ZAMFARA STATE was created out of the old Sokoto state and is located in the North West of Nigeria. It covers a land area of about 32,789 km² and has a 1995 projected population of 2,115,595 people, about 85% of which live in the rural areas. It is for this reason that successive governments have selected cheap, affordable and simple water supply delivery schemes as hand pump boreholes for the socio-economic wellbeing of the people. About 90% of the state is underlain by a variety of crystalline rocks of the basement complex of north western Nigeria described by McCurry (1976) to be composed largely of gneiss, schist, migmatite, granite and granodiorite. The structural features commonly exhibited by the basement rocks include foliation, lineation, folds, rock-rock contacts, faults and joints. The rest of the state is occupied by the oldest sediments of the Sokoto (illullemeneden) basin described by Oteze (1976) and Kogbe (1976). Groundwater in the basement rocks of the state can mainly be sourced from fractures and joints commonly (Yaya et al., 2001) and in the intergranular pores of fine to coarse (white or light grey) sand or gravel Oteze (1976) in the sedimentary areas.

Method of investigation
The methodology of study includes an assessment of previous rural borehole construction programmes executed by the Federal and State Agencies in the last two (2) decades with the aim of determining the cause of success or failure of the schemes using such parameters as reconnaissance carried out before job execution, selection criteria for qualified contractors, funding, payments of contractors, operation and maintenance of scheme after execution etc.

Community mobilization/sensitization
In the early 80s when Sokoto Agricultural and Rural Development Authority obtained a World Bank loan to fund the construction of 1200 boreholes in the old Sokoto state, one of the vital ingredients of success was an effective and result oriented community mobilization/sensitization of the beneficiary communities before, during and after the project execution (Table 1). This was done through the ward, village, and district heads who in turn set up Water Users Committee comprising of three locals amongst whom is a craftsman. The foundation laid was thereafter used as a step to success by subsequent schemes. The education of the locals during this mobilization then and now is that these schemes are owned by them after execution and they should put in measures to ensure that the scheme is sustained through regular maintenance and rehabilitation. A number of these wells today are still functional because of these measures.

Planning and management
The period of execution of the schemes is another important tool. Accessibility to these areas especially during the raining season (July – September) can be very poor and success of project execution. Bureaucratic bottlenecks in the selection of contractors, release of funds etc. often drag the period of commencement of the project to July. The 150 boreholes scheme by DFRRRI took off in June when the raining season is about to begin and the contractor suffered poor access to sites during the initial period of the project. This led to their inability to complete the target of 150 boreholes despite the fact that they were well equipped for the job.

Funding/costing
Borehole construction world over is capital intensive. A number of these schemes failed because of poor costing and funding. Particular mention can be made of the Improved National Access to Water Supply and Sanitation and the ongoing scheme by the State Ministry of Local Government and Chieftaincy Affairs that have been poorly costed and have progressed very poorly. Sufficient funding by the rest scheme especially that by SARDA and DFRRRI led to remarkable success.

Selection of contractors
The method of selection of qualified contractors by competitive bidding using such criteria as possession of relevant equipments, good knowledge of the local terrain through participation in previous scheme in the area, sound capital base, employment of qualified personnel etc. have proved a huge success for the World Bank assisted schemes, DFRRRI and PTF. Other schemes are scored low in this regard because their main criterion in selecting contractors was based more on political sentiments than possession of sufficient technical efficiency to perform.

Payments of contractors
All the schemes except that by DFRRRI involved the use of Engineering/Hydrogeological Consultants for planning, execution and management of the projects. These Consultants as part of their main functions were to quantify periodically jobs completed by contractors and forward
same to the implementing agencies for payments. SARDA and PTF schemes were hardly affected by bureaucracy as such contractors were paid promptly as at when due. Other schemes suffered one form of bureaucracy or the other.

**Sustainability**

The need for the users to enjoy completed water supply delivery was more emphasized by policy structures put in place by all the schemes except the ongoing one.

Members of the Water Users Committee are trained on the operation and maintenance of the hand pumps to enable them carry out simple repairs in case of minor breakdown. Access to spare parts was made easy by making petty traders in the beneficiary communities stock them. They report major breakdown to the implementing agencies for possible assistance.

**Concluding remarks**

The two schemes executed by Sokoto Agricultural and Rural Development Authority and that by Directorate of Rural Development have made substantial impact on the socio economic well being of the rural populace in Zamfara State. This has been largely due to good planning, result oriented community mobilization, use of qualified personnel, etc. Although subsequent schemes employed similar management tactics, they suffered from frequent change in state and federal administration and bureaucratic bottlenecks by government officials.

Future schemes if to be successful must involve qualified consultants that are staffed with Hydrogeologists/Geophysicists and Water Engineers with relevant working experience on similar projects in the area, be well funded, separated from the bureaucratic bottlenecks of government, honour promptly contractual payments and educate beneficiary communities on the need for sustainability through on-the-job training of the Water Users Committee from time to time.

**References**


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<table>
<thead>
<tr>
<th>S/N</th>
<th>TITLE OF PROGRAMME</th>
<th>IMPLEMENTING AGENCY</th>
<th>PERIOD OF EXECUTION</th>
<th>SUCCESS OR REASONS FOR FAILURE OF PROGRAMME</th>
<th>TARGET NUMBER OF BOREHOLES FOR EXECUTION</th>
<th>ACTUAL NUMBER OF CONTRACTORS</th>
<th>ACTUAL NUMBER COMPLETED &amp; COMMISSIONED</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1,200+ Borehole Construction Programme</td>
<td>Sokoto Agricultural and Rural Development Authority (SARDA)</td>
<td>1984 – 1996</td>
<td>Good planning, use of qualified and equipped contractors, prompt payment of contractors etc.</td>
<td>Over 1,200 hand pump boreholes in old Sokoto state including Zamfara state</td>
<td>2</td>
<td>2 Over 1,200 hand pump boreholes in old Sokoto state including Zamfara state</td>
</tr>
<tr>
<td>2</td>
<td>2,000+ Borehole Construction Programme</td>
<td>Sokoto State Directorate of Rural Development (DFRRI)</td>
<td>1987 – 1991</td>
<td>- do -</td>
<td>&gt;do&lt; 2,000+</td>
<td>109 boreholes</td>
<td>Change in state administration and subsequent change in policy, slow release of contractors payments etc.</td>
</tr>
<tr>
<td>3</td>
<td>Phase III Rural Borehole Construction Programme</td>
<td>Petroleum Special Trust Fund (PTF)</td>
<td>August 1998 – June 1999</td>
<td>Less than 50 boreholes</td>
<td>150</td>
<td>4</td>
<td>Change from military to democratic government, involvement of poorly equipped contractors, slow release of funds etc.</td>
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<tr>
<td>4</td>
<td>National Rural Water Supply Programme</td>
<td>Federal Ministry of Water Resources</td>
<td>Sept. 2000 – September 2001</td>
<td>Less than 20 boreholes</td>
<td>70</td>
<td>3</td>
<td>Poor funding, costing, poor planning and use of unqualified and poorly equipped contractors</td>
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