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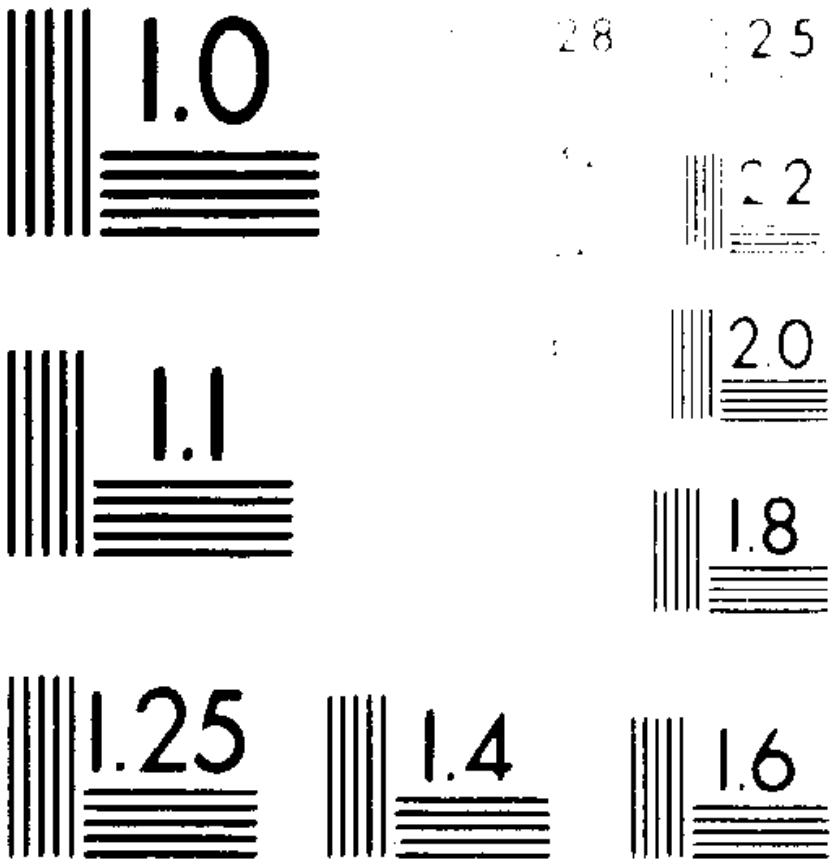
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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

13325

Tanzania.

EVALUATION OF PROJECT US/URT/77/003
"CONSOLIDATION OF VILLAGE PRODUCTION OF
AGRICULTURAL IMPLEMENTS BY LOCAL BLACKSMITHS".

UNITED REPUBLIC OF TANZANIA

RP/URT/82/002

Report on Consultant Mission *

Prepared for the Government of Tanzania by
the United Nations Industrial Development Organization

Based on the work of
Mr. Jacques L. Fournot, UNIDO Consultant
on mission from 21 March to 18 April 1983

April 1983

* This document has not been submitted for formal editing.

Abbreviations

F R G : Federal Republic of Germany

S I D O : Small Industry Development Organization

S I D F A: Senior Industrial Development Field Advisor in DAR ES SALAM

T S : Tanzania Shilling

$: United States dollar (1 $ ≙ 10 TS)

U F I : Large Factory of farming tools in DAR ES SALAM

U N D P : United Nations Development Program in DAR ES SALAM

Foreword

This reports relates to the UNIDO Project US/URT/77/03 "Consolidation of village production of agricultural implements by local blacksmiths" which took place in the regions of MARA - MWANZA - KAGERA, from July 79 to August 80, provides an evaluatio of this project achievements & proposes a draft of project document for a "phase II" of the same project.

It can be stated that the objectives of the Project have reasonably been attained, and that there are good foundations for further consolidation.

Concerning the proposed phase II of the project, a two year duration is suggested with an overall budget of 449 000 $. Included is a provision for a supply of tools & equipments for the blacksmith groups of 30 000 $, that they should replay to SIDO. A detail list of those tools is included in the report, to enable their purchase prior to the project initiation.

Summary

1) Immediate objectives of the Consultant mission
2) Special considerations. Background . Justification
3) Consultant activity
4) Coordination of the Consultant observations & recommendations with the views of the FRG delegation & of the Substantive Officer of UNIDO Headquarter
5) Evaluation of the Project and of the SIDO follow-up since the Project end, until now
6) Project document draft for phase II
7) Job description for phase II
8) Comment of consultant concerning the development of regional industries able to fill the shortage of ox - drawn farming implements

Chart	I	Map	
Chart	II	Appendix	I (1 to 3)
Chart	III	Appendix	II (1 to 3)
Chart	IV (1 to 8)	Appendix	III (1 to 3)
Chart	V		

1) Immediate objectives of the Consultant mission

The Consultant in collaboration with the Substantive Officer from UNIDO Headquarters and with the Officer appointed by SIDO had to perform the following duties : (c f job description)

1.1) Under-take the evaluation of project US/URT/77/03, so exactly determine the successes/failures of activities implemented & the reason thereof.

1.2) On the basis of the findings, analyse the need of the project and work out new proposals & recommendations for its phase II.

1.3) Prepare a new project document in which financial & technical assistance requirements are indicated including budgetary allocations for all componemts require

1.4) Prepare appropriate job description for experts required.

1.5) Submit to the Government authorities an updated Project Document including financial requirements.

2) Special considerations. Back ground. Justification .

This project was started in july 1979 with financial inputs provided by the Government of the Federal Republic of Germany and lasted for only one year.Considered as a pilot project for the production of selected improved agricultural tools, the project had, inter alia, foreseen in its work programme, to send some local blacksmiths for training abroad and to carry out an evaluation of the project for further financing. Due to unforeseen circumstances, these aspects of the project could not be implemented. The present mission is intended to evaluate it and to come up with updated project document for phase II of the project.

Within the overall industrial development policy of the country, smallscale industry is one of the basic elements of "Ujamaa" or "self-reliance". In the guidelines issued by the national party, special emphasis was given to the importance of establishing small-scale industries at village levels as an integral part to the rural development strategy in particular those aiming at improving agricultural output. Priorities are thus given to the production of improved agricultural tools by local blacksmiths.

Since one year technical assistance provided to this project by UNIDO through the financing of the Government of Federal Republic of Germany was not adequate hence the justification of the present proposal that may lead to consolidating the initial efforts.

3) Consultant activity

A summary of activity is given in appendix I. The mission activity was initiated in DAR ES SALAM from 23 to 26 March, then followed with a travel to the regions of KAGERA, MUSOMA, & MWANZA from 27 March to 14 April and ended in DAR ES SALAM on 16 April. During this period the UNIDO Consultant was accompanied by the Technical Adviser appointed by SIDO; the mission program was set up by SIDO in consultation with the SIDFA & the consultant.

4) Coordination of the Consultant objectives & recommendations, with the views of the FRG Delegation & of the Substantive Officer of UNIDO Headquater

From 8 April to 16 April the SIDO Technical Adviser & the UNIDO Consultant were joined by : the Official from the FRG Ministry of Economic Cooperation
- the Consultant from the same Ministry
- the Substantive Officer from UNIDO headquarter

Prior to the arrival of the above delegation, the UNIDO Consultant, in collaboration with the SIDO Technical Adviser, on the basis of previous reports & recommendations and field visit observations, had in mind to recommend the setting of a network of workshops for the production of farming implements such as ox-drawn implements, carts & other simple hand operated crop processing apparatus, for which there is an acute shortage of production in in the country.

These views were not approved by the FRG delegation who insisted on the following point budget limitations, no power equipments for the village blacksmith, no central workshop, no grant of equipment to the blacksmiths.

Thus after thorough discussions, it was agreed by the five participants that the conclusions & recommendations should be in line with the views of the FRG delegation, in particular, in matters related to financial requirements which condition all other aspects.

The basic findings & recommendations of the UNIDO Consultant were communiquated in the form of draft papers to the FRG Delegation and to the Substantive Officer from UNIDO before departure from DAR ES SALAM.

This reports is based on the same draft papers.

5) Evaluation of the Project and of SIDO follow-up since the Project end.

5.1) Records & reports available at UNDP office, and data provided by SIDO

The project lasted from july 79 to August 80, with the participation of one Expert during that period, and of one Forge Consultant from 15 October to 13 December 79.

Nine blacksmith groups were identified in the KAGERA, MWANZA & MARA regions, as capable of development, at the condition that ;

- appropriate tools be provided
- raw materials be supplied
- appropriate work sheds be erected.

A set of tools was provided in Jan. 80, free of charge to the 9 groups. This is tabulated on chart I, next page, on columns "a". Those tools were purchased in Kenya at . cost which amount could not be reconciled, from the file available in UNDP/ DAR ES SALAM, with the figure of 28 600 $ indicated in a UNIDO inter office correspondence.
Beside the 4 hand standing forges, purchased in Kenya, 5 leather bellows manufactured locally under the supervision of the Forge Consultant, were also provided.

