Journal of Economics and Sustainable Development www.iiste.org
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.2, No.4, 2011

Linking Poverty Incidence to Water Resources Use: Policy Implications and Remedies Using Nigeria as Case Study

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Abstract

Water has been identified as a crucial resource for all life, production and development, while a lack of access to water has been linked to poverty. Its availability is closely linked to human welfare and health by affecting nutrition status and quantity of drinking water especially of the poor. It has impacts on household labour because of the time and energy spent in obtaining it. This paper examines the linkages between poverty incidence and water resources using descriptive statistics on secondary data from vast body of existing water resources management and poverty literature with the aim of suggesting a frame work that Nigeria's policy maker, the international donor community and other stakeholders may find useful in formulating policies related to management of Nigeria's water resources in Nigeria. This study reviews the changing trend in water policy formulation in Nigeria and challenges and impact of those policies on sustainable water supply provision. The observation suggests that putting too much emphasis on drinking water needs, addresses a rather insignificant part of the problem of water resources and biases the range of solutions which are likely to be proposed for perceived shortages.

Keywords: Water, Poverty, Policy, Water Scarcity, Water demand and Supply**.**

1. Introduction

It has been widely acknowledged that water is a critical element of poverty in its many dimensions (World Bank, 1993; Asian Development Bank, 2000; World Commission on Dams, 2000; WSSCC, 2000). In response, there is a growing call to recognize guaranteed access to water for life (sanitation, hygiene, and subsistence production). This is in addition to the call to allocate water to the environment in quantities sufficient to guarantee a sustainable future for the resource. There is wide recognition that water is becoming an increasingly scarce resource, forcing users to become more efficient in utilizing water.

Water supply is an important commodity for human, animal and plant life. Provision of water services is one of the most important prerequisites for improving the quality of life of people, which is the long-term goal of almost all development policies and strategies in Nigeria. This argument suggests that "*water is life"*.

Nations, the world over, strive for studious planning, development and management of resources in order to meet the basic needs of people, over time, to live and maintain a life which is decent, healthy and respectable. These needs are in the areas of calorie and protein intake i.e. food in terms of quality and quantity wholesome water for domestic, industrial and other uses. The United Nations has defined the minimum levels of these basic requirements, which express decent, healthy and respectable life. A country's socio-economic development efforts particularly Nigeria could, therefore, be assessed against these minimum levels of basic requirements (Handidu, 1990).

In the last decade, particularly in the last half of the decade, the issue of sustainable water resources management has attracted the attention of the international community and policy makers in Africa. The issue of water resources management was for example addressed at the Millennium Summit (2000) which produced the Millennium Development Goals (MDGs), the World Summit on Sustainable Development (2002), the 3rd World

Water Forum in Kyoto (2003), the Africa Ministerial Council on Water, and the programmes and actions articulated under the New Partnership for African Development (NEPAD) framework.

The new emphasis on water resources management in Africa is coming with a shift in the principle and approach to the management of water resources. It is now recognized that water is a commodity of strategic importance because of increasing demands and rising costs, coupled with diminishing supplies (Sharma et. al., 1996). Furthermore, it is recognized that it is no longer feasible in a long-term, cost-effective and environment friendly manner, to increase water supply by building additional dams and conveyance systems, sinking new wells, constructing desalinization plants, etc. In addition, it is now recognized that solutions must be found at the user-end of the pipe that is, improving water use productivity, reducing conveyance losses, reusing water and optimizing allocation (Sanstrom, 1997). The underlying principle is that water is a scarce good with dimensions of economic efficiency, social equity and environmental sustainability. Therefore, it has both public and private characteristics, and hence there is an important role for public and private participation in efficient management and development of water, particularly communities that use water (Sharma et al., 1996; Karikari, 1996).

