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**MANUFACTURE AND DIFFUSION OF LOW-COST  
TRANSPORT DEVICES IN ZIMBABWE**

**PHASE 4: FINAL IMPACT ASSESSMENT AND EVALUATION**

<b>PROJECT NUMBER:</b>	<b>DP\ZIM\89\003</b>
<b>PROJECT DURATION:</b>	<b>36 MONTHS</b>
<b>PHASE 4 PERIOD:</b>	<b>2 MONTHS</b>
<b>STARTING DATE:</b>	<b>01-05-95</b>

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**DATE:** **FEBRUARY 1996**

## PREFACE

This report is the final evaluation of a project aimed at improving the access of rural communities in Zimbabwe to more effective means of transport. This three year project has been implemented for UNIDO by the Institute of Agricultural Engineering (IAE) in Zimbabwe with technical and socio-economic assistance from the Intermediate Technology Development Group (ITDG) provided through IT Zimbabwe. ITDG was the contractor for the project and has provided overall management, monitoring and reporting of the project.

The key feature of the project has been a national programme of training and dissemination to introduce a wheel manufacturing technology developed by ITDG into small workshops to help them overcome a bottleneck in the production of animal-drawn carts (ox-carts known locally as scotchcarts). This has enabled these workshops to be able to increase the supply of carts to rural communities and also to diversify their activities into production of other low-cost vehicles such as wheelbarrows and handcarts. The overall objective of the project has been to improve the access of rural households to these low-cost means of transport, thereby providing significant benefits to small-scale farmers, low-income households and particularly women.

The project started in March 1992 and has comprised four phases:

**Phase 1** (March to May 1992) - covered the establishment of the project at IAE: completion of surveys which had been started as a forerunner of the project to carry out studies of the transport needs and situations of rural communities in the different agricultural zones of Zimbabwe; and preparation for the first training course.

**Phase 2** (June 1992 to June 1994) - comprised the main part of the project involving the training programme, follow-up of workshops and technical development work.

**Phase 3** (July 1994 - February 1995) - this was planned to include consolidation of the training programme, dissemination of lower-cost transport devices developed in Phase 2 to trained workshops and a detailed evaluation of the impact of the project on village-level transport in rural areas. However, it was clear from monitoring of the project in Phase 2 that it was having a significant impact on improving the supply of scotchcarts from small to medium size workshops and this was benefiting rural households that could afford to buy carts. It was therefore agreed in the Tripartite Review meeting of June 1994 that the main need in Phase 3 was to attempt to improve the impact of the project on particular target groups, women and poorer households (who could not afford carts). Phase 3 therefore covered the consolidation of the training programme and the development and dissemination of lower-cost transport devices which were more affordable to the target groups.

**Phase 4** (May/June 1995) - a final evaluation of the project carried out by an independent consultant with assistance from a team of staff from IAE and ITDG.

The progress of the project has been monitored by a series of contractual reports (see Bibliography in this report) and by annual Project Performance Evaluation Reports (PPERs) and Tripartite Reviews (TPRs). The latter forms of monitoring have enabled UNIDO and the Government of Zimbabwe to make direct inputs into the evaluation and direction of the project.

This final evaluation report has been prepared by Ms. Sheena Orr, an independent consultant contracted by ITDG to lead the evaluation team, and Mr. Peter Njenga, a rural transport advisor for the IT Kenya East Africa Transport Programme. Both have considerable experience of the development issues of rural people and of working in a participatory manner with rural communities. The evaluation was carried out over a three week period from 15 May to 6 June 1995.

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- to Peter, fellow team member, for the many hours spent discussing the issues and ideas that emerged out of the evaluation
- to people visited in various organisations for taking time to share their ideas and views

and, as always,

- to the villagers and artisans themselves for taking time to discuss their lives and businesses with yet another bunch of outsiders!

THANK-YOU

*Sheena Orr  
Team Leader*

## List of Abbreviations

AFC	Agricultural Finance Corporation
AMS	African Marketing Services
ESAP	Economic Structural Adjustment Programme
GTZ	German Technical Assistance
HIVOS	Humanistic Institute for Cooperation with Developing Countries. Holland
IAE	Institute of Agricultural Engineering
IT	Intermediate Technology
ITDG	Intermediate Technology Development Group
LCVs	Low-cost vehicles
NGO	Non-Government Organisation
PPER	Project Performance and Evaluation Report (A UNIDO monitoring document)
RATE	Rural Artisan Training and Establishment
RTT	Rural Technology Training Section of IAE
SADC	Southern Africa Development Community
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organisation
ZSTC	Zimbabwe State Trading Corporation



## EXECUTIVE SUMMARY

### 1. Evaluation

This report is a product of the Phase 4 project evaluation of the MANUFACTURE AND DIFFUSION OF LOW-COST TRANSPORT DEVICES IN ZIMBABWE. This 3 year UNDP funded project (March 1992 - March 1995) was implemented by the Institute of Agricultural Engineering with specialised technical and socio-economic support from ITDG and IT Transport. The evaluation took place in May/June 1995 over a three week period and was carried out by a team of five people (2 external, 3 internal).

### 2. The Project (Section 2.1)

The key feature of this project was a national programme of training and dissemination of the wheel making technology developed by ITDG into small workshops to help them overcome a bottleneck in the production of wheeled transport devices. The overall objective of the project is to ease the transport burden and related time constraints faced by households in the communal lands by increasing the availability of good-quality, low-cost transport devices.

The project had four stated outputs:

- the development, testing and manufacture of low-cost transport devices
- a pool of trained artisans able to produce the devices
- a dissemination strategy aimed at improving the access of women and poorer households to low-cost transport devices
- a sustainable and long-term strategy for scotchcart manufacture and dissemination

These outputs were organised into 4 phases, each with a defined activity plan (See Table 2, p11).

### 3. Project Design & Implementation (Section 2.2)

The ITDG and IAE used their respective professional expertise in a complimentary manner. The flexibility and credibility of IAE is considered to be a key feature in the success of the project. Overall, the institutional arrangements worked fairly well although the failure of UNIFEM to be involved on the gender side left a gap that was never really filled. The funding arrangements with UNDP for local expenditure were both complicated and time consuming. The project suffered from the lack of a full-time person to push the project along, provide administrative support to the technical adviser, oversee monitoring and facilitate liaison between the different institutions. Issues arising during the project (such as defining low cost) were generally resolved to the mutual agreement of all concerned.

### 4. Project Performance (Section 4)

The project performed well and is considered to have been successful in fulfilling its activities. More than 50 workshops have been trained; a range of low cost vehicles have been developed and tested and are now ready for dissemination; parts manufacture and supply has been commercialised; the basis of a nation-wide support network for artisans has been laid; links with partner organisations working with poorer groups have been established.

The strengths and weaknesses of the various project activities are summarised in Table 1.

