KAVANGO BLACKSMITH SURVEY

February - May 1996

Report prepared by KFSR/E

DRAFT
ACKNOWLEDGEMENTS
We would like to thank all those who were involved in carrying out this survey. These include Blacksmiths: Michael Tjekero, Moses Kapanda, Alberto Incha, Ndumba Sihungu, Johannes Sikindo, Kalipa Saviya, Nikodemus Nasimi, Abraham Ndala, Pius Simbungu, Leonard Mangundu, Ndumbura Shikombera, Ndjengwa Mandevu, Johannes Musenge, Bonifatius Haingura, Nicodemus Sinema, Martinus & Mugenga Sumpu, Eugen Kamana and the blacksmiths of Rundu Open Market.
Cooperation for Development Engineering: Kieron Deeming
KFSR/E: David Gibbon, Klemens Hatutatale, Amos Hengua, Harriet Matsaert, Johannes Simbombo.

ABBREVIATIONS
ADC - Agricultural Development Centre
AET - Agricultural Extension Technician
CD - Cooperation for Development
DAP - Draught Animal Power
KFSR/E - Kavango Farming Systems Research and Extension Team.
MAWRD - Ministry of Agriculture and Water Resource Development.
SUMMARY AND RECOMMENDATIONS

Current Blacksmithing Activities in Kavango
Thirty nine blacksmiths were identified working in the vicinity of the Kavango ADCs. We believe that the total number of blacksmiths working in Kavango is considerably higher than this. Many villages are served by more than one blacksmith. Experience in blacksmithing ranged from 2 to 50 years. This indicates that people are still taking up this profession.

The main activities which blacksmiths are engaged in include manufacture of axes, hoes and knives and plough repairs (handles, shares, landslides and frogs). A number of blacksmiths, in the Rundu area, have also developed some products for the tourist market. Many blacksmiths are also involved in carpentry. One blacksmith interviewed is also producing harnesses for donkeys. Equipment used appeared adequate for current activities. Farmers interviewed in two locations, expressed satisfaction in the level of service provided by blacksmiths. Very few non functioning tools were found in the households interviewed.

Until recently blacksmithing services were bartered or given freely (to family members) rather than exchanged for cash. Blacksmithing is only now becoming a cash generating enterprise. All blacksmiths interviewed carried out this activity on a part time basis only. Most blacksmiths interviewed felt that blacksmithing was not a viable business.

All blacksmiths had been trained through working with other blacksmiths. None of those interviewed were aware of any other training or information sources. No blacksmiths were keeping accounts or business records of any kind.

Blacksmiths noted a number of constraints which they experience in carrying out their work:-
Low demand for products (due to low turnover)
Low profit margins & no control on pricing.
Low status and security of this profession.
Lack of raw materials (particularly in areas distant to Rundu)

Potential for Blacksmith collaboration in tool development for Kavango.
After a briefing on the new DAP programme in Kavango, the blacksmiths who attended the workshop at Mashare, were enthusiastic about the possibility of collaborating in tool development activities. With current equipment and skills, the blacksmiths felt they could:-
- produce ducksfeet and chisel fittings for cultivators
- rivet plough parts together.

In addition, the technical members of the research team felt that blacksmiths working with current equipment would be able to manufacture:-
- harnesses
- wooden beamed weeding implements

With further equipment, the team also felt blacksmiths would be able to:-
- increase the range of plough repairs
- produce plough shares (larger forge needed)
- produce lightweight carts

The blacksmith group identified a number of constraints to the collaboration activity. The most
important constraints were felt to be:-
1. Lack of effective equipment
2. No blacksmith organisations or representation.
3. Poorly developed market.

Other constraints identified (by blacksmiths and the research team) included: low status, low security, lack of raw materials, lack of information or training opportunities.

The workshop also identified a number of opportunities for action:-

Blacksmiths:-
- formation of organisations (initially at village/district level and later regionally).
- sale of products through local retailers
- need for support from MAWRD in the form of information, training, materials and finance
- loans should be made available to blacksmiths (through Agribank?)

Research team:-
- exchange visits with skilled blacksmiths from other areas
- involve blacksmiths in adaptive research and development of new tools
- blacksmith training in business development, production of shares, harnesses (for donkeys and single oxen) and spare parts (in areas where new tools have been purchased).
- competitions to promote interest in blacksmithing (e.g best mangetti cracking tool!)
- incorporate blacksmiths into AET learner groups
- support formation of blacksmith groups (and linkages of these with organisations such as KRFU, Mbangura or Katemo cooperative).
- recruitment of VSO blacksmithing specialist to support blacksmith development activities
- blacksmith buying group to purchase raw materials.
- links with retailers for spare part supply.
- credit should be made available to blacksmiths (particularly those who plan to provide support services for new equipment) (by Agribank?)

Plans for further action
Several blacksmiths who attended the workshop expressed their intention of holding meetings together with other blacksmiths in their area. Formation of groups will be monitored and reported back to the DAP programme by AETs.

The workshop was recorded by REMU. We hope to broadcast the main findings of this survey on NBC.