Scrap steel purchased from UFI, in DAR ES SALAM, has also been provided to the groups during the last 3 years according to data indicated an chart II, at an average/approx. cost, on site of 1000 TS/ton. This supply is paid for by the blacksmith group, either cash or on short credit basis.

An Appropriate worksshed to replace the traditionnal thatch huts, had been designed by the project Expert. Those worksheds were manufactured in 1982 by PIPECO in DAR ES SALAM at a total cost of 108 000 TS ex-work. (plus 85000 TS for transport, etc. supported by SIDO) provided, free of charge, & erected during the last quarter of 1982, except in ITHAWA "B" were a change of location is anticipated.

Tools & Equipments provided to the 9 groups during phase I of the project and situation observed in March/April 83

	KARA					KIWANZA						KAGERA					
	Kisaka	Kiroreli		Nasoko		Ikulwa		Kashishi		Nyamil		Itawa A		Itawa B		Bwanga	
	a	a	b	a		a	b	a	b	a	b	a	b	a	b	a	
Hand forge		1	1					1	1	1	1					1	
Bellow	1			1		1	1					1	1	1	1		
Tube conduit bench	1	1	1			1	1	1	1	1		1	1	1	1		
Stock dies set	1					1	1					1	1	1	1		
Hydro press	1																
Anvil	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	
Engin, vice	1	1	1	1		1	1	1	1	1	2	1	1	1	1	1	
Tool box including																	
12 Various files	12	12	6	12		12	4	12	4	12	4	12	6	12	4	12	
2 Forge tongs	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	
2 Hack saw frame	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	
100 Hack saw blabes	100	100	20	100		100	10	100	15	100	25	100	15	100	20	100	
1 Hand drill	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	
1 Set drill bits	1	1	½	1		1	½	1	½	1	½	1	½	1	1	1	
6 Various hammers	6	6	6	6		6	6	6	6	6	6	6	6	6	6	6	
10 Cold chisels	10	10	4	10		10	5	10	4	10	5	10	4	10	5	10	
1 Tinsnip	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	
1 Compass	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	

a) Provided Jan 1980 (according to documents in UNDP & SIDO files)

b) Existing at time of visit in March / April 83, as observed by consultant (Kisaka, Niasako, Bwanga were not visited)

SIDO Work sheds : Nine prefabricated work sheds (with steel poles & truss, & corrugated steel roof) were delivered to each group & erected during the last quarter of 1982, except in ITAWA "B" where some parts are missing & a change of location is anticipated.

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Scrap Raw materials supplied by SIDO & Turn-over of each group during phase I

	1980/81		1981/82		1982/83		
	Scrap (b) ; in ton	Turn-over (a) 1000 TS .	Scrap in ton	Turn-over 1000 TS	Scrap in ton	Turn-over . 1000 TS .	Number of active workers.
MARA							
Kisaka	2	39	2	50	1	102	10
Kiroreli	2	32	2	34	1	46	6
Nyasako	2	34	2	36	1	50	6
MWANZA							
Ikulwa	2	65	2	72	2	100	24
Kashishi	2	38	2	46	2	70	9
Nyawilamiwa	2	46	2	50	2	72	11
KAGERA							
Ithawa"A"	2	68	2	72	2	85	15
Ithawa "B"	2	35	2	48	2	60	12
Bwanga	2	36	2	46	2	75	8

(a) according to SIDO administrative year : from july to june

(b) other scrap steel is obtained by the black-smith groups from other sources than SIDO

Annex II

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5.2) The following groups were visited : (cf Appendix I & Map)

KAGERA region : ITHAWA "A" & ITHAWA "B" (plus NYUNGWE, non assisted)
MARA : KIRORELLI
MWANZA : IKULWA, KASHISHI, NYAMILE MIWA

BWANGA, KISAKA, NASCKO, could not be visited due to lack of time, long distance, & restriction in the availability of SIDO car.

A summary of observations on the 6 groups (plus one) visited is given in Appendix II.

A inventory of tools remaining from sets provided in 1980 to each group is given on chart I (columns "b")

5.3) Present situation of the 9 blacksmith groups regarding the immediate objectives of Project

a) to improve quality of production through introduction of newer & more efficient hand tools

Only one on-assisted in NYUNGWE (KAGERA) was observed : the products (hoes, banana diggers, knives) are made of thin gage steel & show a rudimentary workmanship.

Incomparison the use of proper anvil, heavier hammers & the supply of heavier gage scrap steels has enabled the assisted blacksmiths to make more sturdy tools. The use of good files and vice allows a better finish & sharper edge of cutting tools. The use of a proper leather bellow or crank blower allows a higher heating power fire & in turn a more appropriate forging temperature for the work piece.

The use of hacksaws, tinsnip, proper cold chisels, hand drill has allowed some cold metal work & sheet metal work that is a broadening of the traditionnal blacksmith range of techniques.

The use of a work-shed, high & large enough (covered area : 4,4 x 7.6 m) enables the workers to move around & stand up more freely: this has certainly a positive, if indirect, effect on the quantity & quality of production.

The above being stated, it remains room for many improvements:

. The engineering vices provided, are of the bench type & made of cast - iron; the proper type should be made of forged steel, standing on a leg resting on the floor or securely fastened to a heavy beam, so that it is possible to work with hammers on the vice.

- The work sheds have been prefabricated entirely of steel pipes, steel angles covered with corrugated iron. There is certainly more economical (appropriate) ways to make that kind of shed using local wood poles & fasteners made by the blacksmiths. The sheds should be erected by the blacksmith themselves. The money saved that way could be used for other tool purchases.

- It seems that the cost of the tools purchased in Kenya has been higher than what could be obtained from specialised suppliers in Europe, India, of East Asia. Quotations from several european suppliers can be obtained by telex, within a week, in general.
- The tube bench, stock dies set, small drill bits, which have been provided, do not seem to fit the actual needs or skills of the blacksmith : there is little or no demand for pipe work, & small drill bits are too fragile to put, at this stage, in the hands of blacksmiths.
- In general the anvils, the firehearths, the vices (except in Nyamilemiva & Ithawa "A") are not set on woodblock, stand & bench. Working in a standing position, instead of the archaic squatting position, should enable stronger strikes of hammer & more precise fitting on the vice.
- It has been stated by SIDO, that leather bellows as they were made locally (in Mwanza), cost about 2000 TS, which is much more expensive than available hand crank blowers.
- Except in IKULWA & NYAMILEMIWA there is no store room built on the site of the work shed. This causes the blacksmith to carry their tools from & to a near-by house.
- The "pilot" workshop that had been set up in MWANZA in 1980 does not exist any more.

It should be noted also :

- That, though it was planned that the blacksmith groups were to pay (on instalments) for the tools & sheds, in fact tools & sheds were granted to them, free of charge, for the reasons that :
- Other international aid organizations had provided equipments free of charge.
- Banks had been reluctant to provide any loans to the groups.

b) <u>to increase production of local farming implements suited to regional conditions</u>

The production, at present is limited to hand tools such as :

- Hoes, Knives, Axes, Bush knives, Diggers, Adzes, wood planes, mining tools, spears
- plus some sheet metal products such as buckets, chicken feeders, drums etc.

Turn over for each group is indicated on chart II for the last 3 years. It shows a steady increase.

As for ox-drawn implements the only production, in very limited quantity, are spare plough shares (made from scrap truck spring blades).

The gap between demand & supply of farming tools & implements being considerable (as shown on chart III) one may regret that the blacksmith production of hand tools remains limited ; of ox-drawn ploughs, cultivatory and carts is nil.

The gap between demand & supply insures a good market. But the blacksmith project does not bring a quantun step that could improve the general supply of farming implements, substancially.

Hand tool design could be modified / improved to adjust to scarcity of raw materials of proper size & thickness. The report of MR. BALFOUR provides good examples of such design adaptation. It has not been observed that any trial application of those designs have been made.

The production of ox-drawn implements would require a supply of proper raw materials, the elaboration of implement designs adapted to the limited blacksmith production means, & a considerable effort in training. It is now difficult to anticipate such development.

c) <u>To provide extension service to rural blacksmiths together with advice on raw material supply & products market</u>

It appears that SIDO at DAR ES SALAM headquarter level and regional levels has insured a fairly affective support to the development of the blacksmith groups activity, particularly in the procurement of scrap raw material. This is shown on Chart II.

The impact of SIDO field technician does not seen to have been very effective in terms of technique (e.g. anvil, vice, hearth, still on ground)

Statistic of production : turn over, number of workers, types of product, seems to be fairly regularly collected. But reliability is not insured since there is no available records & accounting books in any of the groups which have been visited.

