



# Improving Government Health Facility Infrastructure

**DFID** Department for  
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## Improving Government Health Facility Infrastructure

### Summary

Government health facilities in Enugu, Jigawa and Benue States had suffered from years of neglect, with few resources allocated for repairs and maintenance. Rehabilitation of these facilities was considered vital to improve service delivery. In most locations no expansion of facilities was thought to be required. The overriding need was to carry out a sensible rationalisation programme, concentrating on the comprehensive overhaul of key buildings. In the large compounds, outlying structures away from core facilities were not included. In addition, emphasis was placed on restoring dysfunctional electrical, water and sanitation systems and on ensuring that work on fabric and fittings was carried out using durable and low maintenance materials.

Technically, rehabilitation has different challenges than new building. For rehabilitation, three key issues are important:

- Considerably greater and more painstaking effort was required by the design team to meet acceptable procurement standards.
- Mechanisms needed to be put in place to ensure that the awarding of contracts met international tendering standards.
- Contractors had to be carefully supervised to ensure that workmanship met the highest standards possible.

Enugu State was the first to put in place a programme of infrastructure improvement. Following a facility maintenance needs assessment undertaken in 2004, six District Hospitals requiring rehabilitation were identified. The detailed design phase started in December 2004 and work on four hospitals was completed by July 2006.

In Jigawa State, a physical asset inventory and review of the medical equipment maintenance system was undertaken in February 2004. A comprehensive physical asset and medical equipment register for the 15 busiest health facilities was then produced, followed by a rehabilitation assessment of 15 Emergency Obstetric Care (EOC) centres. Infrastructural rehabilitation work started in September 2005 on 26 facilities.

In Benue, the focus was on the Central Medical Store.

Due to budget changes neither Enugu nor Jigawa completed the agreed work plans. In Enugu four out of the six district hospitals were finished as planned. In Jigawa rehabilitation of nine out of the initial selection of 26 health facilities/EOC centres were completed. In Enugu all the main buildings in the facilities were rehabilitated. In Jigawa, as the hospitals tended to be more complex and generally in a better working condition, only buildings essential for the Safe Motherhood Programme were selected: the Ante Natal Care Clinic, Maternity and Delivery wards, Laboratory and Operating Theatres.

Besides hospital rehabilitation, additional work in Enugu included rehabilitation of classrooms at a Midwifery School; identification and renovation of suitable offices for the District Health Boards (DHBs); and an office and upgrading of training facilities for the Enugu HIV Centre. In Jigawa additional work included renovation of the main laboratory at the main referral hospital in Dutse, the state capital, and the main bulk drug store. In Benue State a bulk drug store and supporting offices were rehabilitated.



## KEY FACTS

Construction Costs: Enugu spent a total of £451,000 to complete the renovation of four hospitals, the School of Midwifery, the HIV Centre and the District offices. This amount included:

- Technical assistance (international and national)
- Architectural services
- Tendering processes
- Quantity surveying services
- Monitoring and supervision
- Building contractors

Selected renovation costs

Enugu Ezike District hospital - £66,143

Nsukka District hospital - £49,453

Udi District hospital - £48,568

Agbani District hospital - £35,790

Awgu School of Midwifery - £17,185



## LESSONS LEARNED

Although infrastructural rehabilitation is vital for other service and system strengthening initiatives, attention needs to be paid to:

- Gathering up-to-date utilisation data (both current and projected)
- Strengthening government capacity to manage infrastructural rehabilitation programmes
- Developing standard options/approaches for facilities in order to guide the local architects
- Utilising an anonymous, fair and transparent tendering process
- Implementing a programme-specific system for planning permission where a formal one does not exist
- Adopting robust financial control systems
- Ensuring ongoing maintenance (both systems development and financial release)

# Introduction

Following many years of general neglect and the absence of any maintenance plan, all aspects of health infrastructure required attention in the PATHS supported states. To ensure that the systems and service strengthening initiatives introduced by PATHS were sustainable, it was realised that infrastructural rehabilitation was key. For example, safe motherhood services could not be provided in the absence of functioning wards and theatres; similarly, sustainable drug supply systems needed functional pharmacies and central medical stores.