The recommendations above will be further discussed at Extension, Research and DAP coordination meetings.

Workshop participants agreed that it would be useful to compile a register of Kavango blacksmiths. This could be carried out by asking traditional authorities to register all blacksmiths locally.

The research team feel that further investigation of larger scale workshops in Kavango, and of cart manufacturers would be a useful addition to this study.
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INTRODUCTION

At the October 1995 Kavango Extension Coordination meeting, the possibility of working together with blacksmiths to develop an efficient service for repair and spare parts supply for new draught animal power tools was discussed. The coordination group felt that as well as playing a role in supporting the introduction of new tools to Kavango, blacksmiths could also make an important contribution to the tool development process itself: identifying and adapting tools for use in Kavango. However, there was little information available about the number of blacksmiths operating in Kavango, their current activities or their levels of skills and equipment. It was decided that a survey of these activities was a priority.

The aims of the survey were:-

1. To document the current production and repairs carried out by blacksmiths in Kavango.

2. To assess the capacity of local blacksmiths to produce and maintain or produce spare parts for new tools being developed under the draught animal programme.

3. To carry out an assessment of blacksmith’s needs with regard to information, training and materials to facilitate the production and repair of agricultural tools.

4. To identify innovative and skilled blacksmiths to work together with the DAP programme at Mashare.

5. To identify networks/linkages through which blacksmiths acquire information, materials and other necessities of their trade (which could be used by the MAWRD for training and information purposes).

The survey was carried out in a number of stages:-

1. Agricultural extension technicians (AETs) identified blacksmiths operating in their areas and asked them a number of questions about their current activities and their interest in training.

2. KFSR/E carried out a number of interviews with farmers on the subject of tools: their supply maintenance and repairs.

3. A team consisting of members of KFSR/E, the Mashare DAP team and extension carried out individual visits to blacksmith workshops. A checklist was used to guide discussion which covered experience/training, market, supply of raw materials, investment and future plans.

4. A one day workshop was held at Mashare. At this workshop the potential collaboration of blacksmiths with the MAWRD draught animal power programme was discussed. Small group discussions were used to further explore opportunities and constraints in developing blacksmith activities.
I. STAGE ONE. OVERVIEW OF BLACKSMITH ACTIVITIES CARRIED OUT BY AGRICULTURAL EXTENSION TECHNICIANS (FEB 1996)

This preliminary survey was carried out to identify blacksmiths working in Kavango region, and to gain an impression of the range of activities in which they are involved.

Methodology.
AETs were asked to identify blacksmiths operating in their area, and to complete a very short questionnaire with them. (See Appendix 1)

AETs at Mile 30, Ncaute, Ndonya, Nkurenkuru, Kahenge, Kaisosi, Rupara and Ruuga ADCs took part in this survey. No response was received from the other ADCs.

Blacksmiths were asked the following questions:
Have you repaired ploughs?
What other blacksmithing work do you do?
How many years experience do you have?
Would further training in blacksmithing help you in your work?

Results.
39 blacksmiths were identified at the eight ADCs which took part.

<p>|</p>
<table>
<thead>
<tr>
<th>Place</th>
<th>Number</th>
</tr>
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<tbody>
<tr>
<td>Kahenge</td>
<td>2</td>
</tr>
<tr>
<td>Kaisosi</td>
<td>9</td>
</tr>
<tr>
<td>Mile 30</td>
<td>6</td>
</tr>
<tr>
<td>Ncaute</td>
<td>2</td>
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<tr>
<td>Ndonya</td>
<td>6</td>
</tr>
<tr>
<td>Nkurenkuru</td>
<td>6</td>
</tr>
<tr>
<td>Rupara</td>
<td>2</td>
</tr>
<tr>
<td>Ruuga</td>
<td>6</td>
</tr>
</tbody>
</table>

Of these, 28 blacksmiths had carried out plough repairs. Specific repairs mentioned were: strengthening plough shares and straightening plough shares.

All 39 blacksmiths were involved in manufacturing axes. Other common items produced were hoes (34 blacksmiths), knives (24), spears (12) and arrows (6). In addition one blacksmith mentioned that he also makes oxen yokes. Possibly others also do carpentry.

The median length of experience was 10 years. However experience ranged from 2 up to 50 years, indicating that young people are still taking up this profession.

All 39 blacksmiths interviewed indicated that further blacksmith training would help them in their work.

An interesting finding of this survey is that several communities have a large number of blacksmiths operating in them. In Mile 30 and Rucara there are 4 blacksmiths operating. In Sigone there are 5 blacksmiths working in the one village.
2. STAGE TWO. INTERVIEWS WITH FARMERS ON TOOL USE, SUPPLY AND MAINTENANCE (KFSR/E FOCUS COMMUNITIES)

METHODOLOGY
Interviews were held, as part of normal monitoring activities, with 7 households in Shikoro and Mbora villages. A checklist (see Appendix 2) was used to discuss tools used for agricultural activities, supply and maintenance of tools and any problems experienced.

