1.1 Alternative strategies for the provision of infrastructure in urban unplanned settlement areas: Are these strategies effective and how can they be supported and developed?

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PROBLEMS
Infrastructure services in many urban centres are in a serious need of attention. The little services that there are, are usually concentrated in high income areas which are sparsely populated! Taking Nairobi as an example: Many of the roads are in a poor state of repair, and some have fallen into a state of complete disrepair. The majority of high population low income "informal settlement" residential areas are not served with a formal road network (Mathare, Kibera, Kawangware, Korogocho, to name just a few). Drainage which poses an immediate health hazard to the inhabitants in these areas is even worse. Most of the informal settlement are in areas with poor natural drainage and are prone to flooding. Solid waste collection and disposal is practically non-existent in these areas.

A few reasons leading to the failure in the provision of these services are:

Inappropriate urban by-laws
The laws that govern the provision of services are too stringent and do not give room for different alternatives. It is interesting to note the origins of the Nairobi by-laws. They were just picked from Blackburn (a town in Britain), and used unaltered except for the name which changed from Blackburn to Nairobi!.

Inappropriate (incomplete) training
The institutions of learning, which educate the people charged with the responsibility of providing the services are all geared to the use of only one form of technology. They are all trained to think of heavy equipment without critically looking at other alternatives. It is desirable to have engineers, architects and all other people, charged with providing infrastructure services, especially in urban areas, to have a sense of technology choice imparted into them from the early years of their career.

Resources
The traditional design of services calls for high levels of inputs in terms of materials and equipment which are not easily affordable by under-financed municipal councils.

Planning
This is another area which needs serious attention. Many urban centres started as unplanned settlement areas. Even where plans were made for recognised urban centres either population growth was not given adequate consideration, or accurate forecasts were not available. The large increase in rural-urban migration in search of employment
coupled with population growth has over-strained the available services resulting in rapid deterioration of existing services and non-provision of new services. This unforeseen situation has led to the growth of so called "informal settlements" in many urban centres in developing countries.

Lack of consultation with the users of the facilities to assess their needs is an important aspect which has not been considered in the past.

INITIATIVES TO FIND ALTERNATIVE SOLUTIONS TO THE PROBLEMS

The use of community participation in the planning and execution of infrastructure improvements - an outline of the approach used in Colombo, Sri Lanka

Colombo was one of the first cities to formally encourage the involvement of communities in the provision of facilities and improvements to their immediate environment. The National Housing Development Authority (NHDA) assisted by UNCHS (HABITAT) developed the Community Action Planning (CAP) approach which focused on involving the communities in the planning and execution of infrastructure improvements.

The principles of CAP are as follows: A series of workshops for the community, a specific group of people in a defined geographical area, are held to discuss their most pressing infrastructural and environmental needs. Once these have been identified, the community forms a Community Development Council (CDC) to represent them. The CDC must be registered, with a legal standing, and open and operate a bank account. The first infrastructural improvement is identified and designed in collaboration with the CDC.

A contract is set up between the CDC and the responsible authority for the construction of this improvement (such as a re-designed well and washing facilities). Technical support for the design of improvement works and for the preparation and interpretation of contracts is available either from the NHDA, the city council, or can be privately hired by the community. The NHDA or funding authority then pay the CDC the cost for materials and labour for the first contract and leave the community to organise the work through the CDC. If the CDC is weak in management skills they can be supported by an NGO through which the funds are channelled.

Included in the contract sum is an allowance for a modest profit such as a small contractor would make. This profit is paid to the community with the other moneys and can be used for further improvements to the area or for assisting groups within the community who may wish to start other projects such as income generating activities.

The CAP approach was instituted as a direct result of the poor quality of services provided by contractors, lack of maintenance of services and unsuitable designs. Projects can be implemented with different levels of community participation. The community can be used to execute works for which they have had no input into the decisions of what to construct and how to construct it. This is not proper participation. Alternatively they can be involved in identifying the problems, defining and implementing the solution as was the case in the projects discussed in the section case studies starting at page 113.