In Enugu, an initial report commissioned by the State Ministry of Health (SMoH) in 2003 suggested that six District Hospitals should receive support. A needs assessment was carried out by members of the SMoH and the Ministry of Works (MoW). However, the methodology used for health service planning was flawed. Without adequate briefing and understanding of what PATHS was able to support,

the teams developed extensive and ambitious designs, bills of quantities (BoQs) and cost estimates. There was no supporting justification and no analysis of health service demand resulting in overly elaborate proposals. Further technical assistance was provided in order to ensure that a realistic and workable infrastructure programme was developed.

It was not possible, within the PATHS time-frame or with the resources available to the programme, to build capacity in the MoW and units of the SMoH responsible for infrastructure so that these teams could carry out their role more effectively. Instead the technical planning of the health facilities shifted to the private sector.

In addition, the lack of reliable health service data, at the design phase of the initiative, meant that decisions about what facilities were needed and which were a priority for refurbishment were based on perceived priorities; as seen by the State Commissioner of Health (SCoH) with some input from the Chief Medical Director at each facility.

***Neglected and unmaintained infrastructure is a serious hinderance to quality health care.***



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Each facility required a different approach. The design teams responded as much as possible to the ideas and requests of the Facility Management Committees. Final decisions about how the work was prioritised were made by the State Commissioner for Health.

With the Jigawa rehabilitation programme a similar assessment was made of the EOC centres and some of the busiest facilities. Following this assessment, PATHS staff worked closely with members of the SMoH. Similar problems to those in Enugu were experienced with the lack of robust data and the time-frame needed to build capacity within the ministries.

With a limited budget in both states, the programme of work for each site was restricted to essential remodelling of the main buildings to improve service delivery and to ensure good quality of workmanship. Where possible, water supplies were improved and electrical connections reinstated to the national grid. The work was kept as simple as possible to reduce the burden of future repair and maintenance.



## KEY FACTS

### *Final Outcomes*

In Enugu, 4 out of the 6 facilities were completed as planned. Despite full technical documentation being completed for the other two facilities, this final phase of work was aborted in 2006. In Jigawa, 9 facility rehabilitations were completed. In both states funding changes and time pressures contributed to targets not being met.

# The Response - Strategies Adopted

## KEY STEPS:

1. Appropriate use of technical assistance
2. Agreement on priorities
3. The design phase
4. The tender phase
5. The building phase
6. Ensuring financial control
7. Collaborating with other development partners
8. Adequate monitoring and evaluation systems

## *Use of technical assistance*

Historically in Nigeria, the Ministry of Works is responsible for general infrastructure maintenance and development in the public health sector. Because of limited capacity within the government to manage large and complex programmes of infrastructure rehabilitation within short timeframes, a decision was made to contract to the private sector in all states. The imperative driving this approach was the need to ensure adequate functioning infrastructure thus allowing all the other systems strengthening initiatives to proceed without undue delay. In effect, the work was directly managed by the consultant team and a parallel system was established. However, the MoW and the SMOH were involved in most of the activities (e.g. the tender committee, approving designs, monitoring rehabilitation work).

Use was made of an international consultant and local private sector architects and quantity surveyors. Each architect used his own Quantity Surveyor. This worked well as the architect took overall responsibility for their performance and outputs.

Detailed Terms of Reference (ToR) provided guidance and held the private sector contractors accountable.

## KEY STEPS:

### *Selection of national consultants – architects and quantity surveyors*

For a number of reasons, local architects were selected using different approaches in the different states. In Enugu local architects were identified by recommendation and telephone enquiries. Architects who expressed interest were interviewed by the international consultant and a national consultant engineer. The interview methodology used standard selection processes: reviewing CVs, company profiles and conducting face-to-face interviews. Prospective candidates were taken on field visits to the hospitals where the scope of work and design philosophy were explained.

In Jigawa an architect with a quantity surveyor had already been selected before the international consultant became involved and in Benue a “Design and Build” architect stood out from other consultants and was therefore selected.

The relationship between the international and the national consultants was based on a team approach. The team needed to understand design and local building practices and procedures in the different States.

## *Agreement on the priorities*

In Enugu, initial prioritisation was done by the Commissioner of Health and the PATHS State Team Leader (STL) based on their joint knowledge, experience and the budget available. Requirements at each location were discussed directly with the Chief Medical Director and his staff. Final approval and additional instructions were received from the Commissioner of Health. In Jigawa, the opinions and wishes of the Chief Medical Director were adopted without any further higher-level input.