**TABLE 1: PROJECT STRENGTHS AND WEAKNESSES**

	STRENGTHS	WEAKNESSES
<b>PROJECT DESIGN &amp; IMPLEMENTATION</b>	<ul style="list-style-type: none"> <li>* choice of IAE as partner organisation - credibility and flexibility of IAE has been a key success factor in the project</li> <li>* general achievement of objectives through increasing the supply of carts and other low cost devices to rural households</li> </ul>	<ul style="list-style-type: none"> <li>* Flow of funds via UNIDO for local expenditure was complicated and time consuming</li> <li>* No overall project manager or officer to integrate parts (complicated by staff changes at IAE and ITZ)</li> <li>* Difficulties of addressing poorer sections of the rural community in a commercially focused project.</li> <li>* Lack of specific indicators for outputs</li> </ul>
<b>OUTPUTS</b>		
i) <b>Training of workshops</b>	<ul style="list-style-type: none"> <li>* 55 workshops trained</li> <li>* Informal linkages with other training organisations</li> <li>* Formal role of IAE &amp; RATE (an IAE project) linking other training organisations</li> </ul>	<ul style="list-style-type: none"> <li>* AGRITEX network not used to full.</li> <li>* Training took longer than planned - not enough time to complete dissemination within project</li> <li>* Lack of funds and human resources to do proper follow-up</li> </ul>
ii) <b>Dissemination strategy</b>	<ul style="list-style-type: none"> <li>* Linking with other organisations - Christian Care, ORAP</li> </ul>	<ul style="list-style-type: none"> <li>* Failure of UNIFEM to be part of project</li> <li>* Relationships and activities (e.g. credit) with other NGOs not fully explored</li> </ul>
iii) <b>IAE capacity building</b>	<ul style="list-style-type: none"> <li>* IAE - 3 trainers able to run course</li> <li>* 1 technician capable of testing and manufacture</li> <li>* RTT Section of IAE has gained extensive experience in identifying trainees, training, follow-up and up-take of technology</li> </ul>	<ul style="list-style-type: none"> <li>* Still reliant on ITDG for innovative inputs</li> <li>* Unable to do much without external funding</li> </ul>
iv) <b>Long-term strategy for transport devices</b>	<ul style="list-style-type: none"> <li>* Improved (easier, stronger, lighter, more flexible, standardised) and appropriate (low-cost) technology introduced to workshops</li> <li>* Commercialisation of parts manufacture and supply: ball bearings (ZSTC), puncture proof tyres (Tyre Treads), production of jigs,</li> <li>* Sustainable supply of scotchcarts increased</li> <li>* Establishment of wheel-making technology provides base for manufacture of range of transport devices to meet needs of rural households</li> </ul>	<ul style="list-style-type: none"> <li>* Support network still needs developing fully</li> <li>* Limited impact on poorer households and women (likely to improve in longer term)</li> </ul>

## 5. External Influences (Section 3)

Both the drought and ESAP policies have affected the project. The first through reduced income and activity leading to a reduction in demand for transport devices. The second through increases in prices and public spending cuts. Producers require more working capital to buy inputs for devices, villagers struggle to meet school and medical fees. A further influence on the take-up of technology is the increased supply of South African and Botswanan 2nd hand axles and rims in the south of the country - a changed situation from the situation found in early surveys.

## 6. Impact of Project (Section 5)

The Evaluation Team looked at the impact of the project in three areas: 1. the rural transport sector (market) as a whole 2. individual producers and 3. individual users

The project has had three effects on the **rural transport sector**.

- Most significantly it has increased the supply of carts by reducing a bottleneck in production. Over 40% of workshops trained were using the technology either in whole (22%) or part (24%)
- Secondly, the quality of the product improves (lighter, stronger, value for money) with the incorporation of the new wheel making technology.
- Thirdly, with the development of the other low-cost transport devices villagers will have a greater choice in terms of product choice and price range.

It is hoped that by offering a wider range of devices more people, including women, will be brought into the market. Benefits from these effects will be primarily for the households who can afford transport devices (perhaps 20% - 50% depending on the region). Although most of the lower-cost devices are in their final stages of development they have not been commercially launched yet so no assessment of the likely scale of their impact can be made. In terms of the original objective, the project has, to date, had a limited impact on improving access to households who would not have previously bought a low cost transport device. However, there are no doubt unseen benefits of increased access through hiring and borrowing which have not been evaluated.

For individual **producers** the impact has been varied. Over 50% of those trained have not taken up the technology. The remaining workshops have benefited to varying degrees depending on their location, degree of competition and supplies of axles. For some workshops the technology has allowed them to expand and for others it has given entry into the scotchcart market for the first time. See Section 5.1 for evidence of how the technology has spread in Rusape and brought new producers into the market.

For those who have bought scotchcarts incorporating the new technology the interviews confirmed the already well know benefits of ownership in rural areas: time savings, income generation and physical relief from carrying heavy loads. The high number of male remittance workers, particularly in the South, means proportionately higher numbers of women have access to carts. Most customers interviewed were not aware of the technological improvements embodied in the new technology - but they have found out it is easier to change tyres and repair punctures. The latter is a significant advantage as punctures can be quite frequent when using scrap tyres.

## 7. Lessons Learnt (Section 6)

**Project design** - need clear definition and common understanding of terms used plus clear indicators, objectives and outputs. A project officer/manager is necessary to coordinate the different elements of the project.

**Training and follow-up** - training takes time to prepare and refine. The possibility of training being used effectively can be increased through careful choice of trainees prior to training and a comprehensive follow-up system.

**Sustainability** - this is enhanced by the commercialisation of products - but products must be fully developed and at the marketing stage before commercialisation is sought.

**Spread of technology** - this has occurred through informal as well as formal channels. This has to be taken into account both in assessing the impact of the project and in considering ways to maximise the impact of any future project related activities.

### Conclusion

The project has clearly improved the supply of scotchcarts and has made significant advances in developing other lower cost devices. The degree to which this increased supply has meant improved access particularly to 'low-income households and women' is less clear. Most lower-cost devices are still at the demonstration stage making it too soon to assess the impact.

In order to consolidate developments so far it is important that the activities identified in the Dawson Report (1995) are carried out.

- The project needs to consolidate the training done so far and concentrate on building up the support network for producers;
- Prototypes need to be finalised and the technology disseminated to workshops. The focus should be on the commercial (supply-side) strategy rather than the social one for which the organisation is not equipped at present;
- further contacts should be established with organisations working with or representing target groups in order to get a clearer understanding of the demand for and affordability of low-cost transport devices. This should help to achieve a more effective dissemination strategy;

### Recommendations

- At present there is a proposal for a 2 year continuation of some project activities. It is recommended that funds are sought immediately to maintain the momentum of the project;
- It is also recommended that an extension of the project into other countries in the region should be considered. It is felt that this would build on the experience gained in the project and significantly enhance the overall output of the project.