The community can provide some element of unpaid labour for the execution of the works thus reducing costs and freeing the available funding for further improvements. However, the sole use of unpaid labour can only work well for short term projects. The
project should be completed or at least start functioning while enthusiasm in the community remains high. Therefore it is not recommended for major works in settlement upgrading.

**Designs and methods of construction for community-based urban upgrading**

In the PUSH, Kalerwe and Hanna Nassif projects, which will be introduced below, the designs and construction techniques used for the urban infrastructure works are adaptations of standards and practices established in the rural road sector. However, there are major differences in operating within an urban area and within a rural area. If we consider road and drainage construction, the road width and alignment in an urban unplanned settlement is determined by the space between existing buildings with an effort to keep demolition to an absolute minimum. However, the difference in the approach to drainage is more radical.

- The use of mitre or turn out drains is rarely possible due to densely packed housing.
- Often unplanned settlements are in low lying areas or areas with drainage difficulties, therefore an accurate survey and assessment of the design is needed for each proposed drain before the start of the project. There may be a need for a more rigorous pre-project planning phase than is allowed at present in the preparation of a project proposal.
- In many cases the provision of standard details alone is sufficient for construction and improvement of rural roads by a well trained foreman. However, in the urban situation this is often inadequate unless a qualified engineer is on site to make small adjustments to the standard details as is required.
- In urban areas there are fewer possibilities of getting rid of storm water. The drainage system must continually gather run-off and carry it to a suitable outfall point or existing drainage system. As a result drains must be set at accurate levels and the size of the drains will increase to larger and deeper sections than is normal for roadside ditches on rural roads.
- There are more obstacles in the path of the construction work in urban areas than in rural areas, even in unplanned settlements i.e. electric cables, telephone poles, water supply pipes and domestic connections. These obstacles may result in the need for alterations to the design during the construction phase.
- The design will also be affected by the future maintenance arrangements. Who will be responsible - the community, the municipal council? If the community are to be responsible for the maintenance, then the design must assure ease of access to drainage for maintenance purposes. Even if the municipal council is to be responsible for the maintenance, it is necessary to assess their capacity to carry out certain kinds of maintenance activity. Will they be able to clear long lines of drainage pipes, or will it be more practical to have open drains which can be desilted by a gang of workers with simple tools.

The above points may seem obvious to a municipal engineer, but they are significant in the transfer of technologies and methods of working from the rural setting to the urban setting.
Employment generation in urban works programmes through efficient use of local resources

A project bearing the above title was set up by UNDP and ILO to assist governments of Least Developed Countries in exploring ways to alleviate urban unemployment and poverty through the mobilisation of their natural and human resources for employment, when properly adapted to local conditions. With the emphasis on the use of local resources and employment generation, the project focused on encouraging the use of labour-based methods and appropriate technologies in conjunction with community participation to improve urban infrastructure.

Proposals for pilot projects, one in Dar es Salaam - Hanna Nassif, and one in Kampala - Kalerwe, were two of the results of the Employment Generation Project.

Case studies of three projects - Push, Kalerwe and Hanna Nassif Pilot Projects

Project Urban Self-Help (Push)

Project background

Zambia has one of the highest, if not the highest, urban population in Africa expressed as a percentage of total population. In 1988 the figure was well over fifty per cent. Seventy per cent of Zambians do not earn formal salaries and cannot afford even the lowest cost houses. Therefore, unplanned settlements have mushroomed around Lusaka and other major towns. The Second National Development Plan of the Government of Zambia recognised that although squatter settlements were unplanned they nevertheless represent assets in social and financial terms. Due to a lack of resources, the problems faced by the communities in the squatter areas could not be tackled by the municipal councils. Drainage, disposal of solid waste, and sanitation were identified as priority concerns of the communities.

The structural adjustment programme resulted in a dramatic rise in the cost of living. Those people most affected by the increase in prices were the urban poor. The World Food Programme (WFP) in Zambia prepared a quick action project to give food support to them. The work entailed the construction of storm water drains, access roads and footpaths, improvements to the water supply, sanitation and refuse removal.

The aim of PUSH was to offer opportunity for 3,000 workers (in the Lusaka area) to work and receive food rations for a family of five. Many of the head of households in the squatter areas were women and as the women in all households have responsibility for feeding the family, 98 per cent of the participants in the project were women.