There were no formal approval stages or requirements for planning or building regulation approval.

## *The design phase*

### **Selecting architects and agreeing standards**

PATHS was responsible for the selection and everyday working relationship with the architects who oversaw the contract development and implementation stages.

Renovation and rehabilitation work is extremely difficult to survey and document thoroughly. This makes it difficult for contractors to estimate accurately what the work will cost or for the client to have accurate cost information at the pre-contract stage. It takes rare skills to produce good tender and contract documents that are sufficiently robust.

In Enugu and Jigawa, the local architects were commissioned to provide full architectural services. Considerable time was spent by the consultant team with all the architects during site visits and in formal discussions to agree a standard design approach. Frustratingly, for a variety of reasons, in both states deadlines were rarely achieved. The international

consultant provided production drawings in some cases to speed along the process.

Wherever possible, architectural standards were adopted to ensure the selection of materials and finishes that were durable and sustainable; in order to reduce on-going maintenance costs. Contractors were required to meet high standards of workmanship and to utilise correct materials.

The international consultant spent a great deal of time with the local architects raising their awareness of the issues involved. This often meant realignment of their usual approach to architectural design and specification.

### **Development of drawings, bill of quantities and contract documents**

Rehabilitation work requires a different approach to new building when contract documentation is prepared. Considerable time is required to carry out a full site and building survey. Drawings are then developed to show at least four phases of work: existing, demolition, reinstatement and new work. In comparison, a new structure requires just one phase to be described.

This is the only way to produce a full set of documents to satisfy procurement regulations with this type of donor funding. There are simpler and more cost effective ways (see box below) but these were not options that were acceptable for this particular programme of work.



## **Lessons Learned**

### ***Rethinking the architectural approach***

A challenge for the local architects was to think in a different way from the usual requirements of clients. A key example relates to the understanding of the use of water and sanitation facilities. Whilst most clients who can afford architects would be keen to have full flushing toilets and sophisticated facilities, a change in approach was required to understand the challenges of limited or non-existent water supply in rural areas and the traditional habits and customs of the patients.

The architects had to develop a new appreciation of the need for simple, durable and sustainable approaches to design and material specification.

### ***One Alternative Contract Method:***

Rehabilitation work is suited to a contract based on a bill of rates. The successful contractor offers the most competitive rates for standard items of materials and labour. The standards for the building are established as part of the contract documentation but no detailed bills of quantities are prepared, thus saving time. The final contract sum is calculated on a re-measurement of the materials and labour used at the end. Most donors and clients are not comfortable with this approach as it is difficult to budget for. However, this method does save a lot of pre contract preparation time.

For an open selective tendering process to take place with the objective of getting a fixed price contract, a disproportionate amount of effort is required to produce the documentation.

In Enugu, after the first phase of work, only one of the three architects showed (in their drawings and the way the bill of quantities were prepared) that they could adjust their approach to suit a rehabilitation project as opposed to a new building and to fit with international donor requirements. The pre-selected architect in Jigawa understood the rigour of the processes after the first round of site visits. The Benue Design Build Architect also proved to be efficient and technically competent in most areas of work he was required to perform.

## *The Tender Phase*

A clear strategy was prepared in advance to pre-qualify contractors and to establish a tender procedure that had sufficient checks and balances; thus ensuring integrity and transparency. Although PATHS managed the tender process, members of the SMOH were involved as active members of the tender board. The tender process for each phase of work was thoroughly documented and the tender reports were circulated.

### ***Pre-qualification of contractors***

To avoid any accusation of favouritism or bias, national advertising was used to invite contractors to apply for pre-qualification. PATHS made the decision not to accept any previous lists of contractors held by the MoW or recommendations from other donor lists such as DFID. Ten clearly defined criteria were agreed and different points were allocated to each category depending on importance. The total was 100.

Once contractors submitted their information it was relatively straightforward to grade their standing in an objective manner. There had to be an element of subjectivity as some personal interpretation was applied by the review team, but this was considered to be the fairest way of ranking. The list of rankings was made public and posted on the PATHS' notice board in the respective states. In Enugu, some contractors that had a track record of being highly

ranked for other work tried to object; unsuccessfully because of the fair and transparent process adopted.



