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Impact of European Union Micro-Projects Programme in Water and Sanitation on Rural Communities of the Niger Delta Region of Nigeria

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Abstract
Many studies in Nigeria have revealed that the Niger Delta Region is the least served in terms of basic infrastructure such as electricity, roads, water and sanitation. This study examined the impact of the European Union Micro-Projects Program in the rural areas of Imo State, in the heart of the Niger Delta Region. Five hundred and forty subjects were randomly selected and interviewed in 15 rural communities that benefited from water and sanitation projects between 2003 and 2007. Impacts were evaluated in the areas of water supply and sanitation in terms of quality, quantity, distance and time. Results showed considerable improvements in the quantity of water supply (62%), water quality and sanitation (49%), reduction in distance from water sources (87.1%), time for water collection (57.5%) and incidence in water-borne diseases (40.7%). The success recorded in this externally funded program resulted from many factors, of which the most important is the adoption of the participatory development model by the donor agency in project execution.

Key words: donor agency, micro-projects, participation, rural population, sanitation, water.

Introduction

Water and sanitation are two significant components in the overall development of a nation. Water, as a finite natural resource, is necessary for sustenance of life and ecological systems (Esrey et al, 1991). In recognition of the harm inadequate water supply and sanitation services could cause to quality of life, the international community and Nigeria respectively have continued to make efforts to address the needs. Notable efforts at the International level include among others, development of water management strategies at regional, national and local levels that seek to promote both equitable access and adequate supplies (United Nations, 2001). At the national level, the Federal Government of Nigeria in January 2000 launched its National Policy on Water Supply and Sanitation; with the aim of providing sufficient potable water and adequate sanitation to all Nigerians (Federal Government of Nigeria, 2000; FMWR 2000). At the local level, many state governments and their Local Government Authorities (LGAs) have complemented efforts of the federal government by creating different authorities (Water Boards, Rural Water Development Agencies, etc.) to provide water for the masses. Despite these efforts many studies have revealed that the levels of water and sanitation services within the country still remain generally unsatisfactory (Onyenechere 2004, Okereke 2000, Uzoma 1996), and highly politicized (Igwe et al 2007). In recent times, a number of donor agencies (UNICEF, USAID, The World Bank, etc) have vigorously engaged in the provision of water supply and sanitation systems in the rural areas of the Niger Delta Region where there are perceived gaps in access to these services. However, over the years, little attempts have been made to assess the general impacts of these projects. This study therefore aimed at assessing the impact of water and sanitation projects financed by the European Union on the rural population of this politically marginalized region. It was based on the assumption that rural communities have the capacity to plan, execute and manage their facilities on sustainable basis if adequately empowered. The basic tenet is that local control of water projects, as opposed to centralized control, will result in more accountable service provision and better services.

Methodology

The European Union Micro-Projects Program was initiated in 2003, in the nine states that make up the Niger Delta Region. The first phase commenced

in Bayelsa, Delta and Rivers States (MPP3) and was later extended to other states, namely, Abia, Akwa Ibom, Cross River, Edo, Imo and Ondo States (MPP6). The program was generally designed to improve the quality of life in the rural communities of these states. The aim was to ensure that communities have access to water supply and sanitation services in safe and adequate quantities. The study area is Imo State, which lies between latitude 4^0 45' and 6^0 15' North, longitude 6^0 30' and 8^0 09' East. It is bordered on the North by Anambra State, on the South and West by Rivers State and on the East by Abia State. The area is about 5289.48km^2, making about 0.6% of the total landmass of Nigeria and has a total population of 3,285,580 (NPC 2006). Between 2003 and 2007, a total of 88 water (boreholes) and sanitation projects were executed in the state (Table 1). The study was carried out in 15 communities which included Ezuhu Nguru (Aboh), Amuzi (Ahiazu), Ezoke (Ehime), Amudi Obizi (Ezinihitte), Umuago Urualla (Ideato North), Aboh Ebikoro (Ikeduru), Owu (Ikeduru), Ibeme (Isiala Mbano), Umuocham Ntu (Ngor Okpala), Ugbele-Aka (Njaba), Amaokpara (Nkwerre), Amuzi-na-Dim (Nwangele), Amato Alike (Obowo), Etioha (Ohaji/Egbema) and Ugwuntu-Ihube (Okigwe). Two major criteria were used for the selection of these communities. First, they are located far from major urban centers having no other sources of water supply aside rain water, ponds, streams and water vendors. Second, they are communities whose projects were executed between 2003 and 2007 and whose impacts have began to be felt by the local population.

