

# Primary community school construction

*A co-ordinated effort was needed to begin to rectify the primary school infrastructure in Malawi. Garry Whitby explains how one project is incorporating the lessons of both appropriate building technologies and community development to build the schools that parents want.*

MALAWI IS ONE of the poorest countries in the world. After multi-party democratic elections in 1994, the new government set about correcting 30 years of single-party government, and one of its first important interventions was the introduction of free primary education for all. Immediately, primary school enrolment reached 2.86 million children — 47 per cent of whom were girls. To cope with this surge in enrolment, untrained teachers had to be recruited (comprising 42 per cent of the total), but even so the teacher-pupil ratio was 1:62.5. The classroom to pupil ratio was even worse, at 1:130, with many children learning outside or in classrooms needing urgent repair, often without even a roof.

There was a clear and urgent need to improve access to, and the quality of, primary education. Several donors offered their help, including this UK-funded programme to develop and promote 'community schools'. Each community school will be unique and tailored to the community, but most will comprise as basics: eight classrooms, two each for standards one to four; up to three teacher's houses, with outside kitchen, bathroom and pit latrine; an administration block to include storage space, head teacher's office, and a

staffroom, with a block of four teacher's toilets; boreholes or water provision; and up to 16 toilets (pit latrines) for the children.

## Research and planning

The programme began by researching and evaluating building technology options. This involved extensive field visits within Malawi to identify technologies, and thorough consultation with international development organizations who have a knowledge of school-building technologies. These consultations resulted in further regional travel, to Kenya and South Africa to inspect other potentially useful technologies not normally found in Malawi.

An analysis of the existing school structures highlighted a series of problems, including roofs blown off by wind, and cracks caused by seismic activity and/or inappropriate foundations. The parameters of the research, therefore, included 50-year wind gusts and loads on structures and roofs, and seismic activity within the country (the highest recorded quake in Malawi was 6.8 on the Richter scale). In both these cases, certified data has been obtained from the Meteorology Office and the Geological Survey Department.

A demonstration site to try out some of the new technologies was chosen in a township in Lilongwe, at a school which had over 4200 children with only nine dilapidated classrooms, with most children learning in the open. Three double classroom blocks using interlocking concrete blocks, stabilized soil blocks, and a timber portal frame with a brick infill were built alongside the burnt-brick structures which already existed.

## Building technologies

The technologies which were researched, evaluated, and eventually recommended as being appropriate options were:

**Stabilized soil blocks** This technology is common in Kenya; it has an established building standard, and there are many examples of schools being built since 1984 and wearing well. The technology involves mixing suitable soils (high in sand and gravel content, low in clay) with a small proportion of Portland cement to stabilize the soil, then pressing it in a hand-operated press to make the blocks. The technology is simple and ideally suited to community participation. The blocks are mortared together with a weak mix of the same materials.

**Concrete blocks** This building system uses a hollow concrete dry-stack block with reinforced corners, openings, and internal columns every 1.5m built onto a concrete foundation with a ring beam. There were existing examples in Malawi (five classroom blocks built in three locations, one in a seismically active area). The blocks are solid and quick to build with. As an alternative to interlocking concrete blocks, ordinary concrete blocks laid with mortar are also recommended.

**Burnt brick** A traditional and conventional building material in Malawi, it should only be used in areas or situations where it is unlikely to cause de-forestation when the bricks are burned. A community may already have a supply of burnt bricks in anticipation of further assistance to build their schools, for example, or the brick clay may be close to commercial forests or re-afforestation programmes.

## Site selection

The process of site identification is complex, and it must involve decision-makers at all levels. Once a community is selected,



*Women are employed in skilled jobs too, particularly block-laying.*

### Box 1. Selection criteria

- long distance from nearest school
- large population of school-going children
- places where existing schools are inaccessible because of physical barriers
- communities which demonstrate willingness to participate
- high illiteracy rates
- availability of groundwater
- areas not benefiting from any other school projects

according to carefully chosen criteria (see Box 1), the government's Community Development Assistants and Primary Education Advisers work with the village headmen/women and local leaders as well as the community at large to choose a site for their school.

The communities are surveyed by specialized companies until a site with water is found and recommended to the community. The Building Supervisor is available for technical consultation throughout this process. Each and every school site is thoroughly surveyed before any of the technologies mentioned are recommended. In particular, the seismic activity in the area is assessed, as well as the wind regime and foundation conditions, to ensure that any necessary extra supports and bracing are designed into the building.

