

IMPROVING LIVING CONDITIONS AND EXPANDING EMPLOYMENT
OPPORTUNITIES IN URBAN LOW-INCOME COMMUNITIES

URT/94/009

HANNA NASSIF PILOT PROJECT DRAINAGE & ROAD WORKS:

DAR-ES-SALAAM

Report by
Consultancy Team
compiled by J. Tournée
Consultant on behalf of ILO
December 1996

1. Nature of this Report

The consulting team's terms of reference were prepared to cover two major tasks (i) the preparation of guidelines for community contracting and (ii) the assessment of specific aspects of the Hanna Nassif Project. This report covers the work relating to Hanna Nassif and community contracting within the Tanzania context. The community contracting guidelines will be submitted in a separate report before the end of February 1997.

2. Terms of Reference

The terms of reference (TOR) for the visit are for "Community Contracting and Cost Comparison, Hanna Nassif Drainage and Road Works". A copy of the TOR for the combined consultancy is given in annex 1. This report will cover part of the first three sections of the Community Contracting, and the Cost Comparison. This report includes contributions from all the team members. In particular, the costs for the works in Hanna Nassif were prepared by J. Fransen and M. Kasure.

3. Consultancy Team

The Team consisted of:

Technical Consultant	J. Tournée (14 days)
ILO/ASIST Technical Adviser	W. van Esch (10 days)
National consultant	M. Kasure (10 days)
ILO/ASIST Urban Training Coordinator	J. Fransen (3 days)

A list of persons met by the consultancy team are given in annex 2.

4. Site Visit to Hanna Nassif

Since the last visit of the team leader, the final section of the main drain has been completed and main drain extension number 1 to meet road 1. This includes the associated drainage and roadworks on road 1. In addition one of the culvert timber decks was replaced by a concrete deck designed by the project engineer. A copy of the calculations for the new deck are still to be submitted to the team leader for an independent check and agreement.

A site visit was made to inspect the works. The finishes on some of the sections were not as good as had been hoped, however the Construction Committee (CC) and the

Project Engineer (PE) said that their priority had been to complete the important drains before the end of the project. As a result some of the tidiness of finishings had suffered. The progress made in a short construction period, with spells of poor weather and very confined and difficult working conditions, is a credit to the CC and the Technical Support Team (TST). During the course of the project the CC and the TST have also developed a capacity for solving on-site problems and adapting designs to accommodate unexpected surprises, such as buried pipes. The issue of the recording of design changes will be covered in section 6.2.1 of this report.

A note from the site visit is attached in Annex 3 of this report.

5. Community contracting

5.1 Review of Community Contracts used in Hanna Nassif

The community contracts originally envisaged for use in Hanna Nassif proved too complicated for practical use with the community, and a very simplified form of contract was developed. The Community in Hanna Nassif found themselves in the position of being both the Client and the Contractor as most of the funds for construction were given directly to the community. This meant that the operation of contracts were directly handled within the Community Development Committee (CDC) assisted by the TST, and counter signed by the City Director.

The community contracts consisted basically of a list of required materials and estimated labour inputs for the works to be completed in specified areas. An example of a community contract used in Hanna Nassif is given in annex 4 of this report. The community received 10% as "profit" on materials and labour costs. This money is put aside for maintenance works such as periodic maintenance. The CDC members responsible for financial matters were not members of the CC who were responsible for the running of the construction contracts.

5.2 Comparison of the Costs of the Main Drain

A design for the main drain was prepared by Cowiconsult including a cost estimate for the tendering of the work to local contractors. The CDC rejected the use of contractors and opted to continue using community contracts to construct the main drain. It is therefore possible to make a comparison of the costs as estimated by Cowiconsult and the actual costs incurred during the construction by the community. It should however be noted that the work did not go to tender and therefore there is no commercial confirmation of the Cowiconsult estimate.

Annex 5 gives a comparison of the cost between the cost estimate as prepared by Cowi and the actual cost. The actual cost of USD 98,000 (Tsh 51,884,872¹) is slightly higher than the engineer's estimate of USD 91,000 (Tsh 48,209,425). The main drain however, has been partly constructed during the rainy season under very difficult work site conditions and it can be expected that also a local contractor would have demanded budget increases due to extra work. Taking this into consideration it can be concluded that the main drain and extension I has been constructed in conformity with the engineer's cost estimate. For a community without much previous experience in construction work this is a considerable achievement.

Another positive indication is that the agreed works have been completed within the revised project budget.

5.3 A brief assessment of Strengths and Weaknesses of Community Contracting based on Consultations

If infrastructure is to be constructed or improved within unplanned settlements, then there are several options open to the implementors. The main options are:

- employ private contractors - large
- employ private contractors - small
- direct implementation through city council / local government / central government
- implementation by communities using community contracts

In all of the options above it should be equally possible to involve the community in decision making about the type, extent, cost and quality of service to be provided. The community could also be involved in a supervisory role. What makes community contracting different is that the community themselves are the implementors.

With the available options listed above, what are the advantages of using community contracts?

1. It makes continuous negotiations with householders possible. It facilitates discussions on demolitions and accommodates compromises between what has been planned and what can be constructed when the unexpected arises. A contractor could be faced with claims for compensation for inconvenience etc. whereas the community can arrange for a suitable compromise.

¹Exchange rate USD 1 = Tsh 528

2. It creates a more flexible attitude with regard to fitting the new infrastructure around their existing assets. Although most of the "fitting" should be done at the planning and design stage.
3. Community initiatives are recognised and supported not thwarted.
4. Using Community contracts can create an increase in self esteem and feeling of ownership for the created assets for the community and individuals within the community.
5. It helps to retain funds in the hands of the community which can then be used for maintenance or other activities. With the lack of resources within government to provide adequate maintenance, most communities will be dependent on their own resources for routine and periodic maintenance. The setting up of a maintenance fund from the contract profits is an excellent start to ensuring maintenance of the asset is possible.
6. It generates employment for both skilled and un-skilled labour in the community. Clauses could be added to contracts with the private sector to ensure employment of unskilled labour from the community, however the involvement of locally-based artisans might be reduced. In the case of community contracts there is the flexibility of either arranging small sub-contracts with artisans from the area for certain skilled works, or employing them directly as part of the workforce. the choice may depend on the nature of the work being carried out.
7. It provides an opportunity for on the job training; technical, administrative, and management. If contractors are used then a lot of the control of the project and the opportunity for acquiring skills within the community will be lost.
8. Perhaps from a technical point of view, there is an advantage in having the community carrying out the construction in very difficult working conditions (i.e. narrow spaces between houses, people walking through the site, etc). Decisions on unexpected alterations to alignment can be made with minimum alterations to contracts. The community through their direct involvement in the construction of the asset, retain the technical skills necessary to carry out the subsequent maintenance activities.
9. In some cases it may ensure higher quality work, where supervision of contractors is lax and the quality of contractors is poor. There is however evidence to suggest that a community may be satisfied with a lower standard of construction, especially in regard to finishings, than a contractor or supervising consultant.

10. It can reduce cost and wastage. The profit margin for the community in the case of Hanna Nassif is only 10% on the basic costs covered in the contract. For small contractors the profit margin may be as high as 50%. The community is more committed to finalizing the work as they are also the beneficiaries. In case of difficult work site environment the community will not so easily give up and request additional payment.
11. Contract procedures are simple, and the processing does not take time, work can start with out delays. There is no need to call for tenders, assess bids, and award external contracts.
12. The CDC is answerable to the people they represent and must demonstrate openness in all their dealings. This should limit the suspicions that money meant for the community is being diverted to other things.