After almost sixty years of water supply development in Nigeria, it is regrettable that only 60% of the population has access to safe drinking water, and in rural areas less than 50% of the households have access to potable water (National Millennium Development Goals Report, 2005). Rural people in the country still depend very much on rivers, streams, ponds, and shallow wells for their water needs. During the dry season, some of these sources dry up and households have to invest a substantial amount of their resources to get water of doubtful quality. This has very serious implications for the economic development and social welfare of the people specifically and the country as a whole. First, there is the tremendous economic waste involved in people spending so much time and effort in search of water. Secondly, lack of water often means relatively low levels of personal hygiene and environmental sanitation. Thirdly, because water is needed for most productive activities, inadequate access to water limits the livelihood options of the people, particularly in rural areas (IDRC, 2002).

2.0 Research Issues

2.1 Defining Poverty in the Nigerian Context

Poverty refers to the state of being very poor. A poor person is characterized as one whose standard of living falls below the minimum acceptable level that is the "poverty *line"* (Mtatifikolo, 1994). Poverty can be groups into two categories, the "absolute*"* and "relative*"*. This approach is appealing, both socially and politically because individuals relate to one another at all levels of economic well being. This discussion leads us to understand that poverty is a dynamic concepts, which change with time and space.

Generally, poverty in Nigeria is a rural phenomenon. About 85% of the poor live in rural areas, and 59% of the people living in rural households are categorized as being poor out of which 44% are being very poor. In other words, poverty is much deeper and severe in rural that urban areas.

In recent years, some distribution and poverty issues have attracted much of global concerns. According to Semboja (1994), greater equity implies higher welfare levels and lower levels of poverty imply higher levels of welfare. During the 1980s, the focus of adjustment programmes was on the economic growth oriented policies. However, the results of these programmes on equity and poverty depended on baseline situations. Recently, environmental issues have been linked to growing income inequality and poverty. The poor live in regions or an area where arable land is scarce, agricultural productivity is low and drought, floods and environmental degradation are common. These areas are marginal and isolated. They lack sustainable income generation and employment opportunities. Similarly, most of these areas lack basic social services and infrastructure, including adequate water supply and sustainable sanitary facilities. The social, economic and demographic factors in these areas interact to push the poor into the marginal lands leading to further environmental degradation and stimulating further poverty.

2.2 Pattern of Poverty in Nigeria

Although Nigeria is blessed with many natural resources like bauxites, gold, tin, coal, petroleum, tin, forest, water land etc poverty level in the country still contradicts the country's immense wealth as over 70 percent of the people wallow in absolute poverty with no food, clothing or shelter (World Bank, 1996,Oshinonebo, 2002).The country has the largest mangrove forest in Africa and the third largest in the world covering a total of 1000km2 along the west Atlantic Coast of Africa between Badagry and Calabar (Ekeke, 2003). But in year 2002, the United Nations Development Programme (UNDP) ranked Nigeria as the 26th poorest nation in the world (The Guardian, July 26, 2002; Dike, 2002) in the midst of plenty and till today the country has not found her ways back in successfully reducing poverty to the barest minimum. Different poverty measures have been considered in

Nigeria. Name among them are: Relative measure, absolute measure and subjective measure. Other measures include Quintile analysis and Inequality measures. Each of the three poverty measures used actually portray that the incidence of poverty was declining in the Southeast and Southwest but was increasing in the North east and North west (see table 2). The result of the Nigerian Living Standard survey 2006 actually showed decrease incidence of poverty of 67.1percent when compared with the figure of 1996, which was 65.6percent. Other measures of poverty had their incidences of poverty lower than the relative poverty. The incidence of poverty using absolute measure was 19.8percent for 2100 calories and 33.6percent for 2900 calories. The 2003/04 Nigeria Living Standard Survey also showed that the national incidence of Poverty was 57.8percent and more than 13 states were below 50.0percent. When disaggregated by sector, urban poverty appears to be decreasing from 58.2percent in 1996 to 35.4percent in 2004. Consequently rural poverty went down by 5percent from 69.8percent in 1996 to 64.1percent (see table2)