A land surveyor surveys the site that the community has given for the school, picking out immovable obstacles such as rock outcrops, indigenous and fruit trees which should be saved, and contours and natural waterways and gullies. A water supply is sourced and developed before building construction begins. A water committee is selected by the community and training is provided in community-based management for the water supply, health, and hygiene.

## School design and layout

The programme tries to involve the whole community in the development of primary school education for their children. A community will only feel ownership of their school — and consequently a sense of commitment to managing and maintaining it — if they are involved as usefully as possible in the development of the school at all stages, from the decision-making process in the design and site selection, to construction and completion. The chosen design will use appropriate local technology and materials which the community understand, so they can participate effectively.

The community is consulted over a range of appropriate school designs, including options for classrooms and administration blocks, as well as the layout of the school. These are then developed and presented to the community with the use of models, based on the architect's recommendations for each site. Balsawood models are used to give the community an idea of the look and feel of the options. Model site layouts, fully landscaped with trees and bushes, are then used to show the community what the finished school will look like.

Women, men, and children are consulted separately, and their decisions are then taken to a plenary session with all involved. The ideas and comments from each group are presented to reach a consensus on the community's preferred design and layout.

The layout is designed to maximize the use of space for learning both inside and outside the classrooms, with use of trees for shade and a *khonde* (verandah) for extra space. The *khonde* also

provides shade from the sun and protection from the rain. A lack of light often makes it difficult for children to read the blackboard, so extra windows ensure that the board is visible from anywhere in the classroom.

## Community participation

Community participation, in the past, has often meant nothing more than free labour. In the Community Schools Project, however, the community participates in the decision-making processes, choosing the school site, layout, and classroom design, and is consulted about how else they could be involved.

The community is asked how it could contribute to the project, given the constraints they face. Most communities agree to clear the site prior to building, and to cut pegs to help with the setting out. They can help to landscape the school, using indigenous tree seedlings and shrubs where possible. Some communities will provide housing for the project's building supervisor, and others will be able to cook for the work-force. Where necessary, communities could improve road and bridge access using community labour techniques.



*The new schools provide a safe and positive working environment for the children.*

Their involvement as employed labour on the major construction works brings income into the community, bolstering the local economy. Skilled artisans are offered training in the unfamiliar technology options, such as block laying. Carpenters, bricklayers, general builders, and painters are identified in a mini-census of skills in each community. In addition, potential storekeepers and night watchmen/women are selected by the community from people considered trustworthy, avoiding the need to bring in 'foreign' workers. Only highly and appropriately skilled foremen, assistant foremen, and carpenters, as well as the Project's building supervisors, come from outside the community.

Training in costing and estimating, on-site management, and on-site cost control for new community contractors is provided to enable the local community to be commercially involved in the minor works, such as pit latrine construction, kitchens, houses, and external works. This way the community is able to determine the value of their input and quote for any future construction activity.

The community is always involved in applying the finishes to the building, which helps them to understand better the maintenance requirements of the school, and develop a maintenance strategy with the help of the Project.

## **Tendering**

The Community Schools Project has a database of registered contractors. This database now holds over 500 contractors. Information is held about each contractor, including their area of expertise, turnover, number of employees, equipment, etc. All of this information is scored, and a pre-qualification process uses this score to select six to eight contractors from the database and invite them to place a tender with the Central Tender Board.

These tenders are then evaluated against the shadow price, which is calculated by the project Quantity Surveyor, and those that are near to our estimate of the construction costs are further evaluated. The contractor is then chosen. Whether women or men, they are invited to attend a workshop on the needs and benefits of employing women, deploying human resources from within the community, and using emergent community contractors.

Experience has taught us that the small contractor can undertake such activities, and when properly supervised and managed, they perform well. To help them with their cash flow management, payments are made fortnightly, based on estimates and actual measurements each month.