FINDINGS

TOOLS MANUFACTURED IN THE HOME

Baskets
Baskets are used for winnowing and transport of agricultural products. These are made by women, using mbare palm, grasses and rope made from mugoro. The women interviewed told us these baskets are made for household use only (not for sale).

Fishing Traps
This equipment is used and manufactured by women. We were told that traps can be made from reeds or from rupundu wood (for those living inland). The traps are tied with mugoro string.

Mortar and Pestle (Sini & Munwhi)
This equipment is essential for food processing. It is also used to pound substances for other purposes e.g usivi leaves pounded and used to fill holes in metal drums. Some households had manufactured their own mortars and pestles, or had been given them by relatives. Others had purchased this equipment (see tools manufactured by specialists). We were told that the best wood to use was usivi, mutundungu and mupupa for mortars, musu is a good wood for pestles.

These tools can last for a long time. One household member told us that repairs can be made to cracks in the mortar by inserting small pieces of wood into these cracks. Another told us that the mortars must simply be thrown away when they crack

Yoke
Those households who had ploughs also had wooden yokes for their oxen. Mugoro, mukekete and mupanda is good wood for yokes. These can be made by the men of the household, or can be purchased from specialists.

Sledges
Oxen owning households had sledges and canoes for transport. Canoes were also traditionally used for beer brewing. We didn’t get information about who manufacture these and which wood is best to use.

Skids for ploughs
Depth wheels are replaced by wooden sleds as soon as the plough is purchased. This can be done by the plough owner.

Tool Handles
These are often made by men in the household, though they can be purchased together with the
tool. One informant told us that *mugoro* and *ugava* made the best handles as this wood is lightweight and long lasting.

**Rake**
Two of the households interviewed had a rake. One of these was homemade with the head made from an old tyre.

**Kasipembe Equipment**
A hollowed out tree (*mangetti* is good) is used to distill the Kasipembe. Most other items must be purchased in town.

**TOOLS MANUFACTURED BY LOCAL SPECIALISTS**
Both the focus villages have several blacksmith/carpenters working in them. However at Shikoro, the river village, we were told that lack of wood for carpentry is becoming a problem. One informant told us he would have to go inland or to Angola to buy a mortar.

All households interviewed had locally manufactured tools.

**Axes (Nzimbi)**
These tools are essential for land clearing and all households had at least one. Prices for these range from $10 (no handle) to $20. One household interviewed had both a local and a shop bought axe. The local axe was preferred as it was lighter and more maneouvurable. Sharpening of axes and hoes is carried out by local specialists for a small charge ($1.50 - $3).

**Hoes (Matemo)**
These tools are used for weeding and also for making holes for dry planting. All households have one or more traditional hoes, though a number of households interviewed did have shop bought hoes as well. The hoe blade are usually made from old plough shares. The cost of a hoe was in the region of $30 (with handle). Hoes can last for many years. One middle aged informant told us she was still using a hoe she had as a young girl.

**Knives**
Knives have multiple uses for agricultural and household activities. One household interviewed told us that every woman (and man presumably?) has her own knife. Knives are manufactured from metal and wood (not sure what metal is used). Cost ranges from $2.50 to $6.

**Spears**
Spears are used for fishing (and hunting?). Several households had these tools. Fishing spears had reed handles.

**Mortar and Pestle**
Several of the households interviewed had purchased their mortars and pestles from local specialists. Often these specialists are also blacksmith.

Most households had made use of village blacksmiths to purchase and repair tools. However, one household had purchased locally made tools at the open market in Rundu. The husband was probably working in Rundu at this time.
Though all households make use of local blacksmiths, turnover of tools seem to be quite low. Blacksmithing or carpentry appears to be a part time profession for these local specialists. We will follow this up further in the blacksmith survey.

SHOP BOUGHT TOOLS

Plough & Plough Chain
All ploughs used are factory made. The plough owning households interviewed had purchased their tool from Rundu hardware. Spare parts were also purchased from Rundu, though Mbora villagers were also able to make use of Mbunya Mission.

Hoes
Several households had shop bought hoes. These are heavier than the local hoes. There were mixed responses about their relative performance. One woman informant told us she uses the heavier and larger hoe in preference to the local hoes, another woman informant told us she prefers the lighter hoe.

Sacks
These are used for storing agricultural produce (and also for children’s clothes). We were told that people make use of millet meal sacks, rather than buying them new.

Metal & Plastic Utensils
Most households are making use of metal bowls as well as the traditional woven baskets for collecting and processing agricultural produce. These are purchased in Rundu or in local shops.

Axe
Only one household had a shop purchased axe. This was not being used and we were told this was because the hole for the tool handle was too thin (handle breaks easily), the informant added that she found the axe too heavy. I think the purchase was regretted.

Panga
One household only had a panga. Used for land clearing?

Scythes
Though we did not see a scythe at any of the households visited, the shop keeper at Shikoro told us that he has sold many of these.

Mousetrap
We did not see any mousetraps at the households visited, but the shop keeper at Shikoro told us he sells many of them. He told us people use them to trap rodents in their fields.

