

## REVIEWED PAPER

**33rd WEDC International Conference, Accra, Ghana, 2008****ACCESS TO SANITATION AND SAFE WATER:  
GLOBAL PARTNERSHIPS AND LOCAL ACTIONS****Assessment of water supply and sanitation  
of some coastal communities of the Niger Delta**

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*A series of separate surveys were carried out on six coastal communities within a span of three years. The study focused on the assessment of water supply and sanitation facilities in the selected communities. Water samples were collected at various sources (boreholes, rivers, wells, streams and springs). Physico-chemical and Microbiological characteristics of the various water samples from the study areas show that all the water sources in the study areas were not fit for human consumption or for any reasonable use. The quality of sanitation facilities in these communities were grossly inadequate. Therefore, there is a need to develop deliberate specific programmes that are fit for purpose to address the total lack of adequate water supply and sanitation in the coastal communities of the Niger Delta. The study makes recommendations for the development of a 'Framework for Intervention Programmes on Water Supply and Sanitation for Coastal Communities in the region'.*

**Introduction**

Most communities in the Niger Delta reside in the sea coasts, estuaries and mangrove swamps. "The Niger Delta covers an area of about 70,000 square kilometers and accounts for 7.5% of Nigeria's land mass. It extends from Apoi to Bakassi and from Mashin creek to the Bight of Benin through a coastline of 560km, with an annual rainfall of 1500-4000mm" (Karibo, E.O. 2004). Safe water supply and sanitation is scarce in almost all communities in the Niger Delta in spite of the fact that they are surrounded by water. The vast majority of the settlements in these coastal areas depend on high iron and arsenic content shallow contaminated springs, wells, streams, boreholes and rainwater from rooftops. {Aguo, (2004), John, (2007), Kokpan, (2006) and Wenes (2005)}.

In most of these coastal communities there is an absence of sanitation facilities and direct defecation into the surface water has been the traditional practice. The overhung latrine (popularly called Jetty Latrine) is commonly used. These Jetty Latrines are shanty-like toilet structures built over the rivers and swamps close to the coastal communities. There are issues of a lack of privacy and distance from the living area of the people which negates the support of the Jetty Toilets. However, the greatest minus of these latines is that defecation is still done directly into the water resource which serves to pollute an already threatened surface water.

Contaminated drinking water supply is another problem related to sanitation. Due to geographical location, the water supply from the site may be either contaminated or with high salinity. The groundwater is brackish and contaminated by the subsurface encroachment of salt water from the ocean. The conclusion is that the indiscriminate disposal of human waste and the pollution of water sources could culminate into episodes of feco-oral infections transmission. There are very high records of epidemics of feco-oral transmissions like cholera, typhoid fever, diarrhoea schistosomiasis, tapeworm and ascariasis especially during the dry season. The purpose of this study was to assess some coastal communities' water supply, sanitation facilities and hygiene behaviour.

**Methodology**

A series of separate surveys were carried out on six coastal communities within a span of three years. The study areas include coastal communities in Rivers and Bayelsa States (see table 1). The survey methodology was adapted from Ockelford Jeremy and Reed Bob (2002).

Study was conducted to apprehend the present status of knowledge, attitudes and practice level regarding

water, sanitation and hygiene behaviour in these coastal communities. The study focused on the assessment of water supply and sanitation facilities in the selected communities. Data were collected using questionnaires, oral and personal interviews. Other methods of data collection were water analysis and review of relevant literature. The study areas were selected based on the fact that each of them represents the various terrains of the coastal communities. Some are complete islands while others are bordered by waters.

Water samples were collected at various sources (borehole, rivers, wells, streams and springs). Water samples were collected with sterile containers and analyzed for the following parameters: colour, PH, Total Suspended Solids (TSS), turbidity, iron and coliform organisms. The conventional methods described in Standard Methods for the examination of water and wastewater (A.P.H.A., A.W.W.A., W.P.C.F. 2003) were applied.

<b>Communities</b>	<b>Local government areas</b>	<b>States</b>
Onuebum	Yenegoa	Bayelsa
Deken	Gokana	Rivers
Odieke-Akoh	Ahoada East	Rivers
Ekeremor	Ekeremor	Bayelsa
Ngo	Andoni	Rivers
Opobo	Opobo/Nkoro	Rivers

## Discussion

The study reveals that most of the water supply sources of the communities surveyed did not meet WHO recommended limits. (See Table 2). Microbiological quality of all the water sources in the study areas were not fit for human consumption or for any reasonable use.