Technically the project was supported by 3 UNV civil engineers and a part-time consultant from HABITAT. In addition ILO was approached to run training programmes on road and drainage construction for the engineers, technicians and community leaders. The municipal councils provided counterparts to the technical team and additional field workers in the health and community participation fields. In each compound (unplanned settlement area) an NGO was responsible for the execution of the project under the guidance of the main NGO, Human Settlements of Zambia (HUZA), and the WFP.

The project once started in Lusaka was then extended to Ndola and other "Copperbelt Towns". The results have been very positive in demonstrating what can be achieved when self-help efforts are properly directed technically and support given for the
organisation. The title suggests that the work would be carried out on a self-help basis. In fact most works were paid for using food rations, however at week-ends some of the men from the compounds came forward to do excavation on a self-help basis and training was carried out for self-help maintenance.

**Technical aspects**

Using mostly standard details devised for rural roads and roadside drainage it was necessary to adapt them to suit the new environment. With a policy of minimum or nil demolition of property, the designs had to be flexible to site conditions. Unlike some of the unplanned settlement areas in other countries, in Zambia most of the main accesses which had been laid out were still free from buildings and roads up to 5.5 m carriageway width were possible with drains on either side. In some of the narrower side roads it was necessary to design 3.5 m carriageways in cross-fall with one side drain. Due to the relatively good soil conditions in most of the compounds the drains were unlined, with some stone pitching in particular problem areas. The project had been designed assuming outputs comparable with reasonably run rural road construction sites. In practice there were several reasons why the targets were not reasonable and why there was need for extra works. They are as follows:

- removal of refuse from the site which had been dumped over many years.
- the large number of vehicle crossings required across the side drains for entry in to business premises, churches, clinics, and private houses.
- the large number of pedestrian accesses needed across the side ditches and main drains.
- the need for larger cross-sections for the side ditches and main drains, as water cannot be taken away in mitre or turn out drains.
- the increase in the number of road junctions and thus in the provision of drifts and culverts.

For example one 225 m long road, needed 4 vehicle access drifts across the side ditches, 6 pedestrian accesses and one main drift or culvert at the junction with the main access road. This is a considerable increase on the rough estimate of 2 culverts per kilometre for a rural road.

The work was being "paid for" by food rations and all who came forward to work regardless of ability were employed. It was therefore difficult to achieve reasonable task rates. The women preferred working in groups. Due to an early start to employment when not all technical details were finalised they were used to being given small tasks for large groups of workers.

Despite some difficulties, which are to be expected in adopting a new approach to urban upgrading, the achievements of the project are visible and have been very well received by communities, municipal councils and government alike. Recently traffic on a main route in Lusaka had to be temporarily diverted and many drivers found themselves on well constructed unpaved roads which had been improved under PUSH. The project started in 1991 and has been extended and is still carrying out improvements to unplanned settlement areas.
The use of community participation was central to the success of PUSH, but the community participation did not include the use of community contracts. All operational activities were controlled by the project staff.

**URBAN WORKS PROGRAMMES IN UGANDA - KALERWE COMMUNITY-BASED DRAINAGE UPGRADING PILOT PROJECT**

**Introduction**
This project was part of the UNDP financed inter-regional project called "Employment promotion in urban works programmes through the efficient use of local resources" outlined in section of Employment Generation in page 112. Kalerwe is in Kampala, the capital city of Uganda.

Kalerwe, the pilot project area, suffers from severe flooding, especially during the rain season. It was observed that the community was anxious to solve this problem by improving the existing drainage system. This resulted in the area being selected for a pilot project.

This project was started with the immediate objectives of:

- constructing a functioning and maintainable drainage system.
- establishing and testing methods of working suitable for community-based upgrading of drainage systems in unplanned settlement areas in a sustainable and replicable manner.
- creating capacity in the government institutions of an enabling approach to upgrading.-to develop and test the capacity of the community contracting system.

The project started in mid 1993, slightly later than planned. A series of meetings, workshops and seminars were held to raise awareness within the community to the problems they face and possible solutions. From these meetings, a community development committee was elected to run the day to day operations of the project.