2.3 Linking Poverty and Water Security

The concept of water security was highlighted in the Framework for Action and in the Ministerial Declaration of The Hague in March 2000 and is seen as the key to addressing the water crisis in the 21st century. It means that people and communities that have reliable and adequate access to water for their different needs, are able to take advantage of the different opportunities that water resources present, are protected from water-related hazards, and have fair recourse when conflicts over water arise. The concept of water security is based on the creation of mechanisms that ensure that the poor have secure and sustainable access to water resources, which in turn means strong links to participation and the governance conditions that dictate this access. Central to this is recognizing all users' needs and the value and potentials of all uses of water resources in making decisions about their future. Water resources (including aquatic plants and animals, hydropower, aesthetic, and other services) come from many sources (including surface water and groundwater) and have many uses (such as domestic needs, irrigation, fishing, industry, and waste disposal). Where scarcity exists, conflicts emerge and the poor and powerless are more likely to be marginalized. The idea of water security means there are mechanisms in place to ensure this marginalization does not happen.

Gender is a key issue in any analysis of poverty and water. Women disproportionately make up the poor and are the main managers of many water resources. Women face the burdens of fetching water for use in the home, of coping when there is not enough water for domestic needs, and of caring for those made sick by poor-quality water. Women are also often the main actors in productive activities around the home that rely on water—vegetable gardens, livestock, handicrafts, and services. Empowering women is critical to achieving more focused and effective water management. Successful empowerment will create an improved social and institutional environment for women that benefit many other aspects of life. The basic assumption is that water resources are important to the poor. The extent to which this is the case varies from place to place, but generally poor people depend upon water resources in four ways.

- Water resources are direct inputs to production. Agriculture is the most obvious and the viability of agriculture is closely linked to reliable access to water. However, there are many other areas of production including tree and garden cultivation around homesteads, livestock raising, fishing, small-scale manufacturing such as pottery, brick-making, tanning as well as services such as laundering. Water is also vital for many types of manufacturing and other larger economic activities that provide employment for the urban poor in particular. The poor often rely on these non land-based production activities to give essential diversity to their livelihoods and to overcome their lack of assets.
- Water resources are a basis for the health and welfare of the poor, and especially of vulnerable groups such as children, the elderly, and women in general. Both the quality and the quantity of water matter greatly in this, and safe and adequate quantities of water are recognized as a precondition for an acceptable standard of development, to meet the UN Millennium Declaration targets for 2015—to halve the proportion of people who suffer from hunger, cannot access or afford safe drinking water, and are without adequate sanitation. This is one of the most obvious areas where gender perspectives are of particular importance, as women are the providers of water in the home.
- Water resources are critical to the viability of the ecosystems through which the poor access the natural resources on which many aspects of their livelihoods are based. Even where water is not a direct input into production, other natural resources (such as forestry, fishing, or grazing) that are contingent on the viability of ecosystem processes depend on the flows of water through these systems. For example, naturally occurring annual floods provide low cost protein, an important input into the livelihoods of the poor.

- Water, when there is too much or too little, may also affect the poor, as they are the most vulnerable to water-related hazards such as extreme floods, droughts, major storms, landslides, and pollution. This vulnerability can undermine any effort to break the poverty trap and can even cast the not-sopoor into poverty by destroying the basis of their livelihoods through a cataclysm. Low resilience to these water-related vulnerabilities is a defining characteristic of poverty where these threats exist.

3. Changing Trends in Water Policy Formulation in Nigeria

Nations, the world over, strive for studious planning, development and management of resources in order to meet the basic needs of people, over time, to live and maintain a life which is decent, healthy and respectable. These needs are in the areas of calorie and protein intake i.e. food in terms of quality and quantity wholesome water for domestic, industrial and other uses. The United Nations has defined the minimum levels of these basic requirements, which express decent, healthy and respectable life. A country's socio-economic development efforts particularly Nigeria could, therefore, be assessed against these minimum levels of basic requirements (Handidu, 1990).

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The new emphasis on water resources management in Africa is coming with a shift in the principle and approach to the management of water resources. It is now recognized that water is a commodity of strategic importance because of increasing demands and rising costs, coupled with diminishing supplies (Sharma et. al., 1996). Furthermore, it is recognized that it is no longer feasible in a long-term, cost-effective and environment friendly manner, to increase water supply by building additional dams and conveyance systems, sinking new wells, constructing desalinization plants, etc. In addition, it is now recognized that solutions must be found at the user-end of the pipe that is, improving water use productivity, reducing conveyance losses, reusing water and optimizing allocation (Sanstrom, 1997). The underlying principle is that water is a scarce good with dimensions of economic efficiency, social equity and environmental sustainability. Therefore, it has both public and private characteristics, and hence there is an important role for public and private participation in efficient management and development of water, particularly communities that use water (Sharma et al., 1996; Karikari, 1996).

