Assisted self-help housing

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Self-help housing: the concept

Necessity and the lack of affordable housing alternatives mean that poor families frequently are obliged to construct the basic shelter they need themselves using salvaged materials and a great deal of ingenuity. These houses are gradually extended and improved as money becomes available and as the security of occupation increases. Formal housing projects, such as sites and services schemes, have sought to channel these activities in order to provide affordable housing to low income groups with the provision of materials or loans for materials and technical assistance to enable families to organise for themselves the construction of their houses on serviced lots. Between these two extremes there are numerous interesting examples of organisations intervening to varying degrees to assist families in constructing or upgrading their houses.

Self-help housing projects have important financial advantages. The cost of improved housing is reduced which compensates for a lack of savings and earnings capacity; it reduces loan repayments; and increases the capacity of the housing sector by producing a greater volume per unit invested. Socially, these projects encourage community and individual development and self-respect; create commitments and the acceptance of responsibilities; and provide a framework for mobilising human resources and improving the quality of life. Carefully targeted assistance can also provide valuable educational advantages. The technical training given to house-builders provides semi-qualified personnel for the construction industry, while the associated social training assists in the formation and organisation of strong community groups, the implementation of further improvement projects, and the development of individuals who are conscious and responsible for their own well-being.

Two distinct mechanisms are employed in self-help housing schemes. The construction of houses may be based either on the individual efforts and initiatives of the future occupants (own initiative) or the work may be carried out by organised groups of families who assist each other reciprocally in the construction of their houses (mutual assistance). The second method, while more difficult to organise, provides greater community benefit when successful and also offers more scope to undertake other related improvements such as infrastructure or community facilities.

The problems

Whilst self-help housing projects have come into widespread use the concept is not without its problems. It is essentially a slow construction process and allowance has to be made for this if the advantages of the concept are not to be lost. Schemes that involve a very large initial investment in infrastructure create substantial financing charges if plots are not occupied and loans taken up quickly. A considerable financial burden is placed on the beneficiary families if they are required to service materials loans well before the completion of their house. In one form or another the financing of the initial investment has to be covered and a long drawn out construction phase can easily offset the cost advantages of the self-help process.

In many self-help schemes the quality of the finished product is poor or variable and this can create disillusionment with the project and an unwillingness to make the loan repayments. Difficulties can result because beneficiaries feel that the
materials or techniques proposed for these schemes are inferior or even defective. They may also feel that they have done all the hard work themselves and resent the need to make loan repayments.

Professionals often have a confused perception of the requirements of self-help housing schemes and look to labour intensive, low skill techniques which often lengthen the construction period unduly. The objective should be to make the construction task as efficient and quick as possible and to an appropriate quality, without losing the advantages of the self-help process, bearing in mind the numerous tasks and skills needed for successful house and infrastructure construction. A readiness is required to accept both local materials and mass produced products; modern technologies and labour intensive approaches, and combine them in the most appropriate way for a particular situation. The development of a strong community group to undertake self-help work and the identification of their needs and priorities is fundamental to the success of this type of project; however a sense of frustration and the poor performance on many self-help housing projects often stems from a failure to adopt suitable techniques that make the various tasks as efficient as possible.

By way of an illustration, the techniques used by one organisation concerned with improving the living conditions of low income families will be examined more closely.

A self-help programme in Central America
The Fundacion Frontora de Vivienda (FUPROVI) is a private non-profit making organisation which was established in Costa Rica in 1987 with the following objectives:
- contribute to improvements in the living conditions of the urban and rural poor and to the development of existing squatter settlements;
- assist low income groups in the identification of their housing and community development requirements;
- support the organisation and participation of communities in the development of housing and upgrading projects using self-help concepts, particularly that of mutual assistance.

The foundation's programme has four components:
- credit for materials for the construction or improvement of housing;
- credit for materials for minor infrastructure work and community facilities;
- provision of technical, legal and social assistance, training and supervision;
- provision of equipment and tools to assist the construction activities of the community.