In Uganda, the urban communities are organised into Resistance Councils (RC) starting from zonal levels up to city council level; i.e. RC1 up to RC5. With this level of organisation, it was relatively easy for the community and the project to establish committees for the drainage works.

**Approach**
From the beginning, the Government of Uganda, through the Ministry of Finance and Economic Planning, and that of Lands, Housing and Urban Development were involved and their cooperation registered. The cooperation of the Kampala City Council was also sought and received.

There were two components to the construction part of the pilot project. The first was to construct a main drain through ten Resistance Council 1 (RC 1) zones in cooperation with the community comprising the ten zones. The second part of the project was to construct secondary and tertiary drains in one of the ten zones - Kibe zone. Different levels of community contribution were expected on the different classes of drains, amounting to 15 per cent on the secondary drains and 30 per cent on the tertiary drains, with only a very minimum contribution on the main drain. Contributions were planned in terms of free labour and a monetary contribution via a household levy for paying the contribution for
the secondary and tertiary drains and especially for the community contractors for the maintenance of these drains.

Both a topographical and social surveys were done and designs prepared by a consultant. These designs were approved by the Kampala City Council. Community contract documents were prepared. The project operated on simplified contracts which were fully explained in workshops. The contracts were for labour only. All materials, transport and equipment was organised by the project team. An example of the simplified contracts is attached in Annex 1.

The planned work entailed a construction of 2.4 km of main drain, 1.5 km of secondary drains and 3.8 km of tertiary drains. The main drain has a cross-section (internal dimensions) of 2.1 m deep, 1.8 m base width and 3.5 m top width. Various options were considered for the construction to be used for the three drain types.

The alternative designs considered were:
- precast concrete slabs as lining elements.
- non-reinforced cast in-situ concrete lining.
- brick and plaster lining.
- factory prefabricated drainage lining elements.
- masonry lining.
- no lining.

The soil conditions, silty lateritic clays, were insufficient reason on their own for the provision of a lining, however in the interests of creating a permanent improvement and for ease of maintenance it was decided that the drains should be lined. Stone pitching with weep holes was chosen as this type of lining could be constructed by the community and the materials were locally available. Community members were trained by experienced masons in the construction of the linings. The training was so successful that many of the newly trained masons were offered employment for similar work in other parts of Kampala.

The physical achievements of the project were 2.4 km of main drain, 3 of the 4 secondary drains were completed and materials had been supplied for the continued work by the community on the fourth secondary drain after the end of the project period.

The main drain was provided with crossing points and grills at regular intervals to trap debris which should be regularly removed to avoid blockage. This calls for an efficient maintenance system. Practical training demonstrations for maintenance were held, after the completion of the main drain, which covered:
- clearing and levelling of the banks.
- desilting and removal of debris.
- cleaning of the side linings and weep holes.

From this training, it is hoped that the maintenance committee formed will be able to manage and administer the community maintenance contracts adequately. At the end of the project negotiations were still underway to share the financial responsibility for maintaining the main drain between the city council and the community.

Due to an anticipated and observed problem of solid waste dumping in the drains, which would impair the flow of water, plans were underway to introduce composting of organic waste as an income generating activity to the community in collaboration with the small enterprise, informal sector unit of the ILO.
Conclusion
The pilot project had made, by international standards, exceptionally rapid progress in completing the main drain construction and the majority of the secondary drains. Due to the rather abrupt finish to the project, only one demonstration tertiary drain was completed. In addition to the physical progress, significant progress has been made in creating capacity within the community for the management and control of the works, including training for the maintenance of the drainage system. Inhabitants were all along enthusiastic due to the open community participation methods used which instilled a sense of trust and ownership of the project. It was mostly men who were employed in the construction of the drains due to the nature of the work. However, women were well represented in the committees and at the workshops. The pilot project period was too short and ended abruptly; before the capacity of the community to manage the remaining part of the construction and the subsequent maintenance has been tested. Modalities for adoption and replication of the procedures by the local authority concerned have not been worked out and tested although they are aware of all the processes involved. Proposals have been prepared for additional works and further development of the cooperation between communities and local authorities which would be of undoubted benefit to the Kalerwe community and neighbouring communities. The extension to the pilot project is well supported by the Kampala City Council and the Ministry of Lands, Housing and Urban Development.

