

## Review

# Sustainability and impact of community water supply and sanitation programmes in Nigeria: An overview

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**One of the common features in Nigeria and indeed in many developing countries is that the impacts of community water and sanitation programmes are limited, because many of them are ill-conceived and are abandoned prematurely due to numerous attitudinal, institutional and economic factors. Thus, there is lack of sustainability in the sense of service delivery and upkeep of services. This paper proposes a set of pragmatic strategy that would involve all stakeholders, by ensuring effective partnership with a view to raising the sustainability level of community water and sanitation programmes. The paper believes that the key to sustainability is that all stakeholders involved in the consumption/use, maintenance, cost recovery and continuing support, perceive it in their best interest to deliver good and high quality services.**

**Key words:** Water supply, sanitation, sustainability, community participation.

## INTRODUCTION

Even though water is one of the precious gifts to mankind, lack of access to safe drinking water and basic sanitation is one of the problems affecting billions of people around the world (Hesperian Foundation 2005). This is particularly so in the developing countries where level of access to water and water related facilities are said to be very low. In 2000, 40% of the World's population lacked access to basic sanitation. At the World summit on Sustainable Development (WSSD) in Johannesburg in 2002, the International Community agreed to a target to halve the proportion of people who lack access to basic sanitation and water supply by 2015. According to Antonio (2005), more than 1.2 billion people in the World still lack access to safe drinking water and 2.6 billion lack accesses to even basic sanitation. Barney (2005) noted that, over the next 30 years, virtually all of the world's population growth is expected to be concentrated in urban areas in the developing countries, in which Nigeria occupies a vital position, with its attendant socio-economic and environmental impact.

This portrays that the developing countries are facing

great challenges in meeting community water supply needs and improving access to basic sanitation. Various scholars believe that the new sanitation target agreed at the WSSD is realistic, but still presents significant challenges, due to the fact that, proposed infrastructure development can only be viable (a) if they will have a beneficial *impact* on communities, and (b) if this impact will be long-lasting or sustainable. Unless beneficial and sustained impact is likely, there is little point in carrying out environmental, economic, and other appraisals with a view to subsequent implementation. In the light of the foregoing, this paper attempts to evaluate community water supply and sanitation programmes, with a view to determining their impact as well proffering sustainable strategies for meeting the prevailing problems and challenges of the sector.

## THE WATER AND SANITATION PROBLEM IN NIGERIA

The problems people experience with water supply and sanitation in Nigeria are numerous and complex. The nature of the problem differs depending on the context - rural or urban, routine or civil emergency e.t.c. This paper

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**Table 1.** Components of the water and sanitation problem in Nigeria

ASPECT	IMMEDIATE PROBLEM	CONSEQUENCES
Water Supply	Distant sources	Much expenditure of time and energy (especially by women) Low levels of water consumption, resulting in water-washed disease
	Unreliable sources (drought-prone, or poorly engineered or managed)	Time spent queueing of seeking alternative sources
	Poor quality (faecally contaminated) sources	Water-borne disease
Excreta disposal	Lack of safe facilities for disposal of human faeces	Contamination of soil, surface water and ground water
	Little privacy for defaecation, and lack of water for anal cleansing and hand-washing	Defaecation (by men) in open, often near water (e.g. canal side of river banks); hardship for women for whom public defaecation is unacceptable
Wastewater disposal	Engineered facilities for treatment or safe disposal rarely exist	Indiscriminate disposal leads to environmental contamination, insect habitat creation, and/or unsafe re-use downstream

Source: Adapted by Authors from DFID Factsheet, 2005.

focuses on the poorest rural and peri-urban areas, where people have access to a very low level of water supply and sanitation technology; it does not specifically address the situation of emergency need or those of urban pipe-borne water supply and sewerage.

Inadequacies in water supply and sanitation infrastructure (sanitation taken here to include excreta and wastewater disposal/treatment) pose separate, but linked problems. The immediate problems result in a string of further consequences, which adversely affect the quality of life of the poor. This chain of consequences is summarized in Table 1.

The identified problems are particularly common in almost all rural areas of Nigeria, particularly in the northern part of the country where there is usually a long period of dry season. Increased scarcity of water (through draught or other access restrictions) brings lots of hardships to people and also reduces household capacity to combine water with other assets in order to produce income.