The team had discussions about what level of services can be constructed using labour-based methods and/or community contracts. As survey work proceeded, it became clear that there was no simple technical solution to the drainage problems in Hanna Nassif. As a result the community tackled major construction works, and relied heavily on technical assistance from the TST, especially the PE. With out this level of support community contracting would not be possible especially for more technically demanding work such as the main drain. If the option of employing small contractors is considered, then they too would have needed considerable technical guidance and support. If larger more experienced contractors were sought, they might consider that the difficulties of working in unplanned settlements and the size of contracts being awarded as too small for their scale of operations.

Having improved the living conditions considerably within Hanna Nassif by the construction of part of the drainage system, the Community and CDC are determined to continue with community contracting and do not want contractors from outside the area to come and do the proposed construction work. The notes from a meeting held in Hanna Nassif to discuss Community Contracting are attached in annex 6 of this report.

In Dar-es-Salaam there appears to be greater resistance to Community Contracts from Engineers and City Commission Officials. They are concerned with work quality and perhaps find it easier to deal with contractors in the more 'traditional' manner. The nature of the settlement to be up-graded may also play an important part in the decision as to whether community contracts are used or not. If most of a settlement area is planned with a smaller percentage unplanned it may be that most of the residents are in employment and only want to be involved in the decision making rather than the actual construction work. This is not the case in Hanna Nassif.

Any conclusions as to the best approach to use within communities must be balanced with a correct profile of the community under consideration; its available infrastructure, incomes, education, and skill levels. The options, private contracting (small local contractors, labour based or not etc.) or community contracting, should be thoroughly discussed with the community and together with the community a choice has to be made concerning to most suitable approach.

Notes on meetings with the National Construction Council (NCC), Ministry of Works Engineers, and Dar-es-Salaam City Commission are given in annexes 7, 8, and 9 respectively.

6. Cost Comparison

6.1 Review of construction costs

A financial analysis of the data for the period December 1995 to August 1996 (end of project) has been carried out and are presented in annex 10 together with some relevant data on cost estimates derived from studies.

The data analysed so far do not yet allow for a cost comparison between the actual implementation cost and data derived from other studies (except the comparison of cost for construction of the main drain which is presented in annex 8 and section 5.2). However as is indicated in the financial analysis the specific costs for the different construction activities can be established based on the petty cash vouchers of the project. As it was outside the scope and time availability of this mission² to analyse all petty cash vouchers for the entire duration of the project it was agreed that Mr. J. Fransen will return to Dar es Salaam for 2 weeks in February 1997 for this task.

Once the figures for Hanna Nassif are available they can be compared with the estimates prepared by Cowiconsult on behalf of the Government of Tanzania and the World Bank for the Urban Sector Engineering Project.

6.2.1 Review of the design process

In reviewing the design process, it should be said at the outset that the whole process was far from satisfactory. After a brief resume of the experience in Ilanna

²The mission concentrated on analysing the financial data of the months in which the main drain was constructed in order to compare the actual costs of the main drain and the cost estimate of Cowiconsult.

Nassif, section 6.2.2 will deal with suggestions for improving the design process for future up-grading activities.

The original very basic outline of what infrastructure could be provided was made during the project formulation based on a site inspection and a copy of the only available map. Once surveys of the area were started it became clear that a simple solution was not possible due to the levels in Hanna Nassif.

Due to the non-filling of one engineer's post and personnel changes in the other project engineer's post, continuity of design was not possible. In addition the surveys were carried out by the City Council and the survey staff had other duties which meant a very intermittent presence at Hanna Nassif. As a result of these problems, the progress in design work relied heavily on the back-stopping consultant during brief 10 days to 2 week visits. The community were involved in the design and were particularly active in discussing alternative routes through the settlement. Often the chosen route would change resulting in extra survey and design work.

It was decided that this state of affairs could not continue and that the design of the main drain should be handed over for completion to a locally-based consultant. The consultant would be available to respond to changes on the site and concentrate on producing the designs and documentation. At the same time as the consultant was engaged, a new project engineer was appointed and the engineering aspects of the work in Hanna Nassif improved.

Even where a design had been agreed and completed, working in an unplanned settlement area can produce lots of surprises, one example from Hanna Nassif is given in the box below.

<p>A water main was discovered during excavation along the line of one of the roadside drains (chainage 520 to 580 on road 1) and this necessitated a change to the proposed drainage alignment and levels.</p>

With all the changes in levels and alignments for the drainage, the orderly keeping of records and the completion of as built drawings are essential for assessing the work done and for future extensions to the infrastructure. There appears to be a lack of good records of the designs for alterations to details which may affect the serviceability of the infrastructure.

As a result of the above experiences, the survey and design work should be differently organised.

6.2.2 Recommendations for future design process based on lessons learnt

The Community assisted by their support team should hire in services when they are needed. The technical services (surveyors, planners, engineers) should be as locally based as possible to allow frequent consultations and alterations where necessary. Once the community has decided on their priorities for infrastructure improvement, sufficient time should be allowed for the surveying and plotting of the settlement before design work starts. Sufficient time is also needed for design work to be carried out prior to the start of construction. A joint approach to the design with the community requires regular consultations and open discussions.

Innovative solutions to problems and the use of alternative technologies could be more readily pursued if local expertise provided by consultants was available. They could provide and/or follow up specialist training, and monitor progress in new construction techniques.

Using services from the private sector for design and survey work would increase the communities ability to hire services for other schemes they may wish to implement.

If services can be hired in, it gives the community more flexibility in their choice of priorities to be addressed. If a water engineer has been appointed to the team, but the main priority is electricity it is difficult for this option to be pursued, however if services can be hired in, an electrical engineering consultant could prepare an appropriate scheme.

In summary, it is important not to underestimate the time needed and the flexibility required to produce suitable design options for the provision of infrastructure in unplanned urban settlements. With flexibility comes the requirement to keep accurate records of designs and design changes so that the community are left with a reliable record of the position of the improved infrastructure.

6.3 Estimation of the cost/savings related to the participatory design methods used in Hanna Nassif

Unfortunately it is very difficult to find infrastructure works being carried out in Dar-es-Salaam similar to those in Hanna Nassif and to inspect the design process. There is naturally a cost to continuous consultation and alterations in plans to suit the community. The cost could be measured in time spent on consultation by the individual technical professionals involved. This information was not requested or recorded in Hanna Nassif.

Similarly only a description of possible costs resulting from not consulting the community can be made. There are implications for maintenance and care of the asset if the community is not involved. A sense of ownership will not guarantee good

maintenance but will certainly help. Consultation on alignment and sizes etc., will improve the willingness of the community to accept inconvenience during the construction phase thus causing fewer disruptions to the work. Consultation will certainly reduce the number of route alterations if properly carried out at the planning stage.

7. Acknowledgments

The consulting team wishes to acknowledge the full and excellent cooperation received from the ILO Area Office Staff, the Project Team, and the CDC, CC, residents and workers in Hanna Nassif.

TERMS OF REFERENCE

CONSULTANT COMMUNITY CONTRACTING AND COST COMPARISON HANNA NASSIF DRAINAGE AND ROADS WORKS

The consultant, together with the ILO/ASIST technical advisor and a local consultant, should carry out the following tasks:

Community contracting

- * Review the community contracts used for road and drainage construction in Hanna Nassif project.
- * Compare the costs of the main drain as in the proposal of COWI and as implemented with community contracts.
- * Assess the strengths and weaknesses of the community contracts (also seek the opinion of City Commission of Dar es Salaam, the Hanna Nassif Community and CDC and other stakeholders).
- * Compare the experiences of community contracts in Hanna Nassif, Kalerwe (Uganda) and other countries or organisations (Sri Lanka, Loughborough University¹).
- * Prepare guidelines on community contracting and determine under which conditions community contracting would be preferable above private contracting (for construction and maintenance).
- * Prepare recommendations for future urban upgrading works through community contracting.

