ASIST

Bulletin No. 12
September 2001

ADVISORY SUPPORT INFORMATION SERVICES AND TRAINING FOR LABOUR-BASED PRACTITIONERS
A programme of the Employment-Intensive Investment Branch (EMP/INVEST) of the International Labour Organisation (ILO)

Design and construction of suspension footbridges

By Eng V E Chipuru, Heart Geotechnical Engineers, Zimbabwe

Photo by ASIST Africa

Murerezi footbridge, Zaka Rural District Council, Zimbabwe

Proper access to social and economic facilities and services, such as clinics, schools, and commercial centres, is amongst the highest development priorities for many people living in rural areas. Short span footbridges are one of the access interventions aimed at improving rural access. When they are carefully placed at strategic crossings, the bridges improve rural access and can considerably reduce the time it takes people to transport their farm produce to the market and reach other services and facilities they need. In Zimbabwe such interventions have proven to be of life saving importance for children walking to school, while providing all year round access to other services at the same time. This article, while addressing rural access problems, focuses on the technical aspects of design and construction of short span footbridges.

In 1997 a rural travel study was carried out in Zimbabwe, with financial backing from Sida (Swedish International Development Cooperation Agency) and technical and advisory support from ILO/ASIST. Subsequent interventions involved mainly construction of footbridges in rural areas. The Government has a blueprint for standard suspension footbridges; however, these standard designs need to be adapted to each site. ILO/ASIST was requested by the Government to develop standard designs for spans

continued on page 4

Contents

Technical issues and news

Editorial

In this edition of the Bulletin we have tried to include articles with a more technical content than usual. This is in the belief that, after 25 years of applying labour-based technology, readers want hard information on what works and what doesn't. There is still a lot of news, since one of the main objectives of the Bulletin remains to keep you informed of developments in the field. However, you will also find technical articles on planning tools, footbridge construction, the development of appropriate engineering standards, and surfacing options for roads. In addition there are useful pointers on what to look out for in planning infrastructure improvements in informal urban settlements, and in developing contractors.

Now that the ASIST Asia Pacific Programme is firmly established, you will notice an increase in contributions from that region in this issue.

You will find quite a lot of emphasis on bottom-up planning and community capacity building, and in particular the role that the IRAP tool has to play in this. This is an increasing and necessary trend; however, it is yet to be matched by an accompanying investment in employment-intensive works by governments and donors. One of our main challenges in this new millennium remains how to convince governments and donors that labour-based methods and planning tools are worth investing in. They need to learn their ABC: be Aware of their advantages; have Belief in their effectiveness; and be Committed to their application.

Advisory Support, Information Services and Training (ASIST)

The Employment-Intensive Investment Programme (EIIP) of the International Labour Organisation (ILO) is a large-scale technical co-operation programme promoting the use of local resource based technologies in infrastructure works in developing countries, and strengthening their capacity to apply such technologies, while creating employment with fair working conditions. ASIST is a programme of advisory support, information services and training, within the EIIP.

ASIST currently comprises two regional support programmes in Africa and Asia working within the framework of the EIIP. Their objective is to increase the use of cost-effective local resource based strategies in the provision of sustainable infrastructure, and in so doing create employment with fair working conditions for men and women.

Advisory Support

ASIST provides comprehensive policy, planning, and technical advice. ASIST advises on project and programme design, co-ordination, monitoring, and review of urban and rural labour-based programmes; Access and Rural Employment (ARE) and Integrated Rural Accessibility Planning (IRAP) programmes.

Information Services

ASIST actively gathers, synthesises, and disseminates relevant published and unpublished information on and related to rural and urban labour-based technology and ARE. ASIST provides a Technical Enquiry Service to respond to specific requests for information. ASIST maintains a database of contact persons and institutions involved in the promotion and development of labour-based technology and ARE.

Training

ASIST provides support to national training institutions and universities in the development and provision of training. This involves support in the development of curricula, training programmes and material, training techniques, and methodology. ASIST also supports the international labour-based roadworks training courses for engineers, senior technicians, contract supervisors, and trainers, organised by the Ministry of Roads and Public Works (MoRPW), Kisii Training Centre, in Kenya.

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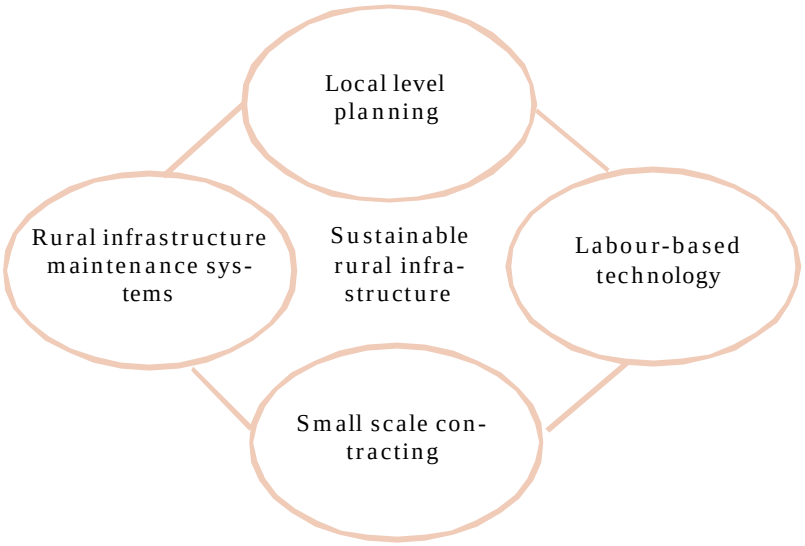
Strategies for poverty alleviation and rural employment creation

By Chris Donnges, ASIST Asia-Pacific, Thailand



The main objective of the ASIST programme is to mainstream its poverty alleviation strategies. The programme has no capital investment funds of its own but targets existing capital investments of governments and donors with the aim of maximizing the impact of these investments on poverty and employment. Strengthening local level planning capabilities is a prime area of potential impact. If resources are allocated according to the real needs of the people, the likelihood of these investments contributing to poverty alleviation increases.

Local level planning – where it all starts

Planning is essential to ensure that local and national governments, and donors, allocate their resources according to the real needs of rural people, and that the investments made serve these needs. Local level planning involves local governments identifying priorities for resource allocation. In the Asia-Pacific region, responsibilities for rural infrastructure development have been decentralized in a large number of countries. It is the local governments that have the responsibility to decide what should be built where and how. Local planning systems, procedures, and practices are evolving to allocate the resources available accordingly. In many countries however, local capacity to effectively assume the new decentralized responsibilities is insufficient, and planning systems, procedures, and practices are rudimentary, often highly political, and not transparent. This often results in an inefficient allocation of the already scarce resources for poverty alleviation in general and rural infrastructure development in particular.

Integrated Rural Accessibility Planning (IRAP) – the core

IRAP operates within a local-level planning environment. IRAP is a planning tool and not a planning system. It does not seek to replace an existing system no matter how rudimentary this system may be. It introduces a number of planning tools that have the potential to strengthen local level planning practices. The tools vary from survey instruments, mapping procedures, indicators, prioritization tools, project identification techniques, to monitoring and evaluation tools. These are all applied during different stages of the planning cycle.

The tools are limited in scope in that they only have a bearing on rural access and rural infrastructure sectors. The tools cannot be used for rural development planning at large. Ironically, this has contributed to the successful adoption at the local level in a number of countries where IRAP activities have been introduced. Often, the first tasks to be decentralized are the responsibilities for rural infrastructure development.

Participatory approach

Local level planning in most countries, in theory, is based on a participatory approach. Community priorities generally include a fair amount of infrastructure works. It becomes obvious that a set of planning tools that have the potential to improve the identification and selection process, based on a transparent participatory approach, is in high demand. IRAP involves communities in the different stages of the planning cycle.

Training

Applying IRAP involves training. Local government officials trained in the use of IRAP acquire planning skills that can eventually be applied in areas beyond rural infrastructure planning. Thus, IRAP is an entry point for strengthening local level planning processes, procedures, and practices.

Implementation

IRAP links planning to implementation. One of its main features is that the immediate outputs produced are in terms of priorities and investment proposals. These are 'ready-made' to enter the political arena for resource allocation, and often result in investment allocations according to the real needs of the people. The priorities identified, and investment proposals designed, seek to maximize the use of local resources, including labour, and have therefore an incremental impact on poverty and employment.

Since it all starts with planning, implementing IRAP paves the way for introducing the other poverty alleviation strategies. ASIST Asia-Pacific (ASIST-AP) promotes:

- labour-based technology to optimize the impact of investments on employment
- small-scale contracting (including community contracting) to maximize the involvement of the private sector, and
- infrastructure maintenance strategies to preserve the investment made, and to sustain the impact on poverty and employment.

In conclusion, plainly put, introducing and applying IRAP tools is a *sine qua non* if ASIST-AP wants to be successful in mainstreaming its poverty alleviation strategies within a decentralized or decentralizing environment.

Creating an impact

To ensure an impact, ASIST-AP works at four different levels.

Micro level

The programme introduces its concepts at the micro level through demonstration and pilot projects. For IRAP purposes, demonstration projects are now being developed for Indonesia, India, and Nepal. Demonstration and pilot projects are necessary in countries that are not yet familiar with the different ASIST-AP approaches. Past experiences have shown that it is almost impossible to mainstream procedures and techniques if they have no track record of success, adoption, and appreciation in a particular country.

Meso level

ASIST-AP works at the meso level by integrating its poverty alleviation strategies into regional large-scale investment programmes financed by multilateral institutions such as the Asian Development Bank and the World Bank. An agreement has been signed with the Asian Development Bank to link the IRAP outputs in the Philippines to a 150 million USD capital investment programme; and in Cambodia, IRAP tools are likely to be used in a World Bank Provincial Rural Infrastructure Programme.

National level

The ultimate objective of ASIST-AP is to mainstream its approaches at the national level. In the case of IRAP, progress in this respect has been made in:

- the Philippines, where IRAP is applied with support from the Department of Interior and Local Government in all Local Government Units in the country
- Laos, where IRAP has been institutionalized as the preferred tool for rural road planning
- Cambodia, where the Ministry for Rural Development has adopted IRAP as a tool for rural infrastructure planning
- Thailand, where the IRAP procedures are being included in a technical manual for local government officials.

Regional level

ASIST-AP in addition works at the regional level through its Regional University Network. Information, research, and experiences are shared between different universities in the region through a network, which includes an electronic discussion group. Universities will also be involved in the further development of the procedures, and in rendering them more country specific. This is presently the case in Indonesia, Thailand, and India. ■

continued from page 1

from 20 m to 160 m (at 20 m intervals), and guidelines for site investigations and construction of suspension footbridges based on the actual construction of at least one pilot suspension footbridge. Standard designs and guidelines have been developed. The guidelines are based on previous experience and knowledge, and information gained from interviewing the user societies of footbridges, plus notes and observations made during construction of the pilot suspension footbridge.

The standard designs were to be used by rural district council engineers with minimal design alterations on site. The ultimate goal was to build district level capacity for construction of suspension footbridges, either in-house or by out-sourcing the construction to the private sector.

Following is a summary of the issues that need to be considered when designing and constructing footbridges covered in the guidelines developed by ILO/ ASIST.

Cable stayed footbridges: Suspension and suspended

Two cable-supported footbridges are commonly used, namely the Suspended Footbridge and the Suspension Footbridge.

Some major features of the suspended footbridge are that the deck walkway is sagging in shape, the deck walkway takes the same shape as the main cables, and the vertical cable hangers are of the same height throughout the span length. Whenever freeboard is achievable and founding conditions permit, the suspended footbridge is a more economical option than the suspension footbridge.

On the other hand the major distinguishing features of the suspension footbridge are that the main cables are supported on elevated towers, with the deck walkway being horizontal or with a convex upward camber. Towers generally consist of two legs interconnected by lateral bracing for stability. The towers may be of steel sections or reinforced concrete construction. The reinforced concrete option is deemed easier to handle on site and requires less long-term maintenance. The suspenders (hangers) are of varying heights along the span. The hanger heights vary with the variation in the sag of the main cables along the span.

Photo by ASIST Africa

Lifting of the deck platform using chains and tensioners during the construction of the Murerezi suspension footbridge, Zaka Rural District Council, Zimbabwe

Design considerations for suspension footbridges

The live load to be considered depends on the load capacity expected and the materials to be adopted. The human occupancy on the bridge is determined by two criteria. Either the number of people allowable on the bridge at any one time is limited by the assumed safety of the main cables against breaking, or the main cable size is chosen to accommodate a certain assumed human occupancy of the bridge. Design economics and safety requirements normally dictate the live load to be adopted at any site. It is not necessary to provide a high bridge carrying capacity for a bridge with low pedestrian traffic. On the other hand it is not prudent to provide an expensive structure whose capacity to service the traffic requirements is limited.

For larger spans (greater than fifty metres), the wind effects should be considered because of the serious sway and longitudinal oscillations resulting from wind vibrations. Temperature changes cause changes in the main cable length, hence changes in the cable tension. Therefore temperature effects have to be considered at the design stage.

Choice of materials

The choice of materials for the bridge elements has a bearing on the final project cost and construction methodology. The choice of materials should be governed by local availability, transportation to site, degree of workmanship to be employed, degree of supervision (quality control), safety, durability (maintenance), and available funding. However, the engineer should make sure that all materials to be used meet the basic minimum requirements of safety and performance.

Siting of footbridge crossing points

The siting of a bridge crossing is determined by several considerations which include, but are not necessarily limited to, width of river, highest flood level, flow direction and water flow speed, site geology and bank stability, presence of tributaries, and existing trail system.

Adapting standard designs

The bridge deck length and height of towers for each bridge span is fixed from the standard drawings. The dimensions and layouts of the deck structure will not change, irrespective of site subsoil conditions. This part of the bridge is therefore adopted from the standard drawings, and no major alterations to the design need be done for each site. Minor changes may need to be done on the connection details to suit available materials and expertise. The bridge foundations were designed with an assumed height above ground level. Freeboard requirements may dictate that this height be increased such that the total height of footings and towers above ground level will be increased. The tower foundations were designed making assumptions on the ground strength, the subsoil activity characteristics, and the freeboard requirements; hence the elevation of the footing top above ground level. For each site these characteristics vary such that the substructure has to be redesigned to suit local conditions.

Construction of substructures

The footbridge should freely discharge the fifty-year return flood and remain undamaged by higher floods. The bridge must extend the full width of the river to a point either side of the channel banks where the footings and embankments are not continuously inundated by water. The embankments should be well protected. All corners of the footings or anchorage blocks need to be sufficiently embedded into the existing ground.

When excavating in decomposed rock or firm ground, only the plan area of the footing or anchor block should be excavated to save on excessive spoil material as well as to avoid the use of shutters for concrete casting. For unstable sides, the excavation dimensions may be increased from bottom outwards by stepping (berming) or sloping the excavation sides. Excavations deeper than one and a half metres (especially in unstable soils) should be braced or shored using an approved method. The slopes may be banked if shoring is not possible but a safe back slope must be maintained.