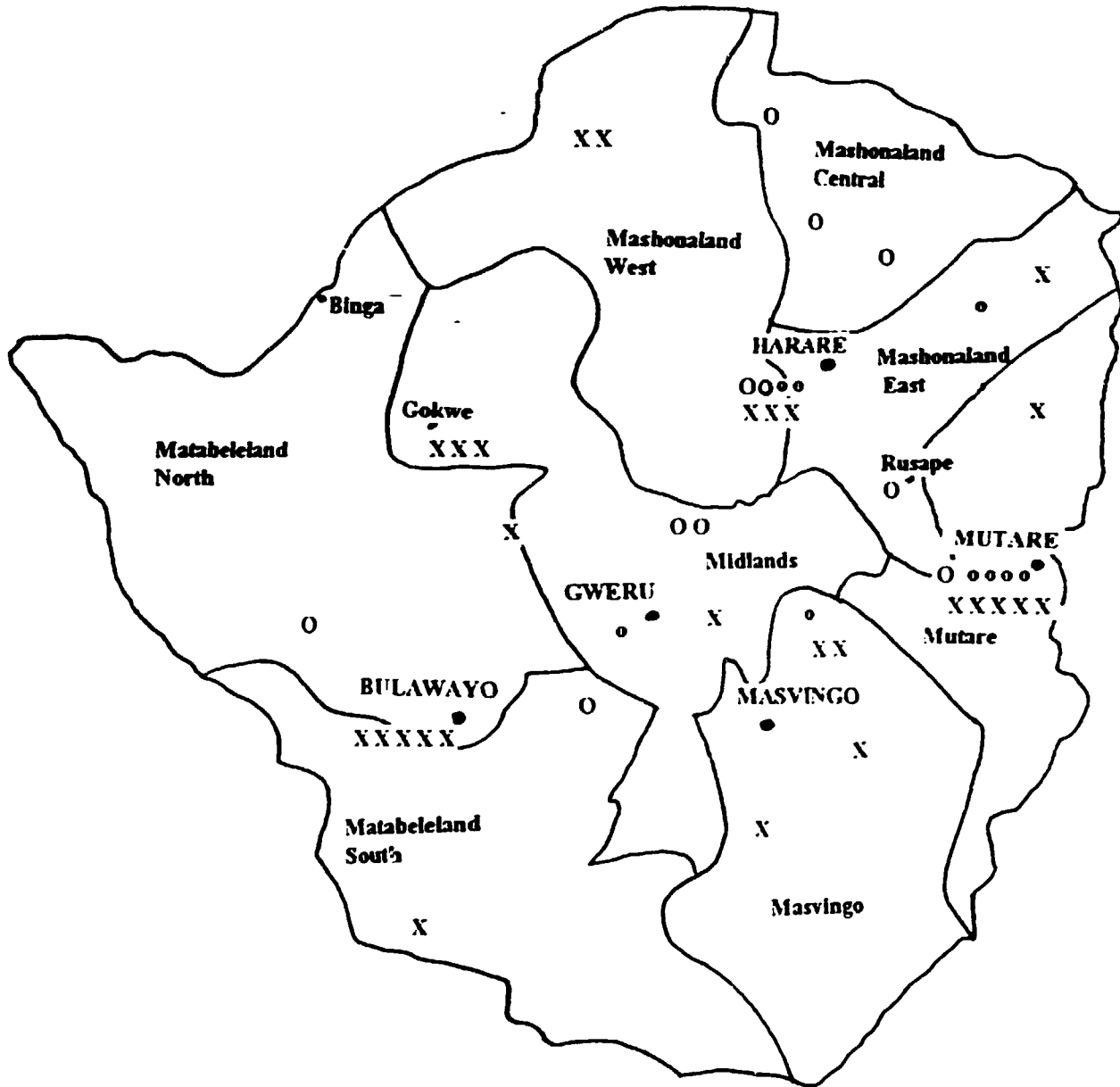
## 8. Other Evaluations - PPER and TPR

Two further evaluations have been carried out at the completion of the project:

- The final Project Performance Evaluation Report (PPER) was submitted in July 1995. A review of this report was carried out by UNIDO Headquarters in August 1995. The review agrees that the project has fully achieved its objectives but that further work is desirable to achieve an effective dissemination of lower-cost transport devices to the particular target groups of women and poorer households. It is recommended that the possibility of co-operating with other organisations in the region to strengthen this particular output should be considered;
- The final Tripartite Review (TPR) was held on 14th December 1995. This also concluded that the overall objectives of the project were satisfactorily achieved and that the low-cost transport technologies are economically viable and sustainable. However, it is recommended that a two-year extension is essential to consolidate the dissemination of lower-cost transport devices to women and poorer households and that inputs from other organisations, such as UNIFEM, with relevant experience in this area is needed to support the IAE/ITDG input. It was also recommended that a proposal to extend the project into other countries in the region should be pursued as speedily as possible.

# MAP 1

## Provincial Map of Zimbabwe showing locations of trained workshops



**KEY to status of trained workshops:**

- O** Workshops producing carts using IAE technology
- o** Workshops manufacturing components "
- X** Workshops not using IAE technology

## SECTION 1: INTRODUCTION

This report is a product of the Phase 4 project evaluation of the MANUFACTURE AND DIFFUSION OF LOW-COST TRANSPORT DEVICES IN ZIMBABWE. (See Annex 1 for the Terms of Reference). The evaluation took place in May/June 1995 and was carried out by a team of five:

Sheena Orr	External Socio-economist, UK
Peter Njenga	Transport Project Manager, IT Kenya
Abel Munyai	Project Socio-economist, IT Zimbabwe
Irvine Chatizwa	Project Co-ordinator, IAE, Zimbabwe
Philimon Sifolongwane	Project Trainer, IAE, Zimbabwe

### Methodology

The 3 week evaluation included a review of project documents, visits to key people, and a 10 day field trip to visit workshops, users, training centres, demonstration sites and villages. A one day workshop was held after the field trip at IAE and included others who had also been involved in the project. (See Annex 2 for details of people visited and workshop participants.) The workshop discussed the findings of the team, identified strengths and weaknesses of the project and generated a list of lessons learned. The workshop discussions form the basis of this report.

### Timing of the Evaluation

The Evaluation was carried out soon after the end of Phase 3 and the recent socio-economic study of February 1995. This means that most activities were evaluated after a very short lead time. At least another 12 months is needed before a better picture of the impact is gained.

### Report layout

The report is divided into 7 sections. Section 2 introduces the project activities, design of the project and links to various ITDG strategies. Section 3 puts the project in context by discussing the external environment and its effect on the project. Section 4 looks at each of the main activities and their performance before assessing their contribution to the overall impact of the project, and highlighting issues arising in Section 5. Section 6 discusses the lessons learnt and offers guidelines for similar projects. Conclusions are summarised in Section 7.

## SECTION 2: THE PROJECT

This section provides an overview of the project and comments on its design and implementation.

### 2.1 Project Overview

The project started in March 1992 as a 3 year joint venture between the Government of Zimbabwe on the one hand, and the UNDP on the other. The IAE, which is the country's leading research institute in agricultural engineering was the direct counterpart to UNIDO, the UN agency with the overall executive responsibility for the project. IAE is an arm of the Department of Agricultural Technical Extension Services (AGRITEX) under the Ministry of Agriculture and Rural Resettlement. The Ministry of Transport, recommended IAE as the institution best suited to be national counterpart to the project.

ITDG was subcontracted by UNIDO to provide specialised technical and socio-economic inputs to the project. ITDG provided its inputs partly through direct socio-economic support by its own staff and largely through a contractual arrangement with IT Transport who provided full time technical support and part time socio-economic inputs.

The **key feature** of this project was a national programme of training and dissemination of the wheel making technology developed by ITDG into small workshops to help them overcome a bottleneck in the production of wheeled transport devices. These devices, particularly scotchcarts, had been identified through surveys as important elements in local-level transport of rural communities.

The **overall objective** of the project was

*to ease the transport burden and related time constraints faced by households in the communal lands by increasing availability of good-quality, low-cost transport devices*

It was specifically expected that the United Nations Fund for Women (UNIFEM), under its own programme, would provide a socio-economist with experience in the area of women's access to improved technology, in order that the project could provide direct and monitorable benefits to women. This arrangement however did not work as UNIFEM seemed to be struggling to overcome its own internal problems.

In order to achieve the above objective, four outputs of the project were spelt out. These were as follows:

- approximately 40-50 private or co-operative workshops trained in operation of wheel making production tools;
- development of a dissemination strategy aimed at improving the access of women and poorer households to transport devices;
- enhancement of IAE capabilities in manufacture and testing of rural transport equipment;
- development of a sustainable and long-term strategy for manufacture and dissemination of low-cost transport devices.



These outputs were organised into 4 phases, each with a defined activity plan. The project would culminate in Phase 4 in an evaluation of the project.

To date, all four outputs have broadly been achieved. Over 50 artisans, a number higher than the maximum planned for, have been trained in 9 courses conducted in 7 regions of Zimbabwe. The training programme at the institute, within the UNIDO contract, is now complete.

There are a number of further activities related to the dissemination strategy which would enhance the effectiveness and sustainability of the project. These have been drawn up by the project as suggestions for further consolidatory work.

## **2.2 Project Design and Implementation**

Undoubtedly, a lot of preparatory work was done before and immediately after the project commenced. (See Bibliography for list of Preparatory Documents). Baseline surveys had been carried out to establish the need for the technology, its viability in terms of cost and design and to look at the potential of take up through small scale artisans and training centres. All this resulted in a carefully designed strategy of work, with clearly spelt out outputs and a phased plan of action following a logical sequence.

### **2.2.1 Project Rationale and Assumptions**

The project is based on assumptions common to ITDG that working through small scale rural producers is a relevant strategy (as opposed to centralised production) for two main reasons:

- rural producers are closer to the customer geographically and can respond to their specific needs; also, they often offer barter facilities.
- employment is created and sustained in non-urban settings

By addressing constraints faced by small scale producers the sector is strengthened. There is also an assumption that 'good practice' will be copied - hence the rationale for selecting 'key' producers who are most likely to be successful, leading to a 'demonstration effect' of the technology. This has been seen in Bindura and Rusape where non-trained producers have by various means, and to various standards, copied trained workshops and taken up the technology.