Cost comparison

An evaluation mission has been planned for the period 5 to 19 January 1997 to review the Hanna Nassif project. However, this mission will only consist of 2 international and 1 national consultant for 12 days. Taken into consideration that Hanna Nassif is one of the first ILO

¹According to Jan Fransen the University carries out a study on community contracting. Jan Fransen will try to find some information on this.

projects aiming at labour based settlement upgrading with strong community involvement, there is a need to review the design and implementation process. More specifically it will be necessary to:

- * review the costs for the roads, side drains and main drain and to compare them with other urban road/drainage works.
- * Review the design process and the changes made by consultants, technical team and or community.

The technical consultant will be the team leader.

The team consist of:

- Technical consultant (10 days)
- ILO/ASIST technical advisor (10 days)
- National consultant (former project engineer) (10 days)
- ILO/ASIST urban training coordinator (economist)(3 days)

The report will be submitted to ILO/ASIST Nairobi before the end of January 1997 (1 hard copy and on diskette in WP51 format). A draft report will be available for the evaluation mission on 5 January 1997.

List of Persons Met

Annex 2

Mrs. Singh ILO Area Office Director
Mr. Doughty ILO Area Office Deputy Director

Mr. Sheuya Hanna Nassif Project Coordinator

Chairman and Members of the Community Development Committee, Construction Committee, Residents, Artisans, and Workers in Hanna Nassif.

Mr. Muhegi Secretary NCC
Mr. Msangi ATU, MOW
Mr. Andreski EU Adviser MOW
Ms. Kimeh CIP Co-ordinator (DCC)
Eng. Mwambiene DCC Senior Engineer

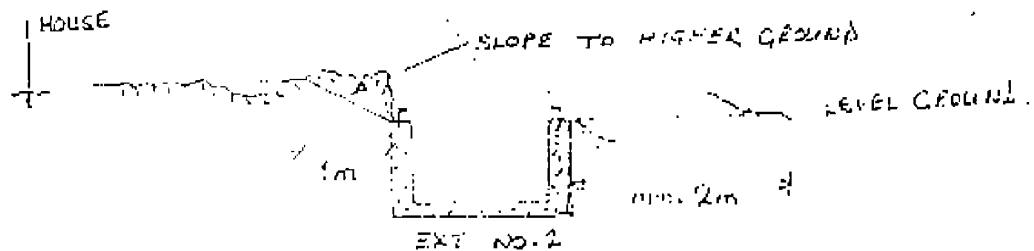
Present: Mr. Nestory Joseph Chairman CC
 Mr. Mpayo Kasure Local Consultant(Project Engineer)
 Mr. Jan Franssen ILO ASIST
 Ms. Jane Tournee ILO - Consultant

The visit was joined later by:
 Mr. Shaban Sheuya Project Coordinator

Main Points discussed during the visit:

1. Area Surrounding Main Drain Extension 1

The excavated soil and rubbish piled at the site during the construction of the drain should be removed and the edges of the drain flattened to provide a safe walking area. In the area of the main drain extension 1, sketch no. 1 should be followed. The soil which had been left for a householder to spread on his plot should either be spread by him in the next days or removed by the CDC. This work should be paid from remaining project funds.



sketch no.1

2. Area from Mrs. Nilson's House to the Councillor's Yard on the Main Drain

The excavated soil and rubbish piled at the site during the construction of the drain should be removed and the edges of the drain flattened to provide a safe walking area. due to the narrow working area, the land should be flat from the edge of the drain as shown in sketch no.2. This work should be paid from remaining project funds.



sketch no.2

3. Replacement Deck for the Drain Crossing at CH.570 on Road 1

The new deck appears to be adequately constructed. There needs to be a small retaining wall built as an extension to the drain lining to retain the fill needed to raise the road level to meet the new level of the decking. This work should be paid from remaining project funds.

4. Replacement of Inspection Hatch Lid in the Long Drain at CH 600 on Road 1

The lid has been destroyed and needs replacing. This work should be paid from remaining project funds.

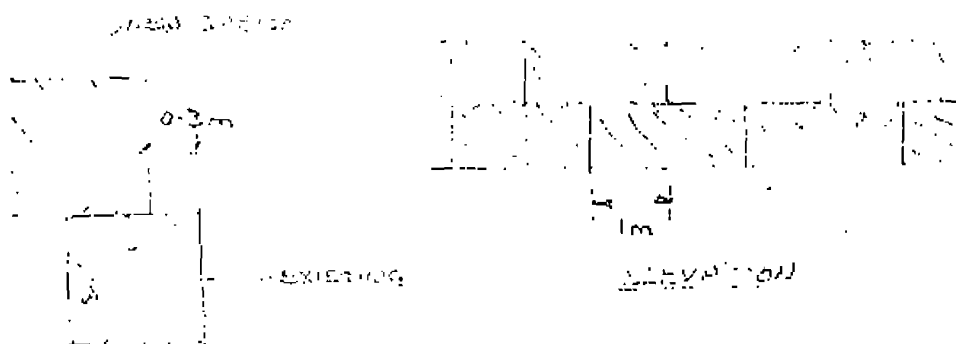
5. Settlement of the drain leading to outfall one from CH 630 on Road 1

A section of the drain has settled slightly, and this settlement combined with the very flat gradients this has resulted in small pools of stagnant water lying in the drain. A cement screed should be placed in the bottom of the drain to accurately set out invert levels which will allow the water to flow towards the outfall. This repair should be done using CDC funds, not project funds.

6. Garbage Dumping Problem at Outfall No. 2 .

Since completion of the gabion basket outfall no. 2, the garbage collecting system for the planned area of Haura Nassif has not been operating properly and people from the unplanned area who were using this service, have returned to their old habit of dumping rubbish on a plot above the centre section of the outfall. As a result garbage is falling into the outfall. As a measure for temporary relief from the problem, an extra layer of baskets should be placed across the worst affected area as shown in sketch no. 3 below. A maximum length of 5 gabion baskets (10m) should be used.

In addition the plot owner agreed to stop allowing people to dump their rubbish there. She had started allowing rubbish to be dumped in this area as erosion protection. The CDC should assist her in making a sign prohibiting the dumping of rubbish in this area.



sketch no. 3

The CDC should also approach the Dar-es-Salaam City Commission to find out why routine collection of garbage from the area has stopped. They should get an agreement that it will resume and inform the wider community once the collections restart.

7. Alternative Deck Arrangements for the Timber-decked Drain Crossings

After the site visit, a short round up meeting was held with the CDC. The main technical question raised was the replacement of the timber decks. The lack of cleaning of sections of drain adjacent to the crossings resulted in the backing up of the water in the drain. The timbers were then wet and had started rotting. The timbers were not of the durable quality that had been anticipated at the design stage.

The ILO Consultant together with the project engineer, agreed to look at an option of a design using separate concrete slabs as an alternative to a single continuous slab. The financing of the alternative slabs would need to be discussed by the CDC and the Project Coordinator.

With the increased experience of the Construction Committee in concreting works, it is possible to have increased confidence in the quality of cast slabs which could be produced by the CC. This was not the case when the decision to use timber decks was made.