### Potential benefits of improved water and sanitation infrastructure

The ideal target of the pragmatic approach is the elimination of all the problem components identified in Table 1. This would be brought about by appropriate water and sanitation hardware and hygiene education to support infrastructure improvements. It is now accepted wisdom among development agencies that water supply

and sanitation technology (at least in the sense of excreta disposal) together with hygiene education form the three foundation stones of good water and sanitation projects. From an objective point of view, it seems clear that time saving, health improvement and environmental protection are the desirable aims of water and sanitation programmes in developing countries. As observed by Hesperian Foundation (2005), water supply and sanitation programmes enables communities to live healthier lives through improvements in their access to water supply and sanitation.

Sustainability of facilities was reported by Overseas Development Institute (ODI) (2004), to be a major concern in the developing countries. Performance on sustainability is often gauged by looking at the number and proportion of functioning and non-functioning facilities. It also noted further that a functioning facility requires attention to a range of managerial, social, financial, institutional- and technical issues. Renato (2003) noted that, soil, surface water and groundwater are to be protected from faecal contamination. Hygiene practices are to be improved by appropriate components of water and sanitation programmes. These goals should be achieved at acceptable capital and recurrent costs. These goals should be realized for the foreseeable future. These ideal aims however point the way only towards the potential benefits which may be realizable. There are many ways in which infrastructure use differs from that intended; equally there are many reasons why actual benefits fall short of potential benefits.

Few studies have actually quantified consumers' res-

ponses to 'improved' water supply technology. However, very few projects carry out measurements of actual consumption, and time spent on water carrying, pre- and post-project. Thus, little is known too about exactly how much water is required to maintain a minimum standard of hygiene; various Government standards on this issue range from 15 to 50 litres per day, with 20 litres being the commonest (WHO/WSSCC/UNICEF, 1996). The impact objectives imply that water consumption should be increased, while there should be a reduction in the time spent on water-hauling. This implies that the new source is located closer than the old one. New source proximity to user of no more than 400m (this based on a family size of six, a walking speed of 5 km/h, and only two minutes spent at the source per round-trip). However, it is generally accepted that consumption rates do not tend to increase significantly until sources lie within a few minutes (say 100 m) of home (Postnote, 2002). People seem to prefer to save time than use more water. In many cases, especially in rural Nigeria where population is dispersed and traditional sources commonly lie 2 – 5 km (and sometimes more) from people's homes, a high density of new sources would imply a level of investment far above what is presently available. If so, then one or both of the consumption and time expenditure objectives are unachievable. Either consumption will not reach the target level, or significant amounts of time and energy will still be spent on water collection.

It has been clear for many years now that the impact of water supply and sanitation programmes on public health is both difficult to predict and measure, nevertheless, it is a common knowledge that such impact is very great. The studies of the Centre for Population Information (2006) demonstrated this, concluding that the median reduction in morbidity achievable by improving water supply and sanitation ranged from as little as 4% in the case of hookworm, to 76% in the case of guinea worm, with the figures for diarrhoeas, ascariasis, schistosomiasis and trachoma falling between these extremes. Even if the immediate and direct health impacts of a water supply and sanitation programme are limited, this is not reason for despondency.

The beneficial impact of water and sanitation programmes on the people/community cannot be over-emphasized. Water programmes can among other things increase;

- Access to portable water.
- Improved health situation of people.
- Savings from what could have been spent on health treatment can be used in improving household livelihood.

### **The concept of sustainability in water supply and sanitation programmes**

In developing countries, a significant number of projects, including those in the water and sanitation sector, fail to deliver benefits to society over the long term (Antonio,

2005). Part of the cause of this failure lies in poor understanding of the issues of impact and sustainability. A sound, practical, analysis of these two concepts must include:

#### **Impact:**

- A clear understanding of the present water and sanitation *problems* faced by communities.
- Identification of the potential benefits which can be delivered by improved infrastructure.
- Observation of the actual benefits experienced by users and consumers.
- Quantification of the magnitude of beneficial impact achievable in practice.

#### **Sustainability:**

- A pragmatic definition of the concept;
- An understanding of the component elements of strategies for sustainability.

From an understanding of what impacts is, and how it can be brought about in a sustainable fashion, sound strategies for the planning and management of development projects can emerge. What is needed for project designers and managers in the field is a pragmatic concept, which is specific enough to allow the development of objectively verifiable targets. As the aim of a general programme we will simply refer to the achievement of sustainability; as specific objectives, we identify key components of this idea, which can be designed in and measured or observed.