### **2.2.2 Institutional/Organisational Arrangements**

The institutional arrangement worked fairly well throughout the project life. The two main organisations involved in the day to day running of the project, ITDG and IAE, used their respective professional expertise in a complimentary manner, a factor that allowed the project to run with few administrative bottlenecks. As a partner organisation, IAE had the right credibility to establish good contacts in industry, research institutions and an extension network that was beneficial to the project. Furthermore, the flexibility at the IAE allowed the project activities to be easily incorporated within its overall programme of work.

Funding arrangements through UNIDO for local expenditure was time consuming and processing of claims for money spent was slow. This could have led to some delays in carrying out work but ITDG provided 'loan' inputs to maintain the momentum of the project.

While ITDG had been subcontracted to provide technical and socio-economic inputs, UNIDO retained the overall responsibility for the project. UNIDO monitored the progress of the project through informal discussions with the project coordinator and technical advisor, and on a formal basis through the annual Project Performance Evaluation Reports (PPER) and the Tri-partite Reviews (TPR).

Although IAE and ITDG worked well together in successfully implementing the project, the project would have benefited from a full-time project officer to assist with administration, to oversee monitoring and to generally promote the overall impact of the project. This would probably have achieved a more dynamic approach to marketing and dissemination of devices produced by the programme.

During implementation the turnover of staff at IAE and IT Zimbabwe, while not adversely affecting the outcome, did nothing to improve coherence and continuity. There were 2 IT Zimbabwe socio-economists and more significantly, 3 project coordinators during the life of the project. However, core IAE staff (trainers and engineer) and the IT engineer did not change, providing a solid base to the project.

### **2.2.3 Issues arising during Project Implementation**

In the course of implementation some issues (noted below) did arise leading to discussions between project members. These, however, were generally resolved and the project never got bogged down because of them.

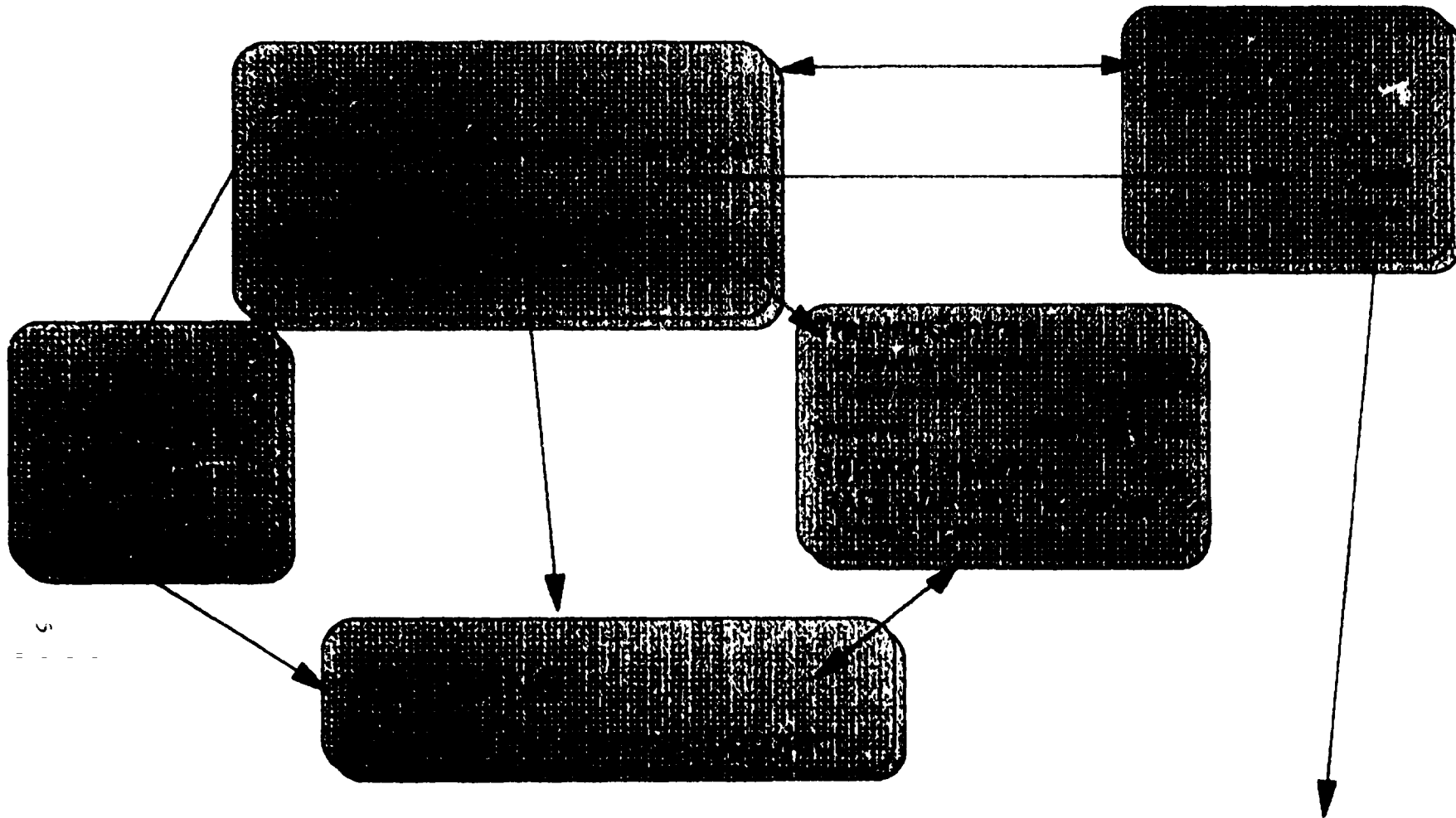
#### **Defining concepts**

The concepts of *low-cost transport*, and *poor people* initially led to discussion among different people involved in the project. The term *low-cost transport*, has variously been understood to mean *low cost relative to motorised transport* or *low cost relative to same product in the market*. As a result, when the prices of the split-rim scotchcart were not lower than that of an average scotchcart in the market, there was concern among some, including UNIDO, that the project had departed from its initial objective. Other team members took the view that it was cheaper than motorised transport, and in the long term, the price was compensated for by its longer life-span compared to other carts in the market (i.e. value for money). A common understanding was reached around the 'value for money' concept.

Similarly, there was a vague understanding of who the "poor people" are in the context of the project. Two perspectives emerged during the project.

- **supply-side** perspective which interpreted the 'poor' as being relatively undifferentiated group dwelling in rural areas. From this perspective the project aimed at generally increasing the supply of low-cost vehicles to this group through the training of artisans; ensuring a supply of ball bearings and tyres; and building up a support network. This can be seen from Figure 1 which shows the linkages between IAE/Industry/Training Centres and artisans being drawn together in a commercial 'supply-side strategy'. This strategy is aimed at those who can *afford to buy* transport devices. (See also Figure 3, p31);

# Figure 1 PROJECT LINKAGES



## Supply Side Strategy (Obj 1,3 & 4)

focusing on increasing the supply of low-cost vehicles to those who can afford

## Demand Side Strategy (Obj 2)

reaching 'women and poorer households' to influence access range of options much wider than commercial strategy e.g. credit facilities

- A **demand-side** perspective which concentrated more on the nature of the users, their needs and characteristics. Here, the differentiations within the rural market are emphasised. Recognising that left to the market the supply-side strategy would not necessarily change usage and patterns the demand-side strategy focused on efforts to help 'women and poorer households' access vehicles. Poorer households in this context is taken to mean relatively poorer than those who can afford scotchcarts.

Project staff recognised all along the difficulties involved in addressing the wider issue of the transport burden and saw the dissemination strategy, which flows out of the demand-side perspective, as only one of a variety of possible ways of addressing the issue.

Looking at the four outputs

1. training 40-50 workshops.
2. disseminating strategy aimed at improving access of women and poorer households to transport devices.
3. enhancement of IAE's capacity in the manufacture and testing of rural transport equipment.
4. sustainable, long-term strategy for manufacture and dissemination of transport equipment.

