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18609

ASSISTANCE TO HANDICRAFTS AND SMALL-SCALE  
INDUSTRIES DEVELOPMENT AGENCY  
(HASIDA)

DP/ETH/86/027

ETHIOPIA

Technical report: Findings and recommendations\*

Prepared for the Government of Ethiopia  
by the United Nations Industrial Development Organization,  
acting as executing agency for the United Nations Development Programme

Based on the work of Boguslaw Hinz, expert in tool-making  
and workshop production techniques

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Vienna

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\* This document has not been edited.

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EXPLANATORY NOTES

A) Abbreviations used are:

UNDP - United Nations Development Programme  
UNIDO - United Nations Industrial Development Organization  
HASIDA - Handicrafts and Small-scale Industries Development Agency

B) Organizational units/staff from the Government and United Nations Agencies responsible for the project:

1) Handicrafts and Small-scale Industries Development Agency (HASIDA)

Mrs. Messeret Shiferaw, General Manager of HASIDA  
Mr. Gulelat Kebede, National Project Officer of HASIDA

2) United Nations Development Programme (UNDP)

Mr. Ravi Rajan, Deputy Resident Representative

3) United Nations Industrial Development Organization (UNIDO)

Mr. Peter Manoranjan, Country Director of UNIDO  
Mr. Brisson, Junior Project Officer of UNIDO  
Mrs. Vera Gregor, Industrial Development Officer,  
Institutional Infrastructure Branch

## 1. INTRODUCTION

### 1.1. Background

The Government of Ethiopia has fully recognized the importance of the Handicrafts and Small-scale Industry sector for the economy. In 1977, broad policy guidelines were issued to ensure the transformation of handicrafts to cottage industries via the support of modern technology. In the same year HASIDA, the "Handicrafts and Small-scale Industries Development Agency" was created to implement the Government's policies. In 1978 an additional responsibility was given to HASIDA to organize handicrafts co-operatives. The recently adopted Ten Year Perspective Plan (1983-1992) confirms the importance attached to this sector and includes the following objectives:

- increased co-operation of the handicrafts and cottage industries.
- up-grading of skills and facilities available to craftsmen and industrial co-operatives through the provision of credits for buildings, machinery and equipment, and the provision of technical and managerial assistance.
- strengthened organization of HASIDA as well as reinforced staff and facilities.

Under the first phase of UNDP/UNIDO assistance to HASIDA DP/ETH/77/018 which started in 1978 and completed operations at the end of 1982, the total input of UNDP resources amounted to US\$ 1,361,165.00. During the same period, the Government allocated approximately 20 million birr from its own resources to HASIDA's activities.

Among the achievements of the project's first phase were:

- Statistical surveys of co-operatives and handicrafts and small scale industries sector in Ethiopia.
- Up-grading of the Ethiopian Handicrafts Centre, which constitutes the key training institution for HASIDA's own staff and for artisans from different parts of the country.
- Construction and deployment of four mobile vocational training and demonstration workshops designed to serve local artisans in the rural areas.
- Close to fifty employees trained abroad in organization and management of co-operatives, or in development of small-scale industries.
- Establishment of a sales outlet "Handicrafts in Ethiopia" and preparation of a plan for the marketing of Ethiopian handicraft articles overseas.
- Progress in improving the design and construction of looms and tools by Engineering Department of HASIDA and its workshops.

- Assistance to co-operatives in the form of technical advice and support in project appraisal, procurement, marketing, management, auditing, etc.
- First step toward the development of a pilot industrial co-operative.

To make HASIDA a fully self-reliant agency for the promotion of handicrafts and small-scale industries activities in Ethiopia, a second phase of UNDP/UNIDO assistance under project DP/ETH/83/012 was approved in January 1984. UNDP provided US\$ 2,500,000 from IPF funds while the Government input amounted to 22.7 million birr.