Kasipembe Production Equipment
Most of the equipment needed to manufacture kasipembe must be purchased or acquired from
Rundu. This equipment includes - metal drums, metal pipe (for distillation) and plastic jerry cans (for fermentation). One household interviewed was involved in kasipembe production. We noted that the investment in equipment for this enterprise was very high ($1200 was a conservative estimate) compared to investment in crop production. This is perhaps not surprising as the enterprise appears to be very profitable (kasipembe is sold at $5/litre) and mangetti nuts are plentiful in the inland.

Because women do not travel as frequently as men to Rundu, factory made tools and utensils tended to be selected and purchased by male household members.

PROBLEMS NOTED
The major problem noted was that blacksmiths do not have enough metal for tool manufacture and repair. The lack of material is so severe, one informant reported, that if you take scrap metal along to a blacksmith, he will make you a tool for free.

Some households noted that the high cost of ploughs ($350) is a problem to them. However these households do not have oxen either - so purchasing a plough is rather hypothetical for them at this stage.

Very few non functioning tools were seen. Two households had broken ploughs. These households had no oxen, and it is likely that they would be able to get their ploughs repaired once they get access to draught animals. The only other tool which was not in use was the shop purchased axe (which was not actually broken). One informant mentioned that she has problems with broken pots and metal bowls (local blacksmiths are not able to repair these).

No household mentioned a problem in getting a tool that they needed.

At Shikoro (the river community) it was noted that the wood needed to make mortars, pestles and tool handles, is becoming scarce.

CONCLUSIONS
Tools for crop production are limited to ploughs, hoes, axes, knives and baskets. Some households also have wheelbarrows and sledges for transport.

Most tools used by the households interviewed, with the exception of ploughs, wheelbarrows and kasipembe brewing equipment, are locally manufactured and repaired.

An adequate number of tool manufacturers serve the two villages and provide an efficient and reasonably priced service. As tool turnover is low, this appears to be mainly a part time occupation. Lack of raw materials seems to be the major constraint experienced.

Rundu hardware appears to have a virtual monopoly for shop purchased tools. Households have to travel long distances to purchase these tools. However, no household interviewed complained

1Suggesting that this enterprise is based on distilling processes observed by migrants in South Africa.
about this. Perhaps this is because most households have to travel into Rundu for so many other purposes - job seeking, hospital, banking etc, and tools can be purchased at the same time.

No problems were experienced with locally manufactured tools, though there may be problems repairing pots and metal utensils. Training blacksmiths to repair these (if its possible?) might increase their market opportunities.

3. STAGE THREE: VISITS TO BLACKSMITHS WORKSHOPS

METHODOLOGY
In this stage, the research team carried out visits to blacksmiths identified at the following ADCs (Agricultural Development Centre).

Mukwe
Ndiiyona
Kaisosi
Ncaute
Ruuga
Nkurenkuru
In addition, an interview was held with blacksmiths marketing their products in Rundu Open Market.
A total of 11 interviews were carried out.

Visits were carried out over a three day period (April 15th - 18th) and a discussion and summary of information collected was carried out on April 19th. A multidisciplinary research team carried out the interviews:-
David Gibbon - KFSR/E team leader, Agriculturist
Klemens Hatutale - KFSR/E Extension technician
Johannes Simbombo - KFSR/E Extension technician
Harriet Matsaert - KFSR/E Social Anthropologist
Kieron Deeming - Community Development Engineering
Hendrik Witbooy - Artisan, Mashare Institute
Godfried Kieb - Draught Animal Power programme.

A checklist was used for the interview (see Appendix 3) which was carried out in the blacksmiths working place. The interview took between 1 - 2 hours and included observation of the equipment used, tools produced and discussion of management, planning, constraints and opportunities.

Constraints experienced
Blacksmiths had been informed of our visit at Mukwe, Kaisosi, Ruuga and Nkurenkuru ADCs. At Ndiiyona ADC we found no extension officer. At Ncaute, the extension officer was present but had not arranged any interviews.

AETs were also asked to hold a discussion with a learner group at each ADC about tools used in agricultural and tool supply and repair needs. Only one AET, Lucas Kamolongo, had managed to complete this task. It is hoped that the other AETs will be able to carry out this activity in the
near future.

Franz Itepu, PAET, was unfortunately unable to join us for this activity due to illness.

RESULTS

1. Description of the current production and repairs carried out by blacksmiths in Kavango.
The team found little differentiation between the blacksmiths interviewed across the region. Most blacksmiths were using the same equipment and producing the same tools.

Experience/Training
Most of the blacksmiths interviewed had been taught their skills by a family member (father or uncle) or by a neighbouring blacksmith. There was no mention of a training fee. Most blacksmiths had learnt by helping their older relatives (operating bellows) and observing their work. One blacksmith told us you can take a piece of metal to another blacksmith, ask him to make something for you, and learn in that way.

None of the blacksmiths had received any further training. They were not aware of any training opportunities or sources of new information for blacksmiths. We were told that methods used, and the products made have not changed since the last generation. However some blacksmiths are involved in some ‘new activities’ such as plough repairs.