COMMUNITY-BASED URBAN SETTLEMENT UPGRADING - HANNA NASSIF PILOT PROJECT

Project background
This pilot project located in the unplanned settlement area of Hanna Nassif was formulated under the Employment Generation in Urban Works Project outlined in section of employment generation in page 112. A study of the area was carried out by the Ardhi Institute, the planning and architectural college of the University of Dar es Salaam. Storm water drainage emerged as the problem most in need of addressing including the problem of storm water mixing with sewage and rubbish to form unhygienic stagnant pools. This area had twice previously been earmarked for upgrading. The second upgrading plan included the demolition of 600 houses. Neither upgrading plan was implemented due to lack of funds. The Hanna Nassif project was formed as a pilot project to test the community contract system in collaboration between ILO, HABITAT, UNV, and the community. Funds for the actual works have mostly come from the Ford Foundation and the European Development Fund. Despite the use of labour-based and appropriate technologies, the costs of major infrastructure works are beyond the means of the community alone. The project objectives are:

- a pilot project on community-based, employment-intensive storm water drainage infrastructure upgrading of the Hanna Nassif informal settlement; creating in turn capacity within the Dar es Salaam (DSM) City Council to respond to such community-based initiatives.
- the capacity for DSM City Council to continue to deal in a responsive enabling manner to community-based urban upgrading proposals be created and expanded.
- a support mechanism for community-based initiatives from Kinondoni (DSM City Council Zone) settlements, involving a network of community volunteers.
The proposed initial works for the pilot project were to improve the access tracks, construct storm water drains, and protection to drainage outfalls. Also included was allowance for demonstration ventilated improved pit latrines and possibly pour-flush toilets, and a component for community initiatives to deal with solid waste. In the process the community would be strengthened and able to act as contractors for the works. They would also be involved in the planning and design of the works.

**Contrasts with the Kalerwe Pilot Project**

Unlike the Kalerwe project this pilot project was more ambitious in what was expected of the community. Whereas in Kalerwe the Technical Support Team (TST) was responsible for all procurement of materials and tools, and the contracts issued were labour only contracts, in Hanna Nassif the community are responsible for all procurement and letting of petty contracts to artisans. They are supported by the TST but have to accept a far greater responsibility for financial control and procurement of materials. The CDC are legally formed as a trust and operate their own bank account into which the funds are paid. A construction committee is in place and is a sub-committee of the CDC and they are responsible for the day to day running of the contracts and the receiving of funds for each sub-contract.

ILO is the executing agency with a national execution team, they are assisted in the field of community participation by UNVs. Habitat are providing general support to Dar es Salaam City Council and particular support to some of the council members of the TST. There were several delays in the signing of the project document and this resulted in a measure of disillusionment with in the community. Construction is now underway but progress has been slow due to design alterations and lack of engineering staff on site. The community contracting system is still undergoing changes and needs to be better organised. Despite commitments being given by the community, the parts of the work designated to be done by self-help has not been done by self-help. The idea of including self-help participation or monetary contributions was to maximise the amount of works that could be carried out with the external financial assistance and to enhance the feelings of ownership in the improvements being implemented.

As a pilot project Hanna Nassif has highlighted many of the difficulties of dealing directly with communities, relying on support from city council staff (this has been very mixed) and using communities to implement what are technically demanding works. However, work is still progressing and it is hoped that lessons will be learnt in solving some of the problems outlined here. The project has also highlighted the need to identifying which types of construction work are suitable for community contracts in the sense of their direct participation, and which may be better left to contractors under the joint supervision of the community and the community technical advisers.

**Other projects**

**Urban Slums Project - Nairobi**

Urban Slums Project is a population, environment and health/family planning services project in the urban slum areas of Nairobi. It is funded by the United Nations Population Fund (UNFPA) and sponsored by the National Council for Population and Development. The implementing agency is the Public Health Department of the Nairobi City Council. The project started on a pilot basis in January 1993 and runs up to December 1995 although it is basically a family planning project, one of the objectives is to improve
environmental health conditions, drainage canals and culverts through combined community efforts and the services of Nairobi City Council (NCC) in seven of Nairobi's largest slum communities in a sustainable manner.