Expert assistance was foreseen for:

- The development of improved tools and implements, as well as of improved production techniques of co-operatives and artisans.
- Further development of and support to existing co-operatives plus preparatory work leading to the establishment of the country's first industrial estate.
- Further improvements in marketing procedures for handicrafts.
- In addition, it was foreseen to assist HASIDA in the establishment of two pilot industrial co-operatives and to provide funds for further training of HASIDA's own staff and local artisans.

To make HASIDA a self-reliant agency for the promotion of handicrafts and small-scale industries activities in Ethiopia, a third phase of UNDP/UNIDO assistance under project DP/ETH/86/027 was approved in September, 1989. UNDP provided US\$ 965,396.-. The purpose of the III phase of the project is the completion of the installation of machinery, training and start-up of production in the:

- Training and demonstration foundry
- Dil-Berhan Sheet Metal Pilot Co-operative
- Semen-Terara Weaving Pilot Co-operative

which HASIDA is organizing as model industrial co-operative enterprises.

### 1.2. Duties of Expert

The duties of the expert related mainly to the General Metal Workshop and were the following:

1. Supervise the Metal/Engineering service workshop.
2. Train the national counterparts engineers and technicians in the design and production of tools, dies, jigs, fixtures and other workshops production techniques.
3. Supervise the installation of machinery and equipment and the production start-up of the forging/press work Pilot in the Maresha Industrial Co-operative.

4. Advise on efficient utilization and appropriate maintenance of the equipment available.
5. Review additional special machines and facilities required by the HASIDA Metal Workshop.
6. Organize and advise a clear management system for the workshop so as to enable it to best service the needs of HASIDA's target groups.
7. Develop prototypes of improved tools and implements for the use of Handicrafts, Co-operatives and Small-scale Industries.
8. Assist in installation of the machinery and equipment in the Dil-Berhan Pilot Sheet-metal Co-operative Training and Demonstration Foundry and Semen-Terara Weaving Associate Co-operative.
9. Establish pilot industrial co-operatives for the production of essential goods and services for training and demonstration purposes.
10. Provide marketing, engineering and technical services to artisan co-operatives and small-scale industries.

## 2. ACTIVITIES

This report covering the period from January 1985 up to July 1990, is concerned with the author's activities as expert in Tool making and Workshop Production Techniques at the Handicrafts and Small-scale Industries Agency Engineering Department but concentrates on the final period on his assignments, January - March 1990. The author started his activities under project DP/ETH/83/012/B/01/37 on January 1985. More detailed information on activities carried out in the earlier period can be found in the preceding reports:

1.	Preliminary report	January - February 1985
2.	Progress report	January - June 1985
3.	Progress report	July - December 1985
4.	Progress report	January - June 1986
5.	Progress report	July - December 1986
6.	Progress report	January - June 1987
7.	Progress report	July - December 1987
8.	Progress report	January - June 1988
9.	Progress report	July - December 1988
10.	Progress report	January - June 1989
11.	Progress report	July - December 1989
12.	Activity report	January - March 1990

Although the expert's main assignment was at the General Metal Workshop he nevertheless took care of other HASIDA activities in his field of specialization.

The following is an account of the expert's activities in various organizational units of HASIDA and comprises the following:

### 2.1. General Metal Workshop

- Training of technicians in tool making and metal workshop production techniques.
- Supervision of the production in the Metal Engineering Service Workshop.
- Training of technicians in the use of tools, machinery and techniques for the production of dies, jigs, fixtures and other workshop products.
- Training of the technicians to use grinding tools on the cutter and tool grinding machine.
- Commissioning for the copy milling machine, jig boring machine and pneumatic hammer.
- Assembling the MIG-Welding machine.
- Assistance in production of prototypes of simple machines and tools; e.g.
  - Wood turning lathe
  - Abrasive cutter (pipe cutter)
  - Sheet metal bender
  - Tumbler
  - Seaming machine, hand operated
- Production and testing of other prototypes as required.
- Assistance in servicing the small-scale industrial co-operatives such as the Dil-Berhan Sheet-metal Pilot Co-operative, the Semen Terara Pilot Weaving Co-operative, and the Training and Demonstration Foundry.
- Introduction of industrial engineering activities in production methods and processes.
- Assistance in design of tools, dies, jigs, fixtures and simple machines for the co-operatives and small-scale industries.
- Review of requirement for raw materials, tools, machinery and equipment for the Metal Workshop, Sheet-metal Pilot Co-operative and Foundry.
- Assistance in repairing existing machines.
- Assistance in training people from different organizations and co-operatives.