Concrete must meet the required specifications according to applicable standards. River water (especially flowing) may be

used for concrete works. Generally, water that is suitable for drinking is suitable for concrete. The various concrete constituents may be mixed in proportions defined by masses. For remote sites, it may be difficult to use this method of mix proportions on site. The mix proportions may be specified per cubic metre of concrete in which case the mix proportions are given as volumes to make up a specified target strength. This method is not ideal because of uncertainties in getting exact volumes, especially with the implements to be used on site for volume batching. Though the uncertainties are greater, this method of mixing may be the only appropriate method for isolated bridge sites.

Erection of cables

Cables are the most important parts of suspension bridges; therefore great care needs to be taken on handling to avoid kinks and splicing. Kinks and splices reduce the cable breaking tension. Before the cables are pulled across the river, control points should be marked on the cables, preferably with paint. The cables may be carried across the river either by walking across the riverbed in dry bed rivers, across temporary bridges if any, or by paddle boats in flowing or deep-water rivers. If no bridge exists, the cable may be pulled through the river by the use of ropes attached to the cable end. The cables may be hoisted onto the towers by one of two methods, *i.e.* hoisting from the tower sides or hoisting from the tower front. Taking the levels of the marked maximum sag position with a levelling machine or theodolite in relation to the tower top can monitor the sag during and after cable hoisting.

Erection of deck

The suspenders (hangers) and deck may be erected by either starting at midspan and working outwards or by starting at the ends and working towards the centre from both ends. The deck is erected by using fitter platforms, which should be approved by the engineer before use. The distance between the suspenders should be measured carefully and the distance from the towers confirmed after every tenth suspender.

Source of labour

The skilled labour required for bridge construction are steel fixers, concrete mixers and poker vibrator operators, cable tensioners, drivers, and quality control checkers. It is not likely that this manpower can be obtained within the locality of the project, except maybe drivers. The contractor usually has to bring his or her own skilled manpower. The footbridges are likely to be erected in areas where there are abundant unskilled labour resources.

Maintenance of footbridges

It is recommended to use standard inspection forms for monitoring the steel bridge components. The use of standard forms is meant to systemise the maintenance of steel parts and to set out proper procedures for inspection and acceptance of steel components. Inspection of the steel and filling in of the forms must be carried out carefully by a qualified person.

The anchorages will be inspected for rusting of the turnbuckles and hooks, functionality of the threads, and integrity of the individual members. The anchorages are exposed to vandalism and may be adversely affected by misuse. The steel cables, especially the main cables, may not be easy to inspect, especially between the towers. The erection platform may be used as an inspection platform if it is still available. The cables should be checked for rusting, spalling of the steel threads, and general loss of tension. The loss of tension is not easily quantifiable but is apparent from loss of structural integrity or deformation of the bridge. Hand feeling may also be used as a general check for cable tautness.

The live load from pedestrian traffic and wind effects tends to impose stresses in the connections. The connections may lose functionality by shearing of bolts and rivets, unscrewing of nuts, slackness in grips and studs. Each joint should be examined visually for any such failures and the defects made good. The cable seating over the deck is exposed to movement of the rope over the saddles. This movement may lead to deterioration of the saddle seating. The saddles may be moved out of position and the anchor bolts may be sheared. Greasing the saddle seating enhances the movement of the cable over the saddle.

The vertical hangers are subject to vertical and horizontal oscillations as well as to human activity at supports. The hangers may then deteriorate in tautness and may be displaced from their vertical orientation. It is easy to recognise a malfunctioning suspender by the loss of straightness and alignment. The deck is prone to normal wear and tear from human activity such that the deck connections will wear and the steel components deteriorate. The deck is also prone to rust action and should be inspected for any signs of rusting. The side wire mesh is the most vulnerable component of the deck due to the flexibility of the construction materials. The wire mesh may be vandalised by pedestrians. In some cases portions of the wire mesh may actually be removed for use by local people. The wire mesh is also prone to normal rusting and to disfigurement due to deterioration of the other adjoining bridge components.

The guidelines are available from ILO/ASIST for US$ 6.00 a copy. ■

Increased application of labour-based methods through appropriate engineering standards

By Tony Greening, Transport Research Laboratory (TRL), Zimbabwe

Photo by ASIST Africa

Soils testing kit used for in-situ materials testing on site

The need for improved knowledge of the lifetime costs of low-volume roads of different standards has been evident for some time but was specifically identified by practitioners at an ILO/ASIST seminar in Uganda in 1997. Following the recommendations from the regional seminar, a concept note was developed for a project, which would provide guidance on:

- the selection of appropriate construction standards for low volume roads
- selection criteria and compaction standards that are realistically achievable for typical soils using light equipment
- appropriate quality assurance techniques and site approval procedures
- the impact of different standards and techniques on maintenance needs and strategies
- the interaction between these various components and the likely impact on engineering performance and lifecycle costs.

Although a considerable amount of research has already been conducted addressing standards for low-volume unpaved roads constructed by conventional methods, very little research has been carried out on unpaved roads constructed using labour-based methods. The need for information on the life-cycle costs of these roads has become more pressing in recent years with donors funding many rural road projects in support of development programmes to improve livelihoods. The involvement of many different road agencies, NGOs, consultants, and contractors in these schemes has led to a proliferation of diverse standards and practices, the lifetime cost implications of which are largely unknown. There is little quantitative evidence available to assist practitioners in making appropriate decisions, many of which have a substantial impact on performance and total costs.

Country and donor support

In response to the identification of this need, ILO/ASIST, the Transport Research Laboratory (TRL), and the Swedish consultant Swedish National Road Consulting AB (SweRoad) prepared a consultation document for a project for discussion with potential collaborating country organizations and donors. ILO/ASIST also commissioned missions by TRL and SweRoad to visit some of the countries that declared an interest in the project, and there has been widespread support for the project both at country level and amongst the donor community.

The complete project is expected to be multi-donor funded. The country components have already begun in Ghana and Zimbabwe with support from the Department for International Development, UK (DfID) and the Danish International Development Agency (DANIDA) respectively. The Uganda component funded by DfID is expected to start soon. The Swedish International Development Cooperation Agency (Sida) and the Norwegian Agency for Development Cooperation (NORAD) have expressed interest in supporting other country components. Most of the countries in the region have planned or ongoing projects, which could contribute to meeting the technical objectives of the project. Negotiations will continue with some of these and with donors for additional support for the country-specific field studies and for the final consultation/dissemination phase.

Project aims

The main aim of the project is to improve the cost-effective provision of roads in rural and peri-urban areas in Africa. Thus the project is targeted at the populations in Africa that tend to be most economically and socially disadvantaged, and that often have the poorest road infrastructure, which hinders their participation in development.

Field studies

Information from this project will facilitate investment decisions, improve opportunities for the application of appropriate designs and construction methods and for the allocation of resources for anticipated maintenance needs. This knowledge is particularly important in adverse conditions where construction materials are poor, and where the prevailing environment is harsh at certain times of the year and rapid deterioration can be expected, even at very low levels of traffic.

There have been some studies on the relative costs of using plant and labour but these have not taken into account the different construction standards or how these might impact on performance and total engineering costs. Deterioration due to environmental and climatic effects on these very low-volume roads can be greater than the effects of traffic. This is the important difference between these and more highly trafficked roads.

This project aims to quantify and build an understanding of the effects of the main controlling components (construction standards, climate, soils, traffic, *etc.*) likely to affect performance and lifecycle cost implications of low volume roads. Although a considerable amount of research has been conducted to address standards for low-volume unpaved roads, this has been on more highly trafficked roads and has concentrated on traffic-induced deterioration. There remains a real need to develop appropriate standards for low-volume roads that promote appropriate technology choice.

Appropriate engineering standards, reflecting the needs of the rural road user, can be compatible with both equipment and labour-based methods. This research is set in the context of developing appropriate standards and lifetime costing for the cost-effective provision and maintenance of low-volume unpaved roads, whilst promoting flexibility in the choice of construction technique (equipment or labour-based methods) used to achieve the required standard. Therefore, the engineering standards developed from this research will also facilitate decisions to be made on technology choice.

The field studies in the various participating countries will be aimed at providing data to satisfy country-specific needs whilst also providing information for the regional research matrix.

Sustainability and technology transfer

The main international partners in the project are ILO/ASIST, TRL, and SweRoad. Whilst TRL are providing the research expertise, ILO/ASIST personnel include international and regional engineers who are experienced practitioners in labour-based technology. The project is designed to maximise the benefits of local partnerships. Where possible, countries have been selected not only to cover the range of variables being studied but also to benefit from the wide local knowledge available from practitioners in labour-based technology.

The project also has substantial sustainability, technology transfer, and capacity building components. It is designed to increase the viability of small-scale local contractors through the development of appropriate standards and methods for the rapid approval procedures of roadworks. Technology transfer will be achieved through the involvement of local partners including consultants, contractors, academic and research institutions, and road authorities. These local partners will play an active role in developing, teaching, and implementing appropriate cost-effective designs, standards, and practices. Through participation in the project, collaborating organizations will develop improved capacity to identify, carry out, and obtain funding for research in support of the road sector in the region. Their involvement is essential for the sustainable development of road infrastructure.

Outputs

The project will, therefore, produce the much needed guidance on likely 'best practice' for particular sets of circumstances, and will combine field evidence from different countries into a regional guideline. The main outputs from the study will be the country and regional guidelines on recommended standards for the cost-effective construction of low volume roads. The country reports will be based on the analysis of the results of the in-country research, and will make country-specific recommendations. The regional guideline will provide recommendations and advice on the selection of appropriate standards from performance-based relationships developed from the roads studied, with the aim of using approaches that optimise lifecycle costs. The project will also link to parallel unpaved road research initiatives being conducted elsewhere in the region and worldwide. ■

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Bibliographic Database on Labour-Based Technology

The ASIST bibliographic database of over 9000 employment and technology related publications is now available online on our website http://www.ilo.org/asist. You may browse the database and order publications from ASIST online. You can also download the database.

The database is also available for distribution on computer diskette or CD-ROM. You can order a read-only version.

Price: US$25.00 for a one year subscription with quarterly updates sent by airmail (this includes a set of diskettes or a CD-ROM and a user manual).

CONTACTS

Database of Labour-Based Technology Practitioners

ASIST maintains a network database of people and organisations concerned with alleviating poverty through employment intensive infrastructural works and through access and rural employment programmes.

If you would like to be registered on this database, please complete the registration form inserted in this bulletin and return it to the ASIST Information Service. If you are interested in consultancy work, please also send an up-to-date version of your CV.

Labour-based road surfacing trials in Zimbabwe

By the Department of Roads, Labour-Based Advisory Unit, Zimbabwe

Photo by ASIST Africa

Labour-based road surfacing trials in Inkosikazi, Zimbabwe

Background of labour-based technology in Zimbabwe

Zimbabwe has an agro-based economy and most of the population lives in the rural areas. The country has an extensive road network of major and feeder roads.

Most of the rural community depends heavily on the feeder road network, which has historically been given less priority than the primary and secondary road network, and is in a state of disrepair.

In 1991, the Department of Roads (DoR), through the Labour-based Development Unit (LBDU), introduced labour-based technology, which promotes the use of local resources and is less dependent on imported heavy machinery. The main objectives of introducing this technology were among others:

- to improve accessibility in areas historically neglected
- to empower the local population by creating job opportunities
- to ensure the continued maintenance of rural feeder roads.

This pioneer work, undertaken by DoR, was later reviewed positively both in terms of fulfilling its set of objectives and its suitability to the local conditions of Zimbabwe. As a result, the DoR expanded labour-based works and continued training engineers and technicians in the technology.

After further developing the technology in-house, the DoR/LBDU started the Small-scale Contractor Development Programme in January 1997. The aim of the programme was to encourage private entrepreneurs to take part in the provision of rehabilitation and maintenance of public infrastructure. To date about 19 small-scale contractors have been successfully trained (out of which 16 have been equipped) and are engaged in the improvement of rural feeder roads in various parts of the country. More than 100 small-scale maintenance contractors were also trained and engaged in carrying out routine maintenance operations on DoR roads.

Currently the LBDU is implementing the second phase of the contractor development programme, which started in April 2000 and is scheduled to continue to December 2004. The main objective of this phase is to consolidate the achievements in the previous activities under the labour-based programme, and to expand the technology into other sectors, such as Rural Districts Councils, Urban Councils, *etc*. The programme is funded jointly by the governments of Denmark and Zimbabwe.

The LBDU is still responsible for the co-ordination of the labour-based programme activities. The unit has been renamed the 'Labour-based Advisory Unit (LBAU)', which reflects the changes in its role.

As part of its responsibilities under the second phase of the labour-based programme, the LBAU is carrying out labour-based road surfacing trials with the aim of ascertaining the viability and effectiveness of the technology in Zimbabwe.

Why labour-based road surfacing?

Historically, when initiating a labour-based project, the major emphasis has been on the assessment of potential social benefits and on minimising the initial cost of construction. Little or no consideration has been given to the engineering lifetime, cost and benefits. This has led to the prescription of standard designs for all types of roads irrespective of the climate, material types, terrain, and traffic levels they are exposed to. In Zimbabwe, most roads covered by the labour-based programme are secondary roads with traffic volumes of above 50 vpd (vehicles per day). The LBAU would like to ascertain whether this type of road could justifiably be upgraded to a low-cost surfaced road.

Suitable road construction gravel is becoming a scarce commodity in most parts of Zimbabwe making road building expensive. Therefore, there is need to look for alternative ways of making use of locally available materials, *e.g.* blending using stabilisers or building rubble.

Provision of funds for road maintenance is reducing in real terms and the DoR maintenance coverage is decreasing every year. Eventually the DoR will be forced to concentrate on the core road

network (primary roads), and the rural feeder roads will be left to deteriorate. Surfacing of these roads would reduce the maintenance requirements and considerably reduce the maintenance workload of the DoR.

The LBAU is therefore carrying out surfacing trials to develop an appropriate design and work method that will address the above concerns.

The main objectives of the surfacing trials are:

- to come up with an appropriate mix of designs for the different combinations of inexpensive locally available materials and binders, in this case emulsion, and
- to ascertain the viability and cost effectiveness of labour-based surfacing in Zimbabwe.

In general, the intention is to develop a simplified method of surfacing roads using as much labour as possible with minimal equipment.

The first phase of surfacing trials was done on a section of Inkosikazi Road in Matebeleland North in December 2000. The road is a low standard road (*i.e.* designed for traffic equivalent to 0.05 million standard axles) with about 25 vehicles per day of which 30% are heavy. Trials with four surfacing types have been planned, *i.e.* double seal, single seal, sand seal, and slurry seal. To date two types have been laid.

