observation of the researcher and through personal interviews. Secondary data used in this work was collected from journals, textbooks, policy handbooks and government publications (Our Benue Our Future policy document, BENARDA,).

2.6 Instruments of Data Collection

Data collection was carried out using the following instruments:

i) Personal interviews - Infrastructural development in Konshisha Local Government Area has historical antecedents. It is therefore necessary to interview the members of such communities to unearth the underlying issues associated with the state of such infrastructure. To do this, unstructured or in-depth interviews was used as described by Mathers, Fox and Hunn [16].

According to the authors, unstructured interviews are so called because; they have very little structure at all. The interviewer approaches the interview with the aim of discussing a limited number of topics, sometimes as few as one or two, and frames successive questions according to the interviewee's previous response. Although only one or two topics are discussed, they are covered in great detail. Unstructured interviews are exactly what they sound like – interviews where the interviewer wants to find out about a specific topic but has no structure or preconceived plan or expectation as how the interview will proceed. The relationship between the interviewer and the informant is important. Some characteristics of key informant interview are that the researcher has a general purpose and may use a topic guide but informant provides most of the structure of the interview. Generally the researcher follows up on 'cues' or leads provided by the informant.

ii) Personal observations – Personal observations will elicit questions on issues that are not clear and seek clarifications from members of the community through personal interviews.

iii) Photographs - Photographs of the infrastructures investigated were used to present the current state of such infrastructure. The photographs were used to support and compliment the other relevant data in the study.

2.7 Method of Data Analysis

Data is presented in tables while photographs were used to show the state of infrastructure in the study area to support personal interviews and observations.

III. IMPACT ASSESSMENT OF WATER SUPPLY AND HEALTH FACILITIES ON AGRICULTURAL PRODUCTIVITY IN KONSHISHA LOCAL GOVERNMENT AREA

3.1 Water supply system

It was observed that, the major sources of water available in Konshisha Local Government Area are streams and shallow wells. This has for a long time kept the people of the area completely out of dry season farming. The respondents reported that the available sources of water are not enough to cater for the domestic needs of the people. The streams in Konshisha normally have water from early June and dry up in early December. It was learnt that People resort to digging shallow wells along the streams in order to have drinkable water. These wells are commonly called "Aswa" which in turn dry up around middle of March before the new rains set in. In the area of tube wells, some families who can afford the cost pay for drilling of tube wells in the compound using locally manufactured drilling tools. This becomes the major source of water for the close family relatives as well as neighbors. This also does not have guarantee since other families cannot afford the cost to drill such in their compounds. Therefore, the pressure from many families makes it difficult for the wells to satisfy the needs of the community.

In attempt to address the water problem in the area, the Benue State Public Utilities Board (BSPUB) embarked on the construction of water works. This was carried out by Patterson Candy International (PCI) water works, which were located in Tse-Agberagba and Korinya. They were to provide potable water for the people. It is unfortunate that these could not serve the purpose for which they were constructed, since the two water systems are for a very long time non-functional (Figures 1).

Some of tube wells commonly called “Jor Enie” remain the source of water for the people of Korinya and Tse-Agberagba despite their unhygienic state. These are said to be unhygienic because the wells were constructed without provision for cover. People usually use all kinds of containers tied to all kinds of ropes to draw water from the tube wells. The open nature of the wells exposes them to all sorts of dirt such as dry leaves shading from trees around the area, dust/sand, insects which drop and die inside the wells, reptiles as well as frogs. All these contaminate the water in such wells creating health hazards for those who consume such water (Figure 2). This situation is the same as found among the shallow wells which are commonly dug near bamboo and raffia palm trees. These are usually found along swampy areas which are also the major sources of drinkable water during dry season. Communities within the Local Government who are not located near natural streams or swamps resort to the construction of earth dams to serve their water needs. These are commonly funded from community levies where every family contributes the amount required of them.



Figure 1. Abandoned Peterson Candy International (PCI) Water Works at Tse-Agberagba (February, 2016).



Figure 2. Tube well (Jor Enie) near Post Office at Korinya (January, 2016).



Figure 3. Water been drawn from small wells (aswa) dug beside the main stream (January, 2017).



Figure 4. Earth dam at Tse-Agberagba (January, 2017).



Figure 5. Manual operated bore hole located at Anshagba village (May, 2017).

These dams just like the shallow wells serve as major source of water for the communities involved. The dams are as well exposed to the same unhygienic nature since both animals and humans drink from the same source. In order to reduce the hazards, associated with this, small wells are dug at the edges of the dams, commonly called aswa (Figures 3 and 4). The water from the dam filters carefully into these wells from under the ground; with this, the water from the wells are meant strictly for drinking, while that from the pool is used for other activities. This is because the wells are dug in a manner that animals are not able to drink directly from them. The fact still remains that, these wells consume a lot of time while trying to draw water from them. The average time taken to get five litres of water from these wells is about 30 minutes, but the people are left with no choice than to wait patiently and get the water that is clean and considered more hygienic than that from the common pool.