### 2.2. Maresha Pilot Industrial Co-operative

This Co-operative is financed by the Government but entirely developed and set up by HASIDA and the project was in full operation since early 1985. My activities related to the Maresha Pilot Industrial Co-operative were the following:

- Supervise the installation of machinery and equipment and production start-up of the forging/press work.
- Train the backsmiths in servicing of machinery and using different tools, jigs, dies and fixtures for production of different farm tools.



- Preparation and development of new farm implements.
- Assistance in repairing machinery and dies as follows:
  - Pneumatic hammer
  - Excentric press 63 ton
  - Excentric press 160 ton
  - Air compressor
  - Power hacksaw
  - Dies for production of H-hinges
  - Dies for production of rakes
- Assistance in production of two washer dies.

Design and assistance in production of:

Two set bending dies for drop hammer  
Two washer dies  
Five countersink jigs for H-hinges size 50 x 55, 95 x 55, 110 x 55, 140 x 55, and 140 x 70.  
Bending jig for production axes  
Two jigs for upsetting and grinding pins for the production of rake.  
Assembly jig for the rake.  
Knives for hand lever shear for cutting wire 6 and 7 mm.  
Two calibrating jigs for H-hinges.  
Four devices for the drilling machines.  
Clamps, bolts, nuts, washers and sleepers for the excentric presses 63 ton and 160 ton.  
Spacer plate for the press 63 ton.  
Wedges for the drop hammer and pneumatic hammer.

Assistance in design and production of:

Three dies for the production of Buckles (in three different shapes and sizes).  
Bending die for the production of D-ring.  
Bending die for the production of hook.  
Bending die for the production of bottle cones.

This production was very successfully made in the Maresha Pilot Industrial Co-operative. During six months of operation around one million items has been produced.

### 2.3. Dil-Berhan Pilot Sheet-metal Co-operative

HASIDA through assistance it received from project DP/ETH/83/012 and project DP/ETH/86/027 financed by UNDP and executed by UNIDO has started to establish the Sheet-metal co-operative. The objectives of this pilot project are to test the technical viability of transforming activities from traditional skills and know-how into relatively modern manufacturing activities using more advanced and productive technologies, and also to test the methods of how best to achieve such transformation. If the ventures prove to be successful,

other co-operatives in similar lines of activities will adopt more productive technologies and an appropriate industrial management system.

Status achieved so far:

The building is all ready finished, most of the basic machinery and equipment has been delivered. The mechanical engineers and technicians started installation of the machinery and equipment. The staff is selected and trained in HASIDA Metal Workshop. The production start-up and on-the-job training in-situ will start in the early future.

#### 2.4. **Semen-Terara Pilot Weaving Co-operative**

HASIDA through assistance received from project DP/ETH/83/012 and project DP/ETH/86/027 financed by UNDP and executed by UNIDO has established the pilot industrial textile weaving co-operative. The building is finished, the installation of the machinery and equipment was made with assistance of two Indian Experts. Staff was already selected and sent for training.

#### 2.5. **Technical and Engineering Extension**

HASIDA is responsible for assisting private entrepreneurs in the small scale engineering sector and industrial co-operatives in dealing with technical problems by providing substantial back-up support services in the areas of plant design, equipment selection, the design and production of tools, training, spare parts production etc.

The activity of the above mentioned workshops are organized under Technical and Engineering Extension Department (TEED) which is the main technical arm of HASIDA for providing direct support to the sector.

The following functions need to be realized:

- The design of engineering products for manufacturing in small industries and co-operatives. The engineering design development of a completely new product or the modification/up-grading of the existing products with due consideration of the resource availability in the country.
- The engineering design division is responsible for design and improvement of work in the areas of civil, electrical, chemical, mechanical and industrial engineering, both for products production processes, tools and dies, layout, buildings etc.