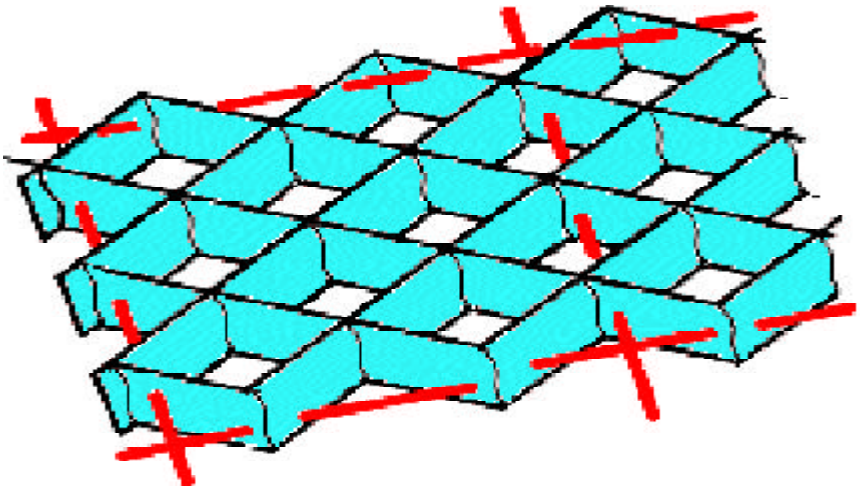
During the trials conducted to date the handling and application of surfacing materials has been accurate and conformed to the standards of Ministry of Transport and Communication for similar roads. Aggregate and binder application was done manually using simple but controlled mechanisms, and application rates were achieved within ± 5% of specifications. This successful construction is attributed to intensive training and good planning. Planning has been found to be one of the critical aspects in labour-based surfacing.

The equipment used is very simple and light such as wheelbarrows, a sit-on roller, shovels, a tractor, and a tar baby. Some of the tools used were improvised to suit the works.

The second phase of trials is in progress and is expected to be completed this year. ■

A South African product for building labour-based roads and drains

By G J R van der Meulen, Consulting Engineer, South Africa



Mrs Sally Hall developed a technique to weld a sort of large honeycomb-like geomat out of floppy plastic. This product has been marketed under the trade name Hyson cells® and has been found to be useful for infrastructural work.

Hyson cells®

The geomat has 150 or 200 mm square rather than hexagonal cells and is usually made 7 m wide and 30 m long, in thicknesses ranging from 75 mm up to 2 m.

For water retaining structures such as canals and sewerage ponds it has been found that the most common thickness specified by the engineers in South Africa are 75 and 100 mm. For trafficable pavements ranging from lightly trafficked low volume roads up to heavy-duty container yards the thickness specified ranges between 75 and 150 mm.

The plastic is merely 0.2 mm thick. The geomat is stretched tight to prevent the cells from collapsing and is supported by strings, which are threaded through the mat in the factory and form part of the patents covering the Hyson cells®. The strings have the task of holding the cells up but also prevent the mat from floating in wet concrete.

To support and anchor the mat, 10 mm diameter steel pegs are hammered into the sub-layer and are used at roughly one per square meter, except at the edges where closer spacing is used.

Once the cells have been positioned they are filled with a suitable fill material. Soil is used for building retaining walls, small dam walls, and vegetated coverings. For water retaining linings and trafficable pavements cement based concrete or mortar is most suitable.

The amount of cement determines the strength of the hardened blocks, which form inside the individual cells. The compressive strength is determined with cubes and is expressed in million Pascal units (MPa).

Whereas for some pond linings or slowly flowing canals weak concrete / mortar / grout of 10 MPa will suffice, the strength for a road surface should never be less than 20 MPa. The stronger the concrete the longer the road will last. It is generally accepted in South Africa that for important roads the concrete strength must not be less than 33 Mpa. A useful life of about 30 years can then be expected before major maintenance work is needed.

Research and experience

Professor Alex T Visser of the University of Pretoria has been involved with research on the reasons why roads built with Hyson cells® have out-performed conventionally constructed roads, in particular those built with poor road foundations. It is difficult for manual labourers with picks, shovels, and hand tampers to maintain a consistently high quality of compaction and grading of the foundation layers. The secret of the success of the Hyson cells® system is the ability to build local access streets on in-situ soil without extensive earthworks. The evenness of the underlying layers is however paramount.

Even slight deformation of the plastic cell boundaries allows the adjacent faces of the hardened blocks to form interlocking protrusions. The result is that even after each individual block has shrunk about 0.1 to 0.2 mm during hardening and drying out there still exists a 3D interlock between adjoining and surrounding blocks. Consequently, it is impossible to force one block down through a pavement even and in particular when the foundation is soft.

Both conventional flexible tarred and rigid concrete roads are highly dependent on the quality of the road foundation layer work for both their rideability and structural strength. Rideability refers to the evenness of the road surface and the corresponding comfort for the user. The structural strength is related to the formation of potholes, cracks, and ravelling at joints and cracks.

In 1994 Princess Anne, then President of the Chartered Institute of Transport and a sponsor of the Save the Children fund, visited South Africa and bestowed on Professor Visser the award for the best research paper, which dealt with Hyson cells® pavements and which contributed to the transport debate that year. During her speech she stated that Hyson cells® was a remarkable product as it allowed both unskilled men and women (with some initial training by Hyson cells® personnel) to construct durable roads in their neighbourhoods once and for all, instead of continuously spending time maintaining poor roads. This frees time to tackle other urgently needed projects.

Practical design considerations

Particularly for flexible tarred surfaces it is very important to ensure that the road foundations stay as dry as possible (wet soil is softer than damp or dry soil). It has therefore become good practice to construct roads higher than the general surroundings and to provide cambers or cross-falls to shed rainwater off the road as rapidly as possible. This requires importation of soil or gravel into the roadway and demands additional materials, transport costs, and labour. In addition the roads form shallow weirs, which impede the natural flow of rainwater.

However, with Hyson cells® minor roads and local access roads can be designed with flat tops or even hollowed to act as shallow rainwater canals. The low points (inverts) of such shallow canals should generally be in the centre of the road. In South Africa some local streets have been built with a side drain integral with the roadway as only two 200 x 200 mm edge beams, instead of four if they had been constructed as two separate entities.

When cambered local access streets are raised, the dwellings are often inundated while the roads are dry after rainstorms. If the roads are designed to serve the dual function of road and storm water canal then there is less likelihood of the surrounding dwellings being inundated during rainstorms.

The reason why designers can and do successfully use these new design concepts is because Hyson cells® canal linings are sufficiently waterproof. The South African Department of Water Affairs has successfully built irrigation canals carrying substantial heads of water. The small head of water that flows down a road only allows minute quantities of water to reach the foundations through the capillary gaps between the blocks. Furthermore, any water that might penetrate to the foundation would not be at the wheel tracks and therefore would not be detrimental to the life of the road.

Further information can be obtained on the website: www.hysoncells.co.za or from the author's e-mail address: maber@iafrica.com ■

ASIST Technical Enquiry Service

ASIST offers a Technical Enquiry Service (TES), which provides technical information upon request on labour-based technology and access and rural employment to projects, consultants, policy makers, donors, training institutions, and others interested in labour-based methods and management.

To support the technical enquiry service, ASIST actively collects both published and unpublished documents on accessibility planning, local resource utilization and employment-intensive technology for sustainable infrastructure construction and maintenance and sustainable livelihoods, and related topics. The collection includes techncial manuals, designs and specifications, text books, research reports, project reports, training material, periodical articles, *etc.* in both print and digital formats. Most of the collection is in English, with a small number of documents in French and Portuguese. The computerised bibliographic database, ASISTDOC, is maintained to facilitate quick and easy access to the collection of over 9000 documents (see page 9).

ASIST also has links to other information resources around the world, and maintains contact with experts in the field who can be called upon to provide technical advice or information.

If you require technical advice or information on labour-based technology for infrastructure development and/or access and rural employment, contact the TES by mail, fax, telephone or e-mail at any of the ASIST addresses.

You are also welcome to pay us a visit!

Building code review: A legacy that lives on

By Elijah Agevi, Intermediate Technology Development Group, Eastern Africa (ITDG-EA), Kenya

'Standards in developing countries tend to serve more as a means of social stratification than as a means of reconciling the shelter needs of the population with the maintenance of a reasonable level of environmental quality. They are so unrealistic that they are deservedly ignored by the majority of people in their efforts to solve their own shelter needs[2].'

Rapid urbanization, galloping inflation, and the elusive quest for shelter for all are some of the major constraints to sustainable development in Africa. These factors and the inter-related impacts have caused insurmountable difficulties to policy makers, development planners, and political pundits. Do standards, procedures, and regulations have a role in ameliorating the scenario?

During the 1980s, informal housing in many African cities reflected the total inability of most national or city authorities to provide adequate serviced land and infrastructure to their rapidly growing populations. In the 1990s and 2000s African cities have continued to transform in four major ways, namely size, spatial arrangements, the quality and delivery of services, but with adverse effect on low-income groups.

One of the factors that has been recognised as a hindrance to the development of and accessibility to decent and affordable shelter is outdated and highly inappropriate building and planning regimes. The need for review of standards, procedures, and regulations in Africa has been eloquently expressed by all stakeholders. A number of countries have tried to review their standards and by-laws with varying degrees of success.

The Kenyan case outlined below is indeed an example of how not to review[1]. A number of lessons have however been learnt from this case, such as the need to integrate the roles of various key stakeholders. It is clear that there is an urgent need to develop a review methodology that is simple, inclusive, and easily enforceable by the communities.

The paradox of standards, procedures, and regulations

- The formulation of appropriate building and planning standards, procedures, and regulations is more of an institutional problem than a technical one and hence more difficult to deal with.
- Less than half of the urban population can afford to build according to the prevailing standards and regulations.
- Complicated and time consuming procedures discourage the urban poor from investing in improving their built environment.
- Regulations often restrict the choice of materials and technologies
- Regulations favour modern over indigenous technologies.
- The lack of standards covering alternative materials and technologies has prevented their wider usage.
- Standards and procedures more often than not impair the livelihood of the poor.
- Procedures can be costly.
- Regulation prevents the poor from generating income in residential areas.
- Standards and regulations are often incomprehensible to all but a few.
- Knowledge and information on standards and regulations is often difficult to access.

So, to regulate or not to regulate? The debate goes on...

Need for change

Current housing standards in most developing countries are inappropriate to the needs of the poor, derived as they are from European standards for housing and infrastructure. Since the majority of urban residents in developing countries live in unplanned and illegal settlements, there is a need for a new paradigm, abandoning the colonial inheritance and using a more flexible approach[2].

The existing legislation as contained in the building code does not adequately cover the provision of infrastructure services. The building code has not been amended and local authorities have not comprehensively amended their respective by-laws. There is, therefore, need to review the entire building code and to adopt relaxed building and planning standards, and simplified regulations. There is also an urgent need to decentralize and institutionalize code administration in line with increasing the role of the community sector in shelter provision. Needs and affordability-based infrastructural standards are urgently required for informal settlements.

International as well as national housing policies and strategies increasingly argue for the revision of housing standards, but until now there has been little accessible information on how this can be achieved, or on what projects and countries have learned from their experience.

National review processes and programmes have tended to favour the rich and better-endowed stakeholders at the expense of the poor. An exclusive 'expert-driven' process that does not involve key stakeholders (the poor and vulnerable groups) has characterized the formulation and review processes. The consequences of such policy formulation processes are grave and obvious and yet we continue with the same processes and practices.

Is this the way forward into the 21st century? It is essential to stop, think, and learn from local, home-grown review experiences.

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1. Although Kenya was the first country in the South to address its inappropriate building standards, this early action did not lead to early results. It took the hard work of the non-government sector in Kenya to bring the need for change back onto the political agenda, and to follow it through..

2. Recently launched book: Yayha, S. et al. 2001. Double Standards Single Purpose. Reforming housing regulations to reduce poverty. ITDG Publishing

A case of too many actors?

Conclusions

It is clear that policy formulation and review processes are out of touch with reality on the ground. The core questions we ought to address include:

- How can we build on local resources and indigenous knowledge in identifying key policy issues in building standards and regulations?
- How can we work together to involve community-based organizations in the policy formulation and review process?
- What alternative people friendly and sensitive dissemination methods can we put in place for effective communication of the policies and review findings?
- How can we build effective and inclusive partnerships in the formulation and implementation of policies, standards, and regulations?

Building regulations have a major bearing on the cost of shelter and services for the majority of the urban population. They constitute a major barrier to affordable housing and services.

In many countries, including Kenya, there is consensus that the prevailing building codes, statutes, and regulations are outdated and unrealistically high. Many countries have had only limited success in reviewing their building and planning standards due to inconsistent methodology, which does not facilitate meaningful and effective local level participation. There are both local and regional examples of review processes.

Implementation of reformulated and relaxed standards has been on an *ad hoc* and on project-by-project basis, and has only been achieved after costly and lengthy discussions. Dissemination of information on reformulated by-laws has been piecemeal, uncoordinated, and ineffective. The building, planning, and engineering standards, statutes, and regulations are scattered in many documents and are prone to a lot of individual interpretation.

Many public, quasi-public, and private sector groups have vested, and occasionally conflicting interests in the field of standards. There usually is no single central body overseeing the formulation and implementation of building standards, procedures, and regulations, and to co-ordinate and regularly monitor the performance of building by-laws. There is machinery at local authority level to enable initiation, adoption, approval, and implementation of relaxed standards, which affect provision of housing to the low-income earners. Some local authorities have indicated willingness while others have actually approved the implementation of projects based on relaxed building and planning standards. Some developers have initiated designs, which incorporated relatively relaxed planning, building, and engineering standards, which should be encouraged. Where relaxed standards have been used, this has facilitated faster completion and consolidation. The reverse is equally true.

Establishment of a competent broad-based enforcement team with adequate resources is needed if we are to take the gains of revised standards and regulations to the next level of implementation and scaling up.

Finally, let us meaningfully practise what we preach; partnership, involvement, and engagement of all key stakeholders in the formulation and implementation of standards and regulations that affect all people. ■

Transport and the urban poor – a case study, Karachi, Pakistan

By Sohail Khan, Water, Engineering and Development Centre (WEDC), UK
Summarised by Tomas Stenström, ASIST Africa, Zimbabwe

Transport has long been recognised as a critical element in pro-poor urban development, yet it has received relatively little attention in recent urban poverty discussions. A study of Karachi seeks to address the relative neglect of transport and equity issues by looking at how transport influences the quality of life of some of the poorest in the city.

In Karachi, transport is important for the livelihood strategies of many of the urban poor. Transport is also important for the long-term prosperity and development of the city. The cheapest form of 'formal' transport is privately operated buses providing services along routes defined by local government. Hence this has been the focus of this study.