This activity diverts people's attention from dry season agricultural activities. It has also contributed to the degrading state of agricultural productivity in the area. The reason for this is that, the task of searching for water for the family is normally carried out by women and children while that of dry land clearing for farming is still done by the same women. Therefore diverting the attention of women from this simply means reduction of hands on the farm which in turn affects agricultural productivity.

This trend has been the same across the local Government until the past four years when United Nations International Children and Emergency Fund (UNICEF) executed some potable water projects across the area. This has brought about the construction of both manual (Figure 5) and solar powered bore holes all over the communities. Each of these bore holes serve within a minimum of seven kilometers radius. This has gone a long way to reduce the health hazards associated with water consumption from open streams and shallow wells. This considered to have done just a little in terms of reduction in time wasted, since at this point the time is consumed both during rainy and dry season, considering the number of families to be served.

It is very unfortunate that some communities where the project supervision was poor, the contractors (drillers) did not bother to reach the water table for free flow of water throughout the year. This limits the water supply from such bore holes to only surface water, whose source is the rain fall. By this, the boreholes dry up as soon as the rain stops and dry season sets in. Therefore the people of such communities are left with no choice than to resort to their shallow wells despite all the associated health hazards.

The unhealthy water supply status within the Local Government as described above poses serious threat to agricultural productivity. On one hand, the Local Government seems to have been cut off from dry season farming due to the difficulty in access to water for house hold consumption talk less of irrigation

farming. This has limited agriculture in the area to single season farming thereby reducing the general productivity. On the other hand it is an indisputable fact that agriculture in the area is manual labour based, which implies that only healthy individuals can work on the farm. Considering the health hazards associated with water sources available within the area, there is no doubt that the preponderance of water borne diseases becomes inevitable. When this happens many farm families are affected, the sick in most cases are the children while some cases are the grown-ups. Whichever is the case, the attention is diverted from the farm to caring for the sick, thereby reducing the hands on the farm or delay in the timing for farming; this in turn affects the productivity in agriculture. In the same vein, the amount of money which would have been used to finance agriculture by way of hiring labour or purchase of tools and seeds is thereby used to source for drugs for the sick as well as settle treatment bills in the hospitals as well as herbalist homes.

3.2 The health facilities

Konshisha Local Government has one General Hospital at the Local Government Headquarters. This hospital, as reported by interviewed personnel, is managed by two Medical Doctors and numerous Nurses and Midwives. Their functions cut across different aspects of catering for the sick of all kinds. This notwithstanding, there is still experience of poor health delivery services in the area. The reasons advanced for this scenario are that:

(i) **Lack of specialization:** The Doctors available at the General Hospital are mainly General Medical practitioners. This avails their incompetence in handling some patients that may require specialist attention. As a result of this, many cases which could not be managed at the General Hospital Tse-Agberagba are currently referred to the Federal Medical Centre Makurdi, Benue State University Teaching Hospital Makurdi sometimes and St. Thomas Hospital Ihugh, while some to General Hospital Gboko respectively.

All these mentioned above are located long distances away from Konshisha area, as such the transport fare to reach these points by both the patient and those caring for the patients becomes one problem. While the medical bills on reaching the referred health care points is in most cases considered exorbitant for an average farmer.

(ii) **Poorly equipped state of the available health care centres:** Despite the general practice identified with the Doctors at the General Hospital, some of the cases which could have been managed by them become impossible. This based on the interview with some health workers in the area results from non-functioning of some equipment occasioned by consistent interrupted power supply. According to them, some cases are referred from them to other places not necessarily for reasons of their inability to manage, but for reasons of insufficient/absence of necessary equipment. For instance, in cases of disease outbreak and accidents, their major problem in such situations remains insufficiency of wards and beds to accommodate patients on admission. The last resort becomes transfer of some to places capable of accommodating them.

The Primary Health Care Centre Korinya and that of Gungul are reported to be managed by Nurses, Midwives and some Community Health Workers. The nature of this staffing alone has incapacitated them from handling some cases that require expertise. The remaining local government health clinics found within the area are those ones as presented in Figures 7d and 7e. These are found virtually in every noticeable settlement. The sad aspect of this is that, as is presented, the appearance alone portrays the nature of their services. These health clinics are managed and headed by holders of Junior Community Health Extension Workers (JCHEW certificates) they are always referred to. These category of health workers have little to contribute to caring for the sick, they only serve as first aid in cases of minor injuries caused by accidents and sometimes are also incapable of rendering first aid services due to absence of basic drugs as well as poor supervision. Going by this situation, rural people are left with no other choice than to cover distances spending both money and time in search of better health care services or traditional medicines which otherwise would have been invested in agriculture to boost productivity.