Status:

At present the chemical engineering unit has not yet been established. The civil engineering service is fully operational. The main service (mechanical and industrial engineering) is operating. Only six mechanical engineers and two draft girls are employed, which number is inadequate for the tasks. The metal workshop has several tasks:

- training of industry trainees,
- installation of machinery and equipment on project sites,
- jig, die, tool and prototype production,
- production of spare parts for co-operative and small-scale industries. The metal workshop is understaffed with a total of 29 staff, of which 14 are diploma level technicians and 15 lower level technical staff. Four technicians are assigned to the Training and Demonstration Foundry, three technicians are assigned to the Semen Terara Pilot Weaving Co-operative, four technicians are assigned to Dil-Berhan Pilot Sheet Metal Co-operative and two technicians are also assigned outside. This leaves only 16 staff in the Metal workshop which is not enough. This problem is serious as staff does not suffice to service all existing machines, especially the Copy Milling Machine and Jig Boring Machine. Equipment for the metal working shop at the end of the present project will be adequate.

2.6. **Assistance to co-operatives and small-scale industries**

Assistance and technical evaluation for machinery replacement has been provided to co-operatives and small-scale industries during 1989 and beginning 1990 as follows:

1. Adjustment of pipe reducer for National Energy Committee.
2. Bamboo splitting tool for Bale Regional Women's Association.
3. Regrinding of pins for lead mould for Araya Belay's Battery Industry.
4. Work bench for Ethiopian Handicrafts Center (EHC).
5. Shelves made from wire (EHC)
6. Repair of concrete mixer for Fana Housing Co-operative.
7. Pipe bender/bending tool for Higher 6 Metal Workers Co-operative.
8. Hand lever shearer for Higher 6 Metal Workers Co-operative.
9. Repair of plumbers device for EBCA Ketena 2.
10. Wood turning knives for EHC Wood Workshop.
11. Pipe bending tool for Gondar Wood Working Co-operative.
12. Hand lever shearer for Gondar Wood Working Co-operative.

13. Spindle molder cutter holder Wood Working Co-operative.
14. Bench wood turning lathe for Gondar Wood Working Co-operative.
15. Enlarging hole of circular saw blade for Dil-Betigil Co-operative.
16. Pipe bending tool for Dil--Betigil Co-operative.
17. Frames made from Sheet-metal for Kokeb Canvas works.
18. Balcony for sales shop for EHC.
19. Abrasive cutter/pipe cutter/ for Higher 6 Metal Workers Co-Op.
20. Parting-off of flange from electro-motor for Tobiaw Birke Hollow block Industry.
21. Repair of candy rolling machine for Tadelech Legesse's Candy Factory.
22. Bench wood turning lathe for Betigil Wood Workers Co-operative.
23. Tool box for Mobile wood workshop (EHC).
24. Spare roller for bending tool for Dil-fire Wood Workers Co-op.
25. Repair of chairs for Carpet and Weaving Workshop (EHC).
26. Prototype rod cutter for EHC.
27. Drilling holes on the anchor bolt for Sheger Housing Co-operative.
28. Adjustment of moulding dies for the battery production for Araya Belay's Battery Industry.
29. Production of Maresha forming jigs for Agri-Service Ethiopia.
30. Turning of Bushings and shafts for Tobiaw Birke Hollow-Block Industry.
31. Moulding machine blade holder for Dir Betigil Wood Working Co-op.
32. Production of Drawing table for Ato Ashenafi Amdemeskel.
33. Production of erection wedges for Techexpo.
34. Threads cuts on pipe fittings for Techexpo.
35. Machine handle made of aluminium for Techexo.
36. Hardening of rollers for Techexpo.
37. Welding of fittings on barell for Techexpo.
38. Repair injection gun moulding machine for Techexpo.
39. Pipe bender for Gdmealem Mahari Metal Working.
40. Drilling of angle irons for Bank and University Housing Co-op.
41. Enlarging of circular saw blade and key-way slotted on pulley for Dil-fire Wood Working Co-operative.
42. Repair of planner machines pulley for Higher 7 Wood Working Co-operative.
43. Production of door bolt die punch and die plate for Socomar W/shop.
44. Sheet-metal strips shearing for Araya Belay Battery Industry.