* MR. BALFOUR was the Forge Consultant

Some data on agriculture & industries & related farming implements demand and supply

	KAGERA	KWANZA	MARA
Population	1 009 000 (1978)	1 619 000 (1982)	756 000 (19
Total area sq. Km	28 513	35 192	21 750
Cultivable area sq. Km		17 956	
Under cultivation sq. km		11 730	
Cattle population	424 000	1 291 000 (1981)	826 000
Crops :	Maize Cotton 3000 ton Coffee 15500 " Tea 1000 Millet Cassava Banana	Maize 45000 ton Cotton 50000 " Sunflower 11000 ton Potatoes Sweet " Cassava	Maize Millet Sorghum Caffee Cassava Bananas
Large Industries	Instant coffee (1) Cotton gin Tea blender (1) Sugar mill (1)	Soap (2) Textile (1) Oil edible Cotton gin (6) Engineering (2) Fishnet (1) Furniture (1) Surgical cotton (1) Tannery (1)	Textile (2)
Small Industries	Furniture Coffee hulling Grind mills Garage	300 Units	Brick Fish drying Boat building Blacksmith Footwear Handmade paper Slate
Plough, existing		38 000	26 000
" demand 82/83	(a)	12 000	12 000
Plough supply 82/83	500	2 500	500
Hoe demand 82/83	60 to 100 000	300 000	100 000
" supply 82/83	9 000	90 000	20 000
Plough share demand 82/83		50 000	60 000
" " supply 82/83		12 000	12 000

(a) not developped for lack of implement supply

N.B. Source : Regional Planning Offices & Regional Trading Co

At the regional & local level it seems that a particular attention of the SIDO staff should be directed toward the setting up of basic records & book-keeping. This is particularly relevant to the groups who claim that they are set up & registered as "cooperatives".

Now, it is difficult to know, for sure what are :

- the number of active workers in a group (some workers participate to only a limited activity)
- the number of work-days (in general each active workers works only 3 days / week at the work shop, and works on the farm the rest of the time)
- the sales : types of product, quantity, & price
- the cost of inputs : steel, charcoal etc
- the salaries paid to the workers

The marketing of the blacksmith products does not show any difficulty, whatsoever, the shortage of supply of farming tools being as it is.
For instance a hoe made by the village blacksmiths is sold 30 to 40 TS on site, while the some hoe is sold 45 TS at the state trading shop.

It should also be noted that the activity initiated in the 3 regions & 9 groups has been extended, on the same basis, to several other regions, by the activity of SIDO headquarter. A special working group has been set up by the Minister of Industry with Representatives of the Ministry of Agriculture, SIDO, the National Dev. Corp, UFI, ALAF Industr. the Design & Dev. Center, to promote the decentralization of farming tools & implements design & manufacturing. One decision of the group has been to direct all available scrap steel toward regional & village production of farming tools & implements instead of toward billet smelting.

A good example of above activity in that field, is the manufacturing in DAR ES SALAM, under SIDO supervision of 50 sets of 15 blacksmith tools (composed of 6 hammers, 6 tongs, 2 chisels, 1 flatner) from scrap railway car wheel tyres (carbon steel). Those 50 sets will be distributed to village blacksmith groups at the price of 6500 TS each.

5.4) General evaluation of Project

a) According to the above analysis, in general, one may conclude that the "immediate objectives" of the phase I of the project have been fairly well reached. Some mixed results & shortcomings may be observed, but they may be considered as resulting from unavoidable operation difficulties.

b) One should consider, in this evaluation, that :

- the project target does not really belong to the "small industry sector" but rather to the "informal sector" for which known recipes are often not valid.
- a one year period is a rather short time to survey and master a field of activity scattered over an area more than 500 Km wide, with very poor roads, and distant of some 900 km, from the capital.
- the general shortage of all sorts of supplies, the difficulty of communications, complicate any problems.

c) The results of this Project (phase I) constitute a good foundation for a follow up phase II, where further "consolidation" would be the objective .

6) Project document draft for phase II

According to the FRG Delegation the objective of Phase II of the Project should be limited to CONSOLIDATION of the "9 existing groups" so that this development could be taken as a model for further extension. In this perspective the following Project document is proposed, which draft has already been agreed upon.

A - Overall Development Objectives

In the light of the experience gained during the implementation of phase I of this project and in view of some recent developments external to the project, the overall development objectives of this project are to :

(1) consolidate existing rural small industry production
(2) cooperate with the realization of the national agricultural development policy in the sector of hand tools
(3) upgrade technological level existing in rural areas
(4) create additional rural employment opportunities

B - Immediate Objectives

These are to :

(1) increase production capacity of the nine local blacksmith units already selected
(2) diversify their production lines by introduc ing new items
(3) upgrade the standard of production through the provision of new improved tools and equipment
(4) establish a permanent channel for the purchase of adequate raw materials
(5) select & train some of the blacksmith in record & account book keeping
(6) train SIDO field technicians to supervise further blacksmith group developments.

C. Special Considerations

The first phase of this project was started in July 1979 with a financial input provided by the Government of the Federal Republic of Germany that lasted only for one year. It was considered to be a pilot project for the production of selected improved tools. Great enthusiasm was created by the implementation of this project among the local blacksmith communities concerned thus far neglected but its duration was so short that it can be said that no solid impact was imparted upon their activities. If the desired effect is to be achieved, it is undoubtless that the project requires to be consolidated. It is therefore essential that special consideration be given to this project whose implementation may go a long way in the developmental efforts towards rural industrialization in Tanzania.

D. Background and Justification

Within the overall industrial development of the country, small-scale industry is considered as one of the basic elements of "Ujamaa" for the "self-reliance". In 1973 the national party has issued specific guidelines on the development of small-scale industry. These guidelines have stressed the importance of establishing such industries in the villages as an integral part of the rural development strategy. Furthermore, more recently, national agricultural development policy was formulated in which specific guidelines and stress were given to gradual mechanization of the agricultural sector. Among other things, the latter emphasizes the use of animal drawn tools to be manufactured locally to avoid expensive importation of improved agricultural implements. Priorities are given to local manufacture of improved hand tools, animal drawn equipment so that step by step the country can produce later on small harvesters, processing equipment and more sophisticated agricultural machinery. Hence the importance of this project that aims at strengthening the production capacities of existing rural blacksmiths under the supervision of SIDO.

Although during the implementation of Phase I of this project, some difficulties have been encountered, yet the results pinpoint to the facts that this approach is the right one in the process of rural industrialization. It has shown its ability to harness existing skills in the villages; given the opportunity, the blacksmiths demonstrated their ability for upgrading their know-how to produce better tools and to supply local markets at a competitive price. With more improved equipment, no doubt, they can produce adequate number of agricultural tools of required standards.

E - Project outputs

1) Increased quality and quantity of blacksmith production

Each of the 9 groups will be supplied a number of tool sets, according to their present capacity level.

In each group the workers will be organized in teams of 3 to 4 workers, each team working around one hearth & one anvil, with a set of tools pertaining to that team.

The number of teams in each group is proposed to be as follows :

MARA		MWANZA		KAGERA	
KISAKA	: 3	IKULWA	: 3	ITHAWA "A"	: 3
KIRORELLI	: 2	KASHISHI	: 2	ITHAWA "B"	: 2
NYASAKO	: 2	NYAMILEMIWA	: 3	BWANGA	: 2

Beside tools pertaining to each team, each group will be provided tool sets, to complement what was provided during phase I.

Moreover other tool sets will be provided to each group, to be used in common by the teams, & according to their technical capacity.

The supply of tools will support further skill training to improve quality, quantity, & diversification of production.

The above will go along an improved organization of scrap steel supply, from all available sources in large industries, around mining & public work sites, railway yards, truck scrap yards etc.

Each group will receive training in record & account book keeping.

2) Formal training

Some village blacksmiths training should be organized in the training facilities of the country according to possibities offered by SIDO.
The project will provide three fellowships for SIDO technicians, to upgrade their supervising capacity of blacksmith groups.

3) Reports

A detailed program of actions to be taken by UNIDO & SIDO, prior to the arrival of international expert & volunteers personnel, will be establisted, concerning procurement of tools, training of national technicians and any other actions deemed necessary,

to put field personnel activity on the right footing, at the start. This program will include also the training in "basic swahili" of the international personnel.

During the project implementation, half yearly report will be written by the expert - in - charge. Also a report will be written after the mid-term review and the final tripartite review.

F - Activities

1) As stated above, procurement of tools & training of national technicians will be take place prior to project international personnel appointment.

2) The project expert-in-charge will devote the totality of his time to the blacksmith groups, except for a limited amount of time for project administration, procurement, etc. This means that each group would receive his supervision during an average total time of 2 month

3) A volunteer will be appointed to each region to share his activity between 3 groups

The sequence of project activity in each group could be out-lined as follows :

4) Erection of supplementary work shed, where there are more than 2 teams in operation (a shed is convenient for 2 teams).