The data for this study was collected through the use of a structured questionnaire that contained multiple answers in which copies were administered directly to the respondents. Subjects were interviewed in English or in local vernacular (Igbo) within a period of four weeks. While respondent were mainly farmers (58%), traders (18%), full housewives (12%), civil servants (6%), retired people (3%) and students (3%) cutting across different age groups, the greater majority were women making up to 62%, and men, the remaining 38%. The questionnaire contained pertinent questions bordering on age, sex, quantity of water fetched per day, daily water needs, distance from water sources, quality of water, incidence of water-borne diseases, impact on sanitation, among others. A systematic random sampling method was adopted in which a respondent was interviewed in one out of every three families in each community. In all, a total of 540 subjects were interviewed. For the water quality assessment,

samples were collected from the main sources of water supply and properly analyzed at the Laboratory Department of the Imo State Environmental Sanitation Authority.

Prior to the execution of these projects a socio-economic baseline study was conducted in rura communities in the state (2002) by the Imo State Government, to ascertain the prevailing conditions which included sources of water supply, distance from major sources, water demand and supply per person and per average household of seven, water quality, etc. The baseline data formed the basis for comparison with data obtained from our study. In the primary analysis, univariate statistics were used to present data on the variables studied (mean, range, standard deviation, liters …). Categorical variables and percentages were presented as summary statistics for daily water needs, distance from sources etc. In the secondary analyses, logistic regression was used to assess the relationships between major indicators of our study. The limit of statistical significance was set at 95% confidence level ($p < 0.05$). The data was analyzed using SPSS version 13.0 (SPSS; Chicago, IL; USA).

Results

Increase in Household Water Supply Relative to Demand

In the communities surveyed, there was a considerable percentage increase in the quantity of water supply relative to the total household needs after the execution of the water projects. Table 2 shows that the highest percentage increase in water supply was recorded at Amuzi Obizi (over 90 %), while the least was recorded at Umuago Urualla (38%). Other communities that recorded high increase in water supply include Aboh Ebikoro (72.2%), Umuocham Ntu (68.2%), Ugbele Aka (63.9%), Amuzi-Na-Dim (63%), Amato Alike (63.3%), Etioha (69.3%) and Ugwuntu Ihube (65.9%). Two reasons accounted for this phenomenal improvement in water supply, namely, increased accessibility to water source, coupled with the increased water storage capacities among subjects (more drums, water tanks, jerry cans…). Also, water was made available for an average time of seven hours a day during which families fetched water at will. Communities that recorded low percentage improvement in water supply such as Umuago Urualla (38.8%) and Ezeoke (49.9%) had difficult terrain and geo-hydrological problems which affected project location, reduced accessibility and availability of water supply among subjects.

Improvement in the quality of water supply

Table 3 clearly shows that before the execution of the water project, 46.7% of respondents in seven communities sourced their water from rain water and ponds, 40% from rain water and streams and 13.3% from rain water and water vendors. However, after the execution of the projects, 60% of the subjects depended on the water projects as their main and only sources of water supply, while 40% sourced their water from their water projects and rain water. In communities that have streams (Owu, Abo Ebikoro), families went there only to wash their clothes, ferment cassava or simply for bathing as a matter of habit. Results of laboratory analysis on the water samples from the new boreholes indicated their high quality both in dry and wet seasons. The levels of coli form count in the sampled waters were less than 10 per 100ml sample and numbers of fecal E. coli were equally less than 2.5 per 100ml sample. Exceptions were at Umuago Urualla (stony topography) and Amaokpara (salty soils) whose water samples indicated high levels of iron (2.8mg/l) and sodium (485mg/l) respectively. In these cases the local populations were advised to adequately boil their water before consumption.

