

Review of the Community Building Construction and Maintenance Process in Zimbabwe

Case Study of Dlawo Rural Health Centre,
Nkayi District

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Abstract

Global concern to reduce poverty and promote sustainable development is placing emphasis on activities at the local level. This is the same approach used by the Community Action Project (CAP), a component of the Government of Zimbabwe's Poverty Alleviation Action Programme that gives grants to poor rural communities for investment in social and economic infrastructure and improved natural resources management activities. The objective of the project is to build the capacity of poor rural communities to improve their wellbeing in a sustainable manner. Amongst the projects eligible for funding under CAP is the construction or rehabilitation of buildings such as classroom blocks, rural health centres, staff housing, market shelter, children's day centres and community halls. This paper reviews the process for planning, construction, operation and maintenance of such buildings by poor rural communities. The review is based on experiences from CAP funded projects, Lund University's International Construction Management 2000 course, literature review, Agenda 21 on sustainable construction and international experience from other countries. The proposed construction of a rural health centre by a poor rural community in Zimbabwe is used as a case study. Strengths and weaknesses of the process are discussed, and recommendations are made for the improvement of the International Construction Management course at Lund University and the buildings construction and maintenance process for projects supported by CAP, and lessons drawn for other developing countries.

Introduction

Aim of the Paper

This paper has been prepared in fulfilment of the International Construction Management 2000 course offered by the Department of Construction Management of Lund University, Sweden. Using a case study approach, the paper seeks to analyse the process of planning, construction, operation and maintenance of community managed buildings in Zimbabwe. It also seeks to analyse the extent of compliance of the process with Agenda 21 for Sustainable Construction. From the analysis, lessons are to be drawn, on the basis of which recommendations are made for the improvement of the process. Recommendations are also made, from the review of the process, for the improvement of Lund University's International Construction Management course, and for future use by Zimbabwe and other developing countries.

Background to the Case Study

The paper is based on the proposed Dlawo Rural Health Centre (RHC) in Nkayi District of Matabeleland North Province, Zimbabwe. The local community of Siphunyuka Ward 25, with a total population of 8 921, intend to build the RHC to:

- Increase the life expectancy of the $\pm 30\ 000$ people in the hinterland of the RHC through preventive, curative and rehabilitative services to be offered by the health centre; and
- Reduce the distance travelled by patients and expectant women to the nearest health facility, which is currently over 30 km.

With a total budget of Z\$3 million, the proposed Dlawo RHC project consists of:

- Construction of a stock-type RHC;
- Construction of 3 \times F14 staff houses;
- Water provision (drilling and equipping of a borehole, and water reticulation);
- Perimeter fencing of the site;
- Furnishing and equipment of the RHC; and
- Training of the project committee.

Figure 1 below shows the back elevation of a typical staff house, whilst Figure 2 shows the front and side elevations of a typical RHC. An F14 house consists of a living room, three bedrooms, a kitchen and toilet/bathroom. The standard RHC consists of consulting and treatment rooms, storerooms, three wards (male, female and maternity), a delivery room, toilets and showers, and an environmental health technician's office. Detailed plans are available for the expansion of this basic RHC, should this be required as the hinterland population increases.



Figure 1: Back Elevation of a Typical Staff House

Besides the proposed Dlawra RHC project, the review is also to draw from general experiences in the construction of community infrastructure in rural Zimbabwe.



Figure 2: Front and Side Elevation of a Typical Rural Health Centre

National Context

Since the country gained independence from colonial rule in 1980, the Government of Zimbabwe has been concentrating on redressing the imbalances inherited from the colonial era. This mainly consists of the provision of social and economic infrastructure to the country's previously marginalized rural and urban populace.