**Activities/approach**
From the start all the interested parties were involved. The first phase of the project covers Kangemi and Kawangware areas. The community's awareness was first raised through meetings and seminars to the project, some members were selected for training in order to participate in environmental assessment. Different groups were interviewed and problems ranked. An action plan was drawn up and a village committee selected to carry out the action plan in collaboration with the Urban Slums Project. Garbage collection and drainage improvement were ranked highly. The sanitation works component of this project was thus started. These works include drainage of flood waters, construction of solid waste dumping structures, construction of VIP pit latrines, and construction of water supply points.

The project provides materials for use in the works and the community provides storage facilities and free labour for construction. NCC provided the designs and is involved in the technical supervision of the works. Artisans, particularly masons are employed from within the community and are paid by the project through the NCC.

**Achievements**
Kawangware:
- 2 refuse collection centre have been constructed.
- 1 water kiosk is under construction.
- 400 m of open drainage canal is under construction.

Kangemi:
1. 1 refuse collection centre has been constructed.
2. 1 water kiosk is under construction.
3. 300 m of open drainage canal is under construction.
4. 1 public toilet has been constructed.

**Problems/difficulties**
From interviews with the assistant coordinator of the project and a chairman of the Kangemi community committee, it was observed that the youth are not involved in the community work.

Some of the material, especially dressed stone for lining the drains are stolen. No watchman is employed to take care of them due to a desire to instil a complete sense of ownership to the community. It is left to the community to decide, contribute money and employ a watchman if they see it fit.

Unprecedented delays are frequently encountered due to uncovering of other services like water pipes, telephone cables and electricity cables. The departments concerned take some time before they come to relocate their services.

Another problem was the supply of tools. The community workers were initially supposed to come with their own hand tools. Unlike in the rural situation, most of the
people do not own any tools. Urban slums project has realised the problem and have now opted to buy tools and supply them to the people.

Solid waste dumping structures are not being emptied by the city council. Some of those visited could hardly be seen since garbage had fully covered them.

No technically qualified person is deployed fully on the site to supervise the construction. This leads to delays whenever the community reaches a point where they need technical guidance. The staff in the USP have no technical know-how in construction, they are basically medical health workers. This courses a few problems in supervision though it fosters closer cooperation with the NCC to supply the technical know-how.

Conclusion
This project gives a very good example of community participation which can be recommended for emulation. The community has been fully involved in identifying their problems, drawing up and implementing their action plan. The groups formed for the purpose of income generation or members of the village committees could be trained to take up community contracts, maintenance of the works and future construction. However, this has not been considered and would only be possible if NCC creates a framework for the inclusion of community (labour-based contractors) in their contracting system.

Non-Motorised Transport Rehabilitation Pilot Project
Within the Urban Transport Component of the Sub-Saharan Africa Transport Programme (SSATP) of the World Bank studies have been conducted in major cities in Mali, Kenya, Tanzania, Burkina Faso and Senegal. Plans are underway to start pilot projects for the establishment of urban infrastructure which incorporates facilities for non-motorised transport, including foot paths, cycle tracks on top of the usual carriageway for motorised vehicles. In the provision of this, it is hoped to use labour-based methods.

It is reported in the proceedings of a workshop to discuss the findings of the above studies that a pilot project will be starting in the city of Nairobi by March 1995, but interviews carried out by the author indicate that liaison with all the interest parties is not well coordinated.

Kabiro Human Development Project
This is a project initiated by the Institute of Affairs (ICA), a non-governmental organisation, for the general improvement of the living standards of the inhabitants of a section of Kawangware (a slum area in Nairobi). The project is in an area which is prone to flooding during the rain season and has no access road. ICA, in collaboration with the community, has build a primary school, a village polytechnic and a clinic to serve the inhabitants.