Reduction in Average Distance and Time on Water Collection

Prior to the execution of the water projects, the daily mean distance traveled by subjects was about 4 kilometers while the average time spent in search of water was about 2 hours, taking about 13% of the total daytime activities. Our calculation assumed that daytime used for production is 12 hours. However, after the completion of the projects the daily average time spent to fetch water was reduced to 48 minutes (57.5% reduction) while the daily average distance covered to fetch water was reduced to 450 meters (87.1% reduction) as shown in Table 4. While the highest average distance traveled before the project was recorded at Etioha (2.20 hours), Umuago Urualla recorded the highest average distance after the execution of the projects (0.56hours), for the reasons already explained. The Owu and Amato Alike communities recorded the least distance of 200 meters with an average time of 42 minutes simply because of the reticulation of their water projects, which provided taps at various points (along the roads, compounds of community leaders, community halls) helping to reduce distance covered and overcrowding at project site. The same phenomenal reduction was also recorded at the level of the percentage of average daytime spent on water collection which moved from 12.73% to 4.05% (64.7% reduction). On this

issue, Owu community also enjoyed the least percentage daytime spent of 3.8% while Umuago Urualla still recorded the highest with 4.67%.

Decrease in the Incidence of Water-Borne Diseases

There was high incidence of water-borne and water-related diseases in these communities before the execution of the projects: diarrhea (13%), dysentery (11%), cholera (2%), hepatitis (4%), typhoid (7%), amoebiasis (3%) and malaria (45%). These diseases were significantly higher among subjects in communities that sourced water from ponds: Ezuhu Nguru (0.71), Amuzi (0.69) Amudi Obizi (0.75) Ibeme (0.73) and Amaokpara (0.70) than those that sourced their water from streams or water vendors: Ezeoke (0.57), Abo Ebikoro (0.61), Owu (0.59), Ugbele Aka (0.55) and Amuzi-Na-Dim (0.53). Comparatively, results of our study revealed a considerable reduction in the prevalence of these diseases among subjects: diarrhea (6%), dysentery (5%), cholera (0%), typhoid (3%), amoebiasis (1%), hepatitis (1%) and malaria (38%). Also, the levels of significance of these diseases were greatly reduced: Amuzi (0.33), Ibeme (0.38) Amaokpara (0.32) Owu (0.31), Ugbele Aka (0.32), Etioha (0.37) and Umuago Urualla (0.41). Among these communities, Umuago Urualla and Ezeoke recorded the highest number of victims of these various diseases with 48 and 45 cases respectively, while Owu and Amuzi-Na-Dim recorded the least of 31 cases each respectively. These reductions may have resulted from the provision of regular and potable water supply from the new water projects which helped to improve the general health of the subjects.

Improvement in Sanitation among Rural Families

A month before the completion of any of these projects, a workshop on water and sanitation was organized in each community to sensitize and educate their representatives (women leaders, youths, housewives, members of project management committees) on the importance of water and sanitation in a rural setting. The workshop helped to create awareness among users on the benefits of their new projects, exposed the health hazards associated with indiscriminate disposal of human wastes, and emphasized that better sanitation helps to improve health and productivity. Participants were also taught how to construct modern VIP latrines. Results of our study revealed that after the completion of the projects, 52% of respondents provided their families with modern VIP latrines, about 25% of them had plans to do same in the nearest future while the remaining 23% preferred to be using their old

pit latrines. Observations showed that generally, the dimensions for the new latrines are 3.5 meters deep with an effective average volume of 3.05m^3, equivalent to twenty years use by a family of six (Morgan, 1990).