Considerable gains have been made in this regard. For example, at least 85 percent of Zimbabweans now have access to a health facility within a walking distance of 8 kilometres. The incidence of disease has generally been reduced, e.g. for typhoid, cholera, leprosy and measles, whilst some diseases like polio have been eradicated. This is mostly due to an increase in immunisation coverage from 25 percent at independence to the current 92 percent, and improved water and sanitation facilities. The rate of live births has improved due to the improved antenatal coverage from 20 percent to 89 percent. The country's literacy rate has increased from 62 percent to 85 percent due to improvements in the quantity and quality of educational facilities. For example, with only 2 400 primary schools with a total enrolment of 82 000 pupils in 1979, the country now has 4 500 primary schools with an enrolment of 2.3 million pupils.

In spite of these gains, however, the general quality of life in Zimbabwe remains low. According to a Poverty Assessment Study Survey (PASS) carried out by Government in 1995, about 70 percent of the country's population of 13 million was found to be poor as it lived below the country's total consumption poverty line. Of this, 40 percent were found to be absolutely poor in that they lived below the food poverty line.

To address the problem, the Government formulated the Poverty Alleviation Action Programme (PAAP) as a framework to co-ordinate poverty reduction initiatives in the country. Its implementation is being co-ordinated by the Social Development Fund (SDF) under the Ministry of Public Service, Labour and Social Welfare. The Community Action Project (CAP) is one component of PAAP. It seeks to build the capacity of poor rural communities to improve their well being by giving them grants to construct social and economic infrastructure, and improved natural resources management activities. CAP has a five-year duration and a total budget of US\$72 million. It is expected to fund construction of the proposed Dlawra RHC in Nkayi District.

Agenda 21 on Sustainable Construction

The construction industry and the built environment are two major areas that need careful attention if sustainable development is to be attained in a society today. Following the June 1992 United

Nations Conference on Environment and Development held in Rio de Janeiro, international efforts are currently under way to develop an integrated approach and the formulation of an Agenda 21 on Sustainable Construction. Issues that need to be considered to ensure that construction is sustainable include the following:

- Environmental quality of construction;
- The decision making process, and the extent of public participation;
- Energy saving measures, e.g. in the manufacture of building materials and operation of the buildings;
- Use of renewable or recycled material; and
- Water management.

This paper is also to consider the extent to which the CAP buildings construction and maintenance process complies with Agenda 21 on Sustainable Construction.

Project Design

Project Organisation

Figure 3 below shows the way the proposed Dlawa RHC project is organised in terms of the relationship between the different stakeholders.

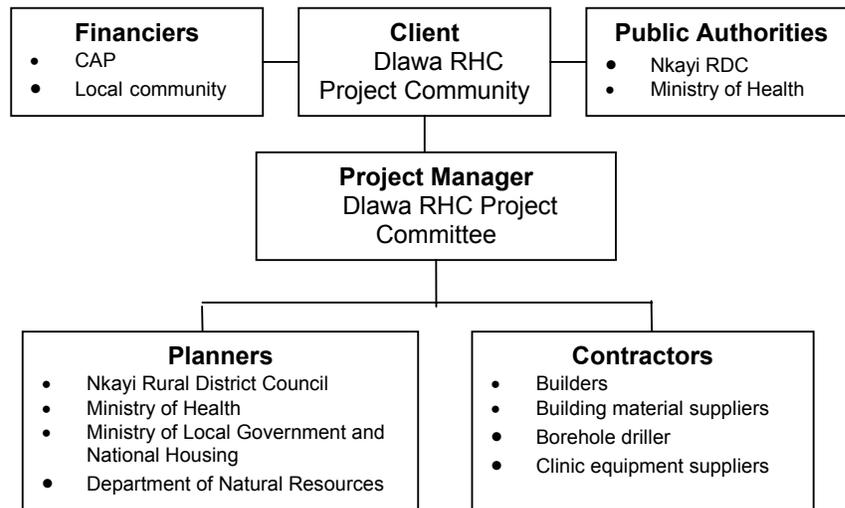


Figure 3: Project Organisation for the Proposed Dlawa RHC

Because of its objective of building the capacity of poor rural communities to improve their living standards, the focus of CAP is on local communities. Communities are responsible for mobilising themselves to identify their problems and needs, and to identify, plan, implement, manage and maintain projects that improve their well being. The communities get financial support from CAP, and are required to contribute not less than 20 percent of the total project cost from their own resources. Where required, they also get technical support from the local authorities, Government agencies, NGOs, etc.