5) Proper lay out of hearths, anvils, bench etc, on proper stands & frame.

6) Training of blacksmiths to work in standing position - training to team-work around one anvil. (one master + 2 strikers)

7) Training to use more elaborate forge tools such as flatner, hot chisel, drawer, swage block, punch, stakes etc, & shear & punch hand machine.

8) Training in more elaborate forge designs such as assembly by rivetting.

9) Design & production of new products.

10) Training in the use of gas welding and cutting (exploitation of scrap steel on mine site, etc)

11) Training in sheet metal work (flanging & beading machine).

12) Training in tempering (chisels, plough shares) & brazing.

13) Training in manufacturing of appropriate forging tools using scrap carbon steel.

14) Selection of some blacksmiths to be sent to local training centers for further vocational education.

15) Setting record & accounting book keeping & training - Relationship with banks.

G - Inputs

BUDGET DRAFT

A) FRG / UNIDO Contribution

		Total man x month	$	
10	Project personnel			
11	Forge engineer (1x24)	24	194 000	
14	Volunteers (3x24)	72	72 000	
15	Travel within the country		40 000	
16	Mid term review & final tripartite review (headquarter officer)		8 000	
19	Total personnel			314 000
30	Training			
31	Fellowship (3x6)	18		45 000
40	Equipment			70 000
50	Miscellaneous			
51	Operation & maintenance			20 000
			Total $	449 000

B) TANZANIA Government Contribution

11-1	Technical officer (1x24)	24	72 000 TS	
11-2	Technicians (3x24)	72	108 000	
11-5	Driver (1x24)	24	24 000	
19	Total personnel			204 000
51	Transport (local)			10 000
			Total TS	214 000

N.B. Housing for international staff is not included in above computation

Comments on the " BUDGET DRAFT "

A) FRG / UNIDO Contribution

14) Volunteers :

The basic rate is 1000 $ /man month. But from information available it seems that no U N Volunteers could be appointed on that FRG financed project. Nevertheless FRG Volunteers could be appointed.

15) Travel within the country

a) .The project "forge engineer" will likely be " stationned " in Mwanza, & will travel, from one blacksmith group location to other, almost of the time would, thus, be out of station.

Total time out - station : 600 days

D S A : 55 $ / day

Total D.S.A. 34 000

b) .Round-trips to DAR ES SALAM by plane

8 for the engineer

12 " Volunteers

20 ⓐ 300 $ 6 000

Total $ 40 000

31) Fellowship

Three technicians would get each a 6 month fellowship, in hand forge & hand cold metal work, in Kenya, Zimbawe, or India .

(depending on their Knowledge of english)

40) Equipment

a) One Car "Land Rover"

four doors, diesel

with : roof luggage carrier with jerrycan holders (5)

- two spare wheels
- set of maintenance tools & box
- set of spare parts for 60 000 Km
- 4 spare tyres + tubes
- 5 steel jerrycans (20 liter)

One trailer, one ton, one axle, (with same wheels as above Land Rover)

With appropriate brakes & back lights 30 000 $

& tarpaulins

(approx. dimensions : 2 x 1,3 m)

	M/F 30 000	$
b) Three motorcycles (HONDA, SUZUKI etc)		
125 Cm3 – trial		
with . tool kit		
. set of spare parts		
. two spare tyres & Tubes	7 500	$
. helmet		
c) One type writer, manual, 40 cm		
One office calculator, printing		
Three Kerosene refrigerators (for each volunteer)		
Camping equipment		
(if necessary, to stay in the villages)	2 500	$
c) Tools & equipments to be provided		
to the blacksmith groups	30 000	$
(refer to chart IV & V)	70 000	$

51) Operation & maintenance

a) . Land Rover

Diesel fuel		
6000 liter @ 0,6 $ / liter	3 600	
Oil, Maintenance & repair	4 400	
		8 000

b) . Motor cycle

Petrol		
3600 liter @ 1,5 $/liter	5 400	
Oil, maintenance & repair	3 000	
		8 700

c) . Miscellaneous purchase, & expenses
(including office supplies, telephone, telex, mail, typist fee) 3 300

20 000 $

B) TANZANIA Government contribution

Beside the national staff cost the goverment (SIDO) would bear the cost of local transportation of the tools, equipments & raw materials provided to the blacksmith groups.

The government would also provide housing for the engineer & the volunteers in each of the three regions, tentatively in Musoma, Geita & Bukoba.

4) Supply of tools & equipments for the blacksmith groups

1) The above project budget allocates 30 000 $ for purchase of sets of tools detailed in chart IV (1 to 8) with estimated costs.

2) Before establishing the final budget actual supplier quotations should be obtained.

3) The number & cost of each set set A 1, A 2, B, C, D, E, is given on the four columns on the left side of chart IV. Costs are given in TS with approximate 10 TS / $

4) Supplier's catalogues which have been used are from :

- LUNA International, S/44180, ALINGSAS, SWEDEN Telex 2409 LUNA
- HAHN & KOLB, post fach 333 STUTTGART
- VULCAIN International, 201, avenue President WILSON, 93210 PLAINE ST DENIS FRANCE Telex 630 140 F VULCPLA

Appendix III provides some data on tools requested

5) Repayment of tools by the blacksmiths

It has been proposed that the tools provided should be repaid at the rate 20 % per year

Chart V give the anticipated amount to be paid each year & turn over

As estimated the repayment would be less than 11 % of the anticipated turn over in 1982/3 while during the following years, with the expected development, the turn over should increase substancially.

7) Job descriptions

Post title : Forge engineer
Duration : Two years
Duty station : Mwanza with extensive travels in KAGERA, MWANZA, MARA regions
Purpose of project : consolidation of nine village blacksmith groups, increase production quantity & quality, introduce new tools & techniques, diversify production; introduce record & accounting book keeping, insure supply of raw material.

Duties :
- Assist & advise village blacksmith groups :
- Train in proper use of improved hand tools
- Improve production quality & quantity
- Diversify products
- Train in forge tool making
- Train in record & accounting book keeping
- Train counterparts at region level & technicians at village level, to insure that development is carried out further, after end of project
- Supervise the three volunteers appointed to the project
- Write reports as required
- Keep project administration according to regulation

Qualification :
- metal work engineering degree or equivalent experience, with practical ability in hand forging techniques
- ten years in small industry management, of which several in developing countries
- ability to train uneducated adult people and inspire spirit & confidence, in that particular field of metal forging
- ability to cope with unexpected & difficult situations related to the isolation of the project area
- ability to supervise a small team of young volunteers.
- ability to travel extensively & with simple accomodation facilities.

Langage :
- english
- swahili : as a working knowledge (if necessary the candidate will be granted tuition fees for swahili lessons)

Background information :
- the first phase of this project, started in july 1979 with financial inputs provided by the Federal Republic of Germany, was completed after one year for want of additional funds. The project started creating enthusiasm among selected blacksmith groups around the lake area. Although, the larger part of the development objectives set in the project document have been fulfilled nonetheless, part of them could not be implemented.

  The present two year project is aimed at consolidation of the blacksmith groups to let them become economically viable and at setting up a model of small scale industry rural development that could be applied in other regions.

8) Comments of the consultant concering the development of regional industries able to fill the shortage of ox-drawn farming implements

From data provided by SIDO it appears that the national demand for ox-drawn plows is 75 000 / year.

The production capacity per year would be :

25 000 by UFI

10 000 by various other manufacturers

5 000 by small industries under SIDO supervision.

It remain a shortage of 25 000 / year.

In the three regions of KAGERA, MWANZA & MARA rough estimates are that there is a demand for several thousands ploughs per year which at present is not satisfyed.

There are considerable propects of development of "ox-drawn forming" in the regions since there are plenty of ox available & since this technique is familiar to be the farmers.

From the consultant experience in West Africa it would advisable to suggest that in each region, be set up appropriate workshops with the proper selection of machine tools to produce ox-drawn ploughs, cultivators, ridgers, harrows, seed-drills, carts and crop processing simple machines .

The necessary investment in machine tools for each workshop would be no more than 100 000 to 150 000 $. Such workshop could produce up to 3000 to 4000 ploughs & cultivators, plus a number of carts / year.

Of course, the necessary amount of raw materials (and revolving fund) would have to be provided according to the planned out put. Anyway, if those ox-drawn equipments were imported a larger amount of currency would be required.

Such kind of production could expect to operate with a 50 % value added.

From his experience in West Africa the Consultant wishes also to suggest that the United Nations Capital Development Fund be contacted to study the possibility of granting the funds necessary to start that kind of regional industry .

There should not be any problem for UNIDO, to draw from it's wide experience, to provide all preliminary data on the subject.