Discussion

Rural water and sanitation problems in the Niger Delta Region in general, and in Imo State in particular, are characterized by two major phenomena, namely, a wide gap between the region and other geopolitical regions of Nigeria because of many years of neglect resulting from economic and political marginalization of the zone (Akinyele 1998), and the top-down development strategy adopted by the federal and state governments in the provision of rural infrastructure over the years, which have had little or no impact among rural populations (Ekop 1994, Edet and Okereke 2001). There is a certain novelty value in the "participatory delivery model" (Montgomery 2002) adopted by the European Union in the execution of the micro-projects program in the region. The logic enshrined in this model was that Community-Driven Projects (CDPs) will not only help in providing the much needed social facilities to the rural population, but will also help in reducing rural poverty, improving health conditions and in protecting the environment (Streeton 2003). The focus was also to improve on the poor results obtained from the old approach in rural development and to demonstrate, to an extent, that rural communities have the capacity to manage their facilities if adequately empowered (Briscoe and Ferranti 2005, Churchill 2005). The is therefore compatible with The World Banks "unbundeled approach" to service provision which covers the utilization of local resources through community-based initiatives (Parkinson and Taylor 2003).

Part of the success of this strategy was that communities themselves formally applied for the projects through their representatives who placed them as their major priorities in their community development process. After careful examination of these applications, followed by visits to the communities, the donor agency granted them their requests. Adequate information (through training and workshops) was provided to the future users of these projects by the donor agency before the completion of the projects to prove that the new systems would be better and more reliable than existing options, especially in terms of accessibility, convenience, reliability and quality of service. Another major factor was the level of consistency on the part of the donor agency as each community that benefited from the project was made to pay 20% of the total cost of the project as counterpart fund without exception. Besides, the selection of these communities was based on merit of the specific cases

rather than an arbitrary choice, as they all have problems of water supply and sanitation and suffered from high prevalence of diseases associated with poor water supply. It was evidently clear that these communities needed water and sanitation services more than other areas and therefore deserved more attention and consideration in project distribution. The Community Project Management Committees (CPMCs) were the local structures created by the donor agency to manage these projects in each of the communities. They played essential role in ensuring the success, proper management and sustainability of the projects. Members of these committees, often numbering 6 to 12, were men and women of proven integrity and collectively chosen by community members by open selection (retired lawyers, teachers, traders, civil servants, etc). However, many people have recently expressed concern about the capability of these structures to operate and maintain these new facilities on sustainable basis in the wake of rising cost of living and in an environment fraught with endemic poverty (Dudley-Gough 2008, Eze 2007).

The issue of sustainability of rural projects has been a great concern especially in the water and sanitation sector and volumes have been written on it (Baldwin 1990, Cornea 2001, Hirschman 2005). However, concerning the case in point, beneficiary communities, with the aid of their respective CPMCs, adopted various strategies to sustain their projects, instead of selling water to community members (water was obtained free of charge in all the communities studied). These included donations in cash and in kind from generous individuals, voluntary labour for the operation and maintenance of facilities, fund-raising/launching activities during festive periods, contributions from different "Age Grades", annual levies on adult males both at home and in Diaspora, donations from "August Meetings" of married women, etc. Some communities also went the extra mile to establish productive ventures such as block-molding industries (Ibeme, Ezoke Amuzi), production of packaged-water of 5ml for sale in urban areas (Amuzi-Na-dim, Ugbele Aka, Ezuhu Nguru) and other activities. These strategies helped to mobilize adequate fund, part of it channeled to cover operation and maintenance costs of the water projects. Since the completion of the projects, water supply has been very regular. During periods of black-outs in electricity supply, each community used the diesel-powered generating set provided by the donor agency for pumping water into large overhead tanks of 50,000 liters-capacity also provided by the donor agency. Within a period of four years, these projects have had great multiplier effects in the community development process in Imo State in general, and in the beneficiary