In terms of organisation, therefore, the local community is the client as well as the beneficiary of the project. To manage project activities, the community elects a Project Committee. The Committee is responsible for co-ordinating all construction activities, using designs and advice from relevant technical agencies, e.g. planners from Government agencies and the local authority. The Committee is also responsible for procuring goods and services, required for the construction of the RHC, from suppliers and contractors.

The buildings are constructed according to Ministry of Health requirements and Ministry of Local Government and National Housing designs. Ministry of Local Government and National Housing and the local authority, Nkayi RDC, assist the community with technical supervision of the project. The completed RHC will be operated by the local authority, which will receive grants from the Ministry of Health to meet recurrent costs such as for salaries and drugs.

The Dlawo RHC Project Committee consists of five men and three women. One of the women is the Project Secretary. This meets the CAP requirement for community projects it supports that not less than one third of the project committee members should be women.

Project Planning

Given the focus of CAP on implementation and management of project activities by poor rural communities, simple project planning approaches are used. This is based on the CAP project cycle shown in Figure 4 below. The communities are expected to select their priority projects in a participatory manner. It is through this process that the four villages that comprise Siphunyuka Ward 25 in Nkayi District came up with their priority lists of projects. The village priorities were consolidated at ward level into a ward priority list. Examples of other projects that were identified by the villages include water supply (dams and boreholes), access roads, a community hall and community nutrition gardens. The ward agreed on the proposed Dlawo RHC as their first priority project.

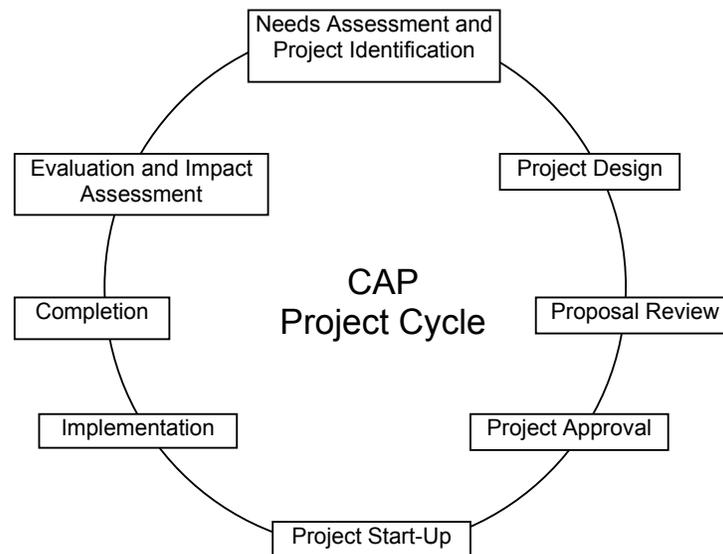


Figure 4: The CAP Project Cycle

Once the ward agreed on Dlawo RHC as their priority, the community selected and agreed on a suitable site for the project. It then sought the approval of the project by both the Nkayi RDC and the Ministry of Health who will be responsible for running the completed RHC and meeting the recurrent costs, respectively. It also sought building plans and bills of quantity for the project from the latter.

To give it the required skills in managing project activities, the Dlawo RHC Project Committee is to be given training in the following areas:

- Community mobilisation;
- Communication;
- Project planning and management;
- Financial management and record keeping; and
- Project maintenance.