Products and market
Agricultural tools manufactured and repaired were:-
axes
hoes
knives
plough repairs - particularly handles and shares, but also landslides and frogs.

Other activities
Non agricultural blacksmithing activities included: mending pots and pans and producing spears. In Rundu some tools and spears were being sold to tourists.

Several of the blacksmiths interviewed (6) were involved in carpentry activities: tool handles, pestle and mortar, yoke making, milk buckets, sieves, wooden cups, doors and furniture. One blacksmith, in Kauti village, had manufactured the body for a donkey cart.

1 harness maker was identified in Hamoye village.
Prices
Prices of tools made in village or sold at market in Rundu.

<table>
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<tr>
<th>Item</th>
<th>Range</th>
<th>Price (NS)</th>
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<tbody>
<tr>
<td>Large axes</td>
<td>20-30</td>
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</tr>
<tr>
<td>Medium axe</td>
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<td>Small axe</td>
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<td>5</td>
<td></td>
</tr>
<tr>
<td>Hoes</td>
<td>10-25</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Hoe handle</td>
<td>11</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Knives</td>
<td>2-12</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Spear</td>
<td></td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Sieve (for flour)</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Chisel</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Wooden bucket</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Bellows</td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Mortar</td>
<td>15-50</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Pestle</td>
<td>8-10</td>
<td>9</td>
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Farming implements at Rundu Hardware

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Hand axe</td>
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<tr>
<td>Hoe</td>
<td>18</td>
</tr>
<tr>
<td>Handle</td>
<td>13</td>
</tr>
<tr>
<td>Plough</td>
<td>350</td>
</tr>
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</table>

Prices appeared to be higher in the far West (Nkurenkuru), probably because raw material is
harder to obtain here. Prices for tools such as axes and hoes from Rundu Hardware were found to be broadly comparable to blacksmiths' prices (and cheaper in some cases).

All blacksmiths interviewed were primarily farmers. Some people told us that blacksmithing is not a viable business. However some felt that money can be made from blacksmithing, though agriculture is still important to feed the family. Blacksmithing appears to be treated as a part time activity rather than a business. No blacksmiths interviewed kept business records (including those selling in the open market). Blacksmithing appears to be in transition from a free service to a commercial activity. Some of the blacksmiths interviewed still do this work with out charging.

Blacksmithing is normally carried out between crop production seasons. Blacksmiths in Rundu told us that axes are the main product sold in winter (for land clearing), and hoes are mainly sold in the summer months.

With the exception of those blacksmiths interviewed in the open market, the main customers are local villagers. The blacksmiths complained of low demand and returns for their products. No active attempts were being made to develop new products or attract new customers. Purchase of tools is related to good harvests and available cash. Poor harvests over the last 2 years may be a reason for the low level of tool production this year.

Equipment and raw materials
Blacksmiths interviewed were working under trees or covered shelters next to the homestead.

Typical equipment used by Kavango blacksmiths was:
(Current cost in Rundu hardware in ()
Twin bellows - usually homemade of wood, or metal.
Anvil - made from railway sleeper, I bar, or sledge hammer. (Sledge hammer N$30 - 63)
Pliers (N$45 - 84)
Hammers (1-2 sets) (N$33-36)
Lump hammers -1 (N$19-29)
chisel - 1 (N$11-16)
bradawl hole punch ‘muho’ - home manufactured, several of different sizes.
File - 1 (N$15 - 40)

Equipment had been mainly purchased in Rundu, though a number of blacksmiths (3) had purchased tools and equipment when working in the mines at Johannesburg. The present value of the tools and equipment owned by most blacksmiths is estimated to be in the area of N$200 (based on Rundu Hardware prices).

Most blacksmiths interviewed were satisfied with their tools. One blacksmith was interested in using machines which could reduce labour input. There was no evidence of recent investment in tools.

Case hardening of steel is carried out by putting the hot tool into wet sand.

The technical experts on the team felt that these tools were adequate for current blacksmithing
activities. A number of new tools and techniques could be helpful in developing new blacksmithing activities (see Section 2 and 3).

Raw materials were obtained from local sources (broken tools or car wrecks) or from Rundu. Raw materials are generally free, though may have to be exchanged for manufactured tools. Many of the blacksmiths interviewed indicated that lack of raw materials was a constraint to them. The presence of a scrap dealer who is exporting metal scraps from Rundu may be exacerbating this problem. Lack of transport also prevents rural blacksmiths from obtaining material from Rundu.

Business Development Plans
Only 2 of the blacksmiths interviewed felt that blacksmithing was a viable business. Though 7 of the blacksmiths planned to continue blacksmithing in the future, most envisaged their blacksmithing as a small scale, part time activity.

The interviewees mentioned a number of constraints which prevented them from developing their blacksmithing activities:-
Lack of market - demand for tools is very low, particularly after a bad harvest
Low profitability
Lack of equipment
Lack of raw materials
Lack of interest by younger generation
Lack of charcoal (1 person only)
Theft of equipment (2 persons only)

Five of the blacksmiths interviewed expressed an interest in receiving training or information from MAWRD. They were interested in both business and practical training. Training needs will be discussed further at the blacksmith workshop on May 2nd.