### **KEY STEPS:**

#### ***Criteria used for pre-qualification***

- Certificate of Incorporation
- Memorandum and Articles
- Company Profile
- Years of Experience
- Proof of Federal Government/State Registration
- Banker's References
- Audited Accounts
- Tax Clearance Certificate
- Completed Projects
- On Going Projects

### ***The tender procedure***

Once the decision had been made to carry out the work using private sector consultants, it was not necessary to use the government District or State Tender Boards. With State approval, PATHS put in place its own tender procedure. Aware of potential criticism, every effort was made to make the process as robust and transparent as possible. The tender process was documented throughout. The tender panel was made up of representatives from SMOH, PATHS, and the international and local consultants.

Each tendering contractor was allocated a code number known only to the PATHS State Team Leader. This information was sealed and kept in the office safe for the duration of the tendering stage. The contractors were only allowed to use their code numbers as identification in their tender submission.

For both Enugu and Jigawa the tender analysis was carried out by the Quantity Surveyor. His recommendations were generally followed by the tender committee in the selection of the best tender.

Only when the final decision had been made were the full identities of the contractors revealed with the opening of the sealed codes.

Thus, the contractors were selected by competitive tendering and contracts were signed between the SMoH and the contractors.

## *The Building Phase*

Due to the time it took to prepare contract documents and to ensure the work moved to the implementation stages as soon as possible, both Enugu and Jigawa grouped the hospitals in phases of work. In Enugu the first phase of work involved three sites. In Jigawa phases were grouped into geographical areas to reduce the travel time for site inspections.

In both Enugu and Jigawa the tender decisions ensured that each facility had a separate contractor. This worked well as a sense of competition developed amongst the contractors, particularly in Jigawa.

Each contractor prepared a timetable for the work, and progress was reviewed on a monthly basis by the local consultant teams.

## *Financial Control*

PATHS provided 100 percent of the funds for the rehabilitation work in both states. However, in Jigawa the actual payments to the contractors were made through the SMoH. This was done in order to remove the donor from the legal tangles that could derail programme activities and thus waste resources; and to ensure that the government continued to play a lead role in the initiative. An important strategy to ensure that contractors would maintain good progress was to guarantee prompt payment once interim certificates had been issued (these were issued once specific rehabilitation milestones had been reached). This required a proactive approach to ensure that the accounts staff were well informed of anticipated forthcoming payments. The accounts staff were actively involved in preparing worksheets which gave detailed projections for the timing and value of payments.

## *Working In Co-ordination With Other Development Partners*

Co-ordination with other stakeholders and donors during the design and implementation phases was encouraged.

The most productive partnership was with the DFID-funded State and Local Government Programme (SLGP). Many of the health facilities in Enugu and Jigawa were located within the operational area of rural water and electricity supply schemes supported by SLGP. A good working relationship developed between SMoH, PATHS and SLGP in both Enugu and Jigawa. Every attempt was made to agree on a common strategy for water and sanitation services at the facilities where both PATHS and SLGP were operating. Joint plans were put in place so that SLGP either provided bore holes and overhead tanks or hand pumps, and PATHS was responsible for the reinstatement of the health service water reticulation system. Despite attempts to fully co-ordinate activities, the PATHS supported work tended to move ahead faster than the SLGP supported work, which created some difficulties.

***Below: A water tank donated by PATHS***



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Despite considerable effort, coordination with the World Bank funded Health Systems Development Programme (which was also operational in both states) did not happen, even though there was an overlap in objectives. This was a missed opportunity.

## *Adequate Monitoring and Evaluation Systems*

Site supervision and contract management were identified as vital for the success of the work. The architects were commissioned to carry out full site supervision services. These were supported by bi-monthly visits from the international consultant, which involved formal site inspections and meetings to check on progress and to provide quality control.

The position of a clerk of works was discussed but it was felt that it would be difficult to recruit the right quality of personnel. The architect had the capacity to make regular site visits and commanded more authority. The frequency of visits required usually depended on the competency of the contractor.

In Jigawa the SMOH Department of Planning was also involved in the monitoring process. Joint site visits were usually conducted with the architect, although on occasions the Department carried out monitoring alone.