The programme places as much importance on the development of sound, responsible local organisations as on physical works and the concept of participation covers all aspects of community development including identification of requirements, planning and organisation of the work and the execution and maintenance of services. It is, however, the fourth component of the programme that is of particular interest to this paper and its role in one project, Los Sauce, is examined to illustrate its application.

House construction
The Los Sauce project covers an existing settlement of 226 families living in makeshift shacks on steeply sloping ground on the outskirts of the capital, San Jose. The climate is cool due to the altitude, with a temperature range of 15°C to 26°C and an annual rainfall of 2,000mm. The area is seismic.

The most popular house construction is concrete blockwork walls and galvanised iron sheet roofing on a wooden frame. The materials lend themselves to self-help construction and training is given on how to tie the structure together to resist earthquake loads. In some housing projects small block making machines are set up at the site but in this case they were not able to compete on cost with the local factory produced blocks and so these were bought in. Small precast concrete slabs that fit into slotted columns are an alternative form of wall construction used on some other FUPROVI projects. These walls can easily be erected by two people, do not require skilled labour and can be completed much more quickly than conventional blockwork walls. This construction method is also up to 35 percent cheaper but in the case of
the Los Sauces project the residents still preferred the blockwork option and their decision was respected. The example illustrates the importance of realistically costing the alternatives but also accepting the wishes of the beneficiaries.

Concrete work in self-help projects can be of very variable quality and valuable materials can be wasted. Small cement mixers are available from the project field office for use by the beneficiaries and help to ensure that a correct mix is used in the concrete tie-beams and floors and in the voids in the blockwork walls. Small compactors were also available to house-builders through the project. The principle employed is to make the tasks as effective as possible.

The fabrication of wooden doors and windows by inexperienced hands can be very time-consuming, waste expensive materials and is rarely successful. In the Los Sauces project a small carpentry shop with modern equipment was set up by the foundation and two carpenters employed. Residents could order units from the shop paying for the materials and a fixed amount for labour. The results are high quality products which cost about the same as those made by self-help when one allows for the extra wastage. Residents were clearly pleased with the results and designs rapidly became personalised. The carpentry shop also began to supply items to other housing projects.

A proposal for the future is to set up a small press to make the metal junction boxes and fittings for the household electrical supply, the motivation in this case being substantial cost savings. Assistance is also given by the foundation to anyone wishing to purchase equipment and set up these types of enterprise on a permanent basis.

The plans for four basic house types are available from the foundation although residents are able to vary the designs to suit their requirements, and assistance is given by the technical staff in making these modifications. In the Los Sauces project four experienced foremen are available to assist the 226 families in the design, ordering of materials, setting out and construction tasks. Handtools and small items of equipment, as noted above, are provided by the foundation to the construction groups. The building materials are provided and delivered by FUPROVI as required and the quantities recorded and charged against each household. 15 percent of the value of the materials is added to cover the provision of all types of assistance and equipment and tools. House construction typically takes six months as against three months for contractor built housing.

Infrastructure works

The self-help approach is also used were appropriate for the provision of infrastructure. Requirements and costs are discussed with the residents and FUPROVI provides the necessary designs and negotiates the standards with the responsible authorities. The foundation supplies the basic materials and equipment and the families work in groups in the construction. A fixed sum is eventually charged to each household for the infrastructure component.

Methods of construction are again selected to make the work as efficient as possible. On the steeply sloping Los Sauces site earth-moving equipment was hired to quickly form the access ways rather than employ labour intensive methods and residents carried out the construction of the concrete footpaths and the drainage systems. The vehicular roads were originally going to be surfaced using stones, which are plentiful, set in mortar but the local municipality was persuaded to provide an asphalt surfacing once the construction work is finished. This is seen as an important gesture of support from the local government.