Thirty to forty per cent of the poor in the city use buses for livelihood related activities. The poor have to use what is available and affordable despite the dangers and difficulties. There are an estimated two deaths and scores of injuries every day as people crowd onto infrequent and poorly maintained vehicles. At bus stops, there are many small traders serving passengers, and these activities are an important source of livelihood, and provide essential roadside maintenance for buses. However, with no formal provision, these traders have to make do with the little space that is available, and create street garbage as well as considerable congestion for local residents.

Transport problems in any city are related to past planning and development decisions. In the case of Karachi, transport networks and systems have grown in an *ad hoc* manner with no attempt at comprehensive planning. Transport related infrastructure such as roads, bus stops, and terminals has been neglected, and providers and users alike have to make do with no formal facilities.

Experiences on the buses are universally negative. Getting space on a bus is so difficult that men risk their lives travelling on the roofs of buses during rush hour. Crowding means that clothes are ruined and stress levels are high. In addition to lack of bus stops and limited services, some routes stop completely in the early evening. The time lost and the limited timetables affect the quality of life and social and self-development opportunities. Women suffer particular problems with the lack of space and harassment on and off buses. An estimated ten per cent of income in an urban poor household is spent on transport.

The providers complain that the regulated low fares mean that revenue is insufficient to cover the cost of maintenance and repair, let alone any improvements to the services. They also complain that staff from administrative agencies frequently stop them and demand irregular payments for any number of bureaucratic regulations. There is an elaborate system of bribes paid to the authorities by transporters and hawkers.

The providers would like to see lower import duties on large vehicles, the provision of insurance facilities, fewer minibus providers, lower fuel prices, improvement of infrastructure, and the implementation of existing plans. In the absence of an alternative, the providers have organised a mutual compensation fund to assist with the replacement of damaged vehicles.

The regulators have little capacity to manage the situation. As noted above, there are major problems with non-enforcement of regulations, in part, due to illegal payments. Attempts have been made in the past to bring together the interested groups in order to make improvements. However, these have failed, partly because participants do not believe that other groups have either the will or the capacity to do anything about the problems. Nevertheless, there is a broad consensus on a few critical issues that need to be addressed.

A consultative process involving users, providers, and regulators resulted in a long list of recommendations. On the basis of these recommendations, the Urban Resource Centre in Karachi has agreed to some of them. Among those, to initiate an advocacy lobby for the required policy decisions, to collect and update information that would be required by the proposed transport agency, and to convene forums and workshops to enable small-scale partnerships between users, providers, and regulators.

The full report, *Urban Public Transport and Sustainable Livelihoods for the Poor. A Case Study, Karachi, Pakistan* by Sohail Khan is available from WEDC at a cost of £14.95. It is also available at http://www.lboro.ac.uk/publications. ■

Photo by WEDC©

A bus stop in Karachi

Small-scale contracting: Lessons learnt

By Bjørn Johannessen, Senior Rural Infrastructure Management Specialist, ASIST-Asia Pacific, Thailand

Labour-based roadworks technology has been firmly established in several nationwide rural roadworks programmes during the last twenty years. In more recent years, there has been a desire to move from works directly executed by projects or government agencies (force account) to the engagement of the private construction industry to carry out the works. The first successful project of this nature commenced in Ghana in the late 1980s — a programme that is now well established in several regions of the country with a significant part of the domestic construction industry involved. Since then, a number of similar programmes have been established in other countries, amongst others in Lesotho, Zambia, Malawi, Sierra Leone, Tanzania, Mozambique, and Cambodia.

It has often been suggested that one way of promoting the local contracting industry was to have small contractors involved through the use of labour-based methods. The emphasis on small contractors was based on the idea that they had a limited amount of equipment and would therefore adapt easily to the use of appropriate technology. For the contractor, the only issue of real importance is whether his or her operations are profitable. Therefore, in order to successfully introduce labour-based technologies in the private sector, it is necessary to (i) demonstrate the cost-effectiveness of these methods, and (ii) convince them that there are long-term market prospects using this technology.

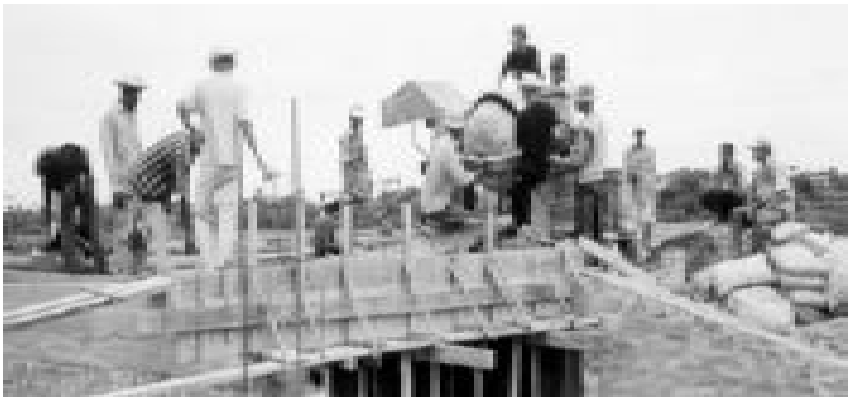
Photo by Rural Infrastructure Improvement Project©

Culvert construction, Svay Rieng Province, Cambodia

Since the small-scale contracting programme commenced in Ghana in the 1980s, a number of alternative approaches have been tried out in terms of involving the private sector in rural infrastructure development. Attempts have been made to establish contracting at village level, combined with self-help initiatives using communities as contractors, involving small contractors through targeted procurement and sub-contracting, converting force accounts units into contracting organisations, *etc*.

Based on the experience and performance of the various types of programmes that fall under the broad concept of small-scale contracting for rural infrastructure development, the Ghanaian model has proven to be most effective and sustainable. Although such a statement can be disputed for a number of reasons, it is clear that this setup has been quite appropriate when developing programmes of this nature in other countries.

Photo by Rural Infrastructure Improvement Project©



Bridge works, Kandal Province, Cambodia

Type of works

The ILO's involvement in small-scale contracting for rural infrastructure works has been centered around rehabilitation and maintenance of rural roads. In most cases, these roads form part of the public road network, consisting of secondary and tertiary roads. In other words they can be regarded as a public asset, and for this reason the work is funded by the regular government budgets. Often, donor agencies are involved through financial (and technical)

Photo by Bjørn Johannessen©

Completed rural road, Kampong Cham Province, Cambodia

assistance. However, the funds are still regarded as part of the resources made available to the public sector.

This issue has clear implications on who is in charge of the maintenance of the rehabilitated assets. Since the work is taking place on sections of the public road network, and implemented by the government, the maintenance obligations would naturally remain with the government. This maintenance work could provide contractors with additional long-term work prospects when funding is available.

Experience shows that the same applies to other types of rural infrastructure works such as rehabilitation of markets, schools, irrigation structures, small bridges, culverts, *etc*.

In most developing countries, there is a large demand for the further development and maintenance of rural infrastructure. This sector can therefore provide significant market prospects for the local construction industry.

Implementation capacity

One of the strengths of the Ghanaian model is that the contract management procedures follow basic contracting principles and concepts. Rather than reinventing the entire system, existing contracting systems are simplified, and only the parts which are relevant for a specific type and size of work are included.

In most public works organisations, there has always been some contracting activities and as a result the staff will have some varying degree of experience and understanding of the basic concepts of contracting. At a minimum, the staff will be aware of the fundamental roles of the client, the supervising engineer, and the contractor.

Furthermore, these organisations will have carried out some form of contracting using a set of contract documents, carried out a bidding competition, and supervised works carried out by private sector entrepreneurs.

In line with the basic concept of utilising local resources to the greatest extent possible, the chances of success are further enhanced when building on the capacity of already established organisations, which may even be represented at the local level where the actual physical works are taking place.

Decentralisation and good governance

Developing local contractors through their involvement in rural infrastructure works requires an efficient contracts management organisation that can properly supervise works, as well as take care of all financial and administrative responsibilities.

As part of developing government agencies' capacity to efficiently manage and implement rural infrastructure works carried out by the private sector, systems and procedures need to be installed which provide a certain level of transparency in the procurement process. Equally, efficient financial management systems need to be established which ensure that contractors are paid on time.

The decentralisation of responsibilities and authority, which is also essential for local decision-making, is a key factor for the successful implementation of geographically dispersed programmes, such as rural infrastructure works. It is particularly important in relation to small-scale works, for which the management resources of central government departments are seldom sufficient to provide proper supervision. Genuine decentralisation also enables local organisations to 'exert pressure' and therefore to defend their projects better because, at that level, the negotiating partners and the needs of the population are better known. This enables

When contract documents of varying degrees of detail are used for the varying scale of projects, it is essential to maintain continuity throughout the different documents. This will enable any contractor development programme to operate in an orderly sequence as contractors move through the various categories of contracts of increasing complexity and volume. Thus a contractor or contracts manager, with an understanding of the concepts of a contract document in its simplest form, will find a familiarity with the more detailed documents used for larger projects.

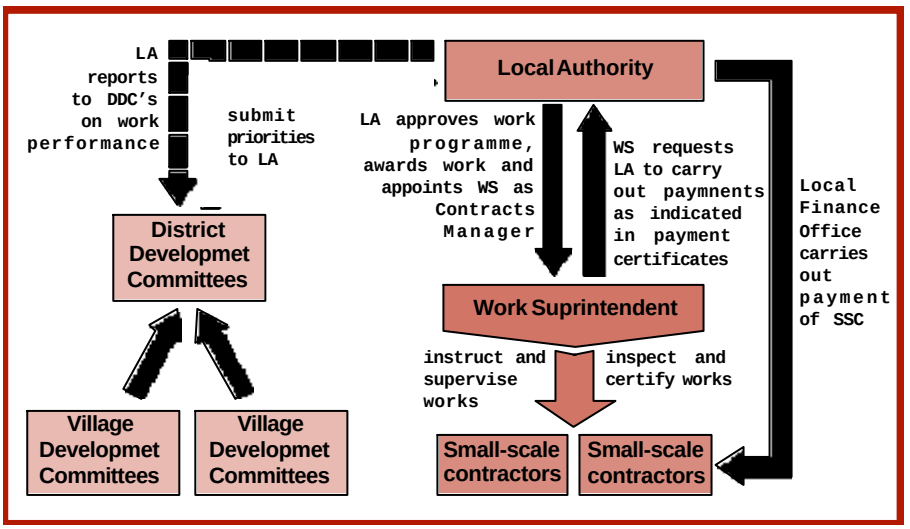


Photo by Bjørn Johannessen©

Earthworks, Prey Veng Province, Cambodia

Over a three year period the Rural Infrastructure Improvement Programme in Cambodia engaged 67 different local builders to construct 977 culverts, and 36 local contractors to build 108 small bridges. For most of these contractors, this type of work was new to them, when they were awarded their first contracts. Therefore, they were provided on-the-job training and close supervision while executing the works to ensure good quality of works and timely completion of works.

beneficiaries to have a greater influence on the technical choices, methods of implementation, and operation and maintenance aspects of the project. In addition, the users will then know who in the community is responsible, and whom they must turn to in case of difficulties.

All the above are key issues for developing good governance within the civil service. For small-scale contracting these are not only desired goals, they are actually prerequisites, and need to be in place at an early stage of programme development. Also, with small-scale contracting programmes, the issues of good governance are placed into a practical and useful context, and are immediately tested for their effectiveness.

Decent work

As mentioned earlier, there is considerable scope for applying small-scale contracting in several sectors in the rural areas. By packaging work to appropriate volumes, contracted work can be managed and supervised by local government offices close to the sites, and executed by local builders and entrepreneurs based in the project area.

Establishing efficient mechanisms, which allow the local private sector to participate in large-scale rural infrastructure development programmes, is not only a boost to local economies, but also a major source of job creation and further skills development. The development of the capacity of this segment of the local industry may enable them to take on similar job challenges in the future, and thus provide new long-term employment opportunities in the rural areas.

Types of contractors

There have been many misconstrued ideas of how small-scale contractors are recruited into a rural infrastructure works programme. One idea is to retrench civil servants and convert them into private entrepreneurs. Another is to create contractors from various interest groups at village level; and yet another is to make contractors out of the future users of the created assets. None of these approaches is viable for large-scale public civil works programmes.

Types of Contractors

Type	Description	Type of Works
Petty Contractors	v single person v labour only v limited skills v not registered	v routine road maintenance v labour only sub-contracts v spot improvement works
Small-scale Contractors	v local builders v possess some basic equipment and hand tools v registered as tradesmen v capital security low v possess some technical skills but limited managerial experience	v building construction v sub-contracts for special skills v construction and repair of simple structures v rural road rehabilitation
Medium sized Contractors	v registered v possess some equipment v capital security limited v entrepreneurial skills v technical and managerial skills	v road gravelling works v major rehabilitation works v bridge and culvert works v construction of gravel roads
Large-scale Contractors	v registered v good access to equipment v good capital security v proven entrepreneurial skills v good technical and managerial skills	v large-scale infrastructure programmes v complex building projects v works appropriate for equipment-intensive work methods

The main advantage of involving already established contractors is that this group can provide evidence of entrepreneurial skills through the works they are currently involved in. Although the major share of their works has usually been building works, they can provide a business entity, and an established organisation with administration, financial and technical staff, which could be further trained and developed to cater for the specific requirements of a rural infrastructure works programme (such as labour-based roadworks).

At the same time, it is important to acknowledge that the government, which is the formal owner of the assets to be constructed and maintained, needs to build on organisations with competent and experienced staff that will take on the management responsibilities of a civil works programme.

When surveys of the local construction industry have been carried out in relation to preparing for small-scale contracting programmes, there has never been any difficulty in finding appropriate size entrepreneurs for the type of works to be carried out.

Equally, it is important to acknowledge that contractors are in most cases willing to move to where the markets for their services are located. Rather than training a batch of new contractors when new projects commence in different locations of a country, it would be more appropriate to utilise proficient contractors from other parts of the country.

Photo by Rural Infrastructue Improvement Project©

Bridge works, Kandal Province, Cambodia

Training

Several projects that have tried to replicate the success of the Ghana programme have focused their capacity building efforts entirely on the contractors and their ability to carry out the physical works at reasonable standards and productivity rates. In order to obtain the required sustainability of a small-scale contracting programme, there is an equal, if not larger, capacity building requirement on the government side.