45. Installation of machineries in mobile wood workshop for EHC.
46. Drilling and welding of anchors for Fana No. 40 and Housing Co-operative.
47. Production of different parts for sheet-metal rolling machine for Kire Industry.
48. Welding of cast iron parts for Semen Terera Pilot Weaving Co-operative.
49. Repair of electric motor shaft and fan for the Wood W/shop EHC.
50. Production of wood loom supporting flanges for EHC wood Workshop.
51. Production of wood clamp and screw for EHC wood workshop.
52. Installation of sliding door for the raw material store EHC Metal Workshop.
53. Production of lead balls tumbler machine/prototype/for Araya Battery making Small-scale Industry.
54. Production of anchor belts for Dil-Berhan Pilot Sheet Metal Co-operative.

### 3.0. FINDINGS

In the beginning of the expert's assignment at the Handicrafts and Small-scale Industries Development Agency the Metal Workshop was not well arranged. In June 1985 HASIDA started building a new Metal Workshop together with the Engineering Department. The tool-room was without tools, specially cutters for the lathe machines, milling machines and sharper. Lack of tool steels and another materials delayed the start-up of training in production jigs, dies, fixtures, tools and prototype production as well as production of spare parts for the co-operatives and small-scale industries. This Metal Workshop has a very important function as no other fully equipped workshop exist in Ethiopia which can assist the co-operatives and small-scale industries in that field. The workshop problem is mainly understaffing, (in 1975 23 staff were on board of which 15 were diploma level technicians and 8 were lower level technical staff). During the reporting period, the number of technicians fluctuated and was sometimes less sometimes more. However, effective running of a tool-room depends upon the availability of highly skilled operators (technicians). It is essential that the tool-room technicians should be trained for at least five years, with in-plant training programmes.

The technicians have to be specialized in the following fields.

-Die maker	5 years training
-Lather machinist	3.5 years training
-Milling machinist	5 years traing
-Grinder machinist	5 years training
-Welder	3 years training
-Heat -treatment	3-5 years training
-Sheet-metal	2 years training

Production at Maresha pilot Industrial Co-operative started in February 1985 when 66 blacksmiths were transferred from Marcato. The general problem from the beginning was unserviceability of the machines, mainly of presses and problems with the dies for five different products of hinges for windows and doors. It had also management and marketing problems too. It is very important to note that the Maresha Pilot Industrial Co-operative has been using various scrap materials from the local market for this production. The product quality, however, was often inadequate comparing to what could have been done with the equipment. This was also due to lack of effective quality control.

During the last five years a number of the technicians changed their work, some of them were sent abroad for scholarship. Others went to the private workshops. Only five of the technicians have served from the beginning of my assignment up to now. The other technicians have been working with me for two or three years, their capacity has really improved and they get a lot of experience in the production of jigs, dies, simple prototype machines and other workshop production techniques.

Equipment for the metal-workshop will be adequate at the end of the present project.

#### 4. RECOMMENDATIONS

1. The Metal Workshop needs additional technicians.
2. Some of the technicians must be sent for training for the newly installed machines, e.g.
  - Copy milling machine
  - Jig-boring machine
  - MIG welder
3. It is highly recommended to employ a technologist for the Metal Workshop who would be extensively helpful in raising the quality of the manufactured production.
4. The Metal Workshop tool-room is not adequate to house the quantity of tools and instrumentation.
5. The tool-room has to have a card file for each tool item with indication of the right index, size/diameter and quantity.
6. HASIDA must strengthen on its Engineering Department by recruiting more staff and develop its extension services especially in management training to industrial co-operatives and small-scale industries.