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4. Challenges and Impacts of Policies on Sustainable Water Supply Provision in Nigeria

The water policy proposed important reform issues in water supply provision in the country. One of the reform issues is that water should be managed at the lowest appropriate level (appropriate being key and a function of the specific conditions in the concerned areas and communities). This principle promotes consumer appreciation for the value of water and sanitation investments. If local conditions and demand are taken into account in the planning, financing, implementing and operation of water supply and sanitation systems, the sense of ownership and willingness of communities to share in the cost and operations and maintenance will be greatly enhanced, thereby increasing the sustainability of the systems.

Although the 2000 National Water Supply and Sanitation Policy stated that government shall sponsor capital investments for rural water supply, the level of provision of water in the rural areas is still very low. For instance, as shown in Table 3, the rural areas in Nigeria lagged behind in various sources of drinking water available to households, except the open public well, rivers/streams and rain water in which they have higher percentages

compares to the urban areas in 2003 (see Table 3). This is not surprising considering the fact that, unlike in the urban areas, rural dwellers rely more on water from rivers, streams and ponds. Also, rain water is a major source of water for domestic use, especially for drinking in the rural areas.

Among the geo-political zones, the south-west zone in which the study is based ranked low in terms of supply of piped water into dwelling yard, protected well in dwelling yard, protected public well and the use of rain water as sources of water supply. In the Western zone, it takes about 9 minutes from dwelling houses to major sources of water.

The development of appropriate technical and managerial capacities and institutions that could support and sustain integrated water resources development in the country and the institutionalization of principle of stakeholder participation, decentralization, the participation of women, equity and economic values even though incorporated in the new policy have not been implemented as should. Therefore, the expected improvements in potable water provision for the populace have not significantly improved. The situation is worse in the rural areas. There are also political challenges in the area of appropriate pricing, equitable allocation of water and sometime policy implementation are extremely linked to political pressures and dictates. Other challenges relate to institutional issues, and international issues, like proper definition of roles at all levels of government, which is still vague and which encourages duplication of effort and multiplicity of agencies across sector.

The existing policy to supply water through boreholes especially in situations where there is no regular electricity supply to power the machines, as currently obtained in the some selected rural areas studied in Nigeria by Gbadegesin and Olorunfemi (2007), is counter productive. Given the fact that women and children are the ones mostly involved in fetching water, there is need to devise technologies for water supply which are women and children friendly. A challenge to the States' water agencies, therefore, is the capability to develop and install appropriate technologies to meet the basic water supply and sanitation needs of the millions of citizens who now lack them. These agencies should purchase and install electric power generators in all its waterworks and booster stations. Also, the agencies should ensure regular servicing and maintenance of all their equipment and machinery. It is therefore obvious that more manpower should be recruited into the technical divisions of the corporation.

Empirical studies (Olokesusi, 2004) have revealed that there are various types of innovative (indigenous) technologies for rural water supply in different parts of Nigeria. There is need to document these IKS in order to enhance concerted efforts not only at developing them by local engineers and technicians but also for government to fund research and development of these technologies. Some of these indigenous technologies include pot chlorination, solar disinfection, simple sand filters, nylon filters, taggiri, harvesting of groundwater and recharging of groundwater, among others.

A challenge to local engineers and technicians is to develop simple machines and tools that will be affordable to households in rural communities e.g. the simple sand filters or to the community at large e.g. solar disinfection. There is also the need for awareness campaign in rural areas on the use of these different methods. There is need for government to make this method available to poor households by providing money for them to put up the harvesting apparatus in their houses.

As part of the appropriate technology strategy which should be emphasized in these austere times, the use of locally produced hand pumps, PVC pipes, protected well and mandatory rain-harvesting is strongly suggested. Rain water could easily be harvested if properly owners are mandated to provide gutters along building roof-eaves which should then be diverted into a covered concrete metal reservoir. Rain water harvesting has been practiced since early history, and it is suitable both urban and rural areas; and the quality of water collected is generally within the recommended limits for drinking water.