For an effective training programme the following key issues should be taken into account:

- The need for training and development is not only limited to the contractor, but equally, or in some cases more importantly, the organisations bearing the roles as supervising engineer and client need careful attention.
- Training must be provided in these four major subjects: (i) roadworks technology, (ii) contracts management, (iii) preventive maintenance and operation of equipment, and (iv) business management.
- Training should be carried out in a real situation, focused on purpose-oriented skills. In most projects of this nature, some training is required before physical works can take place. This pre-construction period needs to be as short and effective as possible, focusing only on the roles and responsibilities the staff will assume after graduation.
- Training should be provided to all cadres of staff involved in the programme.
- Training is more effective if conducted with real examples, and best in an environment of learning by doing. For this reason the training should be linked up with full-scale demonstration sites and an apprenticeship period (trial contracts).
- Client organisations need to be streamlined and re-organised in a manner which produces a conducive environment in which these contracting firms will be able to survive. Staff of the client organisation will require training in the new roles and responsibilities. ■

Photo by Bjørn Johannessen©

Setting out culvert pipes, Prey Veng Province, Cambodia

News from the Employment-Intensive Investment Programme

By Terje Tessem, Employment-Intensive Investment Programme (EMP/INVEST), ILO, Switzerland

The Employment-Intensive Investment Programme (EIIP) is the umbrella programme for the ASIST programme operations in Africa and Asia-Pacific. The ILO has placed renewed emphasis on the EIIP over the recent past and is supporting this programme from its own resources at the level of US$ 2.0 million per year. This includes some nine professional positions and two support staff, out of which four professional staff are based outside ILO headquarters.

ASIST makes the programme really operational in many countries. This setup means that the ILO can undertake a sizeable programme development, backstopping, and monitoring operation. The two ASIST teams are coordinating and implementing EIIP activities in their respective areas (East and Southern Africa and Asia-Pacific). However, EIIP headquarter-based staff are also involved with project development, implementation, and backstopping in some countries, particularly in the areas where ASIST is not yet established. This means mostly in French-speaking Africa, Latin America, and Eastern Europe.

Among the new country projects of particular interest is the US$ 7.0 million NORAD funded programme in Madagascar for small enterprises development, with roads and schools as the main infrastructure outputs. Other projects include work in Honduras and Nicaragua following the hurricane Mitch devastation.

Initial work is also being done to set up a regional programme support in Latin America; a Danida funded programme in the Andean countries is making some progress in this respect. A recent workshop (Lima, May 2001) involving a number of partner representatives (mostly in a consulting role) has enhanced the capacity of employment-intensive programme formulation with governments, donors, and financial institutions.

The development of new documentation for the EIIP is still at the heart of the activities in Geneva. The two EIIP Guides, the blue guide called *Employment-intensive infrastructure programmes: Labour policies and practices* and the green guide called *Employment-intensive infrastructure programmes: Capacity building for contracting in the construction sector* have now been made available in three major languages (English, French and Spanish). There is a leaflet series available for the 'Labour Policies and Practices' guide and a new set of 14 leaflets are just being finalised for the 'Contracting' guide. Other documents include a new *Employment-intensive reconstruction works in countries emerging from armed conflicts*, and the entire road sector training material is being worked into a French version (adapted for language and cultural barriers!).

With the arrival of Wilma van Esch (April 2001) and Marie Winsvold (June 2001), both formerly with ASIST Nairobi, the Employment-Intensive Investment Branch (EMP/INVEST) has been able to strengthen the focus on community-based infrastructure development. Wilma is sharing her time between EMP/INVEST and the sister unit on Small Enterprises Development (SEED). She will be working on community-focused employment creation within public private partnerships and low-income settlement upgrading. Marie will focus on the training component and will continue developing the Urban Site Supervisors course with the Kenya Institute of Highway and Building Technology (KIHABT) and the Kenya Water Institute (KEWI in Kenya.

For further information on EIIP check the website: www.ilo.org/employment/eiip. ■

ASIST Africa news

ASIST Africa, Zimbabwe

During the past few months, ASIST Africa has gone through some major changes, mostly related to organisational setup and staff changes.

ASIST Africa 2001-2004

ASIST Africa phase III ended in June 2001, giving away to a new phase which will run to June 2004. The team will expand the work on poverty reduction, pro-poor employment generation and use of local resources through the promotion of labour-based methods in rural and urban infrastructure development. Mainstreaming strategies will continue for rural access, participatory planning, community contracting, and the development of a labour friendly procurement contracting, and funding mechanisms. A key objective is the institutionalisation of relevant parts of the programme and the development of a tool for intergrated urban accessibility planning to complement the Successful IRAP (Intergrated Rural Accessibility Planning) tool. Technical fields will include roads, water supply sanitation, solid waste mangement, drainage, and irrigation.

Staff Changes

We would like to welcome Graham Johnson-Jones, who joined the team as Director in July. He replaces Jane Tournée who left the programme in April to join her husband in Germany. Fatemeh Ali-Nejadfard was acting Director in the interim period, for which we are very grateful. We take this opportunity to thank Jane for the excellent work done under her leadership.

David Mason, who has been the longest serving member of the ASIST team left the programme in July. He has been working as a Senior Technical Adviser and managing the office in Nairobi. We appreciate his valuable contribution in the fields of labour-based infrastructure development, training, information services and office administration.

Wilma van Esch (Senior Technical Adviser) and Marie Winsvold (Technical Adviser) have moved from Nairobi to take up posts in the ILO Headquarters. We thank them for their contribution to the ASIST programme, particularly in the area of urban infrastructure development, and look forward to fruitful co-operation with them in their new posts. Angela Kabiru-Kang'ethe (Information Co-ordinator) has been assigned to the Harare office.

The Nairobi office has been down-sized to a satellite office in an effort towards the institutionalisation of ASIST services. The office is housed at the Intermediate Technology Development Group, Eastern Africa (ITDG-EA) regional offices in Nairobi. ASIST services will continue to be provided as links between the two organisations are strengthened.

We also welcome to the team Stephen Muthua, who joined the ASIST team in June as Technical Adviser. He will be managing the ASIST satellite office in Nairobi.

We would also like to take this opportunity to acknowledge the valuable contribution of the following Nairobi team members who left ASIST at the end of March when the Nairobi office was down-sized: Annabel Chite (Information Officer), Violet Kwanda (Administrative Assistant), Felister Gitau (Secretary), Irene Njoroge (Library Assistant) and Peter Ngoha (Clerk / Driver). They deserve a lot of credit for the effective operation of ASIST in Nairobi. We wish them success in their future endeavours.

New contact details

The Harare office has re-located from the city centre office at Karigamombe Centre, to Arundel Office Park, which is situated in the suburbs north of Harare. The postal address remains the same:

ASIST Harare
PO Box 210
Harare, Zimbabwe

The physical address is as follows:

Block 8, Arundel Office Park
Mount Pleasant
Tel: +263-4-369824/8
Fax: +263-4-369829
Email: asist@ilosamat.org.zw
or
asist@africaonline.co.zw

The new contact details for Nairobi are:

ASIST Nairobi
PO Box 39493
Nairobi, Kenya

Physical address:

Second Floor, AAYMCA Building
State House Cresent, Off State House Avenue
Tel: +254-2-713028, 719413, 719313, 715293
Fax: +254-2-710083
Email: asist@itdg.or.ke ■

Visit the ASIST website

http://www.ilo.org/asist

for

news and full text publications on

local resource based strategies for sustainable rural and urban infrastructure provision including

„ Labour-based technology

„ Small-scale contractor development

„ Community contracting

„ Rural Access and Employment

„ Integrated Rural Accessibility Planning

„ Development of employment-intensive friendly contract, procurement and funding mechanisms

ASIST Asia-Pacifc news

The original ASIST Asia-Pacific (ASIST-AP) programme document was formulated at the time of the Asian financial crises in 1997. Unemployment sharply increased during this time and the number of people living in poverty grew drastically in a short period of time. The activities of the ASIST-AP programme were therefore primarily geared towards measures to alleviate the effects of the crisis.

The financial crises caused an economic slowdown in the region, but now three years later, although there are promising signs of recovery, not all countries are doing equally well, mostly due to internal factors. In early 2001 therefore, the ASIST-AP set out to review its programme and the premises on which it was formulated. The main conclusions of the review were:

- Poverty and unemployment in the region are still persisting and widespread. However, this is primarily due to a combination of internal and external factors and not just the Asian crisis of 1997.
- ASIST-AP now has a better understanding of the actual requirements of the different countries in the region.
- The programme needs to develop an internally coherent approach with clearly defined deliverable outputs, and establish lasting collaboration with countries and donors to be effective in mainstreaming the programme's poverty alleviation strategies through sustainable infrastructure development.

After revisiting the programme's goal, objective, and outputs, it was decided to take a broader conceptual view and time frame, and be realistic in terms of the institutional changes promoted by the programme.

ASIST-AP's overall goal was redefined as 'access of rural population to employment opportunities and to economic and social goods and services improved through the effective provision of rural infrastructure'. The approach remains people centered.

The immediate objective is to integrate 'local resource based strategies' for sustainable rural infrastructure provision into country and donor capital investment programmes. Local resource based strategies are inherent in the programme's four pillars of work:

- Integrated Rural Accessibility Planning (IRAP)
- Labour-based technology
- Small-scale contracting development
- Rural infrastructure maintenance strategies

Together, these four pillars form a coherent group of activities, which cover all stages of the project cycle from identification, formulation, implementation, and monitoring, to final review and evaluation. They enable the programme to deliver a complete and comprehensive package, which is more attractive to governments and donors.

Funding

One major development over the last six months is that funds have been allocated to the programme from the regular ILO budget. Not only does this provide evidence of the institutionalization of the programme, but also provides a strong argument when soliciting funds from donors. We have also moved office from the far-flung annex of the United Nations building to the main building, four floors below the corridors of power in the ILO regional office.

Staff

Geoff Edmonds took over from Mike Shone as Programme Coordinator in January this year. Bjørn Johannessen became a full time member of ASIST-AP as Senior Rural Infrastructure Engineer, and in early May John van Rijn joined us from ILO Dar es Salaam as Associate Expert.

Country activities

In the **Philippines**, we are finalizing an agreement with the Asia Development Bank (ADB) and the Department of Agriculture to provide support with ADB funds to the local level planning and labour-based aspects of a large rural infrastructure development programme. We are working with the Department of Interior and Local Government, in developing documentation on labour-based methods for the decentralized local government units. We have also continued to support the successful Dutch funded IRAP project.

In **Indonesia**, we have initiated an accessibility planning exercise to demonstrate the technology. We are also setting up the Regional Universities Network in Gaja Madha University. Whilst the project for ADB funding has not taken off, it now seems that funds from the Department for International Development, UK (DfID) will allow us to link onto a major ADB rural road rehabilitation project.

In **Thailand**, we are working with the Public Works Department of the Ministry of Interior to prepare a manual for local government officials on labour-based work and accessibility planning.

In **Cambodia**, we have worked with the successful Upstream project in all areas of the ASIST work programme. We have also been asked by the World Bank to prepare parts of a forthcoming rural roads project.

In **Lao PDR**, the accessibility planning project is coming towards an end after five years in which the planning tool has been operating in most of the Provinces of the country. We are going to be funded by ADB to provide support on labour-based contracting in a provincial rural development project.

In **Bangladesh**, we have provided input into the preparation mission of an ADB funded rural infrastructure development project.

In **India**, we are in the process of finalizing the arrangements for carrying out accessibility planning work in the states of Orissa and Rajastan.

In **Nepal**, we participated in the review of a rural infrastructure development project. We are also finalizing arrangements for an accessibility planning exercise. We have also been asked by the Department of Local Government to develop the institutional capacity of the Department in relation to the implementation of a large number of rural infrastructure programmes.

We are alos busy developing and publishing both promotional and technical material in user friendly formats, particularly for the web, which is the preferred means of communication in this part of the world. ■

The eighth regional seminar for labour-based practitioners, Cairo, Egypt, October 2000

By Elias Madondo, ASIST Africa, Zimbabwe

The 8th Regional Seminar for Labour-Based Practitioners was recently held in the Egyptian capital, Cairo. The five day meeting, which ran from 15th-19th October, drew more than 200 participants from 27 countries, mainly from Africa, but also from Asia and Europe. The Egyptian Social Fund for Development (SFD) hosted the seminar, supported by ILO/ASIST.

The scope of the regional seminars has broadened over the years from the initial focus on rural roads to other sectors such as urban infrastructure development through labour-based technology, rural transport and accessibility planning, and water infrastructure development. This was reflected in the papers presented at the seminar, and in the profiles of the participants who came from a variety of backgrounds.

The theme for this seminar was 'The new millennium — challenges for labour intensive investments'. The seminar was officially opened by Dr Mokhles Abou-Seida, Director General of the Public Works Programme, SFD who stressed the need to explore ways to maximise the social and economic benefits associated with labour-based technology. In the opening remarks of the Director of the ILO Multidisciplinary Advisory Team for Northern Africa, Cairo, Ms Loretta de Luca underscored the importance of this seminar in the context of linking investment strategies and employment policies in order to seriously fight poverty. ILO/ASIST presented a paper highlighting some of the challenges facing labour-based technology and its practitioners. Geoff Edmonds, Director of IT Transport, UK (now Programme Coordinator of ASIST Asia-Pacific, Bangkok, Thailand) presented the keynote paper to the seminar, which provided an excellent overview of present issues and challenges for employment-intensive investment programmes.

Photo by ASIST Africa

Rehabilitation of a water suppy network in Cairo Governorate

Other papers presented focused on the following issues: urban communities, rural infrastructure, policy, capacity building, rural travel and transport, and implementation. The papers were presented in parallel group sessions, and the participants had the opportunity to discuss the papers in the groups. There were then presentations and discussions on the group recommendations in plenary.

The participants spent a day out on site visits to three SFD projects within Cairo. These covered the:

- rehabilitation of a water supply network, Cairo Governorate,
- rehabilitation of a canal retaining wall, Giza Governorate,
- water and waste-water system, Cairo Governorate (Old Cairo).

Seminar Conclusions

The overall conclusions from the seminar were presented as the 'Cairo statement', which was formulated as a set of recommendations covering the following eight areas:

- Perceptions
- Policy support
- Education and training
- Procurement
- Technical standards
- Ensuring participation
- Planning
- Implementation and monitoring capacities.

These recommendations are targetted towards national governments, international funding agencies, and other bodies involved in or with an interest in labour-based technology. They are aimed at promoting and institutionalizing the technology. The recommendations will be reviewed at the next seminar when the extent to which they have been achieved or implemented will be assessed.

The ninth regional seminar is scheduled to take place in May 2002 in Mozambique. The theme and exact date will be announced soon and details will be posted on the ILO/ASIST website.

Papers and proceedings from the seminar are available from ILO/ASIST and proceedings will also be published on the ILO/ASIST website: www.ilo.org/asist. ■

Urban infrastructure development information survey

By Angela Kabiru-Kang'ethe, ASIST Africa, Zimbabwe

The Information Services of ASIST actively gathers, synthesises, and disseminates relevant information on and related to employment-intensive technologies and local resource utilization for rural and urban infrastructure development.

The urban component of the ASIST programme is involved in introducing and promoting the use of labour-based community managed approaches in the upgrading of urban low-income settlements. In order to keep abreast with the ASIST clientele information needs, the Information Services carries out surveys from time to time. Last year a survey was carried out to identify the need of those involved in urban infrastructure development.