ICA contacted ILO/ASIST to assist them in solving the access problem. Having realised the importance and appropriateness of labour-based methods, ASIST opted to use the labour-based technology and community participation which was already in place. On a preliminary inspection of the project, the ASIST team found out that the underlying problem in the area is poor drainage. ICA was accordingly informed and plans are at an early stage in liaising with all the interested parties (city council, the community, ICA and the Urban Slums Project discussed above) to see how the problem can be solved.
**Katwe Urban Slums Project**

This is a UNDP/World Bank pilot project in Kampala, Uganda, concerned with low-cost water supply, sanitation and solid waste disposal in urban informal settlement areas with a key objective of development and implementation of participatory approaches that can be used by other External Support Agencies (ESA's) who wish to assist Uganda's development in this sector. The objectives and approach of this project are similar to that of the Urban Slums Project discussed in section on urban slums project starting in page 120 and the Kalerwe project discussed from page 115 onwards.

The Katwe Urban Pilot project was started in 1993 to demonstrate what can be done when communities are empowered to manage their own services. With support from the project it is expected that the communities in the Katwe Parish (the project area) will be able to show that they can be able to solve their own environmental problems through their own initiatives. That is, they will have planned and constructed affordable and appropriate basic facilities that will have measurably improved the situation while creating jobs and income.

The facilities being constructed include: water supply points (kiosks), storm water drainage systems, sanitation/latrines and toilet facilities and solid waste management systems. Due to the approach adopted by the Katwe Project physical progress was very limited but solid ground work has been made in strengthening the community.

**SUMMARY**

1. There is a need for a closer consideration of suitable designs and technologies for the providing of infrastructure in unplanned areas. Ideally a group of engineers with varying backgrounds should look at the solutions to providing appropriate designs for the works taking into consideration the restrictions of finance and land availability, varying soil conditions, and maintenance methods. The group of engineers could include; labour-based engineers, municipal engineers, drainage engineers, sanitation and water supply engineers. Town planners should be included in the group to give advice on the relaxation of planning standards for settlement areas.

2. Following on from the previous is the need to formalise aspects of the upgrading of unplanned settlement areas. There needs to be agreement with planning authorities on alternative planning regulations for certain areas of the town or city designated for the upgrading of unplanned settlement areas. The planning regulations should reflect the situation in the settlements and the scope of improvements that are practical. It should also address problems of land tenure.

3. If small contractors, or communities acting as contractors, are to be used in upgrading works then simplified contract documents are needed and those developed under pilot projects should be used as a basis for formalising this type of contract with the relevant municipal authorities.

4. Resulting from paragraphs 2 and 3 may be the need to support not only the communities in the upgrading of their environment, but also assistance to the municipal authority to adapt and cooperate in these initiatives, institutionally and technically.
5. If this method of working is to be accepted by municipal authorities and housing ministries, then the quality of the finished product must be of a comparable standard or an improvement to the alternatives of using municipal direct labour or traditional contractors. To ensure that the quality of work is comparable it will be necessary to decide for each situation the division of the works into those activities which can be carried out directly by the community and those that must be assisted by competent artisans and contractors. There is a need to look at the greater involvement of the private sector in the provision of design, contract preparation, and supervision services, as well as in the fields of contracting and site organisation.

6. To ensure sustainability in community-based organisations, non-government organisations and councils must be involved in the pilot projects and eventually be in a position to continue the works with very little assistance from outside agencies. In many cities in the foreseeable future it will not be possible to carry out upgradings of unplanned settlement areas without some form of external financing for major works. This is a result of the pressures on councils to maintain the infrastructure in the planned areas of the cities and to halt deterioration in the level of services they provide. There is however scope for cost sharing between councils and the beneficiaries for more minor works.

7. With unemployment and under-employment increasing especially among the urban poor, any method that is used to improve unplanned settlement areas should maximise the use of labour and use the opportunity to create employment. Employment should therefore be a major consideration in the choice of technology used.

CONCLUSIONS
The experience in Zambia, Uganda, Tanzania and elsewhere has shown that there is greater scope for community involvement in the upgrading of unplanned settlement areas than is presently being utilised, and that the use of appropriate technology and labour-based techniques are of a positive benefit in this type of work. There still remains a considerable amount of work to be done to improve on the systems for the implementation of upgradings works.

REFERENCES