A review of the Dlawo RHC project proposal indicates some issues that have not been adequately dealt with, and could have some adverse implications on the success of the project. It is imperative that the planning stage gives adequate consideration to all issues that are critical to the success of the project. Communities need appropriate technical support from their partners to be able to do this.

One major omission that has been noted in the Dlawo RHC project proposal are site plans and evidence of the involvement of technical agencies in site selection. This is an omission common with all community project proposals submitted to CAP for funding. This has resulted in costly delays in the commencement and completion of some projects. A typical example is the Madzivavido Secondary School project in Gokwe North District where a classroom block was re-sited three times, when it had been built to slab and window levels respectively, after the

community had commenced construction without technical advice on the siting and orientation of the building.

In view of this, it is recommended that a site plan drawn or checked by a technical agency such as the Department of Physical Planning or the Ministry of Local Government and National Housing should be a requirement for building construction projects submitted for CAP funding.

It is also recommended that at the planning stage, a conscious effort be made to ensure that the proposed project meets the provisions of Agenda 21 on sustainable construction. The proposed RHC project largely meets these provisions in that it takes cognisance of the potential adverse impact of the project activities on the environment, and suggests measures to ameliorate this. The decision making process is locally based, and locally available material like building stones and sand are to be used as much as possible.

There are other issues, however, that the Dlawo RHC project community will need to consider to improve the compliance of their project with sustainable construction practices. First is the use of solar energy to provide power for lighting the RHC and staff houses, and refrigerators used for storing drugs. Solar energy is clean and renewable, with very minimal maintenance requirements for the system. The community should also consider surface water harvesting, e.g. from the roofs of buildings, to reduce reliance on underground water. Methods that promote ground water recharge, such as planting vegetation to reduce surface runoff, should be encouraged as part of the project. These issues are particularly important since the proposed project lies in a low rainfall area. Evidence of the ability of the proposed borehole to meet the water requirements of the RHC has not been provided, another major omission. Adequacy of the proposed water source should be confirmed before the project proceeds. There are several RHCs in Zimbabwe that have been built but cannot operate due lack of water.

Conflict Management

Conflict manifests itself in all stages of the project cycle. However, it is known to manifest itself much more in the planning stages of the project cycle, decreasing gradually during construction/implementation and project completion. This is because the major decisions on the project are made during the planning stage, e.g. project priorities, objectives, cost estimates, resource mobilisation, administrative procedures, technology choice, etc. It is pertinent to note that conflict avoidance at this stage will result in more problems during implementation that might prove very costly in terms of time and the project budget.

Community projects are not immune from conflict. Issues like election of project leaders, project siting, community contributions to the project costs, influence of domineering people like politicians or influential members of the community, the relationship between the community and its external partners, etc. need to be dealt with.

For such issues to be adequately dealt with, there is need for negotiation and conflict resolution skills to be available at community level. The success of the project can be guaranteed by encouraging constructive dialogue within the community, and between it and its partners. All issues critical to the success of the project will need to be dealt with, and agreed to the satisfaction of all concerned parties, at this stage before implementation commences. This subject matter, therefore, should be on the training programme for the project committee.

Impact on the Environment

The proposed Dlawo RHC project site lies in a low rainfall area with Miombo woodland, and fragile deep Kalahari sandy soils with pockets of sandy clay loams. The Department of Natural Resources carried out an environmental impact assessment (EIA) of the project. Its major recommendations were for the community to:

- Minimise cutting down of trees to areas where buildings are to be erected so as to minimise exposure of the fragile soils to agents of erosion;
- Cover up pits from where gravel and pit sand is taken from; and
- Bury or burn empty cement bags, and properly dispose of other solid wastes.

The project EIA does not show evidence of the participation of the community in its preparation. It is recommended that communities participate in the preparation of project EIAs so as to increase their understanding of the process and encourage their implementation of the recommendations. In addition, the project document indicates that the community is to mould the bricks required for the project, but the EIA does not cover this aspect. These issues need consideration so as to improve the compliance of the project with sustainable construction practices.