8. Funding

There are sufficient funds to carry out the works in sections 1, 2, 3 and 4. Section 5 has to be funded from CDC funds and therefore the decision on when and how to implement the works must remain with the CDC, in consultation with the Project Coordinator. The gabion works suggested in section 6 can be constructed using the gabions in the store, however the cost for labour, stones and transport must be calculated to ensure funds are available. The construction work under item 7 should be a lower priority, as there are now spare timber panels at the CDC offices. Only if funds are remaining from the other activities should this activity be carried out.

JMT 19/12/96

COMMUNITY BASED SETTLEMENT UPGRADING PILOT PROJECT

Hanna Nassif - Kinondoni District
(URT/94/009)

P. O. Box 9212
Dar es Salaam
Date 2 JUNE

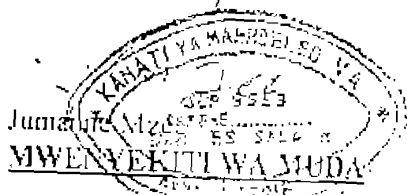
Ref. CON - 2

Bi. D. H. Talawa,
Kaimu Mkurugenzi Jiji,
S.L.P. 9084,
DAR ES SALAAM.

YAH: COMMUNITY CONTRACT NO. 7.0

- 1.0 Karatasi wa Ujenzi ilikaa tarehe 31 - 05 - 95 na kupitia matumizi ya contract No. 6.0 na kuandaa contract No. 7.0 katika contract No. 6.0 zilitumika TShs. 4,998,775.00. Fedha zilizoidhinishwa ni TShs. 4,999,500. Hivyo kuna salio la TShs. 725.
 - 2.0 Makisio ya contract No. 7.0 ni TShs. 6,046,682/= sawa na dola za kimarekani 11,054.26. (kiwango cha ubadilishaji ni 1 US\$ = TShs. 547)
- Tunakuomba upitie matumizi ya Contract No. 6.0 halafu uidhinishhe makadimo ya contract NO. 7.0

Tunatanguliza shukrani zetu



S. Shenywa
MRATIBU

Imekubaliwa/imekataliwa

Sahihii:.....

MKUTANO WA KAMATI YA UJENZI ULIOFANYIKA
TAREHE 31 - 05 - 91

WALIOHUDHURIA CDC

WALIOHUDHURIA CDC

J. MZEE - Ag. Chairman
N. Joseph - Member
Salim Said - Member
L. Rugambwa - Member

TST

S. Sheuya - Prog. Co-ordinator
M. Kasura - Project Engineer
O. Yahira - S/Tech
E. Malambika - S/Community Animator

YALII: COMMUNITY CONTRACT NO. 7.0

Mkutano wa Kamati ya Ujenzi ya CDC ulitishwa ili kupitia matumizi ya contract namba 6.0 na baadaye kufanya makisio ya contract namba 7.0.

Yafuatayo ni makisio ya contract namba 7.0

1. Vifaa vya kazi

Mchanga, 7trips @	17,000.00	119,000.00
Bols		612,000.00
Nyundo		55,000.00
Gloves		30,000.00
Mbao		272,800.00
Kokoto		95,000.00
Tindo (chisel)		12,500.00
Spanner		4,000.00
Cable wire		2,400.00
Cement		499,700.00
Washer		21,700.00
Rubber		2,000.00
Union		17,100.00
Kifusi		238,000.00

Drill bit	1,500.00
Gabion	2,205,500.00
Misumari	2,000.00
Dudu killer	2,000.00
Polish Brush	400.00
Belts	<u>210,000.00</u>
Sub Total	<u>4,402,600.00</u>

LABOUR

Capentry (Timber decking)	597,000.00
Casual labour	<u>811,800.00</u>
Total	<u>1,408,800.00</u>

TRANSPORT & OFFICE SUPPLIES

Transport materials	-	65,600.00
Transport office supplies	-	21,000.00
Stationery	-	25,400.00
Inservice training	-	<u>123,282.00</u>
		<u>253,282.00</u>
Total		<u>235,282.00</u>

Grand total 4,402,600.00 + 1,408,800.00 + 235,282.00 = 6,046,682.00

CONTRACT NO. 6.0

EXPENDITURE FOR T.A.S 4,999,500 - 20TH MARCH TO 30TH APRIL, 1995

S/N	DATE	ALACERIAL	LABOUR	TRANSPORT	OFFICE SUPPLIES	POSHO	10%	TRAINING
1	21.3.95				Photos - 1,500.00 First Aids - 5,000.00			
2								
3	22.3.95		Casual	100.00				
4	24.3.95							CDC - 3,000.00
5					Typing - 1,000.00			
6			Casual	129,100.00		Askari 10,000.00 MPhazi 10,000.00 SAspeper 10,000.00		
7								
8								
9	27.3.95	Penol	Casual	1,500.00				
10		Washer						
11		Moko						
12		Patrol						
13	31.3.95	Patrol speer						
14								
15			Kiungu tofoti	3,500.00	Typing - 1,500.00			CDC - 9,000.00
16	31.3.95		Casual	1,200.00				
17	3.4.95		Casual	4,000.00				
18	5.4.95	Gravel	Casual	1,400.00				
19	31.3.95		Casual	6,600.00	Sweeping - 800.00			
20	3.4.95	Nails	Casual	157,400.00				
21	5.4.95		Casual	5,400.00				
22		Cement	Casual	600.00	Rein & Paper 3,000.00			
23	6.4.95	Runners						
24	7.4.95	Gravel	Casual	144,200.00	To NRC - 3,000.00 Typing - 1,000.00			CDC 2,100.00
25	15.4.95		Casual	93,300.00	Typing - 1,000.00	Askari 10,000.00		CDC 4,200.00
26	16.4.95	Stones						CDC 9,000.00
27	16.4.95	Mchanga						
28		Gravel						
29	18.4.95	Gravel	Casual	700.00	Photocopy - 700.00			
30	19.4.95	Gun boots						
31		Pipe wergit						
32	21.4.95	Stones	Casual	68,150.00				
33		Mchanga						
	SUB			613,750.00	5,100.00	15,500.00	40,000.00	26,500.00
	TOTAL							

FROM 1ST MAY - 31ST MAY, 1995

NO	DATE	MATERIALS	LABOUR	TRANSPORT	OFFICE SUPPLIES	POSTAGE	TRAVEL	TRAINING
1	2.5.95	Dudu Kiber	1000.00					
2		Mbarac	1600.00					
3	3.5.95	Mawe	58,000.00					233,700.00
4	1.5.95			To NDC To Site	3,500.00 2,000.00			4,500.00
5		Cement	72,000.00					
6		Mesago	1,272,024.00	Casual	134,300.00			2,100.00
7				To Site To (Depot) Shop	3,000.00 30,000.00			
8				To NDC	3,000.00			
9	6.9.95	Stones	299,000.00	To NDC	3,000.00			
10	8.5.95	Balls & Nuts	156,000.00	To town	6,000.00			
11								
12	9.5.95			To NDC	3,000.00			
13				To town	6,000.00			
14		Gun Box	75,000.00					
			1,925,624.00		60,500.00			
			1,368,001.00		22,100.00			6,300.00
			3,291,625.00		82,800.00			11,500.00
								17,800.00

GRAND TOTAL 4,998,751/-
BALANCE b/f = 725

Table 1: Actual cost for labour and material on main drain and extension I.