communities in particular. In fact, improved accessibility to water sources had led to average daily gains in time of about 58%, which was invested in agriculture (increase in farm holdings up to 18%), private economic ventures such as cooperative societies (Owu, Ibeme, Etioha), petty-trading (12% of subjects especially in Amudi Obizi, Umuocham Ntu, Amato Alike) and in construction activities in all communities as more water was made available. . On the sanitation aspect, there was improvement of hygienic and sanitary practices among subjects. Many families provided themselves with improved ventilated pit latrines, others upgraded their traditional pit latrines while the use of WCs was encouraged for those who could afford them. Other important health interventions by the donor agency included systematic awareness and containment campaigns on the spread of water-borne and water- related diseases, HIV/AIDS and other sexually transmitted diseases. Emphasis was also placed on food hygiene, safe water storage, and general health education. The integrated water and sanitation program was equally introduced in the primary and secondary schools to promote health and hygienic education for an improved standard of living among pupils and students. All these interventions conformed to the National Health and Sanitation Policy and international practices.

Conclusion

This study has tried to analyze the impact of the European Union Micro-Projects Program in water and sanitation on selected communities in Imo State within the Niger Delta Region. It has put into evidence the longstanding suffering of the rural masses and has shown that water supply deficiency can have many adverse effects on the social, economic and health conditions of the people especially in rural areas. The results obtained have explicitly shown how micro-projects in water and sanitation sector can greatly improve the conditions of living of rural inhabitants and contribute to their development process. They have also shown that if the rural populations are given the opportunity to participate in decision-making, planning, implementing and operating projects that touch them directly, the projects ended up being well-managed and sustainable. These results overwhelmingly contradict negative ideas and opinions leveled against rural communities concerning their attitudes towards development projects (Chima 1989, Lawal 1997, Fox 2001, Triche 2002). Sustainability of rural projects is therefore possible with the total mobilization of local forces, based on the principle of solidarity which is customary to rural populations in Sub-Saharan Africa. The success recorded in this program was as a result of many factors including

good working relationships between communities and donor agency, a local political commitment that was perceived as strong, good institutional arrangement, careful attention to the concerns and priorities of communities and transparency and fairness in water resource management. Our results corroborate the idea that the provision of improved drinking water will result in an improved health pattern in a population only when people practice improved personal hygiene (Esrey 1996, Nwosah 2003). Also, they go a long way to prove that local solutions to water provision are essential to achieving general community goals and to ensuring that the needs of those who are currently unserved or underserved are met in the most effective and equitable way possible (UNHSP 2003). However, it is pertinent to note that only 88 out of the 265 communities in Imo State benefited from these projects. Many communities in the state in particular, and in the Niger Delta Region in general, still lack water and sanitation facilities and need them urgently. With the completion of this 5-year micro-projects program (2008), the federal and state governments and other donor agencies should draw inspiration from the example of the European Union in the provision of the much needed water and sanitation facilities in this marginalized and neglected region of the country in the years ahead.

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Table 1: Population, Land Area and Density of Imo State by Localities

S/N	Local Government Area (1)	No. of comm. (1)	Population (1)	Area (KM^2) (1)	Population Density (People Per KM^2) (1)	Total No of Water and Sanitation projects (2)
1.	Aboh Mbaise	11	152187	185.30	821	04
2.	Ahiazu Mbaise	17	128608	111.20	1157	05
3.	Ehime Mbano	12	125950	139.70	902	04
4	Ezinihitte	15	11508	108.30	1122	06
5.	Ideato North	13	170106	172.40	987	01
6	Ideato South	15	111892	90.33	1239	01
7.	Ihitte Uboma	15	93547	104.50	895	02
8.	Ikeduru	14	141377	183.60	770	12
9.	Isiala Mbano	16	138618	203.30	682	07
10.	Isu	5	77424	31.30	2474	01
11.	Mbaitoli	13	195971	213.46	918	06
12.	Ngor Okpala	17	122249	635.73	192	01
13.	Njaba	7	108394	96.63	1122	04
14.	Nkwerre	6	70313	28.65	2454	03
15.	Nwangele	6	95768	72.35	1324	04
16.	Obowo	11	84882	97.80	868	01
17.	Oguta	16	114430	509.60	225	02
18.	Ohaji/Egbema	9	157029	958.01	164	01
19.	Okigwe	7	85685	337.60	254	02
20.	Onuimo	4	83595	69.40	1204	04
21.	Orlu	18	154366	154.60	998	05
22.	Orsu	9	120405	55.20	2181	03
23.	Oru East	9	109807	161.31	681	03
24.	Oru West	10	87149	73.13	1192	03
25.	Owerri Municipal	1	129245	24.88	1175	-
26.	Owerri North	13	219179	165.83	1322	03
27.	Owerri West	12	130362	305.18	427	-
	Total	265	3,285,580	5,289.49	621	88