Organisations
No blacksmith organisations or support groups were identified either in the rural areas or in Rundu. However, several of the blacksmiths interviewed expressed an interest in having such an organisation.

Further Information Needed.
At the end of the survey, the research team felt that they had a fairly good knowledge of current blacksmith production activities. However it was agreed that further information on cart manufacturers and on slightly larger scale workshops (with welding equipment) would also be useful.

2. Assessment of the capacity of local blacksmiths to produce and maintain or produce spare parts for new tools being developed under the draught animal programme.

The team felt that with current equipment blacksmith have the capacity to carry out the following (if training could be provided):-
- harness
- sweeps and chisels
- wooden beamed weeding implements
- rivet plough parts together

Activities which would be difficult for blacksmiths, with current equipment, knowledge and infrastructure are:
- manufacture of carts (problem with large scale & lack of raw materials. Groups, or individuals in collaboration with garages might be able to produce carts).
- manufacture of shares (current forge is too small).

With further equipment blacksmith might be able to diversity their production by:
- expanding the number and quality of plough repairs carried out
- manufacture and repair of tin utensils.

3. Assessment of blacksmith’s needs with regard to information, training and materials to facilitate the production and repair of agricultural tools.

Based on the discussions held with blacksmiths, a number of constraints to the development of new blacksmithing activities were identified by the research team. A number of information, training and other opportunities, to resolve these constraints, were proposed. It is planned to build on these together with blacksmiths at the coming workshop.

<table>
<thead>
<tr>
<th>Main Constraints</th>
<th>Information, training and other opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials</td>
<td>Transport (through forming groups to coordinate, linking up with retailers etc).</td>
</tr>
<tr>
<td></td>
<td>Linkages with scrap metal dealer?</td>
</tr>
<tr>
<td>Limited tools and techniques restrict diversity and quality of production.</td>
<td>Useful additional tools/techniques include: larger forge, files, hand drill (though costly), hacksaw (though blades are costly), spanner, anvils, solder irons, access to bolts, use of old engine oil for case hardening.</td>
</tr>
<tr>
<td></td>
<td>Links with local retailers - to provide spare parts and raw materials.</td>
</tr>
<tr>
<td>Limited demand and low returns.</td>
<td>Wider range of products</td>
</tr>
<tr>
<td></td>
<td>Spread customer base.</td>
</tr>
<tr>
<td></td>
<td>Sell through local stores.</td>
</tr>
</tbody>
</table>
| Lack of information on new technical options | Exchange visits to other areas  
Annual blacksmith workshop  
Training courses  
Radio broadcasts for blacksmiths  
Videos  
Competitions  
Association. |

**Blacksmith Workshop**

Those blacksmiths who were actively involved in blacksmithing and seemed to be enthusiastic were invited to attend the blacksmith workshop to be held on May 2nd.

The research team identified a number of organisations which could be involved in blacksmith networking activities:-

- Kavango Farmers Union
- Mbangura Woodcarvers Cooperative
- Katemo Farmers Cooperative
- REMU

Representatives of these organisations were also invited to the blacksmith workshop.

4. **STAGE FOUR: BLACKSMITH WORKSHOP**

**INTRODUCTION AND AIMS**

This workshop formed the third part of a survey of blacksmith activities by the MAWRD extension, the draught animal power programme and KFSR/E.

**ATTENDANCE**

**Blacksmiths**

- Moses Kapanda - Mile 30
- Alberto Incha - Mile 20
- Pius Simbangu - Kakura (Nkurenkuru)
- Leonard Mangundu - Ruuga
- Ndumba Sihungu - Ndiyona
- Micheal Tjekero - Kauti
- Johannes Sikindo - Ncuma

Late arrivals:-

- Bonifatius Haingura
- Nicodemus Sinema

**Extension Staff**

- Franz Itepu
- Alex Endunde - representing REMU
- Lucas Kaholongo
Representatives from the Farmers Union, Katemo, Mbangura and REMU were invited to attend the workshop. Unfortunately, only the REMU representative managed to attend.

Introduction
The meeting began at 11.15 with an outline of the agenda and introductions from all the participants. (See Appendix 4).

SESSION I: MAWRD Programme for Draught Animal Power

This was presented by Mr Godfrey Keib and covered the following areas:

1. Introduction
   - the rationale for the introduction of draught animal power and its potential role in the development of farm systems.
   - the role of Mashare Agricultural Development Institute in the development of DAP in Kavango Region.

2. Objectives
   - to promote DAP in the Northern Regions
   - to develop and adaptive research programme to identify and test appropriate implements and cultivation techniques
   - to train extension technicians and artisans in appropriate methods
   - to work with local artisans to develop a capacity to repair and maintain equipment
   - to promote networks through which Blacksmiths can acquire information and materials

3. Prospects for the use of animal traction in Namibia
4. Priority target groups for training
5. Survey and assessment of training needs
6. The potential role of blacksmiths in supporting DAP in the development of new tools and equipment.
7. Areas in which blacksmiths and the DAP programme can work together to improve the current situation.