ANNEX I

Necessary tools for Metal workshop for the near future  
(price references are extracted from LUNA CATALOGUE).

Description	Diameter	Qty.	Unit Price	Total Price Sweden Kr.
<b>Twist Drill Morse Taper Shank</b>				
SKF Toos No. 130				
Ref. 0007-4252	50 mm	2	1005.-	2010.-
0007-4500	55 mm	2	1415.-	2830.-
0007-4757	60 mm	2	1745.-	3490.-
<b>Center Drill SKF Tools No. 200</b>				
Ref. 0015-0409	1.6 mm	20	30.75	615.-
0015-0607	2.5 mm	20	31.-	620.-
0015-0706	3.15 mm	20	38.-	760.-
<b>Hand Reamer SKF Tools No. 202-50</b>				
Ref. 0060-0205	3 mm	10	66.-	660.-
0060-0304	4 mm	10	72.-	720.-
0060-0403	5 mm	10	72.-	720.-
0060-0502	6 mm	30	72.-	2160.-
0060-0601	7 mm	10	76.-	760.-
0060-0700	8 mm	20	76.-	1520.-
0060-0809	9 mm	10	98.-	980.-
0060-0908	10 mm	20	98.-	1960.-
0060-1005	11 mm	5	124.-	620.-
0060-1104	12 mm	10	124.-	1240.-
0060-1203	13 mm	5	146.-	730.-
0060-1302	14 mm	10	146.-	1460.-
0060-1401	15 mm	5	164.-	820.-
0060-1500	16 mm	10	164.-	1640.-
0060-1609	17 mm	5	194.-	970.-
0060-1708	18 mm	5	194.-	970.-
0060-1807	19 mm	5	215.-	1075.-
0060-1906	20 mm	10	215.-	2150.-
<b>Machine Reamer SKF Tools No.224-56</b>				
Ref. 0066-4300	8 mm	10	122.-	1220.-
0066-4508	10 mm	10	130.-	1300.-
0066-4706	12 mm	10	150.-	1500.-
0066-4904	14 mm	10	150.-	1500.-
0066-5109	16 mm	10	158.-	1580.-
0066-5505	20 mm	10	188.-	1880.-
0066-5703	22 mm	5	220.-	1100.-
0066-5901	24 mm	5	250.-	1250.-

Description	Diameter	Qty.	Unit Price	Total Price Sweden Kr.
0066-6108	25 mm	5	255.-	1275.-
0066-6107	26 mm	3	295.-	885.-
0066-6305	28 mm	2	370.-	740.-
0066-6503	30 mm	2	380.-	760.-
0066-6701	32 mm	2	425.-	850.-
0066-6909	35 mm	2	540.-	1080.-
0066-7204	40 mm	2	670.-	1340.-
<b>Shell Machine Reamer SKF Tools</b>				
No. 236-50				
Ref. 5079-5004	36 mm	2	375.-	750.-
5079-5202	40 mm	2	425.-	850.-
5079-5301	42 mm	2	550.-	1100.-
5079-5509	45 mm	2	450.-	900.-
5079-5806	50 mm	2	560.-	1120.-
<b>Arber SKF Tools No. 245-00</b>				
Ref. 5080-0200 No. 5	-	2	500.-	1000.-
5080-0309 No. 6	-	2	590.-	1180.-
<b>End mill SKF Tools No. 211-621</b>				
(Single long)				
Ref. 6548-0055	2 mm	50	61.-	3050.-
6548-0105	3 mm	50	58.-	2900.-
6548-0204	4 mm	50	58.-	2900.-
6548-0303	5 mm	50	61.-	3050.-
6548-0352	6 mm	50	61.-	3050.-
6548-0501	8 mm	30	71.-	2130.-
6548-0550	9 mm	20	97.-	1940.-
6548-0600	10 mm	20	86.-	1720.-
6548-0659	12 mm	20	102.-	2040.-
6548-0758	14 mm	10	126.-	1260.-
6548-0907	16 mm	10	144.-	1440.-
<b>Slot Drill for Keyway SKF Tools</b>				
No. 211-401 (Single medium length)				
Ref. 8511-0013	2 mm	50	63.-	3150.-
8511-0039	3 mm	50	63.-	3150.-
8511-0054	4 mm	50	63.-	3150.-
8511-0104	5 mm	50	63.-	3150.-
8511-0203	6 mm	50	63.-	3150.-
8511-0401	8 mm	30	70.-	2100.-
8511-0500	10 mm	30	80.-	2400.-
8511-0609	12 mm	20	84.-	1680.-
8511-0807	14 mm	20	46.-	1920.-
8511-1003	16 mm	10	118.-	1180.-
8511-1201	20 mm	10	160.-	1600.-