It is clear that Outputs 1,3 and 4 are directly related to the supply side focus of the project aimed at 'increasing the availability of good quality, low-cost transport devices to households in communal lands' as stated in the overall objective.

Output 2 focuses on two particular segments of the communal household 'market' - women and poorer households in an attempt to improve access of these particular target groups. It demands a different perspective and approach - one combining market research and community development and requiring a longer time view and, close work with communities. As noted already this aspect was only addressed periodically by the consultant and local socio-economist in the early stages of the project and systematic effort was not focused on Output 2 until Phase 3 of the project. There were justifiable reasons for this:

- socio-economic monitoring was delayed because the effects of the severe drought in 1992-93 significantly restricted activity in the rural sector. Information which might have been obtained on the transport activities and needs of the target groups of Output 2 was therefore not collected;
- on the technical side it was necessary to give priority to the key aim of introducing the wheel-making technology to overcome the bottleneck in production of scotch carts. The establishment of the technology provided the opportunity to produce wheels for other lower-cost transport devices and development of these started when the key phase of the project was completed. This development was guided by discussions with workshops, Agritex extension staff and other informants such as IT staff working on food security projects in rural areas.

It is considered that a clearer definition of objectives, activities and resources needed may have resulted in greater progress on Output 2 during the lifetime of the project. It is one of the areas which would have benefited significantly from the employment of a full-time project officer on the

project. However, it is anticipated that substantial progress will be made during the further work planned to consolidate the impact of the project.

#### *2.2.4 Lack of specific indicators for outputs*

The 4 outputs of the project were very clearly spelt out. However, specific measures of achievement for each output would have been useful. Even with indicators, monitoring some aspects would still be a problem. Businesses are often reluctant to give trading figures and cart owners are spread over a wide geographical area making follow-up costly and time consuming. Finding a few key indicators, such as use of the technology by workshops is better than a long list of unmonitable items. At the end of the day there will always be unexpected delays and changes. For instance, it was impossible to assess at the start of the project how easy or difficult it would be to find suitable workshops. In hindsight, a lot of effort went into selecting workshops, some of which did not have the capability and/or motivation which subsequent experience showed was needed.

## SECTION 3: EXTERNAL ENVIRONMENT

The external environment in which the project operated has changed in a number of ways over the project period. Three areas which have had impacts of varying degrees are briefly outlined below, these being

- drought
- the economy
- supply of axes

### 3.1 Drought

The project period coincided with 2 seasons of drought. Although drought is a regular feature of some areas the 1991/92 country-wide one was particularly devastating. Cattle, the main source of wealth and non-remittance income in some areas, died in their thousands. (Official figures confirmed that 1/2 million died in Masvingo province alone). In Matizenyika, where most people owned cattle before the drought, only 10 households out of 72 now own. From a village with 'hundreds of heads of cattle' (exact numbers unobtainable but different villagers told their stories) only 18 exist. The current drought is also taking its toll, not directly in cattle deaths but in reduced food and income leading in some cases to distress sales of assets.

**Effect on project** - the resource base of villagers has declined during the period of the project resulting in reduced sources of income. The reduction in agricultural activities of the wealthier villagers has had a two-pronged effect - there is less labouring work available for poorer households and less demand for transport devices for productive use.

### 3.2 Economy

The Zimbabwean economy was struggling even before the introduction of the Economic Structural Adjustment Programme (ESAP) in the early 1990s but it is clear that ESAP has added an additional burden to the two sectors of particular interest to the project: small scale producers and rural households. Although the effects of ESAP on the economy are the subject of continuous debate it is possible to discern some trends. (See ITDG, 1994 for a study of the effect of ESAP on small scale producers)

#### 3.2.1 *Small scale producers*

The report by IT Zimbabwe, while acknowledging the variations between sectors, notes a number of areas where small scale producers have been adversely affected by ESAP and the general economic conditions prevailing:

- credit squeeze and high interest rates making access to investment and working capital difficult (although most of the workshops we spoke to were not likely to have applied for loans previously)
- increase in costs of inputs - meaning that working capital doesn't go as far and profits are squeezed
- reduced demand for products due to a general decline in economic conditions (e.g. manufacturing output has been declining since 1991; in 1994 20,000 jobs were retrenched affecting remittances from migrant workers and thus scotchcart demand in the areas dependent on remittances)

The overall impact has been to increase competition throughout the economy - this has been felt particularly keenly in the small scale sector where margins are generally lower, the resource base smaller and the coping strategies more limited.

Lack of working capital was often quoted as a constraint on producing vehicles - but then it always is for small producers, so attributing blame to any one cause is difficult.

### *3.2.2 Rural households*

Although the drought has had by far the biggest impact on the income of rural households critics of ESAP also point to the regressive nature of user fees which have effectively denied access to education and health facilities to poorer households. Being basic needs, these fees also take money away from other purchases for those who can afford them. Money which previously might have bought a wheelbarrow is now used to buy medicine or pay for school fees.

Discussions in a number of villages (See Appendix 5) revealed how spending money on transport was way down the list of priorities of the majority of households in the poorer regions. For many, day to day life is a battle for survival. What money is earned (from labouring, basket making, beer brewing etc) is spent on food. Clothing, medicine, soap and hoes come further down the list. Only those households in areas where agriculture has performed well, such as in the Midlands, can think about buying a cart. Although based only on impressions gained during the evaluation it seems that in remittance areas the effects of ESAP and the drought combined have had a greater effect with the result that less money is available than usual.

### *3.3 Axles*

Another external factor affecting the project has been the influx of scrap axles from Botswana and South Africa. Judging from the early surveys this seems to be a new phenomenon although project staff said they were aware of these supplies when the project started. Without the on-going monitoring it is impossible to know just how the flows have change over the last three years. However, from interviews with producers it is clear that the availability of these axles in the south of the country is a major factor in explaining why some workshops are not using the technology. (Few of the 10 trained workshops in and around Masvingo and Bulawayo are using the technology). Training continues to be offered, however as it is unclear for how long this supply of axles will remain. It also makes workshops independent of a single seller of second-hand axles thus, potentially, putting pressure on price.

## SECTION 4: PROJECT PERFORMANCE

This section looks in more detail at the actual activities carried out during the project and assesses their performance. The project outputs are used as the framework for this analysis with separate sections on surveys and training (Output 1), dissemination (Output 2) and capacity building (Output 3). The issue of sustainability (Output 4) is dealt with in Section 5 which looks at the overall impact of the project.

Table 2 provides an overview of specific activities proposed for each phase (UNIDO P91/62) and the actual activities reported in the various phase progress reports. Phases 1 and 2 progressed largely as planned with most of the activities taking place as scheduled. Developing and refining the training programme did take longer than expected but this was felt necessary if lessons learned from one training course were to be incorporated into the next. The concentration on training and technical development and testing in the early phases meant that the dissemination programme was late in starting. A revised schedule was drawn up and agreed at the TPR preceding Phase 3. The resulting dissemination strategy was then carried out. As mentioned earlier, further work is proposed in order to consolidate and enhance the effectiveness of the project.

Overall the project has performed well. One area where perhaps more could have been done is on the socio-economic side, particularly in the last year of the project. The main input has been from the visiting socio-economist. In between visits little was done to develop ideas and basic monitoring information such as the current status of workshops was not collated.

### 4.1 Initial Surveys

Preparatory work for the project started as early as March 1989 with an investigation into transport characteristics and requirements in rural Zimbabwe (Zille, 1989). By the time the project formally started in March 1992 a total of 10 reports had been written, 3 surveys of rural workshops and training centres had been carried out and 2 studies of ownership, use and hire of scotchcarts completed. A fourth survey of workshops and a third for ownership followed in early 1992 once the project had started. (See Bibliography for list of Project Documentation)

From these surveys and reports a wealth of information was provided which helped the detailed planning of the project. The surveys also highlighted the need for other activities to complement technological developments e.g. finding a cheap, reliable supply of ball-bearings.