Apart from this category of health facilities discussed, there are other health facilities owned by both private individuals and missionary or religious bodies. These unlike the government facilities ones described earlier they strive their best in terms of equipment and personnel. They are however managed for profit and as such charges for a rural dweller are considered high but the desired attention is usually given to those who patronize them. According to the interview, these charges though exorbitant are left with no other choice considering the distance and the cost of transportation. For an environment where manual labour is the only source of power for agriculture, adequate health care will have a lot to aid production. This is because a healthy body and a stable mind are necessary for giving agriculture the attention it requires.

The "issue of health and water supply as significant social infrastructures have a bearing on agricultural productivity. The health status of rural dwellers is proxy for measuring their ability and agility to effectively participate in agriculture production. There is unavailability of health facilities/services in the rural areas. More so, a few available ones are far and wide apart. Farmers are eventually constrained health wise with dearth of health services. This resultantly drops their productivity level. Availability of safe and hygienic potable water in

the rural areas will help to prevent some health issues that are water prone. This will definitely improve farmers output [17].”

This aspect of infrastructure appears to some extent silent as regards agriculture, yet the importance can never be over emphasized. The fact remains that, as long as agriculture in the study area solely depends on manual (human) labour, it is worthy of note that, adequate health facilities will to a large extent contribute to the development of agriculture. It is unfortunate to note that, as large as the Local Government is, there are only three noticeable health centres which in the usual nature, are also located along the federal tarred road just like other infrastructures mentioned earlier. These are: Primary Health Care Centre Gungul, General Hospital Tse-Agberagha and Primary Health Care Centre Jov and Korinya (Fig. 6 to 8). These hospitals mentioned with the assistance of the St Joseph’s Maternity and Clinic Korinya, strive their best in giving required services to patients on most of the common diseases, while those that cannot be handled by them are therefore referred to St. Thomas Hospital Ihugh, General Hospital Gboko, and those in Makurdi respectively.



Figure 6. Front view Primary Health Care Centre Korinya (January, 2016).



Figure 7. Local Government Health Clinic Jov, Mbavaa (January, 2016).



Figure 8. General Hospital Tse-Agberagha (February, 2016).

This trend tends to affect agriculture in the sense that, long distances are covered by some families before reaching the health care centre. Thus time consumed on health issues negatively affect agriculture. Sometimes, inadequate healthcare given by these available health care centres makes the sickness persist thereby keeping more hands off the farm. This is caused by insufficient qualified health personnel as personal

interview with some indigene of those areas revealed. It is also unfortunate to note that only General Hospital Tse-Agberagba (Fig. 8) has one qualified Medical Doctor, the rest are managed by nurses and mid-wives.

Apart from the time consumed, the aspect of finance cannot be left out. The money used as transport fare to reach the health care centres could have otherwise been used to finance agriculture for more productivity through hired labour, purchase of tools, purchase of chemicals respectively.

IV. CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

This study assumes that, agricultural productivity is highly dependent on the infrastructure available. Therefore, to achieve agricultural productivity that is capable of tackling hunger, poverty, food insecurity challenges that characterize the Nigerian rural population, there is need to have an in-depth assessment of the infrastructural facilities on ground. Negligence to this is observed as one of the causes of failure of most government policies on agriculture. The problem has brought about poor returns on investment in agriculture. The trend has made most of the citizen to belittle agriculture thinking that there is nothing reasonable in engaging in farming activities. This notion is not true considering the fact that one of the strong forces that pulled Europeans to Africa was the discovery of developmental opportunities driven from agriculture.

4.2 Recommendations

i) Adequate water supply across the local government area is also recommended, this will help to reduce the risk of water borne diseases as well as time consumed in search for water. These will cumulatively increase the hands on the farm and in turn boost agricultural productivity.

ii) As observed in the literature review, most of the rural farming activities are carried out by women, children and youth. That is why family heads who engage in commercial farming resort to polygamy. It is also a fact that the duty of catering for the sick is carried out by women, at the same time, women and children are those characterized with maternal and infant mortality in the rural areas. Based on this, agriculture in the rural areas with Konshisha Local Government inclusive, can only improve on productivity when adequate health facilities are put in place. This will ensure prompt and efficient attention in terms of disease outbreak and as well reduce the mortality rate thereby increasing the number of hands on the farm.

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