Description	Diameter	Qty.	Unit Price	Total Price Sweden Kr.
<b>Carbide Tipped - Indexable Inserts</b>				
<b>"SECO" Q</b>				
Ref. 5853-2656 TPNN 160304 525M		400	11.30	4520.-
5853-0205 TPNN 160308 525M		500	11.30	5650.-
5853-0403 TPNN 220408 525M		500	19.80	9900.-
5855-0047 SPNN 120308 525M		500	13.40	6700.-
5872-0103 SPKN 1203EDR 525M		500	22.70	11350.-
5871-0203 TPKN 2204PPR 525M		200	26.60	5320.-
5870-0303 TPGN 160308 525M		200	25.30	5060.-
5870-0402 TPGN 220412 525M		200	38.60	7720.-
<b>Milling Chuck LOFAB No.3030+4030</b>				
<b>Machine Taper 150</b>				
Ref. 6723-0102/303 40 (1 3/4")		4	1700.-	6800.-
Extra Taper Collets 0723-1308	6 mm	4	170.-	680.-
0723-1407	8 mm	4	170.-	680.-
0723-1506	10 mm	4	170.-	680.-
0723-1605	12 mm	4	170.-	680.-
0723-1709	14 mm	4	170.-	680.-
0723-1738	16 mm	4	165.-	660.-
0723-1753	18 mm	4	170.-	680.-
0723-1779	20 mm	4	165.-	660.-
0723-1803	22 mm	4	170.-	680.-
Ref. 6723-0201/4030 50/2 3/4"				
Extra Taper Collets 6723-1902	10 mm	2	2650.-	5300.-
6723-2009	12 mm	2	255.-	510.-
6723-2108	14 mm	2	255.-	510.-
6723-2306	18 mm	2	255.-	510.-
6723-2355	20 mm	2	255.-	510.-
<b>Arbor LOFAB No. 83351</b>				
Ref. 5798-0101 15040 (1 3/4")		2	485.-	970.-
5798-0203		2	485.-	970.-
5798-0302		2	485.-	970.-
5798-0401		2	485.-	970.-
5798-0500		2	540.-	1080.-
<b>Adapter LOFAB No. 3330</b>				
Ref. 5801-0406/902/2 40/1 3/4"		1		425.-
5801-0505/902/3 -"		1		425.-
<b>Drill Sleeve</b>				
Ref. 0355-0803 5/3		3	140.-	420.-
0355-0902 5/4		3	140.-	420.-
0355-0605 5/2		3	140.-	420.-
6451-0209 3/2		2	135.-	270.-
6451-0308 4/3		2	220.-	440.-
6451-0407 5/4		2	350.-	700.-