### 4.2 Training Programme

#### 4.2.1 Activities

A total of 9 courses have been run training 53 artisans along with 6 artisans from 4 training centres. Training courses were held in various locations in order to give good coverage of the country. Details are shown in Table 3. A training manual was developed and distributed to all course participants during training. Participants on later courses benefited from the development of additional low-cost vehicles such as the water barrow and donkey/hand cart. Follow-up is planned under the project extension for those who missed out on this training.



**TABLE 2: PROJECT ACTIVITIES - PROPOSED AND ACTUAL**

PHASE	PROPOSED ACTIVITIES (UNIDO p91/62,pp8 -10)	ACTUAL ACTIVITIES
<b>PHASE 1</b> <b>3 months</b> <b>March - May 1992</b>	<ol style="list-style-type: none"> <li>1 Survey of rural workshops and training organisations</li> <li>2 Planning &amp; preparation of training programme</li> <li>3 Plan devel/test of wheel/bearing/lev</li> <li>4 Complete survey of ownership/use/hire of scotchcarts</li> </ol>	<ol style="list-style-type: none"> <li>1 4 surveys - JD/PZ Aug 89 (8WS) - AS/PS May 90 (30WS) IAE 91 (30WS) - ITDG/IAE (15WS)</li> <li>2 Pilot course at Driefontein April 90</li> <li>3 Rig installed Ap 90, commissioned Feb 91,</li> <li>4 3 surveys: JD/PZ Aug 89, JD Jun 90, IS May 92 + <i>planning of promotion &amp; dissemination</i></li> </ol>
<b>PHASE 2</b> <b>24 months</b> <b>June 92 - June 94</b>	<ol style="list-style-type: none"> <li>1 manufacture sets of production tools for training courses (t/cs)</li> <li>2 6 t/cs x 6-8 participants x 2 weeks</li> <li>3 Follow-up visits at 3/4 month intervals</li> <li>4 Liaise with Govt/NGOs to improve coordination</li> <li>5 Monitoring to assess impact on workshops and households</li> </ol> <ol style="list-style-type: none"> <li>6 Continue devel/test programme</li> <li>7a Monitor field trials</li> <li>7b Assess demand for prototype vehicles</li> </ol>	<ol style="list-style-type: none"> <li>1 60 sets of production tools produced</li> <li>2 50 workshops trained during 8 t/cs of 10 days</li> <li>3 Regional visits made</li> <li>4 AGRITEX staff used in prom &amp; disem</li> <li>5 Workshops production = 328 carts/1<sup>1</sup>/<sub>2</sub> wheel assembly/67 barrows/15 handcarts Monitoring &amp; Evaluation - 7 WS visited, Broken cart survey Consultant SE+ loc SE survey 10WS and 8 users (Nov 93)</li> <li>6 Oxcart wheel, bearings, hub/axle, tyres testing continued</li> <li>7 Wheel/water barrow, handcart, w/bowser developed <i>- no field trials or assessment of demand</i></li> </ol>
<b>PHASE 3</b> <b>8 months</b> <b>July 94 - Feb 95</b>	<ol style="list-style-type: none"> <li>1 Detailed 2 month evaluation of impact (+ women)</li> <li>2 Continued follow-up visits to WS &amp; TCs</li> <li>3 Estab scheme of continued technical support to WS</li> <li>4 Implement other activities identified by evaluation</li> <li>5 Dissemination of results to rural WS</li> </ol>	<p>* Agreed at Tripartite Review that this phase should focus on improving impact* Actual activities included:</p> <ul style="list-style-type: none"> <li>- manufacture of prototypes</li> <li>- field testing of prototypes - via NGOs</li> <li>- feedback from field testing</li> <li>- socio-economic study (JD Feb 95)</li> <li>- establishing links with training centres</li> </ul>
<b>PHASE 4</b> <b>2 months</b>	<ol style="list-style-type: none"> <li>1 Final Evaluation 2 months after Phase 3</li> </ol>	<p>Evaluation carried out May/June 1995</p>

**TABLE 3: DETAILS OF TRAINING COURSES**

Course No.	Date	Venue	Number of Artisans Trained
1	1992July	IAE Harare	5
2	Nov	IAE Harare	5
3	1993Jan	Mutare	10
4	Feb	Bulawayo	6
5	May	IAE Harare	4
6	Sept	Gokwe	7
7	Nov	IAE Harare	5
8	1994March	Masvingo	6
9	1995Feb	Hlekweni	5
9 courses		6 venues	53

At the time of the evaluation almost 50% of artisans trained were found to be using the technology either to produce whole carts or just wheels and axles. (See Section 5 for more details on impact).

An essential part of the dissemination strategy from the supply side involved making existing training centres aware of the technology and training them in its use. Six training centres also received training in the hope that they would subsequently include the technology in their own courses. The current situation is as follows:

- 2 running courses aimed at artisans - Life Sowing Ministries and Silveira House
- 2 include on longer course - Chinoyi & Driefontein Mission
- 2 not currently doing anything but have plans - Hlekweni and Mashvingo Technical College

(Appendix 3 gives more details on each of the Training Centres)

Equally important is that these training centres form the basis of a network which is to be developed further to include:

- AGRITEX (which has one mechanisation officer in each Province)
- RATE (Rural Artisan Training and Establishment Project) which includes Hlekweni, Silveira House and IAE
- informal links with other training centre such as Mashvingo Technical College, Driefontein, Chinoyi and Life Sowing Ministries.

#### 4.2.2 Performance

The training component of the project went well providing 48 workshops with good quality training in wheel bending technologies. The training of other training centres also helped to disseminate the technology and formed the basis of a network for future support to rural producers. The formal role of IAE and the RATE project in linking other organisations also contributes to the long-term sustainability of the project objectives.

Some areas where further work could have been done were noted but time and human resources were the limiting factor:

- AGRITEX could have been used more fully e.g. using regionally based staff (mechanisation officer) for updating workshops on technological developments; monitoring the status of the workshop and noting the location of carts discovered in the course of their extension work;
- Training took longer than planned (partly due to the increase in workshops to be trained from 30+ to 40+) which meant the timing of the dissemination strategy had to be revised;
- Adequate follow-up was not carried out due to a lack of financial and human resources at IAE e.g. new designs and adaptations to prototypes were not always disseminated to workshops, particularly those trained earlier. (The workshops are spread over a wide geographical area making follow-up costly in terms of time and money.);
- Monitoring of some aspects of the project could have been carried out more methodically and the information collected put together in more useful ways e.g. a centrally kept file (at ITZ or IAE) on each workshop could have been used to store information from various visits made.

#### 4.2.3 Observations about Conducting Training

The implementation and subsequent evaluation led to discussion about a number of issues relating to the running of training courses. There is general agreement that the effectiveness of training, by which we mean the likelihood of training being used effectively after the course, can be increased if particular attention is paid to the following:

- **Training takes longer than you think!** - allow time for feedback and adjustment - running training courses is a process of continual improvement;
- **Who is trained** - artisans and medium size producers of scotchcarts are more likely to use the training than school leavers and non-producers;
- **How people are identified for training** - selection should be based on pre-defined assessment criteria - technical, financial & managerial - carried out by trainers who are familiar with the technology, familiar with the artisans, have good common sense and are good at talking to and assessing people;

- **Length of course** - 10 days specific training on wheel bending was felt to be the right amount of time with 5 days business training for those taking up technology. Business training may be particularly relevant in helping smaller producers to place themselves in relation to larger producers in highly competitive situations:
- **Local conditions** - Effectiveness of training in terms of technology uptake is very much related to local economic conditions: competition from other producers and alternative supplies of axles. These factors should also be considered when planning courses e.g. are there areas where competition from larger producers is too strong such as in Gokwe where the market is flooded by cheap Bambanani carts. The importance of business training has already been highlighted.;
- **Access to kits** of production tools is essential for promoting the technology. Subsidising kits in this project was felt to be the right option as the technology was new and the cost high for small producers to bear ( at IAE the kit was sold to course participants for \$300, real cost \$1,500). Other training centres sell the carts produced by trainees to help cover costs. In addition, IAE has encouraged the commercialisation of the technology so other producers can gain access to the necessary production tools. This has resulted in the kits being advertised and produced for sale on the open market.
- **Follow-up and support** - project staff are very aware of the need to develop the support network so that trained artisans can continue to exploit the technology to the full. Box 1 shows support services which could be offered to artisans through the network based on feedback already received by project staff.