Project Budget

The total budget for the proposed Dlawá RHC (see Table 1 below) is based on current prices obtained by the community from suppliers using standard bills of quantity for the proposed buildings and clinic equipment, and general estimates for the rest of the budget components.

Table 1: Budget for the Proposed Dlawá RHC

Project Component	Activity	CAP Grant Requested (Z\$)	Community Contribution (Z\$)	Total
Clinic building	Construction	895 000	450 000	1 345 000
3 × F14 staff houses	Construction	417 500	100 000	517 500
Perimeter fence	Erection	75 100	50 000	125 100
Water provision	Drill, equip and reticulate borehole	600 000	Nil	600 000
Clinic equipment	Procurement	512 400	Nil	512 400
Capacity building	Community Project Committee training	46 300	Nil	46 300
TOTAL		2 546 300	600 000	3 146 300

N.B. The sub-budgets for the different project components include a 10 percent contingency.

The community is expected to contribute not less than 20 percent of the project cost, with CAP providing the balance. The community contribution is in the form of labour (e.g. for brick moulding, site clearance and unskilled labour for the construction), locally available material (e.g. stones, gravel and building sand), and cash (each household in the project area is contributing \$50 towards project costs).

It is important to emphasise the need for a carefully prepared budget for the effective control of project costs. For example, although the Dlawá RHC project proposal indicates that each household in the project area will contribute \$50 towards project costs, the total amount expected to be raised this way is not factored into the project budget. Also, no inspection costs are reflected in the budget, although the community is expected to meet the travel and subsistence costs of technical agencies that will be inspecting the buildings. In addition, the costs for maintaining the project have not been catered for.

In obtaining quotations from building material suppliers, it is noted that the communities normally use the building plans and not bills of quantity. This results in the suppliers not quoting all the material required so that their quotes will appear to be cheaper. It is recommended that communities source quotations on the basis of approved bills of quantity. The local authorities should make the bills available to their communities.

Information Technology

The use of information technology (IT) in the planning of the proposed Dlawá RHC project is limited to the use of a computer as a “glorified typewriter” by Nkayi RDC to type the project proposal. Computer hardware and skills are absent at community level, and very limited at council level. The Rural District Councils Capacity Building Programme being implemented by the Ministry of Local Government and National Housing is expected to improve IT use in councils.

IT use is limited to the national level in the CAP Project Management Unit where an Oracle based project management information system (MIS) is being established. The MIS is to be used to track community projects funded by CAP, prepare progress and executive information reports, and to maintain a unit cost database of commonly used building material. The MIS also has a financial accounting and management component run on Sun Accounting.

It is recommended that CAP encourages the use of IT by rural district councils. This can be done, for example, by encouraging the councils to maintain simple databases of projects under implementation, and to have e-mail facilities through which periodic reports such as financial returns and monthly reports can be exchanged. CAP should also review project management software, which is now readily available on the market, with a view to finding one that can be used to facilitate its operations. Examples of such software include Microsoft Project and Micro Planner X-Pert.

Construction Stage

Procurement

Once their project proposal is approved for funding, the next step for the Dlawá RHC Project Committee will be to procure goods and services required for the construction of the different project components. Goods to be procured include building material and clinic equipment, whilst services include those of building contractors and borehole drillers. The main objective is to ensure that goods and services are procured in the most efficient way, with particular attention to economy, efficiency and quality.

For the procurement of goods, the community uses the local shopping approach, whereby it seeks quotations from suppliers. The goods are procured from the suppliers who offer the most competitive prices and conditions. This method of procurement is used because the building material for the project is procured in stages as and when required, and it enables the communities to obtain the best prices. It also helps develop the capacity of the community to buy at best advantage, and reduces the problem of storing the material before it is used.

Depending on the size of the project, the tender approach is used to procure the services of contractors.