Phase II. Summary of proposed supply of tools & equipments to the 9 blacksmith groups

Set	Cost /set b	Sub-total a	Sub-total b	MARA Kisaka a	MARA Kisaka b	MARA Kirorelí a	MARA Kirorelí b	MARA Nyasako a	MARA Nyasako b	MWANZA Ikulwa a	MWANZA Ikulwa b	MWANZA Kashishi a	MWANZA Kashishi b	MWANZA Nyawil a	MWANZA Nyawil b	KAGERA Ithawa "A" a	KAGERA Ithawa "A" b	KAGERA Ithawa "B" a	KAGERA Ithawa "B" b	KAGERA Bwanga a	KAGERA Bwanga b
A 1	8,6	13	111,8	2	17,2	1	8,6	1	8.6	2	17.2	1	8.6	2	17,2	2	17,2	1	8,6	1	8,6
A 2	4	9	36	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4
B	8,3	9	74,7	1	8.3	1	8,3	1	8,3	1	8,3	1	8,3	1	8,3	1	8,3	1	8,3	1	8,3
C	13	4	52	1	13	–		–		1	13	–		1	13	1	13	–		–	
D	3,9	3	11,7	1	3,9	–		–		1	3,9	–		–		1	3,9	–		–	
E	2,7	1	2,7	–		–		–		1	2,7	–		–		–		–		–	
TOTAL			288,9		46,4		20,9		20,9		49,1		20,9		42,5		46,4		20,9		20,9

(a) number of sets

(b) estimate cost of sets in 1000 TS, CIF DAR ES SALAM

Total estimated cost: 28 9000 TS, i.e. rounded: 30 000 $

Chart IV (1)

- Proposed List of tools & equipment to be supplied during phase II

Set A 1 - Basic Tools & Equipment for one " Team "

Forge work	Price (a)	Catalogue reference
1 Anvil 100 Kg with square hole 25 x 25 mm for stakes	1 400 SEK	Vulcain nº 3824
1 Sledge hammer 6 Kg with handle lg.750 mm Straight pein	145	
1 Idem cross pein	145	
1 Hand hammer 2,5 Kg straight pein with handle lg·400	80	
1 Idem 1,5 Kg	65	LUNA 1917 / 0307
1 Tongs flat jaws Lg 0,5 m	46	Vulcain nº 3799
1 Tongs rounded	46	" 3803
1 Tongs universal	46	" 3816
1 Flattener 50 x 50 mm	150	LUNA 1926 / 0207
1 Hot chisel 1,8 Kg	105	" 1929 / 0303
1 Rotary blower with hand crank	350	Vulcain 3796 (AC)
1 Cast iron air out-let	200	" 3793
Sub total	2 778 SEK	

(a) : approximate price in "swedish crown" according to avaibable catalogues

(Set A1 continued) Cold metal work	Price SEK	Catalogue reference
1 Hack saw frame ext: ist blade lg 300 – cross section 18 x 18	35	LUNA 0680 / 0106
100 Saw blades lg. 300 mm 13 x 0,6 mm – 10 teeth/cm	200	" 0668 / 0201
3 Cross cut cold chisel 250 mm	80	Vulcain 3845
15 Hand cold chisel 250 mm	400	" 3844
15 File, bastard, lg 400 mm (9 flat, 1 square, 2 half round 1 round, 2 triangular)	675	
15 File, mechanics , lg 300 mm couble cut (9 flat, 1 square, 2 half round 1 round, 2 triangular)	450	
10 Steel file brush	40	
1 Steef hand-snip lg 300	115	LUNA / ER-DI 120
1 Rule (meter) folding lg 1 m, metric, alum. alloy	14	
Sub total	2 009	
Set A 1 Total	4 787 SEK	

\+ Provision for inflation, packing & freight : x 1,25 = 5 983 SEK

(1 $ = 7 SEK) 855 $

(1 $ = 10 TS) 8 600 TS

Number of sets A 1 to provide : 13

Set A 2 - Supplement of basic tools for each of the 9 "groups" having already received a set in 1980 (phase I)

		Price	
1	Flattener	150 SEK	
1	Hot chisel	105	
100	Hack saw blades	200	
15	Files, bastard	675	(same mix as in Set A 1)
15	Files, mechanics double cut	450	(")
10	File brush	40	
3	Cross cut cold chisel	80	(same as in Set A 1)
15	Hand cold chisel	400	"
1	Sheet hand snip	115	"
1	Rule (meter folding	14	"
	Set A 2 Total	2 229 SEK	

\+ Provision for inflation, packing & freight : x 1,25 = 2 786 SEK

398 $

4 000 TS

Number of sets A 2 to provide : 9

Set 3 - Common tools & equipment for each of the 9 "groups"

(each group has two or three teams)

Forge work	Price SEK	Catalogue reference
1 Forge leg vice jaw, width 150 mm	800	HAHN & KOLB 51063/100
1 Anvil stake chisel (tail 25 x 25 mm, same as anvil square hole of set A1)	88	LUNA 1555 / 0106
1 Funnel stake 60 x 60	325	LUNA 1557 / 0401
1 Angle bick iron	63	LUNA 1561 / 0108
1 "Extinguister" bick iron length 325 mm - Weight 6 kg	540	LUNA 1560/ 0208
1 Special stake face 100 mm one side chamfered	120	LUNA 1564 /0303
1 Hot punch with handle max dia 30 length 100	100	LUNA 1932 / 0407
1 Swage, top, with handle dia 12	100	VULCAIN 3831 /12 (Etampe)
1 Idem dia. 20 mm	100	VULCAIN 3831 /20
1 Punch with handle dia 20 mm	100	VULCAIN 3834/20 (Dégorgeoir)
1 Rivet punch diam.at point 15 mm	145	LUNA 2308 / 0203
1 Swage block 85 Kg 400 x 400 mm	600	HAHNA & KOLB 57180 / 030
1 Mild steel plate 1 x 0,75 m, thick. 30 mm Four straight & rectangular sides, rough finish	600	(to make a forge work table)
Sub total	3 681	

(Set B continued)

Miscellaneous

		Price SEK	Catalogue reference
1	Grindstone with water trough hand crank wheel stone diam. 300 mm thick. 50 mm with one spare wheel stone	250	LUNA 3830/0208
1	Center punch length 100 mm diam. at point 5 mm	7	
1	Adjustable spanner 19 mm	38	
1	" " 35 mm	84	
1	Rivet punch set 2 / 2.5/ 3 / 3.5/ 4 / 5	58	LUNA 1625 / 0102
1	Square, forge long leg 500 mm	32	LUNA 2538 / 0700
1	Caliper, popular length 120 mm	22	
1	Pipe wrench 2"	187	LUNA 0745 / 0505
1	Adjustable plier	41	" 0765 /0104
1	crow bar, lg 600 mm Hex steel with nail puller	34	LUNA 2278 / 0308
1	Nail pincer lg 200 mm	22	LUNA 0807 / 0401
1	Combination plier lg 180 mm	22	" 0783 / 0409
1	Wood hand saw	41	" 2308/ 0203
1	Mechanies screw driver 6 x 125 mm	10	
1	" 16 x 225	28	
1	Forming tongs, sheel metal single seam	82	
	sub total	958	
	Set B total	4 639 SEK	
	+ provision :	X 1.25 =	5 799 SEK
			828 $
			8 300 TS

Number of sets B to provide : 9

Set C

C 1	Price SEK	Catalogue reference
1 Combination punch & shear hand operated machine sheet thick. 6mm round bar 25 mm hole punch max dia 15 mm thick. 9 mm with : spare pair of blades set of punch & dies diam : 3/4/5/6/8/10/12/15 (3 punch & 2 dies per size)	5 000	VULCAIN 3922
C 2		
1 Thin sheet flanging & beading machine, hand operated thickness 1 mm working depth 200 mm with 6 pairs of rollers	2 270	LUNA 5035 / 0206
Set C total	7 270 SEK	
+ provision : x 1.25 =		9 088 SEK
		1 298 $
		13 000 TES

Number of sets C to provide : 4

SET D

	Price SEK	Catalogue reference
Gas welding & cutting equipment		
Fitter box	1 400	LUNA 3490 / C100
welding & cutting torches		
. With set of spare nozzle, " " parts (gaskets, etc) hoze	400	
10 Kg brazing rod (brass)		
2 Kg flux		
. Gas cylinders 2 wheel dolly	400	
Set D total	2 200	
+ provision : x 1,25 =		2 750 SEK
		393 $
		3 900 TS

Number of Sets D to provide : 3

Set E

	Price SEK	
Winch, lever	1 075	VULCAIN 4804
load lifting 1500 kG		TIRFOR T 13
pulling 2500 Kg		(LUNA : CINAWINCH)
plus :		
wire rope, 40 meter, diam 11,5 mm	455	
Set E Total	1 530 SEK	
+ provision :X1,25 =		1 913 SEK
		273 $
		2 700 TS