# Results

“Like blood in the veins of an anaemic patient, like water to the refugee in Darfur Region, like a new item of clothing on the body of a destitute; the infrastructural refurbishing of our District Hospital and the other inputs put a new look, new life and abundant hope into the healthcare service delivery in our entire District with tremendous results”

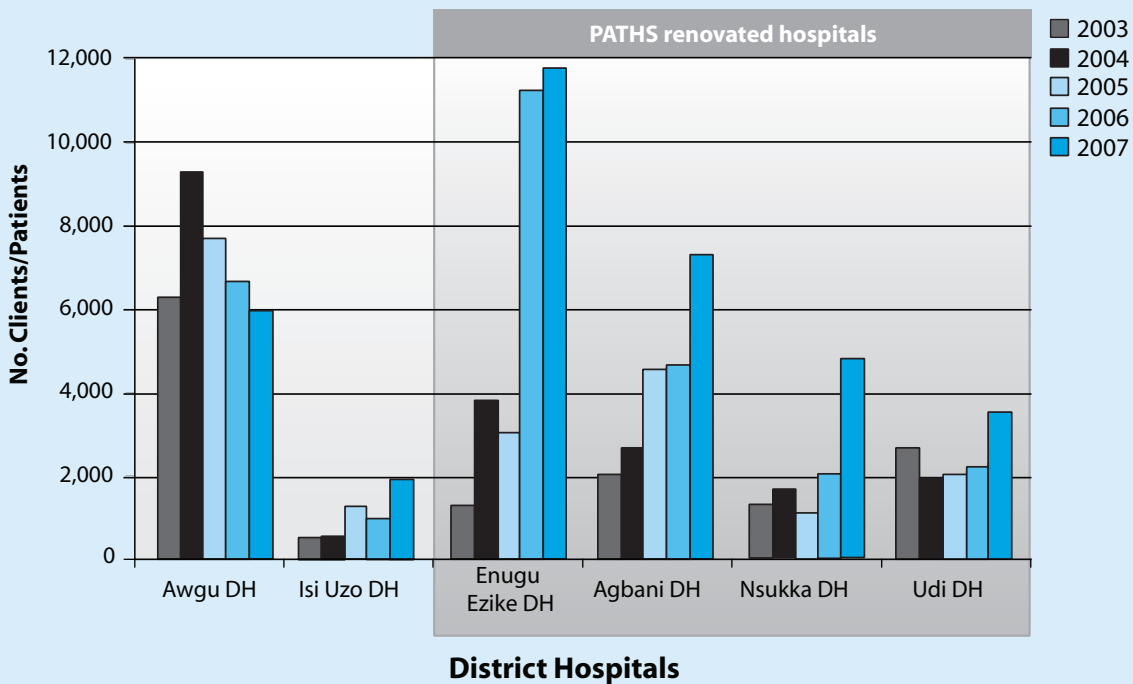
*Dr CO Eze, CEO, Enugu Ezike*

The very fact that someone was taking an interest in the health facility had a positive impact on communities in the facility catchment areas. The impact of new fresh-looking buildings was high after years of neglect. A cleaner fresh environment also had a morale-boosting effect on the facility staff and managers from the SMoH.

In most cases although the level and quality of services had not returned to the time when the buildings were first constructed, providers now had the ability to offer essential services in a good facility.

In Jigawa state, the effect of the rehabilitation work was still reverberating in the state many months after completion. The current State Commissioner of Health is using the renovation process as a model to be adopted for all renovation works in his ministry. The SMoH is also using the revised tendering procedures as a gold standard procedure for awarding contracts.

**Enugu State District Hospitals Utilization, 2003 - 2007**



Note: The graph shows patient attendance over the period from 2003-2007. Work on four of the district hospitals (Udi, Agbani, Nsukka and Enugu Ezike) was started in 2004 and completed by June 2006. All four hospitals show an increase in patient attendance over this period with two (Enugu-Ezike and Agbani) showing very significant increases. Parallel to the renovation process other significant work took place, for example, establishment of Drug Revolving Funds. Thus increases in attendance are attributable to a number of factors. Of the hospitals not renovated, Awgu showed a decline in attendance, while the increase in attendance at Isi Uzo is probably attributable to the recent availability of medical staff.

## Before and After:

### *Nsukka District Hospital – Enugu Ward Block*

- New pitched roof over poorly constructed and inappropriate flat roof which was leaking badly.
- Good overhang provides better weather protection to the walls
- In the absence of good compound security all windows and openings provided with strong security bars
- Overgrown vegetation and debris cleared from around the building.
- Improved access for the disabled and for bed trolleys if future expansion links the adjacent theatre block with the ward block.