MONTH	ACTUAL COSTS	COMMENTS
January 1996	3,049,583	start of main drain construction
February 1996	4,445,430	
March 1996	7,600,660	
April 1996	6,772,329	
May 1996	10,582,285	covered drain
June 1996	6,995,840	covered drain
July 1996	4,970,450	
August 1996	7,468,295	
Total	51,884,872	

The Cowi consult Engineer's cost estimate was:

Main drain: Tsh 41,448,600
 Extension I (adapted): Tsh 6,760,825

The total costs for extension I and II is Tsh 27,043,300 (Cowi estimate does not divide the costs between extension I and II). Based on distances (ext. I is 60 m and ext. II is 240 m) and difficulties in construction it is estimate that the cost for extension I is 1/4 of the total costs for the extensions.

Total: Tsh 48,209,425

Informal note on the Meeting at Hanna Nassif to discuss Community Contracts 12/12/96
Annex 6

Meeting with CDC, Labourers, Representatives of Women's Groups, Community Members, Residents and TST members.

The Study Team introduced themselves and explained the purpose of the meeting which was to look at community contracting in comparison to 'traditional' contracting.

The following questions were put to the meeting:

Question 1. If I am coming from outside Hanna Nassif to build something (i.e. City Council to build a road), why should I consult with the CDC and the community? I could get permission from City Council and then enter Hanna Nassif and build my road.

The responses were as follows:

- i) It would not be possible to build with out consultation as the builder would be disturbed by the residents and the residents disturbed by the builder.
- ii) The community would be reluctant to discourage any form of development in their area by not co-operating where they had not been consulted. however people coming into Hanna Nassif should realise that the community can help them and that their help should be sought.
- iii) There would be difficulties in maintaining an asset that the community had no say in what was being created.
- iv) If someone from outside cooperates with the community, then the community can be made more aware of the benefits of the new asset.
- v) Demolitions can be avoided if the community are involved. thus the environment and infrastructure can be improved with the minimum of disruption.

Question 2. Would it not have been much simpler if the City Council and the contractor would have done the work, after all the community and the CDC have spent a lot of time in meetings and discussions?

The responses were as follows:

- i) Employment will not be created in Hanna Nassif and the Hanna Nassif "self-development" will suffer.
- ii) Our children will not get jobs if the work is done by a contractor. (This belief is very strong even when the community have been assured that an employment clause could be written into the contract. they have no faith that the contractor would comply or be made to comply.)
- iii) Meetings and construction activities have helped to bring the community together. This

- benefit arising from the community involvement would be lost.
- iv) People see the construction of the roads and drains in Hanna Nassif as a historical achievement for the community. It makes them feel proud and the owner of the created assets.
 - v) Skills training especially on-the-job training has been a benefit to the people who were involved in the work.

Question 3. What reasons would you use to persuade me that I should use the community for the construction, rather than agreeing the design with the community and then bring in a contractor to do the construction work?

The responses were as follows:

- i) The community now have their own staff of people trained in construction and they would be let down if the work would now be handed to a contractor.
- ii) Can the community be sure that the contractor will employ them, give them training, and share the benefits?

With the responses to questions 1 to 3 it was felt that the community were not managing to produce arguments for the benefits to the funder / client, only benefits for the community themselves. In an attempt to bring out a stronger response the fourth question was asked.

Question 4. If we say that a private contractor is faster, cheaper, and produces better quality work than the community. Is that statement correct?

The responses were as follows:

- i) A contractor would reduce employment, and people would have to work harder and for longer hours.
- ii) Being fast is not relevant, the experience which can then be used for the maintenance is more relevant.
- iii) The contractor will bring in his own people from outside - if not the labourers then certainly the skilled workers.
- iv) Who says that a contractor is cheaper? A contractor can try lots of tricks to increase his payment.
- v) The contractor may take some of the money and then leave the job (quoted Bagamoyo Road as an example which had been in the newspapers)
- vi) The contractor might run away when the job gets too difficult, whereas the community cannot run away, and if they do not finish the work they will be accused by their own children of failing.
- vii) The experience in Tanzania is that the contractor will not finish the job, but run away with the money.
- viii) It will be more expensive with a contractor, because they will expect payment for every change and every difficulty on site. In the case of the community, they will continue

working in difficult situations with no requests for extra money. Especially the main drain with the construction through narrow areas surrounded by houses.

- ix) In Hanna Nassif we (the community) have a good CDC, a good engineer (project engineer) and good mafundi (skilled workers), therefore the CDC should continue and there should be no contractor brought from outside Hanna Nassif.
- x) The CDC might even refuse funds from a donor if the condition was that they had to use a contractor.
- xi) The engineer is responsible for the quality, therefore it does not matter if it is a contractor or the community who construct the service as far as quality is concerned.

Question 5: In Hanna Nassif the CDC are doing the work (contractor) and paying themselves for the work (client). Will the client ever refuse to pay the contractor when that would mean that they are refusing to pay themselves?

The responses were as follows:

- i) The CC have rejected work and made people do it again with out payment. (i.e. excavation gang, and one carpenter).
- ii) The CDC is already split into two sub-committees. The construction committee (CC) has 4 members and the finance committee (FC) has 5 members. The FC pay the CC. No-one can be a member of both committees. The CDC therefore are operating as 2 separate groups already.

JMT 19/12/96

Present:	Mr. Muhegi	Secretary NCC
	Ms. W. van Esch	ILO
	Ms. J. Tournée	ILO consultant

1. Introduction

Ms. Tournée and van Esch explained that they were looking at community-based contracting and alternative options such as the use of small local contractors.

2. Contractors

Mr. Muhegi explained that there are many contractors in Dar-es-Salaam, but they may not have labour-based experience. Also in the roads sector there is a tendency to use the larger contracting companies.

Contractors in Tanzania are registered in categories which define the type and cost of work for which they are allowed to tender. There are two categories for Minor Works Contractors; M1 and M2. M1 contractors can tender for maintenance works up to a ceiling of US\$ 250,000 and M2 for maintenance work up to a ceiling of US\$ 50,000. The director of a M2 contracting firm will be at least qualified to technician level. However the majority of the contractors registered at this level have never attempted road works. If this level of contractor was to be used for urban up-grading work, then it would be necessary to have a pre-qualification round.

At present there are no plans to carry out labour-based contractor training in Dar-es-Salaam.

3. Contract Documents

There would be no difficulty in inserting clauses in contracts instructing the contractor to employ labour from within the beneficiary community. Craftsmen from within the community could also be employed if they were up to the standard required by the contractor.

4. Using the Community as Contractors

People would worry that the community might not finish the works, and a contractor would finish the work as the firm need to protect their name. (This view was completely opposite to the views of the community).

5. Support

The one area that would need considering would be the level of technical (i.e. technical, financial and administration) support needed by the community in comparison to a small contractor or group of small contractors. In both cases there is a need to develop or adopt simple contract documentation.

6. Road Sector Policy

A policy statement has been issued stating that 20% of the road fund for maintenance is earmarked for labour-based works.

With Ms. W. van Esch (ILO)
Ms. J. Tournée (ILO consultant)

1. Mr. A. Andreski (EU Adviser)

Mr. Andreski is dealing with contracts within the MOW and was approached for information on small contractors and the cost of works as carried out in the private sector.

From his experience in the development of local contractors in Iringa Region, he described the process they had followed to reach satisfactory contracts.

Initially, tendering using 'normal' procedures proved too difficult for some of the smaller contractors who did not know how to price road works, therefore contract packaging (contracts for different activities) and a system of rates was developed and approved by the Regional Tender Board. Contractors were selected on the basis of their technical competence as there was no competitive bidding.