Apart from the issue of inadequate water supply in terms of quantity, the quality of the available quantity of water provided is another major problem. According to Habila and

Kehinde (2003), an assessment of public water supply quality management in Nigeria reveals major inadequacies, notable among which are ineffective and uncoordinated regulation, inadequate resources, low prioritization of water quality issues and poor data management. It shows that, although there exists national guidelines and standards on water quality, compliance with these is poorly implemented and monitored. Thus to deal with this situation, there is a need to: establish mechanisms for better co-ordination; carry out water supply quality management within the context of water resources management; implement a nationwide rapid water quality assessment as a precursor to developing more acceptable water quality surveillance criteria as well as appropriate protocol for periodic water quality assessment and; establish a national expert group on water quality for regular review of water quality issues and development of solutions for mitigating water quality problems. Thus water supply quality management will be more adequately handled and the safety of public water supplies assured.

5. Conclusion and Recommendation

Having reviewed the causes of poverty and water scarcity both and recent, policies on poverty and water resource management in Nigeria past and present and relating them to the increasing rate of poverty in the country as presented in table 1 and 2, sound water resources management is critical to sustainable development, and as a consequence, to poverty reduction.

Securing safe, reliable, reasonably priced water and sanitation services for all is one of the leading challenges facing sustainable development. There is widespread concern that poor water management will be one of the major factors limiting sustainable development during the next few decades.

Accessing water for the common good was the scope of the 2009 World Water Week. It is stated in it that the "critical challenge lies in the integration of water in development policy. Management that promotes efficiency and generates net benefits for the common good is needed. As always, the tremendous variation between countries and other relevant entities must be taken into account in the analyses". Furthermore, "effective policy formulation requires collaboration among several parties to ensure practical implementation and subsequent evaluation of results and performance. The role of government is to establish the framework and provide incentives that stimulate people and business to perform well. Authorities have a key role to balance self-interest with the common good and safeguard the functioning of life support systems".

The new principle and approach to water supply and water resource management, as seen in recent policies examined in this paper, has many far reaching implications for policy design and institutional building as well as policy implementation. For example, the change in principle may be regarded as a basic ideological shift. Generally, such ideological shift cannot be imposed on people since it depends on cultural belief and world view of the people (Wildavsky *et al*., 1994). Consequently, there is need to have a better understanding of the values and ideological preferences of policy makers, bureaucrats and the general public.

Secondly, a change from supply management approach to demand management approach requires a change in the manpower and institutional requirements for water resources management. While supply management approach with emphasis on building and construction of dams, boreholes, conveyance systems, etc, require predominantly engineering skills, the new emphasis on demand management with public and private sector participation will require expertise in social systems in addition to engineering skills.

Lastly, the new integrated approach requires greater knowledge and understanding of the technological, social, economic and ecological dimensions of water resource management and how they are inter-related. Developing the capacity to engage in integrated sustainable development planning from the community level to the highest national decision-making level, remains a major challenge in Nigeria and many other African countries. Sharma *et al* (1996) for example noted that in sub-Sahara Africa as a whole, the following institutional capacity problems are rampant: (i) people are unaware that water is a finite resource with supply constraints, that it has a scarcity value, and that there is a cost to using it; (ii) lack of understanding of the consequences of deforestation and land degradation on the quantity and quality of water; (iii) inadequate capacity building and neglect of traditional knowledge bases as well as gender issues; (iv) management of water resources is highly fragmented among sectors and institutions and there is excessive reliance on public sector services; and (v) weak institutional and implementation capacities.

The implication of the foregoing is that if the new emphasis on water resources management in Africa and Nigeria in particular is to achieve meaningful results, there is the need to have a better understanding of the institutional capacity both in terms of skilled personnel and the available knowledge and understanding of the socio-economic, technological and ecological issues and problems that are involved. Better integration of water management into sectoral and land use policies, greater public participation in the formulation of water management policies and programmes and, above all, more effective measures to ensure that water is affordable to all.