Methodology

A questionnaire was developed and sent out to 92 recipients drawn from the ASIST CONTACTS database of people and organizations involved in employment-intensive technologies and local resource utilization for rural and urban infrastructure development. A total of 39 responses was received, *i.e.* a response rate of 42%. Thanks to all of you who responded!

Results

The respondents came from a variety of areas of specialization including planning, technical, training, policy, community mobilization and organization, technical assistance, and contracting.

Information requirements

The information needs were categorised into the following areas:

Infrastructure: Information on roads and housing, followed by drainage and solid waste management, water supplies and sanitation, is required. Other areas of need indicated include environmental conservation, afforestation and erosion control.

Policy: Within the area of policy, contracting (*i.e.* the creation of an enabling environment) and environmental issues were ranked as the highest areas of need, followed by technology choice, cost benefit analysis, labour and employment issues, public private partnerships, and gender issues. Good governance also came up as an area where information is needed.

Planning: Information on community participation and consultation is in high demand, followed by technology choice, data collection and analysis, and information management.

Designs and specifications: Information on community contract documents is required most, followed by labour-based technical specifications, contract documents and tender procedures for private contractors, and lastly topographical surveying, hydrological analysis, *etc.*

Implementation issues: When it comes to implementation issues information on the management of community contracts is in high demand, followed by labour management, appropriate technology, site management, tools and equipment, and contract management for private contractors.

Monitoring and evaluation: The monitoring and evaluation information most required is on evaluation and impact assessment methodologies, then monitoring methodologies, environmental impact analysis, and reporting systems.

Training: Information on planning, management, and capacity building for training is required most, followed by technical training on labour-based methods, awareness creation, and contract management.

ASIST focus

The respondents felt that ASIST should focus on collecting and disseminating information related to policy, implementation, monitoring and evaluation, planning, design and specifications, and training.

Target groups

The target groups ASIST should focus their information and dissemination activities on were ranked in the following order (highest to lowest): planners, policy makers, trainers, communities, practitioners at the professional level, technicians, undergraduates, researchers, postgraduates, academicians, and those at vocational level. (Engineers were not included as a separate target group as they fall under planners, policy makers, and professional practitioners.).

Medium

Print is still the preferred medium (32% of the respondents) for receiving information, followed by email (30%), CD-ROM (20%), and finally the Internet (18%).

Main conclusions

The results validate the current collection development and information dissemination policy of the ASIST Information Services in the area of urban infrastructure development. Information on urban infrastructure, policy, and implementation of labour-based works were found to be in the highest demand, and also the areas most respondents felt that ASIST should focus its information collection and dissemination activities. This closely reflects the current focus. The target groups selected are also those ASIST has tended to focus its information activities on, particularly planners, policy makers, and trainers. The need for information suitable for communities is an area of need that we recognize and on which we hope to place more emphasis.

We will continue to publish in print and will also continue to build up our digital collection of full-text publications for distribution by email, on CD-ROM, and the Internet. ■

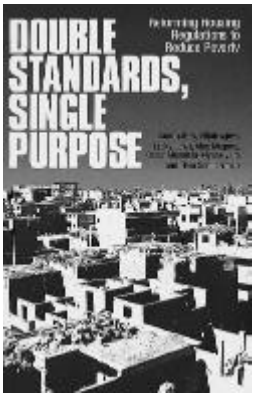
New publications

Double standards, single purpose. Reforming housing regulations to reduce poverty

Saad Yahya, Elijah Agevi, Lucky Lowe, et al.

ITDG Publishing. 2001. ISBN 1 85339 525 0. 192pp. US$22.50

Current housing standards in most developing countries are inappropriate to the needs of the poor, derived as they are from European standards for housing and infrastructure. Since the majority of urban residents in developing countries currently live in unplanned and illegal settlements, there is a dire need to review current practice and adopt a more flexible and realistic approach. This book provides development workers, planners, and decision-makers with information and advice on the revision of housing standards at a national, local, and project level.



Labour-based technology: A review of current practice. Proceedings of the eighth regional seminar Cairo, Egypt 15th - 19th October 2000

Compiled by Catherine Allen, Scott Wilson Kirkpatrick. Edited by ASIST

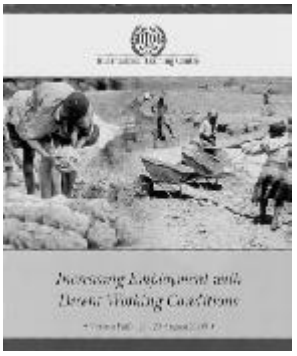
Volume 1. CTP 161. ILO/ASIST. 2001. ISBN 92-2-112538-6.
A summary of the proceedings of the eighth regional seminar, the theme of which was 'The new millennium — Challenges for labour intensive investments'. The seminar presentations and discussions covered issues related to urban infrastructure, rural infrastructure, community participation, policy, capacity building, rural travel and transport. The report provides summaries of the papers presented and discussions held.

Volume 2, a compilation of the papers presented, is also available as CTP 162. The seminar was hosted by the Egyptian Social Fund for Development.

Increasing employment with decent working conditions: Workshop report 21- 25 August 2000, Victoria Falls, Zimbabwe

ILO International Training Centre. 2001. 200pp.
This is a workshop report from a tripartite workshop that was attended by workers, employers, and government representatives. Participants were drawn from five countries, namely Lesotho, Malawi, Namibia, Zambia, and Zimbabwe.

The objectives of the workshop were to promote the use of labour-based technology where viable, and to promote decent working conditions within labour-based works. The eight papers presented at the workshop are included in the report, together with the conclusions and recommendations from the workshop.



Lessons learned: Feeder Roads Programme, Mozambique

Feeder Roads Programme, Mozambique. 2001. 70pp.
The Feeder Roads Programme (FRP) is a labour-based road programme in Mozambique that started in 1981.Under extremely difficult circumstances it continued throughout the civil war, and expanded during the rebuilding of the country with the return of peace in 1992. During its lifetime, the FRP achieved many things, among which were its incorporation into the National Road Authority (ANE), the rehabilitation of nearly 6000 km of unpaved roads, the provision of nearly 5000 person weeks of training, and the creation of over seven million worker days of employment.

Now, 20 years after its inception, the lessons learned during this programme have been compiled into a booklet, including institutional, technical, social, and economic aspects. This booklet intends to show some of the breakthroughs made by the FRP, as well as some of the mistakes. For example, although the FRP started with full rehabilitation of roads, they achieved great reductions in costs by using spot improvement methods and partial re-gravelling where possible, as well as adapting design standards for low traffic roads. The booklet explains the different systems of road maintenance experimented with by the FRP (lengthmen, gangs, contractors). Each had its own advantages and disadvantages, with the best option depending on the local situation.

The booklet pays much attention to the labourers employed by the FRP. For instance, there were no women employed at the start of the FRP. The involvement of women later became a priority, and women are now employed as labourers and trained to be tractor drivers and supervisors. A gender unit was also formed within the FRP, which was recently integrated into the main structure of ANE.

The booklet discusses these lessons and many more, as well as giving an overall picture of the programme. It is bilingual in English and Portuguese, and will be available from the ILO/ASIST office in Harare in September 2001.

Site supervisors course for labour-based and community-managed upgrading of urban low-income settlements

By James Manyara, Kisii Training Centre (KTC), Kenya

Background

Urban poverty in Kenya is increasing at an alarming rate. It is centred in urban low-income settlements, most of which are unplanned, and characterised by extremely poor living conditions. Efforts to curb rural to urban migration have had little impact, and the trend has continued unabated as people move in search of employment. The attention of the Government and international bodies has been drawn to the appalling conditions characterising unplanned settlements as a result of the influx.

Studies have taken place with the aim of finding sustainable solutions to the environmental problems in these settlements within urban areas. Kisii Training Centre (KTC) has been offering various training services in technical areas of road construction and maintenance using labour-based methods. Most of their training sites have been based in rural areas. However it was foreseen that the institution could play a key role by contributing its labour-based technology and management expertise to urban unplanned settlements.

In view of the available potential, KTC, with support from ILO/ASIST and Kenya Water Institute (KEWI), developed a training curriculum that can be used for training urban site supervisors. Other supporting agencies were Intech Beusch and Training Engineering Services (TES).

A course was developed which is currently being piloted.

The curriculum for the pilot course is divided into two stages:

1 Basic course for urban site supervisors
2 Skills course for urban site supervisors

Training objective

The objective of the course is to equip the site supervisors with knowledge and practical skills in implementing labour-based and community-managed improvement and maintenance works in low-income settlements.

Course content

The course is divided into various modules. The Basic course modules include:

- Urban environment
- Measurement
- Community managed labour-based approaches
- Materials, tools and equipment
- Basic technical skills
- Work implementation
- Work planning and reporting
- Quality control.

The modules covered in the Skills course include:

- Work management
- Labour issues
- Solid waste management
- Urban roads
- Urban water supply
- Urban sanitation
- Quantities and costing
- Contracting.

Basic course

The pilot Basic course took place from 1 to 13 December, 2000. The participants were drawn from local authorities and CBOs. Twelve participants attended the course. The course was conducted at Kisii Training Centre with some practical sites situated within Kisii and Kisumu towns respectively.

Skills course

The Skills course is scheduled to take place in August 2001. The participants who successfully completed the basic course are expected to attend this course.

Participants

The participants for the pilot Basic course were from Kenya. They had various professional backgrounds and experience and included:

- Work supervisors
- Foremen
- Community foremen.

Outcome

The participants were very much impressed with the course. Some indicated that the course was long overdue. They felt that the course was relevant, and that supervisors should be encouraged to undergo the training. They indicated that the course addressed the training needs for the urban site supervisors well.

For effective implementation of upgrading programmes in urban low-income settlements, all stakeholders must be sensitised on labour-based methods, geared towards community involvement. In future, participants from other countries within Sub-Saharan Africa will be invited to attend the course. ■

KTC Training Diary

Engineers course in labour-based road construction and maintenance

8 October - 17 November, 2001,
Kisii Training Centre, Kisii, Kenya.

Fees: US$ 4,200. The fees include tuition, field visits, practical training, course materials, transport services during the course, meals and accommodation.

Supervising labour-based contracts

4 - 30 March, 2002
Kisii Training Centre, Kisii, Kenya.

Fees: US$ 5,900. The fees include tuition, field practicals, course materials, transport services during the course, safe travel insurance, meals and accommodation.

Contact:

The Resident Instructor
Kisii Training Centre (KTC)
PO Box 2254, Kisii, Kenya
Tel/fax: +254-381-21634 or
Tel: +254-381-30699
Email: courses@kihbt-ktc.com

Labour-based urban upgrading programme, Lesotho

By Obi Ajuruchukwu, United Nations Volunteers (UNV), Lesotho

The Maseru City Council is set to release the first tranche of the allocation approved for the physical works under the 'Labour-intensive Urban Upgrading Programme' being executed by the United Nations Volunteers programme (UNV) with funding from the Government of Japan. ILO/ASIST provides technical advice to the project team of eight UN Volunteers. In 1999 ILO/ASIST participated in the formulation of the project, focusing on the institutional and technical aspects.

This project is testing the efficacy of community-based urban upgrading for poverty reduction and employment relief, drawing on the perceived strengths of decentralized structures, including municipal authorities.

The 1.3 km road on which the initial physical works are to be focused is located in the Ha Thetsane community now being upgraded by the Council to enhance the living conditions in this low-income settlement. This initial road project will train a core of technical council staff for supervisory roles on other sites in Mabote, Qoaling, and Motimposo communities to be started later in the year when more funds become available from the Lesotho Fund for Community Development. Preliminary surveys and cost estimates have been completed for a total of 74.5 km of secondary community roads that will be rehabilitated to address access and employment needs.

Since its official launch in October 2000, the project team has made significant progress in community identification and mapping processes, including conducting a needs assessment to determine the training needs for community action, and carrying out targeted training sessions at the community level. A training manual is being finalized that focuses on capacity building in community action planning.

Although project activities have been hampered by transport difficulties, the project has made reasonable progress towards mobilizing key partners and inputs crucial to project success. The project is also being propelled by the strong support it enjoys from the supervising Ministry of Local Government, which continues to emphasize its high policy relevance, especially in the context of the government's poverty reduction strategies and on-going decentralization programme. The Government is now exploring with the United National Development Programme (UNDP) and UNV, as part of the formulation of the second Country Cooperation Framework (CCF) for Lesotho, the possibility of nationwide expansion of the assistance within the framework of the Sustainable Cities Initiative in which the United Nations Centre for Human Settlements (UNCHS) Habitat is expected to play a role.

Helping you to improve infrastructure for poor communities

Call for information

By Intech Associates, UK

Intech Associates has been appointed by the UK Department for International Development (DfID) to compile guidelines on low cost road access for poor communities.

The programme will review international experiences in providing 'all-weather' road access using labour-based construction and maintenance techniques with simple equipment. Guidelines produced will be freely available to organisations such as yours and any communities and individuals who would like to improve the quality and effectiveness of road access.

We would like to call upon organisations and individuals who may have an interest in the improvement of road transport access for poor communities, and in particular any persons who may have experience or knowledge of providing low cost, labour-based road surfacing. We are inviting you to inform us of any information or documentation which may help in the compilation of the guidelines.

We are particularly interested in the following types of construction, which can provide a sustainable, and low-cost road surface for poor

Photo by Intech Associates©

Bitumen seal work using labour-based techniques

communities using labour and simple equipment:

- Hand packed stone
- Mortared stone
- Stone setts (Pavé) or dressed stone
- Concrete blocks
- Clay bricks
- Bamboo reinforced concrete
- Steel reinforced concrete
- Ottaseal (natural gravel bituminous)
- Sand seal
- Bituminous surface dressing
- Bituminous slurry seal
- Premixed bituminous macadam
- Penetration macadam
- Stone chipping blinding

We are also interested in the following road base construction techniques:

- Water bound macadam
- Emulsion or slurry bound macadam
- Mechanical stabilisation
- Chemical or emulsion stabilisation

Please respond if either:

1. You may have information, sketches, photographs, equipment details, costs, *etc.* or know of documentation that may assist in compiling guidelines on these types of road surface.
2. You or your organisation would be interested in receiving Internet access to or a hard copy of the guidelines when they are completed. There may also be interim guidelines and reports.

Please provide your contact details and advise regarding your possibility to assist or interest in receiving the guidelines.

Please respond (mentioning the Low Cost Surfacing Programme) to:

Robert Petts, Principal
Intech Associates
53 The Park, Great Bookham
Surrey, KT23 3LN, UK
Tel/Fax: Int.+44-1372-458955
or within UK 01372-458955
E-mail: rob@intech-consult.demon.co.uk ■

Labour-based roadworks 'one grain — four harvests!'