Description	Diameter	Qty.	Unit Price	Total Price Sweden Kr.
Lathe chuck self centering with set standard jaws and 1 set of reversible top jaws				
External	160 mm	2	1900.-	3800.-
External Pratt Burner 1)				
International	250 mm	2	2500.-	5000.-
United Packworks, Listerlane, Halifax, West Yorkshire HX1 5JH Engl				
Cutting Tools - Tool bits "SECO" WKE45				
Ref. 6466-0558	Size 8x8x160	50	45.-	2250.-
6466-0657	" 10x10x160	50	56.70	2835.-
6466-0756	12x12x200	50	91.10	4555.-
6466-1101	25x25x200	20	331.-	6620.-
7624-0100	12x 3x90	20	31.80	6361.-
7624-0209	10x 4x120	20	42.-	840.-
7624-0258	16x 4x200	20	71.60	1428.-
7624-0407	16x10x200	20	110.-	2200.-
Braze Lathe Tools Seco hr 110 S4				
Ref. 5856-0103	Size 12x12x100	20	68.-	1360.-
5856-0202	Size 16x16x110	20	71.10	1428.-
SECO hR 111, S4				
5857-0051	Size 12x12x100	20	68.-	1360.-
5857-0102	16x16x110	20	71.10	1422.-
5857-0201	20x20x125	20	85.80	1716.-
5857-0300	25x25x140	20	108.-	2160.-
SECO GR 117 S4				
Ref. 5858-0036	Size 10x10x90	20	68.-	1360.-
5858-0051	12x12x100	20	68.-	1360.-
5858-0101	16x16x110	20	71.10	1422.-
5858-0200	20x20x125	20	85.80	1716.-
5858-0309	25x25x140	20	108.-	2160.-
SECO GR 136 S4				
Ref. 5861-0031	0 8x125	20	77.90	1558.-
5861-0056	0 10x150	20	83.10	1662.-
5861-0106	0 12x180	20	85.80	1776.-
5861-0205	0 16x210	20	97.30	1946.-
5861-0304	0 20x250	20	108.-	2160.-

ANNEX II

Activity Report for the First Quarter 1990

Main Activities Metal Workshop

<u>Accomplishment</u>	<u>Remarks</u>
- Assistance in production of parts for sheet-metal bending roller for small-scale industry with technicians.	Finished
- Design and assistance in production of lead balls tumbler for small-scale industry with technicians.	Finished
- Design of manual seaming machine.	Finished
- Assistance in training person from different organizations 2+1+2+1 with technicians.	Finished
- Assistance in production bench wood turning lathe with technicians.	In progress
- Assistance in production shaft for India Techexpo with technicians.	Finished
- Assistance in repair shaper machine with technicians.	Finished
- Assistance in production lead balls moulding die with technicians.	In progress
- Participated in preparing work-plan for the Metal-Workshop for the period January-June 1990 with Ato Wubishet and Ato Menkir.	Annex
- Design and assist in production of screws for wood workshop with technicians.	Finished
- Assistance in repairing steering wheel for the pedestal drilling machine for the wood workshop with technicians.	Finished
- Assistance in training staff for Dil-berhan Pilot Sheet-metal Co-operative with technicians.	
- Commissioning was made for the Copy Milling Machine, without testing the traser. This will be done by the expert from the producer. In commissioning participated mech. engineer Ato Wubishet and technician Asfaw and Menkir.	

Accomplishment	Remarks
- Assistance in production legs for the manual hydraulic pipe bender with technicians. Successfully tested.	
- Assistance in production flange for the Foundry with technicians.	
- Assistance in installation of door for the raw material store with technicians.	
- Commissioning was made for the Pneumatic Hammer which was successfully tested. One of the technician must be responsible for the service and for the training.	

### National Staff

1. Ato Abebe Negash	Head of Engineering Department
2. " Afework Abebe	Mechanical Engineer
3. " Mohammed Ibrahim	" "
4. " Wubishet Kifwelew	" "
5. " Berhanu Bejnere	" "
6. " Daniel Mammo	" "
7. " Daniel Amole	" "
8. " Ketema Desalegne	Civil Engineer
9. " Aklilu G/Kidan	Associate Civil Engineer
10. " Ashenafi A/Meskel	Architect
11. " Fikre Sillassie Alemayehu	Senior Draftsman
12. " Habte G/Hawariat	
13. " Tadesse Eshetu	Chemist
14. W/o Senayt Bekele	Associate Civil Engineer
15. W/t Tigist Ishete	Draftsgirl
16. " Asegdech Yzengaw	"

### International Staff

The present UNIDO staff Mr. Hinz Boguslaw, Tool making and workshop production technique expert.