Number of set E to provide : 1

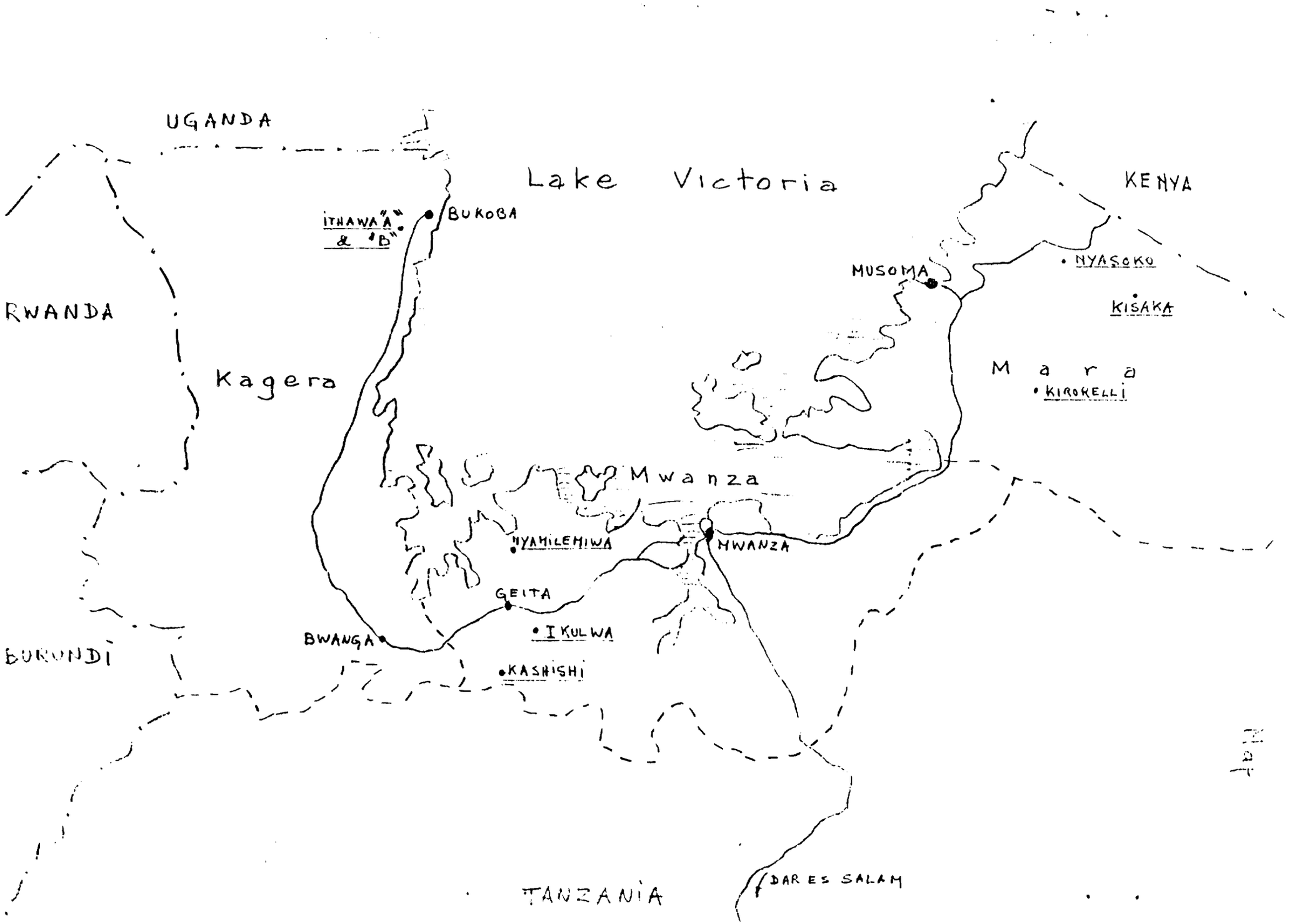
Repayment of tools & equipment proposed for phase II

compared to anticipated turn-over July 82 / June 83

	Phase I	Phase II				Anticipated
	Teams equipped in 1980	Other teams to be equipped	Total teams equipped	Cost of tools & equipment (a)	Repayment 20 % year (a)	Turn-over / year (1982/83) (a)
MARA						
Kisaka	1	2	3	46.4	9.3	102
Kirorelli	1	1	2	20.9	4.2	46
Nyasako	1	1	2	20.9	4.2	50
MWANZA						
Ikulwa	1	2	3	49.1	9.8	100
Kashishi	1	1	2	20.9	4.2	70
Nyawilamiwa	1	2	3	42.5	8.5	72
KAGERA						
Ithawa "A"	1	2	3	46.4	9.3	85
Ithawa "B"	1	1	2	20.9	4.2	60
Bwanga	1	1	2	20.9	4.2	75

(a) in 1000 Ts

Observation : the repayment per year for each group is less than 11 % of turn-over in 1982/83.


UGANDA
Lake Victoria
KENYA
ITHAWA "A" & "B"
BUKOBA
MUSOMA
NYASOKO
KISAKA
RWANDA
Kagera
Mara
KIROKELLI
Mwanza
NYAMILEMIWA
MWANZA
GEITA
IKULWA
BWANGA
BURUNDI
KASHISHI
DAR ES SALAM
TANZANIA

Repayment of tools & equipment proposed for phase II compared to anticipated turn-over July 82 / June 83

	Phase I	Phase II				Anticipated
	Teams equipped in 1980	Other teams to be equipped	Total teams equipped	Cost of tools & equipment (a)	Repayment 5 % year (a)	Turn-over / year (1982/83) (a)
MARA						
Kisaka	1	2	3	46.4	9.3	102
Kirorelli	1	1	2	20.9	4.2	46
Nyasako	1	1	2	20.9	4.2	50
MWANZA						
Ikulwa	1	2	3	49.1	9.8	100
Kashishi	1	1	2	20.9	4.2	70
Nyawilamiwa	1	2	3	42.5	8.5	72
KAGERA						
Ithawa "A"	1	2	3	46.4	9.3	85
Ithawa "B"	1	1	2	20.9	4.2	60
Bwanga	1	1	2	20.9	4.2	75

(a) in '000 Ts

Observation : the repayment per year for each group is less than 11 % of turn-over in 1982/83.

Appendix I (1)

Summary of the Consultant Activity

Mon	21/3/83	Departure LOME – TOGO	16 00 H
	22/3/83	Arrival DAR ES SALAM	14 00 H
	23/3	Meeting MR HENEIN, SIDFA MR BAPURAJ, Technical Adviser, SIDO Administrative office, UNDP MR SAUWA, Manager, Technical Service, SIDO MR MLAGALA, Director, Research & Planning, SIDO Briefing on SIDO organization & activity by MR BAPURAJ Collection of data at SIDO	
	24/3	Meeting MR HENEIN, SIDFA. Discussion about project phase I & consultation program. Discussion about UNCFD possible intervention Visit of UFI, Hoe & plough works. Collection of data at SIDO	
	25/3	Information gathering at SIDFA office " " at SIDO Visit of SIDO Industrial Estate " of PIPECO Works – MR GUPTA – discussion about plough design	
	26/3	Collection of data at SIDO Visit of CASEMENT works – MR TULSIAM - discussion about hoe design Visit of SHEETMETAL Works –	
Sun	27/3	Departure, plane, DAR ES SALAM 07 00 H together with MR BAPURAJ Arrival BUKOBA 11 00 H	
	28/3	Meeting MR KIHIMA, Reg Manager, SIDO, BUKOBA MR MUNGEREZA, Tech. Officer, SIDO, BUKOBA MR NYANA Economist, SIDO, BUKOBA At Region . Hdqter : DR MBWIRE, Reg. Livestock officer MR RUTTA, Reg. Agricultural Dev. officer MRS MUTASHOBYA Reg . Community Dev. officer MR MBWAYU, Reg. Cooperative Dev. officer	
	29/3	Visits of blacksmith groups ITHAWA "A", ITHAWA "B" " of NYUNGWE (non SIDO assisted)	
	30/3	Visit of the KAGERA Sugar mill meeting MR KILUMBI Manager – MR FLAWS Adviser evaluation of hand tools & ox drawn implements needs	