In the present context, the test of sustainability is whether water continues to be abstracted at the same rate and quality as when the supply system was designed, whether the excreta and wastewater disposal systems continue to function and be used as planned, and whether environmental quality continues to improve. As Abrams (1998) points out, "if the water flows, then all of the many elements which are required for sustainability must have been in place. There must have been money for recurring expenses and for the occasional repair, there must have been acceptance from the consumers of the service, the source supplying the service must have been adequate, the design must have been properly done, and there must have been sound construction."

#### **Why are improvements not sustained?**

The commonly observed fact is that many water and sanitation programmes started in developing countries (Nigeria inclusive) with the support of international agencies have not "continued to work over time" (Schouten and Moriarty, 2003; 2005; Schouton, 2006). They have not been sustainable. The causes of breakdown or non-sustainability most of which are relevant in the context of Nigeria are numerous and they include the following:

- Communities or households may never have been convinced of the desirability of new water sources, or particularly new excreta disposal facilities, in the first place;
- The financial costs which communities are expected to raise as a contribution to capital or recurrent expenses may be unacceptable, unaffordable, or impracticable (e.g. monthly or quarterly cash contributions may be impossible for households which only receive income at harvest);
- Communities may never have felt ownership of the new infrastructure, and Governments may have been overstretched and under-resourced, so that repairs and maintenance have not taken place;
- Benefits promised at the outset of projects (e.g. dramatically improved health) have failed to materialize;
- Community education (e.g. hygiene education) and the attitudinal and behavioural change expected to be achieved by it, take a long time to produce results, and yet it often ceases prematurely;
- Even where full community participation or management has been planned in from the start, community-level committees and caretakers have lost interest or trained individuals have moved away. This can be a particular risk if community-level organisation is on a voluntary basis.

Thus, as observed by Schouten (2006) the pump or tap on its own does not guarantee a sustainable water service for all. Making sure that the water flows continuously is much more complicated and this may only be achieved through evolving and adaptive delivery mechanisms. Although, community participation is nowadays an essential foundation-stone of water and sanitation projects in Nigeria, this alone is no automatic guarantee of success. The only way of approaching such a guarantee is to build in at all stages, in as many aspects as possible, and for all stakeholders, a perception that participation is more worthwhile than non-participation.

Nowadays community water management is seen as the best way to guarantee the sustainability of rural water services after the construction of the water system and after the implementing agency has left the community. Over the years of its application a range of methods, tools and mammals have been developed to prepare communities for their management task. More and more examples of community management can be found around the world. In fact, countries like Ghana, Uganda, South Africa, India and Tanzania have all made community water management a key concept in their national water policies and laws and this could be relevant in the context

### **Motivating communities**

Without the motivation of the community to utilize the new source (or excreta disposal facility), sustainability is doomed. The users must believe that the new source is

preferable to their traditional source. The obvious and immediate benefit of an improved water source is usually access, or proximity, while the value of health benefits may not be prominent. On the contrary, the taste of "safe" water may be unfamiliar, and the universal conservatism of consumers may be an obstacle to change. Health education and involvement of the community, to the extent of vesting ownership in them, will usually be necessary to bring about such motivation. Although, this may be a time-consuming activity at the beginning of a programme, it is common for demand, and levels of motivation, to grow rapidly as the benefits of clean water become more visible. A significant further obstacle to the motivation of a community to use a new source may be the change from "free" water to some system of cash payment.

Motivation, value, worthwhileness, or self-interest are essential features of the involvement of all stakeholders, not only the individual consumers. Caretakers and committees within the community, Government or non-Government organizations providing back-stopping for maintenance, those organizing revenue collection, local Government, and private sector stakeholders should all perceive participation and the delivery of high quality services in their own interests, financial or otherwise.

### **Maintenance organization**

A joint report prepared by WHO and UNICEF (2000), noted that, in view of the emphasis during and since the United Nations Water Decade (1981 - 1990) on VLOM (Village Level Operation and Management of Maintenance), a clearly structured, resourced, and trained maintenance organization is necessary. The community-appointed caretaker(s) or committees may have an important role in maintenance (for which they need training), but in almost all circumstances they will need backstopping by some district, regional, or national level organization. The Government agency or NGO will also need resources and training. Communication lines between community and backstopping agency need to be clear, and response times need to be rapid. Spare parts and tools, and appropriate forms of transport, must be available.