*Before*



*After*



Photos © Rob Fielding

“With the renovation work, the buildings are wearing a new look, the environment is clean, the toilets are working and staff are carrying out their duties with ease. In fact, there is no other theatre in Jigawa like our own. The Lab was in a horrible state until one organisation called PATHS came and renovated the building and equipment and gave us a small generator. Since then, we have been having a flow of patients.”

*Dr. Abdullahi Abba Habib,  
Gumel Hospital - Jigawa*

*Before*



*After*



Photos © PATHS Photographer

*When asked if the building work had enabled health services to be provided in a better way, Hajiya Sarau Usman of the Taura PHC Centre in Jigawa said:*

*“It has created a conducive atmosphere and the medical staff of the facility are performing their duties better now. Patients are turning up at the centre in increased numbers, particularly for ANC. For example in 2007 we had 588 patients and 23 deliveries, while in the first few months of 2008 we had 365 patients and 26 deliveries. Community leaders have also indicated that they are happy with the changes. For instance, at Kwejelli settlement a patient who attended the PHC centre, went back home and was telling people that if they want to deliver they should go to Taura PHC because the hospital has been renovated and services are no longer what they used to be.”*



***Dr. Sokpo signing visitors register at the facility***



***Left: Maternity ward before rehab.***

***Below: Section of PHC Centre work completed next to an area that work has not yet begun.***



## CASE STUDY

### *Jigawa State - Jahun District Hospital*

In contrast to Enugu, public health facilities in Jigawa had not faced problems of poor security. The facilities were generally large and equipment was usually available. Jigawa facilities had deteriorated mainly due to decades of little or no investment in new building or maintenance as opposed to vandalism or misuse, which were problems in Enugu.

Jahun was the first hospital to be supported in Jigawa. This was a large facility that had most of the buildings required for a 50 bed district hospital. However, most of the buildings were in a poor shape.

A full condition survey was prepared by the national architectural consultant. The PATHS Jigawa State Team Leader and the SMOH agreed on a general strategy to concentrate on safe motherhood facilities and at Jahun this also included the renovation of a vesico vaginal fistula (VVF) clinic.

A private contractor was engaged to overhaul mechanical equipment; for example, old air conditioners were reinstalled in the Operating Theatre.

Technically, it proved possible to rationalise many of the aspects of the hospital that were inefficient and in poor condition. The ANC clinic was re-planned and modernised; the theatre was completely overhauled and air conditioners correctly positioned; the laboratory was redesigned; and the VVF clinic completely upgraded.

There were two contractors on the project handling different buildings. This produced better quality of work as there was a competitive spirit. Initially, one contractor produced poor quality work, but with effective supervision eventually realised that a high standard of work was required and improved his performance.



Photos: PATHS Photographer

## CASE STUDY

### *Bulk Drug Store – Benue*



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A design build company headed by an architect stood out from the competition to provide technical services and had already been contracted to do the rehabilitation work in Benue before an international consultant provided by PATHS got involved. To provide some independent control, one of the quantity surveyors from Enugu State was given a short-term consultancy contract to price the work independently to ensure that the design build company reflected true market rates. The cost of the work was indeed competitive and it was reassuring to have the independent cost control.



The Quantity Surveyor from Enugu provided valuable support throughout the implementation phase on cost control and the resolution of some minor financial disputes between PATHS Benue and the Contractor.

The design build company was clearly competent at all aspects of the rehabilitation project, including basic design, the production of detailed drawings and priced bills of quantities. He was also able to provide good workmanship on site.

# Lessons Learnt

## Design Phase

### **Preparation for the Infrastructure Programme**

In preparation for the infrastructure rehabilitation, more time should have been allocated to develop a concept paper for the work, with clearly specified targets, objectives and anticipated outcomes. Ideally, before any design work takes place, a physical survey of the infrastructure should be undertaken and health services baseline data gathered; HMIS information should include projected increases in service demand and utilisation. This leads to better forward planning so that facilities would be 'fit for purpose' even with substantially increased demand for services. However, although infrastructural surveys were conducted, HMIS information was simply not available at the time the work started. Thus many of the planning decisions were based on guesstimates. In most cases the sites appeared to have been adequate even for a 100% increase in patients. However, even a 100% increase was an under-estimate in some cases.