	31/3	Winding up with BUKOBA-SIDO Staff
		Visits : TANZANIA OXYGEN – TANZANIA ELECTRIC Co –
		RURAL DEV. BANK
		Departure by air BUKOBA 14 00 H with MR BAPURAJ
		Arrival MWANZA 15 00 H
	1/4	Holyday (good friday) – discussions with MR BAPURAJ
	2/4	Meeting MR MOLLA, Reg. Manager, SIDO , MWANZA
		MR MAUA, Techn. officer
		MR SWEBE, Economist
		at Reginal SIDO Headquater MWANZA
		Visits : MWANZA METAL works (MR KALSI SINGH)
		M.D. INVESTMENTS (Metal works)
Sun	3/4	Departure by road MWANZA, 08 00 H with MR BAPURAJ
		Arrival MUSOMA, 13 00 H
	4/4	Meeting at SIDO Reg. Headquarter MUSOMA
		MR NTEGETE, Reg. Manager, SIDO
		MR SUNGURA, Tech.officer, SIDO
		MR HOJA, Indust. Estate Workshop Manager, SIDO
		Meeting MR LIMA, Director, MARA Industrial CORP
	5/4	Meeting MR MOSHI, Reg.Dev. Director
		MR RUTA, Agric. Dev officer
		MR MWINGIRA, Regional Commissionner
		Visit MARA Industrial Corp workshop, MUSOMA
		SIDO Industrial Estate "
	6/4	Winding up with MUSOMA SIDO staff
		Departure by road MUSOMA at 15 00 H with MR BAPURAJ & MR MOLA
		Arrival MWANZA at 2030 H
	7/4	At SIDO office : writing report draft
	8/4	Meeting MRS RAU – MENTZEN, FRG, Ministry Economic Coop.
		MR ROGER, FRG, Consultant
		MR ZEREZGHI, Substantive officer, UNIDO
		Meeting MR. SHELLUKINDO Reg. Dev. Director, MWANZA

	9/4	Visit "Training center for Agriculture Mechanization"
		Departure MWANZA by road 12 00 H
		Arrival GEITA 16 00 H
Sun	10/4	Meeting of all mission participants & discussion about all aspects of evaluation & planning-
		Meeting with MR MASANGAU. District Dev. Director
	11/4	Visits of IKULWA blacksmith group & KASHISHI blacksmith group
		Meeting with all mission participants for thorough analysis of project phase II budget
	12/4	Visit of NIAMILEMIWA blacksmith group
		Departure GEITA by road 13 00 H
		Arrival MWANZA 18 00 H
	13/4	Meeting with all mission participants at SIDO office
		Departure MWANZA 12 00 H by air
		Arrival DAR ES SALAM 17 00 H
	14/4	At SIDFA'S office
		Choice of tools & equipment to be provide to blacksmith groups
		Evaluation of cost of above
	15/4	Idem - Discussion with FRG consultant about above & over all agreement . Visit of a Forge Training Center, Ministry of Labour
		Redaction of phase II project draft document basic computation
	16/4	Idem
		Meeting with MR. GUPTA Manager PIPECO
	17/4	Discussion on plough & cultivator design Departure DAR ES SALAM by air 06 00 H
		Arrival LAGOS 17 00 H
	18/4	Departure LAGOS 13 H
		Arrival LOME 15 H

Summary of Observations on the 7 Blacksmith Groups Visited

(for detailed information concernings sheds & tools & for supply of raw material & turn over refer to Charts I & II)

KAGERA

ITHAWA "A"

- from BUKOBA : ½ H drive
- no store room
- 1 hearth with SIDO leather bellow + 1 another with traditional bellow
- steel anvil on floor + other stone anvils
- vice fitted on good wood bench
- 10 skilled workers + 5 helpers / apprentice
- special product : banana stem diggers
- acute problem : charcoal on short supply & very expensive
- electric power network available on site in 1984/85 (confirmed by Electric Power Co)
- request for power equipment to be used when power available
- general evaluation : GOOD

ITHAWA "B"

- ½ H drive from ITHAWA "A"
- work under a thatch hut
- steel shed not yet erected due to anticipation of location change; shed materials on site.
- no store room
- 4 ton scrap steel, stored by SIDO, on site
- 1 pit-hearth with SIDO leather bellow + 1 another with trad. bellow
- steel anvil & vice on floor
- 6 skilled workers + 6 helpers / apprentices, working in two teams 3 days per week each

---

- same problem of charcoal as ITHAWA "A"
- same remarks about availability of electric power & request for power equipment
- layout very messy
- general evaluation : below average

N.B. none of those groups keep records & accounting except, supposedly, NYAMILEMA IWA

(NYUMGWE)

- near Uganda border; 1 ½ H drive from BUKOBA
- unassisted group (the only one visited)
- low thatch hut
- stone anvils & rudimentary tools
- used to smelt iron until 1974
- ordinary mix of farming tools but made of lighter gage steel with rather poor craftmanship
- 7 skilled workers + 5 apprentices
- request supply of scrap steel & improved tools

MARA

KIRORELLI

- from MUSOMA 1 ½ H drive
- no store room
- 1 hearth on metal stand with crank blower + 1 pit hearth with trdit. bellow
- vice & anvil on floor
- 1 master + 3 skilled + 2 helpers / apprentice in 2 teams working 3 days / week
- special production of spare plough share from scrap spring leaf
- long talk with village chairman concernig financing of further tool purchase with credit
- finished products are one sales in a small shop on the village square
- general evaluation : fair

MWANZA

IKULWA

- from GEITA : ½ H drive
- large store house & office contiguous to steelwork shed (store house built from local available materials)
- 3 thatch huts, with makeshift scrap steel anvils, are still in use due to lack of space under the steel shed
- under steel shed : 1 hearth on brick stand with SIDO leather bellow + 1 pit hearth with tradit. bellow
- 15 skilled workers + 9 helpers/apprentices
- 6 workers were trained at the TABORA school (mostly on sheet metal work)
- on display a set of products of good workmanship & finish : hoe (40 TS) - spear (70 to 100 TS)-adze (40 TS) - kitchen knife (15 TS)-bush knife (70 TS) - ssor (40 TS)

N.B. above price are more or less the same at other groups

- makeshift punch & die for hoe-eye was made in Mwanza & provided by SIDO (cost 2000 TS)
- workers are paid 30 TS/day
- on every sale the village council takes a 10 % levy

- village chairman requests more tools & training, central raw material store, samples of new items to be produced, two new sheds
- supposedly 20 000 TS are available, now for tool purchase plus 10 000 TS / year after.

. This group has already used a large quantity of scrap steel from a nearby abandonned gold mine; this mine site was visited. To exploit the remaining scrap steel it would be advisable to provide this group with a gas torch cutter & a hoist.

- general evaluation : very good (the best of all groups)

KASHISHI

- 1 ½ drive from GEITA
- no store room
- 1 hearth & crank blower on stand + 1 pit hearth with tradit. bellow
- anvil & vice on floor
- 6 skilled workers + 3 helpers / apprentices
- no worker got out side training
- a team of 2/3 workers produces 10 hoes / day from UFI hoe scrap; or 2 hoes from virgin steel

. this group uses also the gold mine scrap

- the group is registered as a cooperative, but has only a rudimentary organization (no records)
- about 6000 TS could be devoted to tool purchase
- general appreciation : fair

NIAMILEMIWA

- 1 ½ hour drive from GEITA
- one new shed & store room nearly completed (built from locally available materials)
- 1 earth & crank blower on stand + 1 pit hearth with tradit. blower
- 1 SIDO vice + 1 extra vice set on a shaky bench
- good forging process to shape hoe-eye
- 6 skilled workers + 5 helpers
- 2 workers were trained in TABORA
- there is a good market for sheet metal items: buckets, chicken feeders water drums etc

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- during the 3 month farming season each worker works 3 days / week. Otherwise the full group works every week day.
- the group stated that they have account books but those were not shown
- general evaluation : very good

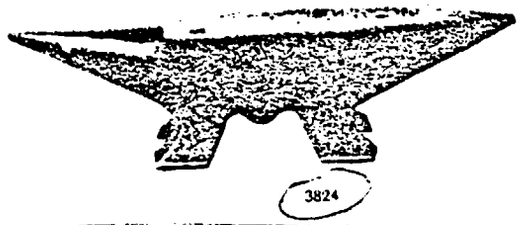
FORGE DE VULCAIN

Appendix III (1

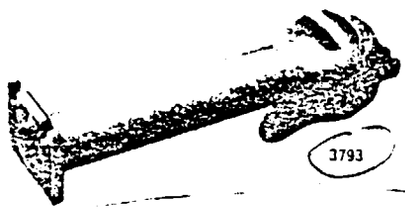
ENCLUMES

En acier électrique, table usinée et trempée

N° 3824 - De forgeron, à 4 patins



Poids approximatif kg	Longueur bigorne ronde mm	Longueur de la table mm	Longueur bigorne carrée mm	Largeur de la table mm	Hauteur totale mm
25	170	200	175	98	150
35	200	230	198	110	165
55	217	265	228	125	195
80	265	310	265	142	215
100	275	350	275	155	230

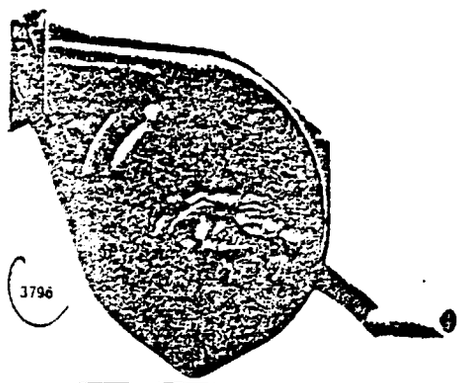


TUYÈRE A RÉCUPÉRATION

VULCAIN

N° 3793 - Pour forges portatives à ventilateur à main

Pour forges N 3789		AC	B
Long. de la bride à l'axe de la calotte	mm	250	320
Poids	kg	2,3	4,5

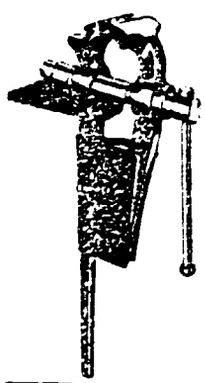


VENTILATEUR A MAIN

N 3796 VULCAIN

Coquille et manivelle acier. Carter en aluminium sous pression. Multiplication à double train d'engrenages à taille hélicoïdale. Butées à billes. Axes à double portée.