There is still scope for technical assistance to realise further benefits. Although not used here interlocking blockwork pavers provide an alternative form of paving which is most appropriate for self-help projects and small machines can be used to fabricate the paving blocks locally. Economies could also be made in the type of access that is provided. Although roads and footpaths only cover 19% of the site area (against a total lettable area of 62%) many of the roads with gradients of around 26% are accessible only to four wheel drive vehicles. Although vehicle
ownership is very low, residents at the site expressed a strong desire for vehicular access where possible believing that it would increase the value of their property. Space, materials and labour could have been saved with a greater use of footpaths and with the use of steps to break up very steep and long inclines if residents had been persuaded to accept these alternatives. Some reorientation of the layout could also have reduced gradients and made drainage easier.

The heavy rainfall and steeply sloping site has necessitated an extensive drainage system. Open semi-circular channels are being constructed by the residents. An important innovation here is the construction of pre-cast concrete channel sections on site. FUPROVI assisted in the local fabrication of a machine (vertical hydraulic mould) using second hand truck hydraulics and pump, and set up a small casting yard at a cost of $4,500. About 100 very good quality dense concrete canal sections are produced daily by two men for use on the project and sale to other housing projects at a cost $1.4 each against $4.6 each for an inferior product from local building suppliers. This cost covers raw materials, wages for the men and a return to FUPROVI for the initial investment. Important factors are again appropriateness for self-help construction, cost effectiveness and the quality of the product. Steps in the footpaths would have aided the drainage system by permitting shallower gradients and the use of energy dissipators in the channels thus avoiding the flow high velocities in the very steep channels.

Water is obtained from a near-by stream for which each family pays a fixed charge. FUPROVI has helped the community build a small dam, slow sand filter and a 50m transmission pipe. Individual connections are provided to the houses. FUPROVI feels that distribution pipe costs are unnecessarily high due to the need to meet the standards set by the water regulating authority regarding minimum pipe diameters, service connections and pipe cover. The same also applies to the sewerage system which is based on a conventional system using 200mm minimum diameter concrete pipes, individual house connections and flush toilets (residents at present use latrines). It is anticipated that the sewer system will eventually connect to a collector leading to a treatment plant. Despite the requirement to use conventional water supply and sewerage systems, they have been constructed satisfactorily using the self-help approach although the need to comply with inappropriate regulations has increased costs substantially.

A more flexible attitude has been displayed by the electricity distribution company which has designed and installed a low cost system with limited help from the community in tasks such as pole location and erection. Only the cost of materials (including street lights) are to be charged to the project. Bulk meters are used at present as the basis for paying for electricity consumed, with a committee responsible for collecting the fees and paying the bills. Residents are however requesting that individual meters be installed eventually.

Financial considerations
The loan to residents covers the purchase of the land, legal costs, a fixed sum for infrastructure and the cost of materials used in the house construction plus 15% for technical assistance. During the construction period the financing is provided by the foundation from its own funds at no interest and only secured against the materials delivered. Once houses are completed the loans are purchased by the housing bank and converted to long term (15 year) loans secured against the property. The same system applies for new house construction and improvements and implies that the finished product must be adequate to guarantee the loan and that the household will eventually qualify for a clean land title and a mortgage. The FUPROVI funds are subsequently applied to other projects although they do require periodic replenishment.

Conclusions
This project has been highlighted to illustrate the different and varied ways in which technical assistance can aid self-help housing and infrastructure projects, and stress the importance of embracing a mix of different methods and technologies
tailed to make the construction tasks as efficient as possible, while not losing the advantages of the self-help approach. This necessitates looking beyond purely labour intensive, low skill activities and identifying where equipment, local fabrication and mass-produced products can be beneficially employed. The quality and durability of the finished project is important not only to satisfy long term financing requirements but also to satisfy the aspirations of the householders and ultimately the success of the scheme. The project illustrates how building regulations often present difficulties and unduly increase costs (water supply and sewerage components), and the importance of low cost financing during the construction period.

Finally, the paper has concentrated on the technical aspects of assistance but recognises and must draw attention to the fundamental importance of involving, developing, strengthening and motivating the community groups when embarking on this type of project if the objectives are to be realised.

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