## **Gender strategy**

The Project has taken care to address gender issues, not only by ensuring that women are included in the decision-making processes, but also by encouraging their participation in all areas of the traditionally male-dominated construction sector. Women are treated — and paid — equally, and the Project provides training to increase the number of women who are skilled in the different areas of contracting. The main ways in which the Project promotes gender equality are:

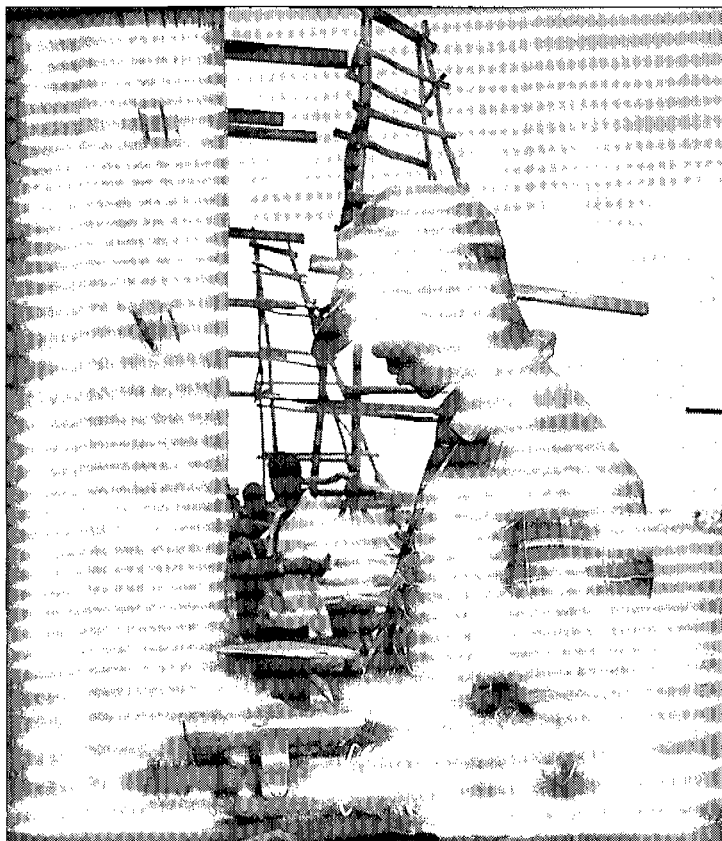
**Employment** Contractors on the Project have been asked to address gender issues by employing as many women as possible, considering them for all skilled jobs, and paying them equally with men. So far, on average, women make up less than 10 per cent of the work-force, and the work they do is mainly manual: collecting water, moving earth, and carrying materials. There has now been some involvement in skilled labour activities, however, especially block laying, where women have been trained from scratch and do a better job than the men, who find it difficult to adapt their brick-laying skills. It is hoped that women's involvement in this skill area will encourage them to try other areas, and that their success will ensure that they are judged on their skills, not their gender.

**Contractor awareness** Selected contractors are invited to a workshop to highlight gender issues in an attempt to encourage them to employ women and deal with on-site issues.

**Selection of contractors** All women contractors on the Project Database, within the district or adjoining districts, are invited to bid for contracts provided they are registered with the National Construction Industry Council in the 10-30 million kwacha category. Their bids are evaluated equally, but where bids are similar, the women contractor will take precedence.

**Community contractors** A positive policy has been adopted to encourage women to join the community contracting training programmes. No one has been excluded, and as a result over 40 per cent of participants on the training programme are women, many of whom bring babies and childminders with them. Women are playing a leading role in the contracts which have been awarded to communities.

**Free labour** As a result of the above practices, the role of women in traditional 'community participation' (i.e. free labour) has declined. Where free labour is offered by the community, men are more heavily involved, usually in road repairs and bridge construction.



*The community does the finishing, ensuring that they will be able to carry out the maintenance in future.*

**Water strategy** Women must make up over 50 per cent of the membership of the water committee. Each community will need two or three waterpoints, and the community will select their choice of school site. Given that women are the main carriers of water to the home, their views on waterpoint siting will be listened to both separately and during the community decision-making process.

**Site selection** During the site selection process, women are grouped together so that they can express their views without fear of ridicule from the men. The same is true for children (and where necessary girls will be separated from boys).

**Unintended outcomes** There are some common, recognized, but undesirable outcomes of these positive discrimination policies, which will be monitored, and where problems arise attempts will be made to solve them. One example is that women can end up working excessively long hours as a result of adding involvement in community contracting or employment to all their other work. Other potential problems include jealous husbands, inadequate childcare, and the deterioration of the women's own health.

## **Training and capacity-building**

The long-term sustainability of the project depends on the existence of construction professionals practicing in Malawi, and at the moment there is a serious shortage. The construction component of the Project is training its own construction officer to a professional level. The clerk of works and the supervisors will be attached to similar institutions or NGOs to gain more knowledge of new or unfamiliar technologies and site management. Along with the other training elements described earlier, the Project will increase the knowledge of construction management and technologies at both community and professional level — a legacy that will spread beyond the schools sector, and support professional and appropriate building projects all over Malawi.

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