Pour forges N 3789		AC	B
Diam. de la buse de sortie	mm	45	55
Vitesse de la manivelle	tr mn	140	120
Debit	m³ h	55	90
Pression	mm d'eau	50	70
Poids	kg	2,2	2,6



Nr. 51063 Schlosser-Schraubstöcke

Deutsche Form, im Gesenk geschmiedet.

Das Trapezgewinde der Spindel ist gefräst und hat doppelte Steigung. Bei geöffnetem Schraubstock treten die Gewindegänge nicht aus der Hülse hervor, keine Verschmutzung. Der Schraubstock Größe 13 hat linksseitig verlängerte Backen. Schlosser-Schraubstöcke in französischer und englischer Form auf Anfrage.

Bestellbeispiel: 3 Nr. 51063078 Schlosser-Schraubstöcke Größe 7

Größe	7	10	13
Backenbreite mm	138	158	208
Spannweite mm	140	160	200
Spannhöhe bis Spindelhülse mm	120	140	unbegrenzt
Gewicht kg	32	50	75
Nr. 51063 Bez.-Nr.	070	100	130

Preise siehe Preisliste 51/7

HAHN & KOLB Stuttgart

HAHN & KOLB STUTTGART

Nr. 57180 Loch- und Gesenkplatten

aus Spezial-Grauguß, unbearbeitet. — Andere Größen auf Anfrage.

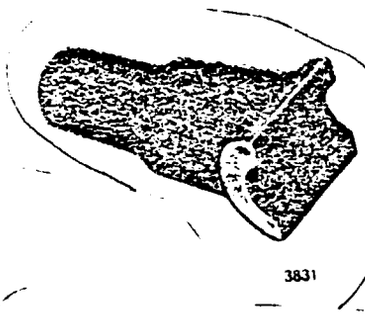
Bestellbeispiel: 1 Nr. 57180050 Loch- und Gesenkplatte Größe 5

Größe		1	3	5	7
Länge	mm	300	400	500	600
Breite	mm	300	400	500	600
Stärke	mm	80	100	120	130
Gewicht	kg	45	85	140	200
Nr. 57180	Bez.-Nr.	010	030	050	070

OUTILLAGE DE FORGERON

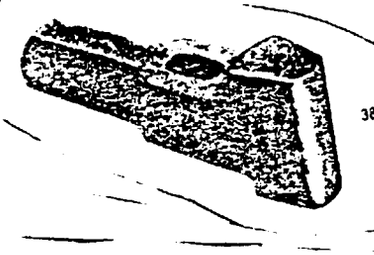
FORGE DE VULCAIN

En acier fondu supérieur



N° 3831 - Étampe de forge pour fers ronds

Diamètre	mm	10	12	15	18	20	22	25	28
Longueur	mm	132	135	140	145	148	150	152	155
Poids.....	kg	1,4	1,5	1,65	1,8	1,9	2	2,1	2,18



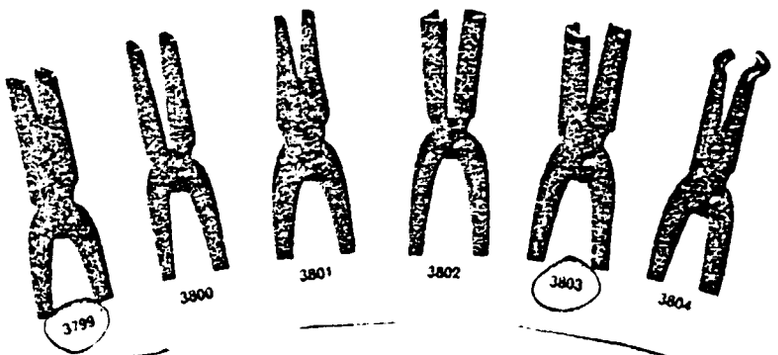
N° 3834 - Dégorgeoir à œil

Diam. de la laine .	mm	10	12	15	18	20	25	30
Long. de la laine .	mm	55	60	68	72	74	78	82
Long. totale.....	mm	130	140	150	160	162	168	172
Poids	kg	1	1,2	1,5	1,8	2	2,5	3

OUTILLAGE DE FORGERO

Tenailles fortes

Branches de 12 mm - Longueur 55 cm - P... unitaire : 1,500 kg.



- N° 3799 - Plate fermée
- N° 3800 - Plate ouverte
- N° 3801 - A moustache
- N° 3802 - A foret
- N° 3803 - A buse
- N° 3804 - A rivet

VULCAI...

N° 3816 - Tenaille universelle

VULCAIN

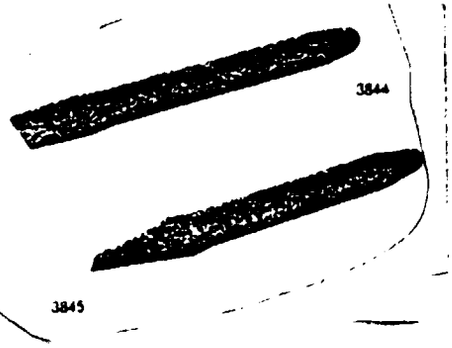
Branches de 12 mm - Longueur 60 cm - Poids : 1,600 kg.

Capacité de serrage : fers ronds ou carrés de 15 à 40 mm.

BURINS ET BÉDANES

VULCAIN

en acier fondu supérieur



N° 3844 - Burin

N° 3845 - Bédane

Longueur ..	mm	140	160	180	200	220	250	300
Section	mm	15 · 7	16 8	18 9	20 10	22 11	25 12	30 1...
Poids	g	110	130	180	250	350	500	850

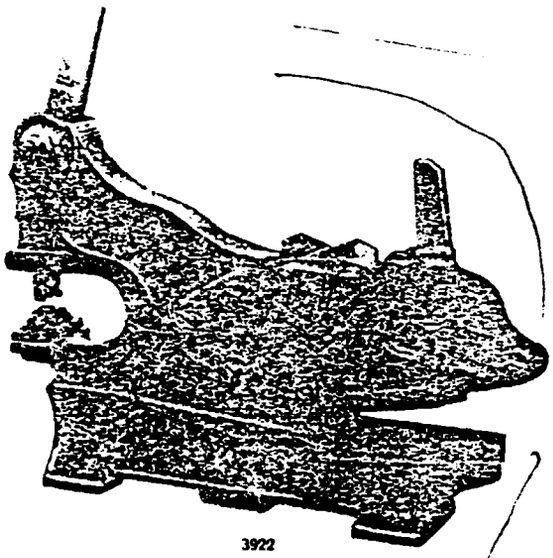
POINÇONNEUSE-CISAILLE UNIVERSELLE

N° 3922 - A tôles et profilés, modèle 56

Bâti en acier coulé; cisaille les tôles en pleine feuille. Guide à vis, réglable, permettant de faire les coupes d'onglet des cornières à l'extrémité des lames de cisaille. Changement de lames instantané. Butée de poinçonnage réglable suivant l'épaisseur à poinçonner.

Un guide de longueur, pour tôles, est fourni *sur demande*.

Capacité de coupe	
Poinçonne des trous ronds de ... mm	15 × 9
Cisaille : les tôles de ..... mm	6
les tôles striées de ..... mm	7
les fers cornières de ... mm	60 × 60
les fers T de ..... mm	50 × 55
les fers ronds de ..... mm	25
les fers carrés de ..... mm	23
les fers U de ..... mm	50 × 25
les fers plats de ..... mm	100 × 8
Long. des lames plates ... mm	210
Poids de la machine ..... kg	100
Encombrement..... mm	600 × 480 × 220



3922

FORGES DE VULCAIN

FERGE DE VULCAIN