Tendering and Contract

The Dlawá RHC Project Committee will need to seek tenders from relevant contractors for the construction of the proposed buildings, drilling and equipping of the boreholes, and fencing of the site. The divided contract approach is the most common method used, where contractors are appointed for separate parts of the project. For buildings, tenders are usually for skilled labour only, with the community providing the required manual labour as part of their contribution towards the project cost.

The Project Committee will enter into contract with the selected contractors. Usually the contracts are entered into by word of mouth, whilst others are simple statements on paper with the contract price but no conditions to protect the community or the contractor.

It is recommended that:

- Contractors are pre-qualified to ensure that only competent and experienced ones tender for community projects. The Rural District Council that can keep a register of approved contractors for use by communities.
- Sample tender and contract forms should be kept by the RDC for use by communities. Appropriate and adequate advice should also be given to the communities on how to fill the forms, which are expected to be simple enough for use by the communities.
- Communities use the divided contract approach as it helps them find the best prices on the market. Although the approach is demanding in terms of management, it is the best in cases where the objective is to build the capacity of communities in project management.
- Communities use fixed price contracts in which the contractor's tasks are defined and a fixed price agreed on. Lump sum contracts are recommended for activities such as borehole drilling and equipping. Building contracts should use a stage payments approach, where the contractor is paid upon reaching different stages in the construction of the building.

Production Planning

Once the building contractor is selected, the next step is the construction of the building within the planned cost and time limits and specified quality. To be ready for this, the community needs time schedules, forecasts of resource requirements for labour, material and equipment, the project budget, material delivery plans and to prepare the site.

In planning the activities to be undertaken in constructing the buildings, the Dlawá RHC Project Committee prepared an implementation schedule based on a simple bar or Gantt chart. The chart shows the activities to be carried out, time-scale and the responsible agent, e.g. community, suppliers and contractor. The use of the bar chart is recommended because it is easy enough for communities to understand, prepare and follow. It is imperative that all the anticipated project activities are captured on the schedule for project monitoring purposes. It is noted, for example, that the Dlawá RHC implementation schedule does not include details on drilling and equipping the borehole, and water reticulation.

Quality Management

The community is responsible for ensuring that the project progresses as planned, costs remain within the budget, and the quality is as specified. The progress of the project over time is controlled using the implementation schedule mentioned above. The Dlawá RHC Project Committee and the selected contractor/s will need to agree on a construction programme that is more detailed than the implementation schedule. This will help the community to better monitor the progress of the project, and also prepare for the timely procurement of building material and payment of the contractors. The detailed construction programme should also indicate key stages when the buildings should be inspected by relevant technical agencies before any further progress in construction is made.

The stages at which a building under construction should be inspected are as follows:

- Completion of setting out and excavation of foundations;
- Completion of the foundations and floor slab;
- Completion of the walls, including window and door frames;
- Completion of the roof;
- Completion of the plaster, joinery and glass;
- Completion of the remainder of the work and handing over of the building; and
- Completion of the six months defect liability period.

The community is also responsible for quality control to ensure that, when completed, the project will meet the stipulated design specifications and standards set aside by the responsible technical agencies. The technical agencies, which in the case of the Dlawá RHC project will include the Ministry of Local Government and National Housing, the Ministry of Health and Nkayi RDC, will provide assistance to the community in inspecting the project at key stages, e.g. setting out of buildings, excavated trenches, slab, window and roof levels, etc. Quality control checks and inspections should not be restricted to the building process alone, but also to the material being used.

It is recommended that the Project Committee, with the advice of the technical agencies, prepares a quality control plan that indicates when, where and by whom inspections are required before the contractor can proceed with construction work. The quality control plan is to be in synch with and complimentary to the project implementation schedule.