"Renovation of the ANC is OK but, looking at the attendance now, it would have been better if the ANC and maternity services had been built separately"

*Staff member, Gumel Hospital – Jigawa*

Renovation takes time and the PATHS programme had to work within a specified timeframe. Thus, in the PATHS supported states long lead in periods and protracted assessments would have been counterproductive, especially as improving infrastructure was the platform on which other systems strengthening initiatives would be built.

### **Building state capacity**

A key question is - should the public sector – the Ministry of Works, or a SMoH Infrastructure Department - be the responsible authority for health infrastructure? Or should infrastructure contracts be carried out by the private sector? Who then within the SMoH should provide technical guidance to the private sector? Whatever strategy is adopted, it is important for long-term sustainability and maintenance that there is technical capacity within the SMoH that is able to manage infrastructure projects. Although significant support was provided and government ministries were involved in all steps of the programme, this is an area that needs further work in the future.

### **Standardising Approaches**

With different architects involved in the different facilities, there was a difference in the approach to each project. For uniform construction and easy long-term maintenance, it is necessary to develop a "tool box" or "standard kit of parts" to guide the architects. For example, space standards for common health-related activities (e.g. for busy ANC clinics) should have been defined at the beginning of the work and applied across all projects. The international consultant attempted to standardise the approach to the design work as much as possible. Time was spent with the local consultant architects analysing accepted building practices and quality of workmanship. Further work could have been done in this area.

One question that continually arose was what was the most appropriate approach to providing water and sanitation? The approach adopted needed to improve the quality of health care, to be easy to maintain and be sustainable. However, no universal policy was developed. The tendency for architects and clients is to include more sophisticated solutions, such as western-style toilets, which in most cases are not appropriate. Whereas in Jigawa, water supply systems appeared to be more sustainable and thus rehabilitation work continued with the repair and reinstatement of squatting slabs and associated septic tanks for sanitation; in Enugu, it was necessary to reduce the number of water points as much as possible and to build simpler, more durable toilet facilities for both staff and patients. For example, at Agbani District Hospital in Enugu, the original



### **Sinking a borehole at Nsukka hospital**

designs provided for a generous number of toilets and hand wash basins. Because no clear policy had been developed, it was difficult at a later stage to persuade the hospital staff of the need to simplify the arrangements.

Very little attention was given to medical waste management. This should be an essential part of any infrastructure proposal and should be included in the design briefing.

### **Approval of Key Stages**

There are recognised international stages for construction work, which clearly define the roles of all key stakeholders. Whilst well-defined work plans were followed by the technical teams, the involvement of the client organisation/s to formally approve and give consent at critical stages did not take place.

Approval in writing at the stages of client's brief, sketch design and final design may be seen as added bureaucracy, but it would probably have resulted in a greater sense of ownership of the rehabilitation work by the SMoH. It would also have reassured the technical teams that the work had received official approval. It is recommended in future that even where formal systems for planning permission do not exist, a formal system is put in place where the SMoH approves all design drawings before building work begins.

### **Contracting of national consultants**

Most infrastructure consultants work on a percentage fee of the final contract sum. However, in this project consultants were contracted on a daily basis. It was therefore important, to ensure that terms of reference were written carefully and reflected all the work stages involved in the construction process.

## **The Tender Phase**

### **Selection of architects**

In Jigawa and Benue, one architect was selected early on. In Enugu, finding architects who fully understood the challenges of working on renovation and rehabilitation schemes proved to be difficult. Thus, the selection process must be able to distinguish which architects have the relevant skills.

Most architects now use computer aided design (CAD). In many countries, drawings are usually done by young technicians who have very little building knowledge but good CAD skills. On the other hand, some older architects do not have the CAD skills to produce the work in an appropriate way. It is necessary to find architects who have the right balance of skills and who can provide a good service.

Similarly, there can be big time savings by using the right tools and technology. In Enugu, supporting resources, such as the printing of drawings, often had to be provided to the architect by the PATHS consultant. Therefore, it is important that the availability of the right tools should be defined early on. This includes survey equipment (electronic or manual); digital cameras; compatible CAD software so drawings can be read electronically by all members of the design team; word processing, spreadsheets and database programmes; up to date printing equipment; reliable email connection to share soft copies; and the ability to safely digitally archive information.