Additional Comments:

- Initially the profit margin for the new contractors was set at up to 50%.
- The deployment and use of equipment was poorly planned and often uneconomical.
- Training was considered as very important and one week training courses were given on contract managing, equipment and labour based contracts. The technical assistance was provided in partnership with NCC.

Mr. Andreski supplied a copy of the paper he had prepared for a meeting of the Institution of Highways & Transportation in Tanzania on the 7th of March 1994. The paper gives details of the contractor training, contract and specification development and the schedule of agreed rates. He also provided a copy of the MOW standard form of contract for piece work, civil engineering works.

2. Eng. Msangi (Appropriate Technology Unit - MOW)

Brief discussions were held with Eng. Msangi on the forms of contract the technology unit have been examining and developing. He supplied a copy of the 1996/97 National Labour-based Road Sector Programme and Policy Guidelines, dated June 1996; which included descriptions of several forms of contract.

Informal Note on a meeting held at the ILO Area Office 16/12/96 to discuss community contracting with the City Commission (DCC)

Annex 9

Present: Ms. V. Kimei CIP Co-ordinator
Eng. K.C.L. Mwambene DCC Senior Engineer
Ms. W. van Esch ILO
Ms. J. Tournée ILO consultant

Subject: Labour-based Construction and Community Contracting

1. Planning and Construction Standards

General agreement was reached that communities know very well themselves what they want and that alternative levels of service can be offered with the consequences of choice clearly pointed out. I.e. wider roads may mean demolitions; more expensive solutions may mean that less work can be carried out. The approach may have to vary depending on the type of community being dealt with and the skills available in the community. I.e. the construction committee may be headed by a mason in one community and by a university engineering professor in another.

2. Labour-based Construction

Agreement was not reached on when it would be best to use labour-based methods, although all parties to the meeting had an understanding of labour-based.

Considerable time was spent discussing the advantages and disadvantages of labour-based techniques, and the difference between labour intensive and labour-based. Also the distinction between machine-based construction with some labour elements was looked at in comparison with labour-based supplemented by machinery.

3. The CIP

The Community Improvement Programme being implemented by the Dar-es-Salaam City Commission, has divided the infrastructure into 3 categories. These are:

- Primary: Standard major construction works using conventional contractors, with funding from local or central government. (i.e. main arterial road)
- Secondary: Infrastructure linking communities or parts of communities in to the main infrastructure. Construction would be by small machine-based contractors, but utilising more labour than the main contractors. (i.e. connecting roads)

Tertiary: Infrastructure serving groups of households within the community, using small contractors. (i.e. feeder roads or tracks).

Cost sharing may be considered in the provision of the secondary and tertiary infrastructure.

The communities sign a memorandum of understanding with the CIP.

There is no community contracting planned for the implementation of the CIP.

Costs Comparison for the Construction Work - Hanna Nassif Annex 10

- A. FINANCIAL ANALYSIS**
- B. COST ESTIMATE FROM COWI AND URBAN SECTOR ENGINEERING PROJECT**

A. FINANCIAL ANALYSIS

Financial analysis. Hanna Nassif project, for the months December 1995, to August 1996.

The aim of the financial analysis was to find out whether specific construction costs of the Hanna Nassif project can be obtained from the available data. This resulted in draft monthly financial reports for the above mentioned months, in which the specific construction costs for the drains, roads, cast work, and outfall were given (see enclosed).

The obtained costs were based on data from the Monthly Progress Report and the Monthly Financial Reports. For the month December 1995, the labour costs have been derived from the Petty Cash Vouchers file, which proved to be a more accurate source of information than the Monthly Reports*. Using the Petty Cash Vouchers file was also more time consuming, and the mission did not have time to repeat the same method for the other months. However, differences in costs by using different methods proved minimal for December 1995, and costs for January and February 1996 are thus expected to be reasonably accurate.

Some tentative conclusions are:

- The financial reports for the analysed months are accurate, but do not separate costs for main drain, road 1 & 2, roads along drains, outfall 1 & 2, and form work
- Outfall 2 has cost about Tsh 5,284,899 (US\$ 10.009.-; exchange rate US\$ 1 = Tsh528). This is considerably cheaper than budgeted for
- Road 1 cost Tsh 1,754,450 for 75 metres in February 1996, which would add up to about US\$ 44.- per metre. However, materials bought may have been used in other months and for other activities. An analysis over more months is necessary in establishing accurate costs per metre

It is encouraging to note that the specific costs for drains, roads, and other construction activities can be established. This would be very useful information, in order to analyse the cost-effectiveness of the approaches used in the Hanna Nassif project.

It is also encouraging to note that the financial reports for the analysed months corresponded to the payment vouchers.

It is therefore advised to organise a ten-day mission to analyse the detailed costs and cost-effectiveness of the Hanna Nassif project. It is proposed to use the attached format in the analyses, and to use the Petty Cash Vouchers file as the basis for the data. The assistance of the Project Engineer will be essential in the analysis.

The costs can be compared with the cost estimates for the Hanna Nassif project prepared by COWI Consult (private contractor), and with the general construction cost estimates used by the

* Various labour days were not reported in the Monthly Reports. They included labour days of: watchmen; work done on contracts; and the shop keeper. For some activities, these labour costs added up to a considerable amount.

Office of the Prime Minister and First Vice President ("Urban Sector Engineering Project. Infrastructure Rehabilitation", 1992, COWiconsult).

Monthly Financial Report per activity: December 1995

Construction costs in Ish and (US\$): Ish 4,092,340 (US\$ 7751)

Exchange rate: US\$ - 5227.48

	Road 1	Drain along road 1	Road 2	Drain along road 2	Main drain	Form work	Outfall 1	Outfall 2 (Gabion)	Total
Construction material	--	933,500 (US\$ 1768)	270,000 (US\$ 511)					1,302,500 (US\$ 2467)	2,506,000 (US\$ 4746)
Labour	112,300 (US\$ 215)	242,368 (US\$ 459)	256,640 (US\$ 486)					804,652 (US\$ 1524)	1,416,940 (US\$ 2684)
Transport	--	38,700 (US\$ 73)	16,100 (US\$ 30)					92,000 (US\$ 174)	146,800 (US\$ 277)
Contingencies	4,520 (20%) (US\$ 9)	4,520 (20%) (US\$ 9)	4,520 (20%) (US\$ 9)					9,040 (40%) (US\$ 17)	22,600 (US\$ 44)
TOTAL	117,820 (US\$ 224)	1,219,088 (US\$ 2309)	547,260 (US\$ 1036)					2,208,172 (US\$ 4182)	4,092,340 (US\$ 7751)
Work done	24 m. excavated, water pipes fitted	28 m. constructed	110 m. gravelled					67 m. excavated; 2 bins. gabions laid	

Remarks:

- Excluding community mobilising costs. Community mobilising costs include overhead costs for construction
- Material cost for road is murrum (170,000) plus 100,000 for stones and sand (also used for the drain and outfall, and therefore difficult to specify for the various activities).
- Costs for drain along road 1 includes grills for road 2
- Labour costs were derived from the Petty Cash Voucher of December 1995 (CDC file). A new CDC office was built, which also took labour expenses. Labour costs of drain along road and the road were sometimes difficult to separate.
- Contingencies are mainly first aid costs, and were divided among activities by me on the basis of the percentage of worker days of each activity (for example: on road 1 about 20% of all worker days were used, thus 20% of 22,600 was taken).

Community mobilising costs: Tsh 129,944, (US\$ 817).