Budget Control

The community is responsible for cost control to ensure that the final cost of the project remains within the budget. CAP has limited to 10 percent the contingency that can be set aside for unforeseen costs over and above the project budget. The process of getting additional funds over and above the budget is long, making it imperative for project communities to make efforts to avoid it at all costs.

It is recommended that the community maintains a cost diary in which variations between budgeted and actual costs are recorded as implementation progresses. This will help the Project Committee foresee any major cost overruns and prepare for them to ensure that the project is completed on time.

Commissioning

Once the construction of buildings and other related activities that make up the project are completed, arrangements need to be made to commission the project. This will mark the completion of the construction stage, and the commencement of the operation and maintenance of the project.

In the case of Dlawá RHC project, commissioning will consist of the following activities:

- Final inspection of the completed project to ensure that it meets quality standards. This is done jointly by the Project Committee, the contractors and the responsible technical agencies: namely Nkayi RDC, Ministry of Health and the Ministry of Local Government and National Housing. Any noted defects are to be brought to the attention of the relevant contractor for correction.
- Issuing of a certificate of completion of the project by RDC.
- Penultimate payment of the contractor by the community.
- Organisation of a ceremony where the community celebrates the completion of the project. Dignitaries will be invited to officiate at the ceremony, and officially open the project. The RDC and the Ministry of Health will give details on the operation of the RHC.
- Commencement of the defects liability period of six months, which must include a rainy season. A final inspection will need to be carried out at the end of this period. If approved,

the community will take over the works, and pay the relevant contractors the defects retention fee (5 percent of the contract price) as the final payment.

- Confirmation of operation and maintenance arrangements for the completed project. The RDC will operate the completed RHC with grants for running costs from the Ministry of Health. The community will be responsible for maintaining the structures and grounds, and considering any additional facilities that might be required, e.g. shelters for expecting mothers.

CAP encourages the holding of project completion ceremonies so as to:

- Reinforce the community's sense of ownership of the project;
- Confirm operation and maintenance arrangements; and
- Encourage other poor communities to embark on similar activities that improve their well being.

Property Management

Project Maintenance

Whilst the completed RHC will be run by the Nkayi RDC with grants from the Ministry of Health, the Dlawā community will be responsible for the maintenance of the project. Although the project document for Dlawā RHC is clear on this, it does not detail how the community will maintain the project.

It is recommended that the community come up with a maintenance plan and the attendant budget, which outline the required activities and cost implications. The plan should outline running maintenance activities, e.g. replacement of broken windowpanes and repair of cracks on walls and floors, and planned maintenance. Planned maintenance consists of preventive maintenance (e.g. rodent proofing of buildings) and long-term maintenance (e.g. periodic painting of the buildings). Consideration will also need to be given to any urgent maintenance that might be required, e.g. if the roof of a building is damaged by stormy weather.

In view of the foregoing, the issue of project maintenance is not adequately covered in the CAP Buildings Construction Handbook. It is therefore further recommended that the handbook be revised to cover the different types of maintenance, and details on how a community can prepare a maintenance plan for their project. CAP should also seek details of general maintenance requirements for buildings which have standard building designs available in the Ministry of Local Government and National Housing or the relevant Government departments, e.g. RHCs, school blocks, staff houses, pre-schools and cattle dip tanks. Details of these maintenance requirements should be made available to local authorities for the benefit of their communities that will be planning such projects.

Project Evaluation

After the commissioning of the project, the community will need to review the process that it went through in developing it. The purpose of this review is to determine:

- The extent to which the project meets its objectives;
- The improvements that can be made in the project initiation, organisation, design, implementation and commissioning; and
- The lessons that can be drawn from the process for use in planning and implementing other future projects.

The community and the partners it collaborated with on the project should carry out the evaluation. The evaluation should analyse the whole planning and construction process, comparing the original plans and schedules with actual implementation. Particular attention needs to be paid in this regard to time, cost and the role of each partner in the process. Causes of delays, cost overruns and savings, conflict, etc. need to be investigated, as should gender issues and the impact of project activities on the environment vis-à-vis the recommendations of the EIA for the project.