### 4.3 Dissemination Strategy

A dissemination strategy was one of the four outputs defined at the beginning of the project. The overall purpose of the dissemination strategy was to improve the access of women and poorer households to transport devices. During the early part of the project, dissemination was mainly through commercial marketing of scotchcarts by trained workshops. Later it became clear that a more pro-active approach was needed to achieve a more direct impact on the target groups.

A study during a visit by the consultant socio-economist in late 1993 concluded that, despite there being an increasing number of scotchcarts in the field, the dissemination of the scotchcarts was not progressing as fast as was considered possible. Equally important, the impact of the project on its primary target group - women and poorer households - while broadly positive remained somewhat indirect and limited. Consequently, a revised dissemination strategy was designed with the aim of addressing these weaknesses. (see Phase 2 Final Report).

## Box 1

### Developing A Network

**Co-ordinator:** IAE (through RATE project)

**Contact Points:** AGRITEX, RATE plus other training centres

**Serving:** Artisans, local NGOs and other interested organisations

**Services Offered:**

- access to refresher courses
- advice relating to the technology
- list of suppliers of ball bearings, jigs, etc.
- a list of other producers of split rim parts or whole scotchcarts  
to facilitate sourcing of parts and supplying to other producers
- a training manual
- information about new designs and technologies
- information about credit sources such as AFC and HIVOS;

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HIVOS has just made an arrangement with Barclays Small Business Section whereby small artisans can access HIVOS funds using a simplified procedure. Amounts as low as Z\$30,000 will be given which makes it applicable for many of the artisans using the wheel making technology who are looking for working capital.

### **4.3.1 Activities within the Strategy**

The central thrust of the dissemination strategy was broadly twofold. It aimed at

- the development and production of Lower-Cost Vehicles (LCVs) which would be more directly affordable and relevant to the needs of the primary target groups - this includes the development and training at IAE and subsequent follow-up activities; and
- enhancing the dissemination of LCVs produced as a result of the project.

The dissemination strategy, as initially conceived, included:

1. Developing lower-cost vehicles tailored to the specific needs of the projects particular target group
2. Working through and with other organisations which are targeting their assistance to the projects target group.
3. Promoting the use of vehicles produced by project trained artisans on labour based road projects
4. Encouraging commercial and co-operative retail outlets to stock the vehicles made by project trained workshops
5. Helping the Ministry of Community Development to develop a strategy for addressing women's transport needs.

### **4.3.2 Progress**

A report on the progress of the dissemination strategy was prepared by a consultant socio-economist 3 months prior to this evaluation. (See Dawson, 1995). During the visit a number of suggested refinements to the project were made, which could be covered in the event of an extension to the project.

The status of the dissemination strategy largely remains as it was during the socio-economist's visit. The progress as contained in the report is summarised below.

#### **1. Development of Lower-Cost Vehicles (LCV)**

Three LCVs have been developed:

- conventional wheelbarrow
- waterbarrow - a hand pushed cart with two carriers for water containers on either side of a central wheel
- a small cart which can be drawn both by donkey or by hand. The poles to which the donkey is attached can be removed for manual use of the cart.

The three vehicles have been field tested and demonstrated. The project team has however decided to promote only the waterbarrow and small cart. This is due to the nation-wide availability of factory made wheel barrows at a lower cost than the artisans would be able to make. At ZS300 - 400 and ZS500 - 600 respectively, the waterbarrow and small cart are considerably cheaper than scotchcarts, which sell for between ZS2.000 - 3.500. Waterbarrows and small carts are currently being demonstrated in various locations in the country. Final designs have now been developed and are ready for dissemination to workshops and other organisations.

## **2. Linkages with other organisations**

Part of the strategy called for the development of linkages between the project and agencies with rural outreach programmes aimed at the project's primary target groups. This was in order to raise the awareness of the potential benefits of the vehicles while improving the access of the target groups to them by way of group purchase and credit schemes which these agencies often operate.

An open day was held at the IAE in December 1993 to which a number of NGOs and other agencies were invited. This succeeded in raising the profile of the project among a range of actors. Following the open day a number of agencies were identified through which vehicles were then distributed to 8 demonstration sites. Eight waterbarrows, 7 small carts and 2 scotchcarts were distributed through 5 different organisations. (See Appendix 4 for details). Most of the agencies have allocated the vehicles to particularly needy individuals or groups. The perceived benefits of the LCVs among these users includes flexibility of use, time savings and income generating opportunities (Dawson, 1995). Feedback on devices came directly from the individuals involved. The organisations appear to have been used as channels not as active partners. Virtually no work was done on alternative methods for reaching various groups e.g. credit facilities.

The sporadic socio-economic input has meant that fuller relationships with other NGOs have not been developed and opportunities for credit initiatives remained largely unexplored. The lack of a person with full-time commitment to the project to work on these issues has already been identified as a constraint.

## **3. Promoting the use of vehicles on labour-based roads projects**

The planned project did not take place and no other similar openings were found.

## **4. Marketing vehicles through Commercial and Co-operative Retailers**

A scotchcart and 10 waterbarrows have been supplied to African Marketing Services (AMS). None have yet been sold due to the generally depressed economic conditions prevailing.

## **5. Helping the Ministry of Community Development**

Due to time constraints the preparation of a Policy Paper has not been carried out. In the Phase 3 final report it is suggested that this will be undertaken as an activity under another IT Zimbabwe Transport Project.

### 4.3.3 Summary

Whereas the training component addressed the supply side of low-cost vehicles, the dissemination strategy sought to influence the demand side more directly by increasing awareness of low-cost vehicles. Also, by developing a wider range of vehicles, particularly ones more finely tuned to women's needs, it was hoped that access of 'women and poorer households' to vehicles could be improved.

The wider, long-term impact of LCVs will depend on translating the *latent* demand into *effective* demand. While feedback from demonstrations has been positive and indicative of potential benefits, the unavailability of fully developed models has meant that few hard-cash purchases have been possible. As also mentioned, affordability is also an issue with lower income groups and is an area where collaboration is needed with other organisations working with the target groups. (See Section 5.3 for further discussion on this issue).

In general, it seems that the dissemination strategy suffered from a lack of continuity and breadth of scope both due to time constraints more than anything. The team were aware of this constraint and sought to do what was possible with the given resources. This is an area which will be consolidated in a planned extension of the project and it is anticipated that in the longer term the dissemination of low-cost vehicles will have a significant impact on providing more effective means of transport for poorer rural households (e.g. those that cannot afford access to scotchicarts).

## 4.4 Capacity Building at IAE

### 4.4.1 Activities

The project has enabled IAE to expand their knowledge and experience by building on what they had in a number of ways.

- 3 trainers are now equipped to train others in all aspects of the technology;
- In addition, staff of the Rural Technology Training Centre have gained extensive experience in identifying trainees, training, follow-up and up-take of technology;
- IAE has developed informal and formal (through the RATE project) links with other organisations which enhance its ability to provide support to artisans;
- An engineer has been trained who is capable of running the development and testing programme with minimal assistance from ITDG staff.

Also, in the preparatory phase

- A development and testing facility was established including the installation (May 1990) and commissioning (February 1991) of a wheel and bearing test rig

### 4.4.2 Progress

The ability of IAE to undertake appropriate developments is evident from the development of various low-cost vehicles, the rigorous testing conducted and the seeking of alternatives where necessary (e.g. importing ball-bearings). The development of a puncture proof tyre for



wheelbarrows and the donkey/handcarts was also a major achievement as commercial wheelbarrow tyres are quite expensive and the badly worn scrap tyres often used on handcarts are prone to punctures. A local company now produces the tyres to order.

The on-going adaptation of prototypes currently being tested in the field is further evidence of IAE's ability to respond to user needs.