### **Tender process**

In the states changes were made to the usual tender processes so that contractors could be selected in a fair and transparent manner. This was

an important and successful initiative. Anonymity of the contractors throughout the tender process prevented any allegation of corruption or favouritism.

In addition, the contractor pre-qualification process, even though it took time, was also an important process.

### ***Attracting good construction companies***

Since there is very little regulation of the construction industry in all three States, contractors have been used to providing low quality work in order to maximise profits. This has resulted in dubious contractual and workmanship procedures. In addition, if there is plenty of building work about, good contractors tend to be reluctant to bid for work in remote areas where mobilisation and logistics are more challenging. It is therefore important to design and group contracts in an attractive way to encourage good contractors to tender.

## ***The Building Phase***

### ***Quality Control***

Having a qualified individual to play a quality assurance role was vital. This role was played by an international consultant. Even then, there were long delays in producing essential information and target deadlines were often missed. Another option would be full-time supervision by a project engineer/architect directly employed by the client. This would be effective for a larger project, with the expectation that until contractors are fully up to the standard there will be the need for on-site training and demonstrations to improve standards.

In Jigawa and Enugu after the first phase of work, one building contractor stood out from the others in terms of performance, reliability and workmanship. Repeat contracts in this case should be recommended but procurement procedures often rule against this.



### ***Dealing with changes during the building phase***

With rehabilitation and remodelling work, it can be argued that the sole purpose for preparing detailed drawings and a full bill of quantities is to obtain a fixed price through the tender process. However, even if facility staff and health committees have been involved in the design process, real interest in the work only occurs when the contractor arrives on-site. It is usually then that staff contribute fresh ideas as they begin to realise the implications of the improvements on their working conditions. Often the design teams prefer to keep changes to a minimum once a contract has been agreed, but the benefits of responding to the users' needs during the implementation phase are considerable. In Jigawa and Enugu the approach taken was sufficiently flexible to allow modifications to the designs as the contract progressed. This increased the ownership of the work by the health staff.

### ***Uncompleted Projects***

In both Enugu and Jigawa some of the planned work had to be aborted due to budget restrictions, despite a lot of preparatory work with facility staff and health committees. In one case, the local community had carried out some work to make it easier for the main contract to be implemented. A key lesson is that once plans have been made to rehabilitate a health facility, it is important that the work is carried through, even if reduced in scope. During the design and preparation stages no promises should be made until the contractor actually turns up on-site.

## *Financial Control*

The role of the Quantity Surveyor is vital in keeping a monthly check on progress and expenditure by the contractor. Within the client organisation, a finance officer or accounts clerk who is fully conversant with the infrastructure programme is required. When there are multiple live site payment schedules to comply with, contract clauses can become complex. This individual will need a full understanding of the following: advanced payments; bank bonds and warranties; variations and fluctuations; interim certificates; retention and release of retention; practical completion; defects liability period; and final accounts.

## *Maintenance and Sustainability*

The infrastructure work needed to be undertaken because of the years of neglect and under-funding of public health facilities. However, SMOHs in all three states lacked workable maintenance policies. Moreover, government budgets to support maintenance were inadequate. In Enugu, PATHS supported the development of a planned preventive maintenance programme (PPM). However, unless maintenance systems are sustained and government financial allocations are dedicated to infrastructure maintenance then it will be only a matter of time before the facilities again deteriorate.



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***Trained PPM officers performing maintenance on an autoclave in Enugu.***

## *Gumel General Hospital - Jigawa*

### *Before and After*



Exterior walls and windows repaired



Old theatre finishes removed and replaced with more hygienic materials



Wards cleaned up and now full bed occupation

## Roni PHC - Jigawa

### Before....



Conditions before renovation:

- Dangerous electrical connections
- Leaking roofs
- Cracked walls
- Broken window louvers
- Peeling and dirty paint



Condition Survey in progress in the main clinic corridor.

### After....



Renovated Ward



Main corridor after renovation:

- Floor cleaned
- Windows repaired
- Ceilings renovated
- New electrics
- Repainted





Partnership for Transforming Health Systems (PATHS)



PATHS is a programme of collaboration with Nigerian partners to develop partnerships for transforming health systems in Nigeria. It is funded by the UK Department for International Development (DFID).

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