The session was concluded with a brief discussion of the issues.

SESSION II. Presentation of visual displays, cultivation equipment, workshop tools and harnesses and yokes.

The participants were taken around the exhibition of:

- drawings and diagrams of equipment and techniques: hand tools, ploughs, rippers, cultivators, toolbars, earth moving equipment, planters, weeding techniques, harvesting, transport and processing equipment. (DG)

- a display of 2 Zimbabwe made cultivators, two lightweight cultivators and two ploughs (FM).

- a groundnut processor. (FM)

- donkey harness designs (FI)

- spacers and swingle tree linkages (FI)

- different types of yoke designs for ploughing and weeding. (FI)

- A range of workshop tools from hammers, chisels, saws, planes, files - both for woodwork and metalwork. (KD)

The participants were given time to question and discuss the ideas, principles and purposes of this equipment.

Much of introduced equipment was very new to most blacksmiths so it may need time to judge the value of this exhibition. At all times, the presenters attempted to stress that these were options not solutions to specific problems.

SESSION III:

1. Report on Survey Activities 1 - 3. Results of survey activities carried out to date were reported by Klemens Hatutale.

2. Report on farmer cultivator trials. This was presented by Mr Frans Itepu and will appear as a separate report.
SESSION IV: WORKING GROUPS
The Participants divided into two working groups with the blacksmiths forming one group with KH and LK facilitating a force field analysis, priority setting and problem and solution analysis exercise.
The second group consisted of the remainder of the participants and they were asked to:-

1. Draw systems diagrams of plough-owning and non-plough owning household farming systems
2. Identify areas where tools and equipment are used in the system and examine which areas might be enhanced through further inputs from blacksmiths.
3. Discuss how blacksmiths could be further involved in the DAP programme.

These discussions were very productive and lasted until 1740.

SESSION V. Plenary presentations of outputs from the two working groups
Group 1. Blacksmiths
The discussion began with feed-back on the morning session. The blacksmiths appreciated the opportunity to see a range of different activities, tools and equipment.
Of greatest interest to them were:-
- the potential use of cultivators; particularly by young children after they have seen what it can do. One problem for some of these farmers is that they do not have their own oxen.
- Old ploughs could be repaired and adapted easily.
- They have the capability of doing all repairs but the greatest problems are the punching of holes in heavy metal and in the lack of welding equipment.
- There is a strong interest in welding training.

The facilitators then set up a force-field analysis of the blacksmith profession which looked at the strengths and weaknesses of the situation:-

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacksmithing and the DAP Programme compliment each other.</td>
<td>There is no organisation for blacksmiths</td>
</tr>
<tr>
<td>The blacksmiths agreed that it was a good idea to come together for a meeting</td>
<td>The job is very demanding but there is no profit due to low prices</td>
</tr>
<tr>
<td>They have a strong interest in new tools</td>
<td>There is no law which regulates prices of the products they sell</td>
</tr>
<tr>
<td>They can replace bolts with home made rivets</td>
<td>There is no appreciation of the value of their work from fellow farmers</td>
</tr>
<tr>
<td>They can replace/repair ducksfeet and chisel points</td>
<td>There is no security in the job. No guarantee that they will be paid for a job.</td>
</tr>
<tr>
<td>They have no experience of the new equipment (cultivators)</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>They lack effective equipment</td>
<td></td>
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</tbody>
</table>

The group then ranked the problems in order of the three most important.

1. Lack of effective equipment
2. Lack of blacksmiths organisation and representation
3. Lack of an effective market

Further analysis was carried out on these three problems

Lack of Tools

- Lack of finance
- New innovations
- Do not know of availability
- Markets not regulated
  - Government did not prioritise blacksmiths work in the past.
  - People did not travel to other places

Lack of BS Organisation

- No community mobilisers
- Lack of information
- No education
The groups then considered possible solutions to some of these problems.

1. To stimulate the activities of marketing agents/buyers who could collect and sell their products.

2. There is a need for support for:- information, materials, financial aid.

3. Training is needed for blacksmiths to improve efficiency in their work in repair and in the development of new equipment.

4. Loans should be available to all farmers and blacksmiths.

Group II. Non-blacksmiths.

The group produced two diagrams of farming systems from the two very different households which were used to stimulate discussion on opportunities for blacksmiths. (see next two pages) The discussion stressed the need to make key strategic decisions about who the initial target group should be. If the focus was on heavy, imported equipment then a few, wealthier farmers would benefit. If the poorer household needs were to be addressed, attention had to be paid to the development of local artisanal skills in the manufacture of harnesses and equipment and the access to donkeys for draught.
NON PLOUGH OWNING HOUSEHOLD

BUSH CLEARING

CULTIVATING & PLANTING

WEEDING

HARVESTING

* NEW OPPORTUNITIES
Ways in which blacksmiths might be involved in the programme were summarised as:-

**Training needs.**
- spare parts manufacture
- light plough manufacture for non-plough owning household
- Harness making and yokes
- small cart manufacture

**Adaptive research**
- Modelling of light weight ploughs and cultivators and their testing and adaptation
- Alternative tine and sweep designs

**Inputs and Links**
- Skilled blacksmiths brought from elsewhere
- Links to suppliers of cultivators
- Staff for the adaptive research unit of the DAP programme
- Blacksmiths in learner groups
- Regular meetings in the field

**Material needs**
- Wood
- High quality metal
- axles and wheels

**Supplies of raw materials**
It was noted that a scrap metal merchant was buying up scrap from Rundu and selling it elsewhere in the country.
A solution to this might be the setting up of a blacksmiths buying group and a request for assistance from Canamco.