### **Cost recovery**

Staffing, training, transport, spare parts, materials, tools, and replacement units all cost money, and some (as far as possible) involve foreign exchange. In times of increasing financial stringency and realism, the trend is to place this burden of recurrent cost on the community (Winpenny, 1994). Whether this is right or wrong, it is a pragmatic response to the fact that developing countries Governments are grossly under-resourced, and even international NGOs have finite resources. The level of

payment, including any subsidies, the basis of payment (by volume, or flat rate per household), and the means of administering and accounting for water charges, all have to be decided, preferably by the community.

A similar case was that of Sarvodaya in Sri Lanka, in which Vinya (2003) noted that Sarvodaya, movement does not believe that straight forward “cost recovery” mechanism will be equitable. Hence, Sarvodaya given its moral responsibility by the poor and the disadvantaged, worked on an idea evolving community financing scheme that would not discriminate against disadvantaged groups in the community. This idea of a partial cost recovery scheme was a successful one through its highly successful rural banking programmed SEEDS (Sarvodaya Economic Enterprises Development Service).

### Continuing support

Evidence from the literature makes it clear that community enthusiasm for keeping water committees functioning, for adopting improved hygiene practices, and continuing the collection of revenue for recurrent expenses, can wane within two or three years of construction (Postnote, 2002; Antonio, 2005). It is essential that the supporting Government or NGO maintains responsibility for such follow-up. This is a long term function, with a need to continue until there is such a ‘critical mass’ of good practice within a district, that there is no going back. This notion of continuing support is to ensuring that community managed water services are sustainable and that adequate institutional support and policy arrangements are put in place to support community management indefinitely.

### Sustainability objectives

It is possible to set targets or objectives for the achievement of sustainability in practice. Ultimately, the test of sustainability is whether facilities are functioning and being utilized. As means to this end, the functioning of community level caretakers and committees, including, especially, their revenue collection activities, should be effective. The backstopping agency should continue to be visible to the community, carrying on its education and training, encouragement, and maintenance support role. In fact, to achieve sustainability objectives for water supply and sanitation programmes, the following steps are necessary:

- Caretakers should be in post and fulfilling their assigned job descriptions.
- Committees should be meeting regularly, keeping minutes, and functioning in a manner acceptable to the community.
- Revenue collection should be taking place in the manner agreed at the construction phase, or in some other effective way t.

- He backstopping agency (Government or NGO) should be in regular and effective contact with the community.
- Usage of water supply, excreta disposal and waste-water disposal facilities should be continuing at high levels.
- Physical infrastructure should be fully functional.

### Community participation

Conventional wisdom is that without community participation, there is little likelihood of sustainability being realized (Narayan, 1995; Oyesiku, 1998). This is in part a pragmatic recognition of Governments’ inability to deliver services, but in part an ideological proposition which values concepts such as ‘empowerment’, and ‘capacity building’ for their own sake. Even from a strictly practical approach, a number of the issues mentioned earlier illustrate the need for capacity building at the community level as well as at the level of Government or NGO. Education in health and hygiene, training in maintenance and the handling of cash, and involvement of women in community institutions and decision-making, are key activities needed to create local capacity to manage. On the part of Governments and NGOs, listening and learning from the community, developing respect for existing methods of organization, problem-solving, conflict-resolution, and decision-making, are essential components of such capacity-building work. This exposes the need for a cadre of staff in the Government or NGO which can fulfill these external support and capacity building functions.

To quote from the work of Abrams (1996) on the review of the African domestic water and sanitation: “It is generally agreed that community engagement and empowerment is the solution to the sustainability of water supply and sanitation services. The hallmarks of empowerment and capacity building are factors such as transparency, partnership, flexibility, respect, and empathy. The study conducted by Vinya (2003) on the water and sanitation project embarked upon by the Sarvodaya Shramadana Movement, (Sri Lanka), indicated that the high level of community participation and guaranteed demand orientation through the village Shramadana society which formed the “software” part of the community development approach combined with intensive training, standardization, and constant close monitoring at various levels- contributed to the “hardware success”.