1. Stationary and office supply: 178,640. (US\$ 338)
2. Training: 14,000.- (US\$ 27)
3. Rehabilitating CDC office: 113,300.- (US\$ 215)
4. Staff salaries: 125,000.- (US\$ 237)
5. Transport

Total costs December 1995: Tsh 4,523,280 (US\$ 8967)

Monthly Financial Report per activity: January 1996

Construction costs in Tsh (US\$), Tshs, 503,244 (US\$ 10,424)

Exchange rate: US\$ = 228 Tsh

	Road 1	Drain along road 1	Road 2	Drain along road 2	Main drain	Form work	Outfall 1	Outfall 2 (Gabion)	Total
Construction material			832,520 (US\$1,577)		2,605,520 (US\$4,935)			541,504 (US\$1,025)	3,979,540 (US\$7,337)
Labour			250,952 (US\$475)		352,298 (US\$667)			743,204 (US\$1,408)	1,346,454 (US\$2,550)
Transport			4,200 (US\$8)		86,500 (US\$164)			69,000 (US\$131)	159,700 (US\$303)
Contingencies			3,510 (20%) (US\$7)		5,265 (30%) (US\$10)			8,775 (50%) (US\$17)	17,550 (US\$34)
TOTAL			1,091,182 (US\$2,067)		3,049,583 (US\$5,776)			1,362,479 (US\$2,581)	5,503,244 (US\$10,424)
Work done			Excav. 24m plumbing Gravel 162m		Excav. 20 m.			Laying gabions 24 m.	

Remarks:

- * Labour costs: Worker days per activity were derived from the Monthly Progress Report, and the actual labour costs from the "Summary of Project Expenditures", January 1996 report. Based on the actual salary of TSh830 for unskilled work and TSh1200 for skilled work, the worker days would result in labour costs of KSh 962,950. Actual labour costs were 1,359,705. The difference in costs is caused by not recruited sub-contracted work and overtime, which have been distributed over the activities as a percentage of worker days for each activity. A more accurate method would be to consult the receipts of the Petty Cash Voucher file of CDC.
- * Contingencies are mainly first aid costs, and were divided among activities by percentage of worker days of each activity (for example: on road 1 about 20% of all worker days were used, thus 20% of 22,600 was taken).

Community mobilisation costs: Tsh 317,640.- (US\$602)

- 1. Stationary and office supply: 178,640
- 2. Training: 14,000
- 3. Staff salaries: 125,000
- 4. Transport: --

Total costs: Tsh 5,820,984 (US\$11,024)

Monthly Financial Report per activity: February 1996

Exchange rate: Tsh=2805F

Construction costs in Tsh (US\$): Tsh 10,342,280 (US\$19,587):

	Road 1	Drain along road 1	Road 2	Drain along road 2	Main drain	Form work	Outfall 1	Outfall 2 (Gabton)	Total
Construction material	1,281,500 (US\$2427)				3,622,880 (US\$6862)	2,400,000 (US\$4545)		944,200 (US\$1788)	8,248,580 (US\$15622)
Labour	455,850 (US\$863)				767,700 (US\$1454)			707,750 (US\$1340)	1,931,300 (US\$3637)
Transport	7,300 (US\$14)				32,800 (US\$62)	50,000 (US\$95)		23,300 (US\$44)	113,400 (US\$215)
Contingencies	9,800 [20%] (US\$19)				22,050 [45%] (US\$42)			17,150 [35%] (US\$32)	49,000 (US\$93)
TOTAL	1,754,450 (US\$3323)				4,445,430 (US\$8420)	2,450,000 (US\$4640)		1,692,400 (US\$3204)	10,342,280 (US\$19,587)
<i>Work done</i>	<i>Stor./excav/ gravel. 75m</i>				<i>Excav./concrete 33 m. Stones..15m</i>			<i>Gabton 10m.</i>	

Remarks:

- Labour costs: Worker days per activity were derived from the Monthly Progress Report, and the actual labour costs from the "Summary of Project Expenditures", February 1996 report. The Progress Report does not report on sub-contracted work and overtime, which during this month mostly occurred for the work on outfall 2. These costs were thus added to outfall 2. For more accurate figures, data should be taken from the Petty Cash Vouchers of the CDC.
- Contingencies are mainly first aid costs, and can not be addressed to specific activities on the basis of available data. They were divided among activities by percentage of worker days of each activity (for example: on road 1 about 20% of all worker days were used, thus 20% of 22,600 was taken).

Community mobilising costs: Tsh 317,640 (US\$602)

1. Stationary and office supply: 178,640
2. Training: 14,000
3. Staff salaries: 125,000
4. Transport:

Total costs: Tsh 10,659,920 (US\$20,189)

MONTH - MARCH - 1996

	Road II	Drain along Road II	Main drain	Total
Construction materials	170300.00	14000.00	5478880.00	5663180.00
Labour	20000.00	3200.00	1837200.00	1860400.00
Transport	8800.00	14000.00	269500.00	292300.00
Contingencies	11520.00		15080.00	26600.00
Total			7600660.00	
Work done	Drift reshapd 2 other drift constructed Road reshaped		Excavation and concreting 90m. Plastering 50m. Tying and fixing reinforcement bars on box culverts Pipe fittings.	

Stationery and Office Supply 960250.00
 Training 16100.00
 Staff Salaries 87500.00

Comments: When starting road construction no allowance was made for areas farther away from the side drains. As a result, during rainfall, those areas couldn't drain the water, hence residents took the initiative to direct the water to the constructed roads. This damaged the road and it was decided to construct more drifts. After constructing the new drifts the road needed reshapng. This involved extra expenses and in the next phase the placing of drifts should be more carefully considered. The material used for reshaping the roads is Murram, materials used for the drifts are Murram, Aggregate and Cement.

Staff salaries are salaries paid to treasurer, storekeeper, watchman and typist (all Community members).

MONTH - MAY - 1996

	Road I	Road II	Main drain covered	Main drain uncovered
Construction materials			7937140.00	-
Labour	203680.00		2512250.00	-
Transport	16700.00		713500.00	-
Contingencies	2155.00		19395.00	-
Total	221855.00		10582285.00	-
Work done	60m. reshaped and re/gravelled on Road I.		40m. was excavated 60m. casted in situ and covered (vehicular access).	

Note: Material used for reshaping Road I were materials on store bought in April i.e. Murrum and Aggregate.

Comments: * This month we started covered portion for vehicular access main drain.

MONTH - JUNE - 1996

	Road II	Drainage along Road II	Drainage along Road I	Main drain	Frame-work	Total
Construction materials	865100.00			4770500.00		
Labour	302890.00			2016000.00		
Transport	17600.00			173600.00		
Contingencies	8920.00			35680.00		
Total	1194810.00			6995840.00		
Work done	14.5m. reshaped and re/gravelled.			60m Excavated, 84m cased in situ, pipes fitted. Formwork adjusted Reinforcement bars for slabs, side walls and top cover.		

- 1) Stationery and Office Supplies 176,600.00
- 2) Training 12,750.00
- 3) Staff Salaries 65,000.00

*10% for community contracts were paid in this month i.e. 3,883,600.00

Comments: Covered portion for vehicular access.

Note: During this month more labourers were employed due to heavy rainfall.

MONTE - MAY - 1996

	Road I	Road II	Main drain covered	Main drain uncovered
Construction materials			7337140.00	-
Labour	203000.00		2512250.00	-
Transport	16700.00		713500.00	-
Contingencies	2155.00		19395.00	-
Total	221855.00		10582285.00	-
Work done	60m. reshaped and re/gravelled on Road I.		40m. was excavated 60m. casted in situ and covered (vehicular access).	