Materials were available locally in small quantities and might be available elsewhere in the country if they could be located.

The means by which some of this material might be transferred to Kavango was discussed:-
- the provision of transport for collection (a collective venture ?)
- Access to loans
- small enterprise development
- Assistance from CANAMCO and RDSP

**How would blacksmiths prefer to work?**

This discussion began among the non-blacksmiths and later was put to a plenary session.
The group proposed that blacksmiths could join existing learner groups or form organisations or do both these. The blacksmiths were keen to start some form of organisation at village and district level initially and later perhaps at Regional level.
The group next discussed how best to communicate with blacksmiths and suggested the radio, through local AETs and through meetings. The location and number of these meetings was to be the subject of the initial meetings called by blacksmiths in their home areas.

It was then proposed to set up a register of all the blacksmiths in Kavango by asking headmen in each village and compiling a list that would be made widely available.

SESSION VI. Videos from Palabama Lusaka, Zambia.

The day ended with a series of videos: one from Zimbabwe of a blacksmith making an axe and 4 training films from the animal draught unit in Zambia on yoke making, ploughing, cultivating and ripping.
BLACKSMITH SURVEY

1. NAME OF BLACKSMITH...........................................
2. NAME OF VILLAGE...............................................  
3. HAVE YOU REPAIRED PLOUGHS?
4. WHAT OTHER BLACKSMITHING WORK DO YOU DO?.............

5. HOW MANY YEARS OF BLACKSMITHING EXPERIENCE DO YOU HAVE?

6. WOULD FURTHER TRAINING IN BLACKSMITHING HELP YOU IN YOUR WORK?
BLACKSMITH SURVEY - CHECKLIST FOR FARMERS

*Interview to be carried out at the homestead, or on the field, so that tools can be examined.*

What tools do you use in your agricultural activities - both for draught animals and hand tools. *(Examine tools).*

For each tool:-

- Where was the tool obtained and when?
- Have you ever had the tool repaired, if so where and by who?
- What was the quality of the repair? *(check visually as well)*
- Have you ever bought spare parts for this tool, if so where and from who?

Do you have any tools which are not working at the moment? *(identify problem)*

How would you rate the tool supply and repair services in your area?

Are there any problems?

What improvements could be made?
Checklist for blacksmiths
The discussion should be carried out in the blacksmiths working place, so that tools and equipment can be examined. One of the group should carry out the interview, while another takes notes. A third group member should tick off the areas which have been discussed on the checklist.

General Discussion Areas

Experience/Training
- training background
- type of experience (work in other areas?)
- sources of information/new ideas
- business skills? (Accounts, business records kept?)

Products and market
- season of sales and production
- main customers
- tools produced and repaired
- other enterprises e.g farming, carpentry, off farm employment
- scale of production
- prices
- trends in production and sales (Could use matrix ranking)
- anything people ask for which can’t be done?

Tools and raw materials
- tools and raw materials used.
- source
- cost
- trends
- linkages with other businesses e.g welders.
- problems

Investment
- equipment purchased for business?
- loans taken?

Future Plans
- plans for the future of the business
- constraints to development of the business
- training/information and other needs

Organisations
- membership of artisanal association / business group?
BLACKSMITH WORKSHOP - MAY 2ND 1996

Participants should arrive at Mashare in time to begin activities at 10.30 am. Accommodation will be provided at Mashare on the evening of May 2nd. Meals, including breakfast on May 3rd will be provided by the Mashare catering team.

AGENDA

May 2nd
10 am Coffee/Teas

10.30 am
Introduction

10.45 - 11
Present MAWRD’s programme for developing DAP. Introduce potential role of blacksmiths in supporting the development of new tools.

11 - 12.30
Opportunity for blacksmiths to examine some of the new tools and ideas being developed at MAWRD - cultivator, ridger etc. Discuss technical constraints and material needs to manufacture/repair/provide spare parts for these tools.

12.30 - 1.30 Lunch

1.30 - 2
Summary of report from survey with farmers and blacksmiths. Report from farmers carrying out cultivator trials.

2 - 3.30
Small group discussions:-
Opportunities and problems in for blacksmiths in producing spare parts and repairing (or even manufacturing) new tools. (Use forcefield analysis, problem and solution trees)

3.30 Tea

4 - 5.30
Plenary Discussion. Use small group’s solution trees as a basis for drawing up an action plan of training, information needs and other follow up activities.

7 pm Dinner

8pm Video show

File:alberta/dap/wkshop