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Table 1: Poverty Level of Nigerian (1970-2006)

Year	Poverty level (% of population	Estimated total population	Population in poverty
1970	19	66.8M	12.7M
1980	27.2	77M	20.9M
1985	46.3	81.6M	37.8M
1992	42.7	91.5M	39.3M
1996	65.6	102.3M	67.1M
2002	54.2	110M	59.7M
2004	57.8	130.2 M	75.2M
2006	67.1	140.1M	82.3M

Sources: (1) Federal Office of Statistics (FOS) poverty profile for Nigeria: 1980 – 1996 in draft national policy on poverty eradication (2000) (2) 2005/06 Nigeria Living Standard

Table 2: Incidence of Poverty by Sector and Zones, 1980 – 2004

	1980	1985	1992	1996	2004
National	28.1	46.3	42.7	65.6	54.4
Urban	17.2	37.8	37.5	58.2	35.4
Rural	28.3	51.4	66.0	69.8	64.1
South South	13.2	45.7	40.8	58.2	35.1
South East	12.9	30.4	41.0	53.5	26.7
South West	13.4	38.6	43.1	60.9	43.0
North Central	32.2	50.8	46.0	64.7	67.0
North East	35.6	54.9	54.0	70.1	72.2
North West	37.7	52.1	36.5	77.2	71.2

Source: FOS (1999): Nigeria Poverty profile, 1980-96, Lagos and NBS (2006) Poverty Profile for Nigeria (Abuja)

Table 3: Distribution of Household by Access to Water Supply and Sanitation Facilities (%)

Household Characteristics	Residence		Geo-political zone						Average
	urban	rural	North Central	North East	North West	South East	South South	South West	
Source of drinking water:									
Piped into dwelling/yard/plot	14.4	2.3	7.8	4.6	10.2	8.3	3.2	4.6	6.6
Public tap	18.5	6.2	8.1	9.7	11.8	11.3	4.6	18.8	10.6
Open well in dwelling/yard/plot	9.4	14.2	12.6	15.1	22.9	1.8	3.3	9.2	12.5
Open public well	6.7	21.1	9.4	30.8	25.0	1.5	5.2	12.7	16.0
Protected well in dwelling/yard/plot	6.7	3.7	5.5	1.8	3.3	10.8	7.0	3.5	4.8
Protected public well	24.4	16.3	11.5	5.3	12.1	33.1	35.8	25.6	19.2
Rivers/stream/spring/pond	8.1	29.9	38.1	1 9.4	11.3	16.7	34.8	16.8	22.1
Rain water	0.5	2.1	0.1	0.0	0.0	6.7	4.3	0.5	1.5
Tanker truck	5.9	1.9	5.9	4.4	0.6	7.3	1.4	4.2	3.3
Other	5.2	2.0	0.6	8.9	2.9	1.8	0.5	4.1	3.2
Total	100.0	98.8	99.6	100.0	100.1	99.8	100.1	100.0	99.8
Time to water source									
Percentage 25 minutes	64.9	51.4	51.1	58.2	62.1	59.4	45.8	59.4	56.3
Median time to source	4.6	9.9	10.0	9.4	6.5	4.9	14.8	9.2	9.4
Sanitation Facility									
Flush toilet	28.7	6.7	9.6	4.5	4.5	41.3	21.2	23.4	14.6
Traditional pit toilet	55.6	56.9	50.1	74.6	74.3	39.8	42.3	39.1	56.5
Ventilated improved pit (VIP)	5.5	1.9	1.9	0.5	1.6	0.9	8.5	5.5	3.2
Latrine	9.7	31.6	38.0	20.1	19.2	17.6	19.7	30.7	23.7
Bush/Field	0.3	2.7	0.4	0.3	0.3	0.1	8.2	1.2	1.9
River	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Others									
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Persons per sleeping room	2.9	3.6	4.0	3.7	3.3	3.0	3.6	2.2	3.3

Note: percentages may not add to 100 due to missing cases

Source: After National Population Commission and ORC Macro (2004) Nigeria Demographic and Health Survey: 2003