As earlier stated, management issue is also of importance to sustainability. In 1993, Jan, Genry and Michad carried out a study on developing and managing community water supplies in Ethiopia and Kenya. The study shows that three management options (agency managed, agency/community managed and community managed) were put into use in different district of the area under study and some degree of success was recorded. This suggests that water and sanitation targets can be achieved through empowering individuals, households, and communities to take charge of their development

needs. In the light of the above, the National Environmental Sanitation Day as presently being observed in Nigeria and rural water projects, which several rural Local Governments are embarking upon particularly with the assistance of UNICEF are right steps in the right direction in quest to ensuring better access to basic sanitation and safe drinking water.

## CONCLUSION AND RECOMMENDATIONS

Governments' inability (largely because of lack of resources) to maintain water and sanitation infrastructure has been the major factor leading to the promotion of community participation in development programmes. Yet, communities rarely have the sustainable capacity to manage their own infrastructure, in complete independence of Government or Non-Governmental Organizations. Community participation works to the extent that it does (sometimes with spectacular success) because it has to. Whether this will continue to be the case over the longer term (that is, several decades) is debatable, as developing country communities succumb to the same pressures which have altered the nature of 'community' in the industrialized world.

Full involvement of communities in all stages of programme implementation and management is the correct pragmatic approach for the present. However, this approach does not divest Governments and NGOs of their responsibility for continuing and evolving support of the programmes which they promote. As communities change, and the needs of their water and sanitation systems change, the appropriate type of support – education, training, financial subsidy, technical assistance, maintenance, even rehabilitation – should evolve. Without support, however, few community-based water and sanitation systems will achieve anything approaching permanence.

Continuous support to community participation, and specifically institutional, legal, and contractual links between communities, Governments and NGOs need to be developed. The aim should be not simply 'sustainability', but permanence through evolution and improvement of water and sanitation services.

Furthermore, private sector participation in the water sector is a topical and growing issue (Hardoy et al, 2000). However, it is important that the advanced countries model of privatization is not foisted on developing countries, where effective regulation may be difficult to achieve. The priority, in countries having the lowest water and sanitation service levels, is to develop the industries which can support the sector: equipment manufacturers and contractor businesses. Here competition can genuinely function, and quality standards can be raised by consumer pressure, unlike in the monopolistic environment of some privatization scenarios. The key with private sector participation is that reasonable profits should be achievable, while consumers or purchasers retain

appropriate rights, protection, and real choice.

### As for programme designers and managers, it is being suggested here that:

- Realistically achievable impact of programmes should be identified and clearly discussed with all stakeholders. Table 1 is intended as a framework.
- Observations of water use behaviour (quantity and quality) in existing systems should be made more widely, in order to refine the targets.
- Key indicators of sustainability should be identified and clearly discussed with all stakeholders.
- Programmes should be designed in such a way that it is in every stakeholder group's best interests to fulfill its part of the service delivery. Voluntary roles are unlikely to be sustainable in the long term.
- Arrangements for continuing support of community-level organizations should be clearly set out, preferably in a contractual form between the community and the backstopping agency.

### For external support agencies

- New models of institutional, financial, contractual, and legal relationships between communities and back-stopping agencies should be sought. Permanence and improvement of service should be the goals. A short term "project" mentality on the part of funding organizations should be eschewed in favour of long term and evolving commitment to developing country partners.
- Greater emphasis should be placed on institutional support (re-training, resourcing, and reform) of Government and non-Government back-stopping organizations.
- Where in-country private sector providers of equipment, materials, and services do not exist, or are weak, means should be identified to strengthen them. Genuine competition and choice should be sought.

In conclusion, this paper has been able to make practical suggestions to those designing or managing water sanitation programmes in the short term. It has also point towards some of the longer term changes which will be desirable or necessary in the sector. Inadequate water supply and sanitation services in Nigeria, like in most other developing countries, result in excessive expenditure of time and energy, water and excreta-related disease, and lack of privacy in defecation. Water and sanitation projects often fail to achieve significant impacts in all these aspects, and systems are often under-utilized, broken down, or abandoned.

The achievement of sustainability requires incentives for all stakeholders involved in use, maintenance, financing, and continuing support of water and sanitation services. For those providing services, these incentives should be financial. Community participation can be

made to work in the short to medium term, but its prospects for long term success are limited. New models of permanent, evolving and improving service provision for the long term are needed. Programme designers and managers should clearly identify, with all stakeholders, the realistically achievable impacts and the means for achieving sustainable services within their programmes. In addition, external support agencies should encourage long-term management strategies built on clear relationships between strengthened support institutions and private sector participants, and communities.

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