- creates employment
- invests money in the community
- provides new rehabilitated infrastructure
- improves quality of life and lowers transport costs

Colin Relf Award for rural transport

Dear Colleagues,

We were all shocked early last year with the news of the death of Colin Relf. For those closely involved it was quite moving to realise that their personal loss was shared by a huge and diverse number of people round the world. It was really quite remarkable how many lives Colin had touched.

Amongst many other interests, Colin was particularly involved with the beginnings of the International Forum for Rural Transport and Development (IFRTD). This started way back in 1985 with a donors meeting that he and colleagues organised in Switzerland to present the idea of an international institute for rural transport. Over the years this idea was refined and revised and eventually came to fruition as the Forum. Colin was very much involved in nurturing the whole idea of the Forum. Some of us felt it would be appropriate to have a simple memorial for Colin associated with the Forum.

The idea for an annual Colin Relf Award for young professionals engaged in work on rural transport emerged as a fitting tribute, given Colin's concern with promoting and motivating the people with whom he worked, and his abiding interest in the written word! This idea was unanimously endorsed at the IFRTD's Advisory Committee Meeting in November 2000. The undersigned agreed to form a sub-committee to help organise and direct this initiative.

The award will be worth £250 and would be presented to a young Third World professional whose study/project/proposal the panel of judges consider the most interesting and exciting in terms of furthering the current thinking on rural transport. The judges would be two to three people. They would be self-selected but hopefully they would be knowledgeable enough to assess the entries, and again in keeping with Colin's interest, pay particular attention to the language! We aim to make the first award this year in September, and would continue to run it as long as we have funds, and obviously interest from potential winners. The competition for the award will be announced through the Forum News (the IFRTD newsletter), and through newsletters of the ILO/ASIST programmes and through other means.

As people who respected Colin Relf and his contribution to development, we hope that you will make a donation towards this initiative, and that you will tell other friends and colleagues of Colin about this. We will keep you informed on how the initiative progresses. If you wish to contribute please send payment by cheque to:

Intermediate Technology Consultants
The Schumacher Centre for Technology & Development
Bourton Hall
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We look forward to your support.

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Evaluation of Hanna Nassif community based upgrading project phase II

By Wilma van Esch, Small Enterprise Development (SEED)/Employment-Intensive Investment Programme (EMP/INVEST), ILO, Switzerland

Photo by ASIST Africa

Upgrading works using labour-based community contracting in Hanna Nassif

This project started in 1993 following a request from a local community and the city council for assistance in upgrading an unplanned settlement. Although other plans existed to improve the environment by reducing the severe flooding, these designs would have resulted in demolition of a large number of houses. As Tanzania already had experience in the use of labour-based methods in rural areas, the ILO was requested to adapt this methodology to the urban unplanned areas.

After the evaluation of the first phase in 1996, the second phase of the project was implemented by the University College of Lands and Architecture Studies (UCLAS) who provided the Technical Support Team (TST). The ILO played an advisory role on the design and labour-based community contracting. COWI (Tz) Ltd. provided the technical design. Funding was provided by the United Nations Development Porgramme (UNDP) and the Ford Foundation. The National Income Generating Programme (NIGP) managed the funds. IT Transport was contracted to carry out an evaluation in December 2000.

The main findings of the evaluation are that the project adapted an innovative approach in both its institutional setup and in the use of labour-based community contracting and community management in an urban environment. The overall concept was found to be well conceived and to meet the needs of the local population. The living conditions have been improved through an improved environment, with less flooding, lower levels of disease, greater access to social and economic services, and increased opportunities for income generation.

Overall the concept was to build local infrastructure using and developing local capacity. This was achieved through:

- Community participation through the Community Development Association (CDA) and wider involvement of residents in all levels of the project from planning to evaluation.
- Clever design of infrastructure to fit within the existing environment.
- The use of construction modes and techniques to maximise the benefit to the local community, such as labour-based methods and community contracts.

Lessons learned

The evaluation revealed a number of lessons that can be learnt from the Hanna Nassif project, the most significant being:

- It is important to focus on institution building as well as on infrastructure, to ensure ownership and sustainability.
- It is important to start devolving responsibility to community organisations as soon as possible.
- The use of a credit scheme to enable some financial stability is an essential element of building local institutions. However, the institution needs to have a certain level of financial management skills before this can begin.
- Institution building should be a combination of training and mentoring of individuals and organisations, and should be seen as a process of learning by doing.
- Similar urban community projects should work within existing local administrative structures as much as possible (or in very close collaboration), with the administration buying in specialist services.
- Mobilisation in large urban communities should be targeted and strategic, using a range of tools to utilise the different modes of communication within a mixed community.
- In large urban communities the collection of funds for works should be through existing structures used for tax collection.
- In unplanned urban environments the promotion and use of labour-based methods and community contracts ensures positive effects and impacts for the local community.
- The use of a credit scheme to stimulate local business, raising awareness of other project activities, and working toward CBO financial sustainability, should be promoted in other projects. ■

Access and Rural Employment country project news from Africa

By Fatemeh Ali-Nejadfard, Jan Sakko, ASIST Africa and Serge Cartier van Dissel, SAMAT, Zimbabwe

Uganda

An initiative involving the application of the Integrated Rural Accessibility Planning (IRAP) tool in the local level planning structure started in August 2000. This process has so far included: a) assessment of the extent the district development plan addresses the access problems of rural households, b) recommendations to improve the district planning mechanism through application of IRAP, and c) identifying the gaps in the district technical capacity to effectively carry out the district planning process. Discussions among key officials at the central and district levels are underway to identify the technical gaps at the district level that can be jointly addressed by the Government and ILO/ASIST to improve rural access through better planning and prioritization of available local resources.

South Africa

Rural access is considered a serious problem in several provinces of South Africa, including Northern Province. A proposal was submitted to the Government in Northern Province in November 2000 for a series of training workshops that would strengthen the local capacity to address some of the access problems in rural areas through better planning and allocation of available resources. This proposal has been reviewed favourably by the Department of Local Government in Northern Province. A joint meeting between the Department of Local Government, the Association of Rural District Councils in Northern Province, CSIR, and ILO/ASIST was held in March discussing the way ahead for further actions. Proposals were made to:

- Seek the possibility of integrating IRAP into the planned training modules of the Integrated Development Plan (IDP) meant for provincial planners, councillors and mayors, senior officials in different provincial departments, and other key personnel required to support the IDP process,
- Provide technical support on rural accessibility and IRAP required for the training of the President's initiative in the two targeted areas in Northern Province within the ambit of the Sustainable Integrated Rural Development Strategy (SIRDS). This is one of the President's initiatives for rural development to be piloted in 13 different areas in South Africa, two of which, Skhukhune and Bushbuckridge, are in Northern Province.

  Relevant to SIRDS, a few centers will be established for Planning, Implementation, and Monitoring (PIM) to train district planners. ASIST's inputs on rural access and IRAP in the PIM training modules were found relevant.

The above training will be carried out through joint efforts between the Government, ILO/ASIST, and CSIR. Assuming the different actors would commit themselves to what has been promised, there would be a considerable impact in addressing poor access in rural areas through the introduction of IRAP into district planning and various Government initiatives at national, provincial, and district levels.

In addition, the collaboration with the University of North continues. Similar collaboration is being sought with Transvaal and Zulu Universities in Eastern Cape. These universities are keen to integrate issues of rural accessibility and IRAP into their courses because they would be very relevant to existing conditions in Eastern Cape, which is largely rural and faces serious access problems.

Zambia

An initiative involving the application of IRAP into local level planning started in Kalabo District, Western Province in August 1999. The process has so far included:

- The assessment of local level planning in addressing the access problems in rural areas
- A pilot exercise to test the possibilities of using secondary data in collecting information for key access variables. This exercise was successfully completed in February 2000 with a set of recommendations for the way ahead. Following the recommendations, a small pilot project was formulated in November 2000 for action in a few districts, with a view to

Photo by Rob Dingen©

Training of trainers in accessibility planning in Malawi

wider application. This project is under review by the Government and a few potential donors.

Malawi

Labour-based technology (LBT) in Malawi is gaining momentum again, since the completion of the successful District Road Improvement Project (DRIMP) and Village Access Roads and Bridges Assistance Units (VARBAU) projects. Different organisations active in Malawi have continued promoting LBT, and a start is being made to coordinate the separate efforts. A few examples of such organisations are given below.

CARE Malawi has started its Community Road Improvement Project (CRIMP), which aims to build local capacity in the private sector. Several small-scale contractors are being trained for the rehabilitation of roads, and women's groups were trained for routine road maintenance. The National Construction Industry Council (NCIC) was also involved and is looking into the possibility of training more of their members to become labour-based contractors.

The World Food Programme (WFP) is continuing its Food for Work programme, with more emphasis now being given to the sustainability of the constructed assets. The new Food for Assets (FFA) programme concentrates on community works, and prioritisation of interventions will be done using the Government's District Planning System (DPS). WFP also plans to extend the FFA into the urban unplanned areas in Lilongwe and Blantyre.

The Malawi Social Action Fund (MASAF) has been involved in labour-based works for many years now, and is the most important funding agency for roadworks in Malawi, apart from the National Roads Authority. Besides this Public Works Programme, there are Community Sub-Projects that deal with a number of different types of interventions.

With respect to Rural Travel and Transport, the past efforts of different organisations in Malawi are starting to bear fruit. The Government of Malawi is in the process of incorporating the Integrated Rural Access Planning (IRAP) tool, which was developed in Malawi, into the DPS. The ILO and the Malawi Rural Travel and Transport Programme (MRTTP) are supporting this initiative. Much capacity building is still needed, however, both in the use of the IRAP tool and in the new DPS.

Zimbabwe

In August 2000, ASIST organised in collaboration with the Government of Zimbabwe (Department of Physical Planning) a four day introductory training on 'Local level planning and the identification of access interventions' in Mrewa. A group of 12 planners, project officers, and engineers from 11 Rural Districts Councils, and five officers from the Planning Department familiarised themselves with the Integrated Rural Accessibility Planning (IRAP) tool. The participants also discussed strategies to improve the local planning capacity and to increase community participation in the implementation of access interventions (*e.g.* footpaths, footbridges, *etc.*). The programme comprised classroom exercises and field work (data collection and site visits).

In March 2001, the Department of Physical Planning hosted a follow up workshop for senior decision makers from different government ministries. The application of the IRAP tool in current planning systems was the focus of discussion. The thirty participants discussed the implications of current planning legislation and planning standards to rural service delivery, weaknesses of district level plans in reflecting the priorities at village and household level, and possibilities to optimise the available financial resources for service delivery to the communities. The workshop concluded that there is need to exercise flexibility in the application of standards and policies, to consult and involve local communities in mapping of facilities and location of services in their area, and to strengthen 'bottom-up' planning through advocacy. The Secretary for Local Government, Public Works and National Housing officially opened the workshop.

During the second half of 2000, ASIST advised the Rushinga Rural District Council (RDC) in the upgrading of the Nyamvumbi dam and spillway. The dam reservoir was heavily silted and posed a threat to livelihoods in the surrounding communities during the rainy season. When the spillway was inaccessible for local transport, people had to walk longer distances and could not transport their farm produce. A Harare based engineering firm assisted the RDC with the repair and widening of the spillway, and raising the dam to its original height. The benefiting communities participated in the rehabilitation works.

(See also article on page 31). ■

Photo by ASIST Africa

Field survey in Mrewa, Zimbabwe

Rehabilitation of the Nyamvumbi dam, Rushinga, Zimbabwe

By Richard Maasdorp, Sesani Projects, Zimbabwe

The Nyamvumbi dam is situated in the Northeast of Zimbabwe amongst the rolling hills of the Zambezi escarpment. This modest dam is an essential part of daily life for the communities around Chimanda growth point. They use the dam reservoir to water their livestock and as a source for non-potable water. For most people of the surrounding communities the dam wall and spillway is an essential daily passing route for transporting goods (by bicycle, wheelbarrow or head load) to the growth point, or to access services in and around Chimanda.

Unfortunately over the years water storage has given way to silt and, as a consequence, the flood absorption capability of the reservoir has been dramatically reduced. Floodwater occasionally overtopped the earth embankment (causing, fortunately enough, not catastrophic damage) and undercut the foundations of the masonry spillway. As each rainy season passed, the danger of the dam wall failing had increased exponentially — a very tenuous situation! Moreover, it was clear that the width of the spillway was in fact too narrow a passing route for pedestrians with head loads, and for children too dangerous to cross during the rainy season.

As one follow up to the *Rural Transport Study in Three Districts of Zimbabwe* from 1996, the dam, a strategic access route, was prioritised for rehabilitation and spot improvement. Funding was made available through Sida, and ILO/ASIST agreed with the Rushinga Rural District Council on a plan of activities. Sesani Projects, a Harare based consultancy firm, was hired to provide technical and project management services. However, the project could only start during the second half of 2000, mainly because of capacity problems within the council.

The scope of work included:

- stumping and clearing of the embankment
- importing 1800 cubic meters of fill material on a three kilometre haul using two tractor-dumpers
- importing by hand 180 cubic metres of water (180 tonnes) for conditioning purposes
- placing of 40 cubic metres of masonry
- fabricating and placing gabions for erosion protection.

Photo by ASIST Africa

The rehabilitated spillway provides access to the market and other social services

ASIST and the Council had agreed that the participation of the local community in the construction works was to be maximised. To this end, many tasks were designed and undertaken by manual labour, such as:

- clearing of trees and vegetation from the earth embankment
- removing unsuitable material and levelling the embankment ready to receive carefully selected 'fill' material
- moisture conditioning the 'fill' material (brought to site by tractor-dumpers) using buckets and a human conveyor system
- compaction by hand ramming at places inaccessible to tractor compaction
- winning of sand and rock for the spillway repairs
- masonry construction of the spillway, its foundation and wing-walls.

After a short trial period, the project adhered to the requirement to deploy an equal number of men and women on site. Sesani Projects, in consultation with the supervisory staff on site, established which tasks were best suited to men and women.

The project was not implemented without difficulties. Although the project got off to a good start, the harsh economic climate meant that there were often lengthy delays in procuring cement and diesel. Those delays were soon followed by two months of incessant rain, which put a halt to all the work. The first phase of the rehabilitation work was completed early this year. More than ten communities surrounding the dam reservoir will benefit from the rehabilitation works. ■

Employment friendly technology in South Africa

Jan Sakko, ASIST Africa, Zimbabwe

In March 2001, the Department for International Development UK (DfID), the Government of the Northern Province, and the ILO signed an agreement for a new programme that will train small contractors who will rehabilitate and maintain rural roads using employment-friendly methods of work. DfID has earmarked 750,000 Sterling Pounds for training activities that will be carried out by the ILO. The ILO will provide training expertise and monitor the programme. To support regional cooperation and exchange of skills, the Lesotho Department of Rural Roads will assist in the training of the selected emerging contractors.