Note: Material used for reshaping Road I were materials on store bought in April i.e. Murrumbidgee Aggregate.

Comments: * This month we started covered portion for vehicular access main drain.

MONTHLY - JUNE - 1996

	Road II	Drainage along Road II	Drainage along Road I	Main drain	Framework	Total
Construction materials	865100.00			4770500.00		
Labour	302890.00			2016060.00		
Transport	17600.00			173600.00		
Contingencies	8920.00			35680.00		
Total	1194810.00			6995840.00		
Work done	145m. reshaped and re/regravelled.			60m Excavated, 84m casted in situ, pipes fitted. Formwork adjusted Reinforcement bars for slabs, side walls and top cover.		

- 1) Stationery and Office Supplies 176,600.00
- 2) Training 12,750.00
- 3) Staff Salaries 65,000.00

*10% for community contracts were paid in this month i.e. 3,883,600.00

Comments: Covered portion for vehicular access.

Note: During this month more labourers were employed due to heavy rainfall.

MONTH - JULY - 1996

	Road I	Main drain	Framework	Total
Construction materials	82300.00	4047100.00		
Labour	23290.00	756350.00		
Transport	12000.00	67000.00		
Contingencies	14050.00	10000.00		
Total	131640.00	4970450.00		
Work done	190m. reshaped and re/gravelled.	110m. excavated 95m. casted in situ cutting, fixing and tying reinforcement bars..		

- 1) Stationery and Office Supplies 38,735.00
- 2) Training 8,500.00
- 3) Staff Salaries 87,500.00

Comments: Water (either rainfall or domestic) directed to the road causing washout of the road hence involved reshaping and re-gravelled of the road. A good example can be seen near Kamula Bar, where a soak pit drains its water directly to the road.

MONTHLY - AUGUST - 1996

	Road II	Main drain	Comments
Construction materials	238000.00	4333350.00	
Labour	64260.00	2850795.00	
Transport	12700.00	142650.00	
Contingencies	11100.00	141500.00	
Total	326060.00	7468295.00	
Work done	100m. reshaped and re-gravelled.	80m. Excavated 100m. casted in situ 6m. box culvert constructed Weep-holes constructed.	Construction of office toilet was done this month and cost of 173,240.00 was used. Labour for construction and excavation 55435

- 1) Stationery and Office Supplies 84,720.00
- 2) Training 27,600.00
- 3) Staff Salaries 87,500.00

Comments: *Heavy rainfall were the cause of more labourers to re-excavated.

This portion involve the excavation for extension I which was full of water throughout the year. During excavation, the risk of erosion was very high and therefore more laborers and materials were involved as was foreseen to stabilize the soil to an acceptable level for construction. Material used are stones, murrum, sand. See pictures of the area before construction: Harara Nassif Office.

B. COST ESTIMATES FROM COWI AND URBAN SECTOR ENGINEERING PROJECT

Cost estimate main drain

Table 2 shows the engineer's cost estimate for the construction of the main drain.

Table 2: Cowiconsult cost estimate for the construction of the main drain.

Item	Description	Qty	Unit	Bill No. 1		Bill No. 2	
				Main Drain Section	Excavation & Structure	Main Drain Section	Excavation & Structure
Part 1							
Preliminary and General							
1.1	Allow for Contingency with all Clauses in Conditions of Contract and Specifications not specifically mentioned herein and all contractor's obligations of every kind not covered elsewhere	1.04	Lump		351000		351000
1.2	Provision of services in accordance with Clause 10 of the General Conditions of Contract	1.05	Lump		231000		231000
1.3	Provision of Insurance in accordance with Clause 21, 22, 23 and 24 of General Conditions of Contract	1.06	Lump		131000		131000
1.4	Allow for retention on bills including for removal on completion of the works	1.07	Lump		290000		290000
Preliminary and General Costs Total to Summary					1890000		1890000
Part 2							
Earthworks							
2.1	Clearing and Grubbing	5.62	m ²	103	930	23000	770
2.2	Excavation for Drain	1.01	m ³	1000	1000	1000000	100
2.3	Excavation for Culverts	1.01	m ³	1000	100	140000	30
2.4	Backfilling for Drain	1.02	m ³	1000	200	110000	180
2.5	Backfilling for Culverts	3.03	m ³	1000	10	18000	7
2.6	Fill in Drain	1.03	m ³	1000	270	143000	300
2.7	Grass Excavation	1.04	m ²	3000	27	13000	27
2.8	Removal of existing structures	1.05	Lump			200000	
Earthworks Costs Total to Summary					2740000		2740000
Part 3							
Structures							
Flow Culvert							
3.1	Concrete Grade 10	3.02	m ²	10000	3	100000	7
3.2	Concrete Grade 20	2.04	m ²	20000	25	100000	15
3.3	Bar Reinforcement	3.03	m ³	100	1000	400000	1210
Concrete Drain							
3.4	Concrete Grade 10	2.01	m ²	10000	24	100000	16
3.5	Concrete Grade 20	2.02	m ²	20000	150	600000	24
3.6	Bar Reinforcement	3.01	m ³	100	1000	400000	1210
3.7	Mesh Reinforcement	2.03	m ²	1000	100	10000	20
Proposed Crossings							
3.8	Concrete Grade 10	1.01	m ²	10000	15	100000	5
3.9	Bar Reinforcement	1.02	m ³	100	1000	400000	1210
Vehicle Crossings							
3.10	Concrete Grade 20	1.03	m ²	10000	21	100000	21
3.11	Bar Reinforcement	2.05	m ³	100	1000	400000	1210
Structures Costs Total to Summary					2710000		2710000
Part 4							
Incidentals							
4.1	Site & Material Transport	4.01	m ³	1000	85	100000	85
4.2	Dully Drains by Covered Drain sections	4.02	m ²	10000	6	60000	6
4.3	Underlay Uncovered Drain sections	4.03	m ²	10000	10	100000	10
4.4	Site Clearance	4.04	m ²	10000	20	200000	20
Incidentals Costs Total to Summary					492000		492000
Summary of Bill to Summary							
Part 1	Preliminary and General			Main Drain Section		Excavation & Structure	
Part 2	Earthworks			1890000		1890000	
Part 3	Structures			2740000		2740000	
Part 4	Incidentals			492000		492000	
Sub Total				5110000		5110000	
Add 20% Contingencies				998000		998000	
Grand Total				6108000		6108000	
Grand Total Main Drain & Extension 1 & 2				4743800		4743800	
						68491800	

Urban sector engineering project

A summary of the relevant data based on the estimates prepared by Cowiconsult on behalf of the Government of Tanzania and the World Bank for the Urban Sector Engineering Project is given below:

From Volume 0, Draft Final Report Oct. 1992; the figures for a minimum standard earth road are US\$25,000. This road is two lane width. Appendix 3.1.3 which contains the cross-section details was not available and Mr. Sheuya offered to try and find a copy to allow a better comparison.

For drainage, the estimate is for US\$ 2,000 per hectare for unplanned settlements for the provision of simple lined channels. Sewers are estimated at US\$ 15,000 per hectare. Given that the main drain in Hanna Nassif is much larger structure than lined drains, and covered in sections, but not as precise as sewerage works, an estimate would have to be made on the basis of an average cost. If US\$ 10,000 is used and it is assumed that half the area of Hanna Nassif is served by drainage, then the approximate cost in 1992 prices would be $50/2 \times 10,000 = \text{US\$ } 100,000$

In addition to these costs would be the construction of outfalls 1 and 2, and the road construction.