The study also reveals that all the communities under study defecate in the fields, bush, and water bodies or behind their houses. This means that there is indiscriminate defecation in these communities. All the communities' major latrine facilities are communal latrines. Deken and Odieke-Akoh communities are the only two communities with individual households owning traditional pit toilets.

The study also reveals that solid waste disposal is not properly managed in all the communities understudy. In Deken and Odieke-Akoh communities, solid waste is disposed anywhere while in the other communities they are disposed at sea. The study also revealed that no sanitation promotion activity has been carried out in all the communities understudy. It revealed that hand washing after toileting is very low in these communities. (See Table 3). Records from the health centres of the study area shows that cases of water related infections abound in these communities (See Table 3).

All the communities surveyed depend highly on rainwater harvesting while 50% get some of their water from streams. Some, like Onuebum and Ekeremor get their water from nearby rivers. Another high source of water is shallow wells often wrongly sited and poorly built. Boreholes also exist in some of these communities but most of them are not functional. The fact that most of these water sources, (except maybe Opobo's spring water) are high in iron and saline content rendering them unfit for domestic use. However, to worsen an already bad situation, the poor sanitation practices of the people and the inadequacy of the sanitation facilities result in high microbial load of these water sources. This further reduces the quality and quantity of water available to the people.

The risk of 'water-borne transmission' and 'water-washed transmission' of faecal-oral disease are high. On the one hand, contaminated sources of water transmit the disease-causing organisms to users (water-borne transmission), while on the other hand, transmission is 'encouraged by poor hygiene due to insufficient quantities of water for washing (water-washed transmission) (DFID 1998). However, the people of the coastal communities of the Niger Delta suffer more from water-borne transmission, (even to epidemic proportions), than they do from 'water-washed transmissions' because the major problem is that of 'quality'. The qualities of the water-sources of the Coastal Communities are mainly abused by indiscriminate disposal of waste, especially human waste (excreta).

Apart from the inadequate and poor provision of sanitation facilities in these Communities, some cultural practices of defecating anywhere create a health risk to the people and their water sources, especially when the

rain falls. Often times, the rains wash the earth surface into the rivers, streams, springs, wells and boreholes. Other times, they do pollute the groundwater sources that supply most of the wells and boreholes.

Since these communities depend solely on these contaminated sources of water for all their activities; and the people continue with their poor hygiene practice; encouraged by poor and inadequate sanitary facilities; it's a dead end.

Sadly, there has never been a well designed intervention programme to tackle the peculiar problems of water supply, sanitation and hygiene behaviour change in these communities. This is also further complicated by a total absence of government presence even when most of these communities are Local Government Area headquarters (Opobo, Ngo and Ekeremor).

Another problem militating against sustainable water supply and sanitation programmes in these communities is because the Niger Delta Development Commission (NDDC), (the Federal government development agency set up with the primary purpose to develop the Niger Delta regions) and the oil and gas companies in the region, do not have well designed programmes to address the issues of water supply and sanitation in the Coastal Communities. They are well known for their sinking of indiscriminate boreholes which suffer the same fate of high iron content, salinity and heavy microbial loads. The experience of the European Union's, MPP3, MPP6 and MPP9 programmes is no different from that of NDDC and the multinational oil and gas companies operating in the region.

According to Shell Petroleum Development Company of Nigeria (SPDC), “---water supply projects provided in most cases were too complex for the communities to maintain”, (Shell People and Environment Annual Report 1997). Over the issues of salinity and other challenges, SPDC observed that, “in the past, we attempted to overcome these problems by installing water treatment plants where possible and drilling deeper water boreholes. However, the results of these options are not always satisfactory,” (Shell People and Environment Annual Report 2003). Therefore, there is a need for programmes that shall address issues of water supply and sanitation in the Niger Delta.

### **Conclusion/recommendations**

Experience has shown that practices adopted in the provision of water supply and sanitation in other parts of the country cannot work in the Coastal Communities. Therefore, the lessons learnt in this study can serve as guide to other coastal communities when planning and implementing their water supply and sanitation programmes.