The results of the process should be discussed openly by the community and its partners, and lessons and recommendations drawn. The beneficiary community, its partners and other communities should feed these lessons and recommendations back into the planning process for future projects.

Beneficiary Impact Assessment

After the completed buildings have been used for a year, the local authority is expected to carry out an assessment of the impact of the project on the beneficiary community. The assessment will seek to find out the extent to which the implementation of the project would have solved the community's problems. For the proposed Dlawla RHC, it will include finding out if there is any decrease in the incidence of diseases, improvement in state of health of newly born babies due to improved ante- and post-natal care, etc. The assessment would also need to find out the extent to which the most disadvantaged members of the community will be benefiting from the project. The findings of the assessment will need to be fed back into planning future community projects to improve their impact on the beneficiary communities.

Experiences for Future Use

From the process reviewed above, there are lessons that can be drawn. These can benefit Lund University in improving the International Construction Management course that they offer each year to participants from developing countries. They can also benefit Zimbabwe and other developing countries in developing or improving the construction management process for local communities.

The Department of Construction Management (DCM) in the Faculty of Construction of Lund University has been running the International Construction Management (ICM) course for several years, with the support of the Swedish International Development Co-operation Agency (SIDA). The course is aimed at planners, architects, civil engineers and other practitioners in the built environment from countries in Africa, South America and South East Asia. These participants have brought with them a wealth of information from their experiences with construction management in their countries. DCM should use this information to build a body of knowledge on the construction management process in developing countries that can be used to improve the content of their course. The course should also pay particular attention to construction processes appropriate for poor communities.

The ICM course in its current form mainly relies on the Swedish model of the construction management process. Admittedly, Sweden has made some of the greatest strides on this subject matter in the world. However, there are experiences from other parts of the world where lessons can be drawn from. These lessons should be introduced in the course, especially since the participants do not have an adequate opportunity to share the experiences of their countries during the course.

In spite of the abovementioned shortcomings, however, the ICM course provides valuable lessons that can be used to improve the construction process used for CAP funded projects. A typical example is the need for appropriate planning and implementation of maintenance arrangements to improve the life cycle economy of buildings. The valuable lessons the course provides can be improved if more literature is made available for participants requiring a deeper understanding of specific subject areas. The course mainly relies on lecturers' notes for reading material, whilst some quoted references are either not available in the library or are in Swedish.

CAP only supports activities of poor rural communities in Zimbabwe. The Government, however, is in the process of developing a strategy for dealing with urban poverty. This is being done under the ambit of the Social Protection Strategy whose formulation is being managed by the Social Development Fund. The process stands to benefit from CAP experiences in reducing poverty through sustainable construction management. The CAP experience can be buttressed by international experience from countries where the approach has been used successfully. A typical example is the *Fundacion Promotora de Vivienda* (FUPROVI), or the Foundation for the Promotion of Housing, in Costa Rica.

The international community, particularly developing countries that are battling with finding ways of improving the well being of poor people who constitute the majority of their population, also stand to benefit from the CAP experiences. Perhaps the major one of these experiences is that of making poor communities the major agents for improving their standard of living. Poor communities have latent potential that can be tapped in a manner that fosters sustainable development. Construction management provides one such avenue.

Conclusion

From the analysis above, it is evident that the CAP has developed a robust and sustainable process for the planning, construction, operation and maintenance of buildings by poor rural communities

in Zimbabwe. The process helps develop social capital that is required for the improved standard of living of the communities. The major strength of the process is its ability to develop the capacity of poor communities to manage the whole process. However, there is still room for the improvement of the process. Recommendations in this regard have been made in this paper. The process also stands to benefit Zimbabwe in its current efforts to develop initiatives for urban poverty reduction, and other developing countries in promoting sustainable construction.

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