Targeted procurement workshops

The Department of Public Works (DPW)and the Association of South African Women in Construction (SAWIC) have hosted a series of provincial training sessions to familiarise emerging female contractors with the new tender requirements for public contracts that have become operational in South Africa. (This system of 'targeted procurement' requires tenders to compete on price-quality criteria and to meet social goals built into public contracts). ASIST supported two workshops in Durban and Port Elizabeth and took the opportunity to brief the audience on the use of labour-friendly construction methods and typical Rural Travel and Transport (RTT) problems. ASIST emphasised the market potential for implementing small projects that immediately improve community access to services, such as foot-bridges, boreholes, schools, *etc.*

The contractors highly appreciated the RTT session and the suggested initiatives for exploring new market areas. The session was a good example of integrating the various ASIST programme fields.

Also on targeted procurement, the national DPW and ILO/ASIST are preparing for an independent assessment of targeted procurement, which is scheduled to take place in July 2001. This assessment will amongst others look at how progressive modifications in the existing South African procurement regime (as implemented through targeted procurement) can stimulate development of local contractors and boost employment creation.

Community-based public works programme (CBPWP)

The CBPWP is a government-funded poverty alleviation programme that addresses infrastructure and employment problems in previously disadvantaged areas. Projects are initiated and managed by the community, and aim to contribute to short and long term employment objectives. This programme has been evaluated twice, in 1996 and 1997 (in partnership with the ILO). Both evaluations found that employment-friendly work methods have not been fully utilised. The United Nations Development Programme (UNDP), DPW and ILO recently undertook a monitoring visit to Kwa Zulu Natal and visited several CBPWP funded projects. The quality of the assets was found to be good. However, there is still extra room for maximising employment and for introducing suitable productivity rates. The three partners are currently undertaking another evaluation of the activities carried out during 1998 and 1999.

New research

ASIST has published an interesting study report on *The Economic Value of Incremental Employment in the South African Construction Sector*. The study, undertaken by Dr. Barry Standish from Cape Town University, analysed the financial and economic boundaries within which construction operations in South Africa can absorb more labour while still being competitive with conventional equipment-intensive technology. The study looks into wage rate issues, multiplier effects of annual wage increases (particularly for the low-income categories), and the impact on Gross Domestic Product (GDP) and job creation. It also assesses the economic impact of locally manufactured construction machinery. The main findings are that labour-friendly construction methods, in combination with locally manufactured equipment, are financially competitive with conventional equipment-intensive construction (bound to certain physical conditions and wage rates, and considering that capital costs of imports are to be amortised).

Whereas the financial viability of labour-based construction methods is proven in several studies, the added value of this report lies in the compelling macro-economic advantages that can significantly contribute to economic empowerment in South Africa. A workshop, hosted by the national Department of Public Works and supported by the ILO, is scheduled to discuss the findings and to come up with recommendations on the use and promotion of employment-friendly strategies. ■

Photo by ASIST Africa

Emerging contractors surfacing a road using labour-based techniques

Training and establishment of labour-based contractors in Botswana

Ezekiel Rametse, Roads Department, Botswana

In a policy statement contained in the National Development Plan Eight, the Government of Botswana emphasizes poverty alleviation through creation of meaningful employment and the application of labour-based methods. The policy further aims at increased involvement of the private sector in the building of the economy.

Responding to these policy statements, the Ministry of Works Transport and Communications, through the Roads Department, requested that a component for application of labour-based methods in roadworks be taken into the Institutional Co-operation Agreement between the Roads Department and the Norwegian Public Roads Administration (NPRA). ILO/ASIST has been engaged to carry out technical audits and special studies to highlight problems and constraints that need to be resolved for a large-scale application of labour-based methods using small-scale citizen contractors.

Since the technology had not been applied in the Department before, it was found necessary to start with demonstration projects through which information would be collected as a basis for a large-scale application of the method in future. Preparations commenced in 1998 with project identification and formulation of an implementation strategy. Candidate projects were identified for construction of low volume sealed access roads and for routine maintenance of the road network.

At present the demonstration projects using small-scale labour-based contractors for routine maintenance are nearing completion, and preparations for escalation of the approach encompassing maintenance of approximately 950 km of sealed primary and secondary roads are well under way. On the construction side, problems have been encountered during the first round of tendering. Options for new designs are currently being considered to make the project roads more suitable for labour-based methods.

Due to the large number of contractors already registered with the Central Tender Board in the lower categories, it was decided to pre-qualify and train existing contractors rather than establishing new companies. One of the main concerns has been how to incorporate the necessary training to ensure that the selected contractors would be able to successfully carry out the works and manage their businesses proficiently and profitably. Since no suitable institutionalised training existed in Botswana, training for the routine maintenance projects was made part of the brief for the supervising consultant. On the construction projects, the engagement of labour-based specialists/trainers directly by the contractors has been incorporated in the tender documents.

It is on the cards that many functions previously carried out in-house by Roads Department staff will be outsourced to the private sector in the future, routine maintenance being one area where small contractors already do a substantial portion of the work. Also intrinsic to the privatisation process is that an increasing share of the contract management and supervision of maintenance works will be done by consultants. In the escalation of the routine maintenance demonstration projects, various models for contracting out routine maintenance and contract management by consultants are therefore being tested. Involvement of local/citizen consultants is imperative to the success of this approach. However, since the experience base in the local consulting industry is very limited as regards labour-based methods and contractor development, association with international/regional firms with the required experience and expertise in this field has been necessary during the initial stages.

Three categories of small-scale contractors have been engaged, these being Grade B (contract limit USD 2 million), grade A (contract limit USD 400,000) and grade OC (Opportunity Category, contract limit USD 120,000). The routine maintenance contracts cover initially all routine activities for a period of one year. In the next stage, contract duration will be up to two years.

As Botswana is a cattle country and has vast areas with bountiful wildlife, vegetation control along the wide road reserves (60m) to ensure good visibility, and chasing domestic animals off fenced road reserves using bicycles, constitute major activities to enhance the traffic safety.

The results from the demonstration projects have been positive in that animal related accidents have been reduced on the respective sections according to police reports. The communities have participated in a positive way throughout, and a considerable portion of the money disbursed has gone to labour wages rather than hire charges for mechanized equipment. ■

Progress of the Namibian labour-based roadworks programme

By Malte Engelien, Roads Authority, Namibia

With effect from 1 April 2000, the responsibility for managing the Labour-based Works project was transferred from the Ministry of Works, Transport and Communications to the newly created Roads Authority. Actual work continued to be executed by private contractors under the supervision of consultants on behalf of the Roads Authority.

The purpose of the project is to enhance the capacity of the public and private sectors in labour-based construction and maintenance, and to efficiently apply this capacity primarily to the construction and maintenance of roads. The outputs of the project include: the completion of the pilot and supervisor training phase, setting up of appropriate technical standards and work methods, training of small scale contractors, construction of roads, creation of employment, expansion to other regions, and preparation of a White Paper on labour-based works.

The funding for this project was covered under the Specific Agreement between the Namibian and the Swedish Governments on the Transport Sector Support – 1995/96 to March 2000 and the new Specific Agreement between the Namibian and the Swedish Governments on the Transport Sector Support – December 2000 to March 2002. The overall funding regime is structured so that the two Governments eventually make nearly equal contributions towards the project.

The primary activity, in terms of costs, is construction of District Roads to gravel standards in the northern regions of Namibia. Other complementary activities, which include research and development, provision of equipment pool, small-scale contractor development, and the drafting of a policy on labour-based works, are aimed at ensuring sustainability of the project.

The project set out to construct about 150 km of gravel roads during the period from July 1995 to March 2000. In this period only 88 km of road were eventually constructed. The delay is attributed to the delay in the implementation of the second phase of the Small–scale Contractor Development Programme, as the output is related to the contracting capacity available.

During the last year, with the involvement of other small and medium scale indigenous contractors, the production rate has improved markedly. 35 km of road were completed, bringing the total length of completed gravel roads to 123 km, and 19 trainees successfully passed the second phase of the Small-scale Contractor Development Programme.

The White Paper on labour-based works has since been completed and adopted by the national assembly. A draft bill to establish a labour-based works forum has been completed and discussions are underway on the forum's mandate in view of the recently formed arm for employment creation within Government. The forum is envisaged to be stakeholder driven in a public/private sector partnership.

In the future, four former trainees of the Small–scale Contractor Development Programme will be identified as candidates for further training in a mentorship programme in the year 2001. All four identified candidates will tender under limited tender conditions on two gravel road tenders. Independent mentors will assist the candidates during the tender stage. During the construction works one mentor will guide and advise the candidates on site.

During the Namibian financial year 2001/2002 construction under at least eight district road projects is planned. 34 km of labour-based roads will be built under the new Swedish Agreement, and a total of 114 km will be constructed co-funded by the Kreditanstalt für Wiederaufbau (KfW) of Germany. ■

Photo by ASIST Africa

Excavating for wearing course material in Namibia

The village road development project in Sri Lanka

Susil Perera, International Technology Development Group (ITDG), South Asia, Sri Lanka

The Village Road Development Project of Sri Lanka, carried out by ITDG, South Asia, while showing the potential of communities to be better involved in rural access road development, also clearly illustrates another point – that of the effective technology transfer through training and networking.

The project started in 1998 and is based on the labour-based road construction methodology promoted by ILO/ASIST.

Under the project, two Nepalese engineers who had received their training at the Kisii Training Centre in Kenya have trained eight village leaders for two weeks at the project sites in Sri Lanka. These leaders, six men and two women, were trained on how to carry out labour-based works successfully with community participation in the two pilot sites in the Southern Province.

Within a short period of commissioning the first two pilot projects, came acceptance for this approach of involving the communities in planning, constructing, and maintaining their own roads through labour-based methods. In two years the project spread to two new local government administrative areas and to another province. Along with this, came requests from the technical officers of the local government offices in the pilot project areas, for familiarisation of this road construction method. By this time the project had also acquired the services of a project manager with a civil engineering background. In November 2000 he completed the International Engineers Course on Labour-based Road Construction at the Kisii Training Centre, Kenya that is supported by ILO/ASIST.

The setting is now right to spread this technology further. The project has plans to familiarise the technical officers with the methodology by facilitating training at two new pilot sites.

In the meantime, the existing pilot projects, now five, are progressing and are helping the communities establish firm links with their local government authorities. These two parties are the key stakeholders of the project and need to work closely to help sustain the benefits of the road by ensuring maintenance through joint efforts. Most local government authorities are often under-resourced and do not have sufficient funds to maintain all the roads that are placed under their purview. A low cost road construction method that also helps share the maintenance responsibility with the community is of high value to them. In the first two pilot sites, the community has taken over the minor and routine maintenance, while their immediate local government authority assists them in long term and major repairs.

ITDG-South Asia foresees three main tasks that need to be carried out to popularise the labour-based road construction method in Sri Lanka. These are:

- Influencing the policy makers to accept and adopt the labour-based method into the mainstream.
- Influencing engineers and technical officers through training and field visits to project sites, *etc*. with the aim of increasing acceptability for the labour-based methods as an alternative technology that can be used in rural areas.
- Building links between the community and the local government to share maintenance. This is achieved by promoting a sense of ownership for the road among the community.

The approach is gaining acceptance in the pilot project areas, but further work is necessary to promote its use in other areas and at national level, as this would help communities in remote and isolated areas. ITDG-South Asia welcomes any assistance from national and international organisations to meet this objective. ■

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Photo by ITDG-South Asia©

A road improved using labour-based methods in Nepal

A way out of isolation and poverty

Highlights of the accessibility needs assessment survey of a cluster of tribal villages in Orissa

By ORFRTD Team, India

The Orissa Regional Forum for Rural Transport and Development (ORFRTD) is the country affiliate and regional forum group of the International Forum for Rural Transport and Development (IFRTD). ORFRTD is a network of like-minded and concerned institutions, organizations, and individuals for advancing the goals of IFRTD for promoting broader and alternative approaches towards meeting the transport needs of the rural communities.

Background

Orissa, with a 31.6 million population (1991 census) spreads over 46,000 villages, has 38% Dalits (Scheduled Castes, *i.e.* underprivileged communities) and Tribals (Scheduled Tribes, *i.e.* indigenous communities) and 49.7% people living below the poverty line. Only 15% of villages (1991 census) are connected with all-weather roads. Poor connectivity is a major handicap to socio-economic development of the state. Above all, the tribal communities living in scattered habitation amidst dense forest/hilly areas are isolated from the development mainstream.

ORFRTD, supported by ITDG South Asia, conducted the study *Accessibility Needs Assessment survey of a Cluster of Tribal Villages in Orissa* during the first quarter of 2001. The survey area covered 17 villages of two Gram Panchayats (*i.e.* local government units at the lowest-level consisting of clusters of villages with populations from 2,000 to 10,000) in Daspalla Block of Nayagarh District in Orissa having 517 families and a population of 2544.

Purpose and methodology

The purpose of the study was to acquire a deeper understanding of the tribal communities, and to assess their mobility and accessibility needs, and to identify suitable transport options and interventions for improving their access to services, markets, and opportunities.

Integrated Rural Accessibility Planning (IRAP) tools were employed in the questionnaire design, data collection, analysis, and processing. Field surveys were conducted using village level questionnaires through village leadership discussions. Household level questionnaires, village social and resource mapping, and other secondary sources were also used. Key indicators were:

- Education: 71.22% illiterate
- Poverty level: 95% below the poverty line.

Transport Characteristics

The average household makes 14.26 trips per day. Its transport activities occupy 2654 hrs per annum or 51 hrs per week, and involved a load carrying effort of 95.56 tonnes per annum. Internal transport (*i.e.* within the survey area) is more significant and accounts for 94.46% of all trips, 79.93% of time spent, 98.36% of total goods moved, and 87.81% of load carrying effort involved. The burden of transportation primarily falls on women. In terms of time, they are responsible for 61%, and load carrying 65%. The daily transport workload ratio of an average adult female, adult male, and child is 61:27:12 in respect of time and 65:23.60:11.40 in respect of load carrying.

Action interventions

Based on the above findings and accessibility needs, the following interventions have been planned according to IRAP strategies:

- Improvement of the existing connecting footpaths and tracks to low-cost all-weather rural roads using labour intensive methods.
- Community-managed bus service
- Application of appropriate technology for improvement of animal drawn carts, and wider introduction of bicycles and trolleys.
- Other non-transport interventions like establishment of a community health centre and two market centers.

Partnership

Considering acute accessibility constraints in the study area, a multi-sectoral partnership approach involving all stakeholders, *i.e.* the community, NGOs, ORFRTD, ITDG, and other national/international agencies, is necessary to translate the mission into a sustainable reality. ■

ISSN: 1020-0606
The ASIST Bulletin is published by the International Labour Organisation Advisory Support, Information Services and Training (ILO/ASIST) Programme.

Editorial team Angela Kabiru-Kang'ethe, Ida Chimedza, Chris Donnges, Terje Tessem, David Mason. Layout by Annabel Chite and ASIST.