One of the major lesson learnt was that the use of the jetty toilets in most of the Coastal Communities are a major source of pollution because of direct defecation into the available surface water. It was also discovered that the provision of water supply and sanitation facilities should be based on the environmental and cultural peculiarity. Other lessons include, the problem of high iron and salinity content in the water supply, which drastically reduced the amount available for use. This means that a simple iron and salinity removal technology can be provided for the communities. Ultimately, the best water supply option available for the Coastal Communities is sustainable rainwater harvesting, since the coastal communities get high rainfall all through the year. The study also, learnt that the Modified Communal Composting Toilets based on a sharing system of no more than 6 families should be preferred to the jetty toilets. Furthermore, most Coastal Communities inhabitants have poor hygiene and sanitation practice which is due to ignorance and lack of awareness. The use of awareness programmes in native languages and in relation with cultural and traditional practices peculiar to each community will be an effective means of education and awareness creation.

The six communities surveyed all have unique peculiarities peeping out of their similarities. For coastal communities that have springs nearby, this can be a better source of water than all the others and sometimes the rain floods and high tide fill up the wells with filth. The strong lesson here for other coastal communities like Opobo, and island with little land space, will be that the use of boreholes and wells must be at the minimal. Rainwater harvesting can be expanded and simple treatment of surface water can also be practiced

To address the problem of water supply and sanitation in the Coastal Communities of the Niger Delta, we recommend a special “Integrated Intervention Programmes on Water Supply and Sanitation for the Coastal Communities’ to be developed and it should incorporate the following key elements:

- Pay close attention to the peculiar terrain of these Coastal Communities
- Include cultural/behavioural re-orientation and gender mainstreaming
- Focus on Integrated Water Resources Management
- Compulsorily work with the communities directly using simple and easy to replicate systems
- Be designed to be continuous for at least a period of five years providing capacity building, maintenance, guidance, awareness campaigns and cultural change programmes.

Community		Onuebum		Deken		Ngo		Opobo		Odieke-Akoh		Ekeremor	
Parameters	WHO Standards	well	river	Bore hole	well	well	stream	well	spring	well	stream	well	river
Colour	5 Pt-Co	15 HU	52 HU	40 HU	-	20 HU	60 HU	16 HU	4 HU	12 HU	25 HU	17 HU	45 HU
Turbidity	5mg/l	20 NTU	30 NTU	35 NTU	-	25 NTU	30 NTU	20 NTU	3 NTU	35 NTU	45 NTU	25 NTU	60 NTU
PH	6.5-8.5	6	6.2	6.4	4.3	5.6	6.2	6.2	6.4	5.8	6.2	6.3	6.5
TSS	25mg/l	29	37.5	23	-	20	30	28	10	38.2	39.3	35.2	42.2
Iron	0.1mg/l	2.1	3.1	2.5	0.3	3.5	2.5	3.5	4.2	3.5	3.1	2.6	3.1
Coliforms	0	6*	8*	2*	2*	10*	12*	9*	2*	12*	15*	8*	10*

HU = Hazen Unit

	Communities under study					
	Onuebum	Deken	Ngo	Opobo	Odieke-Akoh	Ekeremor
<b>Sources of water supply</b>						
<b>Surface water</b>						
Rain water	x	x	x	x	x	x
Lakes	-	-	-	-	-	-
Ponds	-	-	-	--	-	-
Rivers	x	-	-	-	-	x
Streams	-	x	x	-	x	-
Reservoir	-	-	-	-	-	-
Others	-	-	-	-	-	-
<b>Ground water</b>						
Springs	-	-	-	x	-	-
Shallow well	x	x	x	x	x	x
Borehole	x	x	-	-	-	x
Others	-	-	-	-	-	-
<b>Defecation practices</b>						
Field/bush/water	x	x	x	x	x	x
Behind house	-	x	-	-	x	-
Communal latrine	x	-	x	x	-	x
Own latrine	-	x	-	-	x	-
<b>Types of latrines</b>						
Simple pit	-	x	-	-	x	-
Twins pit	-	-	-	-	-	-
VIP	-	-	-	-	-	-

Pour flush	-	-	-	-	-	-
Septic tank	-	-	-	-	-	-
Jetty latrine	x	-	x	x	-	x
<b>Solid waste disposal</b>						
Throw anywhere	-	x	-	-	x	-
Bury	-	-	-	-	-	-
Disposal at sea	x	-	x	x	-	x
<b>Hygiene/sanitation promotion</b>						
Previous sanitation promotion programme	-	-	-	-	-	-
No previous sanitation promotion programme	x	x	x	x	x	x
Key: X: Applicable; -: Not applicable						

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