Sources: (1) National Population Commission (2006)

2) European Union Micro-Projects Program Office, Owerri (2008)

Table 2: Increased margin of Household water supply

Communities	Mean Household Water Demand (litres)	Mean Household Consumption Before project in 2002 (litre)	Mean Household Consumption after project in 2007 (litre)	% increase in water supply
Ezuhu Nguru	1132	577	873	51.3
Amuzi	1051	538	852	58.4
Ezoke	1137	565	847	49.9
Amudi Obizi	995	473	899	90.1
Umuago Urualla	1031	508	705	38.8
Abo Ebikoro	950	411	710	72.7
Owu	986	462	735	59.1
Ibeme	1052	501	799	59.5
Umuocham Ntu	1004	506	851	68.2
Ugbele Aka	1163	511	838	63.9
Amaokpara	997	495	753	52.1
Amuzi-na-Dim	1009	492	802	63.0
Amato Alika	972	433	720	66.3
Etioha	1080	420	711	69.3
Ugwuntu Ihube	988	391	649	65.9
Mean	1037	486	782.9	61.9
SD	-8	-7	-1	-4

Table 3: Evolution of Sources of water supply in sampled communities

Communities	Sources before water project	Sources after water project
Ezuhu Nguru	rain water, pond	borehole, rain water
Amuzi	rain water, pond	borehole
Ezoke	rain water, stream	borehole, rain water
Amudi Obizi	rain water, pond	borehole
Umuago Urualla	rain water, water vendors	borehole, rain water
Abo Ebikoro	rain water, stream	borehole
Owu	rain water, stream	borehole
Ibeme	rain water, pond	borehole, rain water
Umuocham Ntu	rain water, pond	borehole
Ugbele Aka	rain water, water vendors	borehole, rain water
Amaokpara	rain water, pond	borehole, rain water
Amuzi-na-Dim	rain water, stream	borehole
Amato Alika	rain water, stream	borehole
Etioha	rain water, stream water,	borehole
Ugwuntu Ihube	rain water pond	borehole

Table 4: Reduction in Average distance and time spent in water collection

Communities	Average Distance Traveled Before Project (Km)	Average Distance Traveled After Project (Km)	Average Time spent Before project (Hrs)	Average Time spent After project (Hrs)	% of Average Daytime spent Before Project	% of Average Daytime spent After project
Ezuhu Nguru	4	0.3	1.58	0.47	13.2	3.92
Amuzi	3	0.4	1.32	0.53	11.00	4.42
Ezoke	5	0.5	2.15	0.48	17.90	4.00
Amudi Obizi	3	0.5	1.11	0.43	9.25	3.58
Umuago Urualla	3	1.0	1.24	0.56	10.30	4.67
Abo Ebikoro	4	0.4	1.43	0.48	11.90	4.00
Owu	3	0.2	1.15	0.42	9.58	3.50
Ibeme	3	0.3	1.18	0.45	9.83	3.75
Umuocham Ntu	4	0.5	1.42	0.51	11.80	4.25
Ugbele Aka	3	0.3	1.23	0.48	10.25	4.00
Amaokpara	3	1.2	2.10	0.51	17.50	4.25
Amuzi-na-Dim	5	0.3	2.18	0.47	18.20	3.92
Amato Alika	4	0.2	1.47	0.48	12.25	4.00
Etioha	5	0.4	2.20	0.53	18.33	4.42
Ugwuntu Ihube	3	0.3	1.16	0.48	9.67	4.00
Mean	3.6	0.45	1.53	0.48	12.73	4.05
SD	1.0	0.10	0.25	0.08	0.01	0.27