#### *4.4.3 Impact*

While any organisation can always benefit from ideas from outside, it appears that IAE is in a strong position, technically, to maintain the initiatives set in motion by the project with minimal assistance from outside. Availability of funds for testing and dissemination do, however, pose a constraint. Building up a network for dissemination will ease this burden but testing and development will continue to rely on additional funding if it is to be fully effective.

There is also the question of administrative constraints to which IAE is subject which limits its ability to deal with small projects which require flexibility and handling of funds. Government regulations restrict how funds are handled and ITDG's role in smoothing the flow of funds for this particular project was essential for the day to day running, as was the pivotal role of the ITDG engineer based at IAE. Any future project will have to consider appropriate organisational arrangements in view of these comments.

## SECTION 5: IMPACT ASSESSMENT

This section considers the impact of the project outputs from three different perspectives

- individual producers
- individual users
- the market for low-cost vehicles

The last area outlines the different segments of the rural markets in relation to low cost vehicles and discusses the issue of targeting women and poorer households.

### 5.1 Producers

After training, producers have the choice of adopting the technology or not. Here we look at the current uptake of technology, the reasons for using it and also why workshops aren't using it. An interesting aspect of adoption is how some workshops have copied the technology, as the rationale for working through small producers assumes, and an example of this is presented from Rusape.

At the time of the evaluation the following adoption of IAE technology was found:

- 11 (22%) workshops were producing carts
- 9 (18%) workshops were producing parts (rims/axles)
- 3 (5%) training centres producing parts or whole carts
- 28 (55%) workshops not using technology at all

This is shown graphically in Figure 2. The location of workshops is shown on Map 1, p xi. (See Appendix 6 for details of individual workshops).

It should be noted that the above figures are based on the current situation. In a few cases workshops not now using the technology have done so in the past but apart from one or two they did not indicate any intention of producing in the future. The majority of the 28 workshops not using the technology at present had never used the technology after the training (see Section 5.1.2 for reasons).

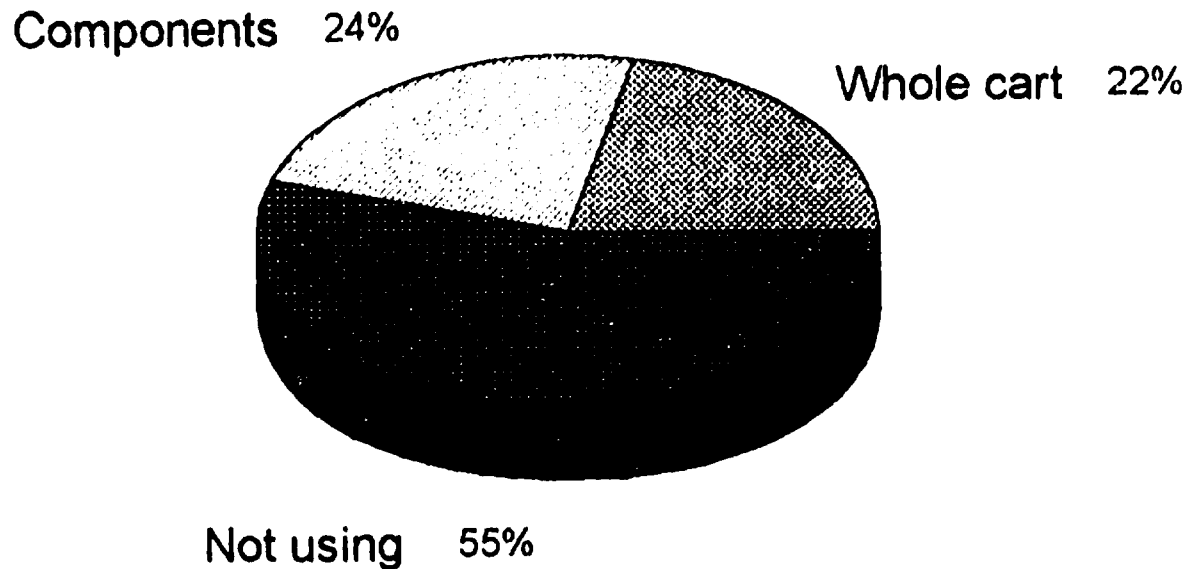
#### 5.1.1 Workshops using technology

The wheel making technology is used in 3 main ways by the 23 producers who have adopted it:

- **to produce high quality carts for niche market** (selling at Z\$3,200+) - 3 - 4 producers are using this strategy explicitly (e.g. Bindura, Rusape). Also included in this group is Cold Comfort Farm (an NGO);
- **opportunistically (with varying quality)** - usually where supplies of axles and rims are short and/or good market conditions exist. (selling from Z\$1,800+) - these 6 -7 producers are found mainly in Mashonaland and the Midlands where agricultural surpluses are generally better than other parts of the country (i.e. in agricultural regions IV - VI);

## Figure 2

# Technology Uptake Among Trained Artisans



Source: Evaluation Survey

- **for component manufacture where larger cart producers exist - those producing components are based in and around the larger towns - 3 in Harare and 5 in Mutare. There is also one in Gweru and a final one in Masvingo Province who was already producing through previous training at Driefontein. Three of the training centres are also producing parts in small numbers.**

The three main reasons given for using the technology are

- **short supply of axles and rims (practical)**
- **market opportunity for carts in general (much better in Regions 2 and 3 at present)**
- **potential of new technology as selling point (entrepreneurial)**

In the absence of any monitoring system it is difficult to calculate the number of carts and axles produced as records are often not kept and businesses are often unwilling to disclose trading figures in any case. Based on the workshops visited during the evaluation it is estimated that over 140 carts have been built in the last year and a further 50 or so axles. Some workshops produce only 1 or 2 items in the whole year while others produce as many as 40 carts, the latter being workshops whose main business is carts. The number of carts sold is linked to agricultural activity and it is very clear that the two droughts have affected sales significantly.

For some workshops the technology has enabled them to stay in business and others have been able to expand their business. Sam Muuduri's story is told in Box 2. As noted in the initial surveys most workshops produce a range of goods, usually including metal door and window frames. Having another technology and its associated products to add to their range is valuable in itself as it provides more flexibility to small producers and allows them to exploit opportunities which arise.

### **5.1.2 Workshops not adopting the technology**

Of the 48 workshops trained (excluding Hwange ones) 28 are not using the technology at all for a variety of the following reasons:

- **drought conditions leading to a lack of demand - this was mentioned all over the country but applies most to Mashonaland where improved conditions would probably lead to more workshops using the technology.**
- **cheap supply of axles and rims -a) in Harare there is a large 2nd hand car market and a regular supply of scrap axles which are used by a number of workshops in the informal sector b) none of the 10 workshops in and around Bulawayo and Masvirgo are using the technology - a cheap and ready supply of South African and Botswanan axles was often given as the reason;**

## Box 2

### SAM'S STORY

Sam Muuduri lives in Bindura in Mashonaland. The surrounding areas are good for agriculture and farmers come to Bindura, the Provincial centre, to buy many of their supplies and implements. There is a good demand for scotchcarts in the region reflected by the competitive situation among producers in Bindura. In the town are 5 or 6 workshops selling carts, two of whom act as distributors for larger manufacturers based in Harare. The biggest sellers have well positioned sites near the main market so that people getting off the bus can see the carts.

A little away from the market Sam Muuduri has his small welding business that he has built up over the years. Metal doors and window frames made up his main business. In 1990 Sam started producing carts in an attempt to diversify. He managed to make around 10 a year. But finding scrap axles was difficult particularly without transport and he nearly went out of business.

In July 1992 Sam attended a training course in wheel bending at IAE which turned his business around. Recognising the benefits of the new technology, and released from the supply constraints of old axles, Sam chose to produce a cart that was differentiated from the other in Bindura by its high quality and superior technology. Business boomed!

In 1993 Sam sold 24 carts, in 1994, 26 and so far this year (a bad one) he has sold 5 but expects sales to pick-up around September. His 'top of the range' cart sells from Z\$3,000 - Z\$3,200. The income from the carts and axles, which now form his main business, has financed an expansion of his business premises and with a turnover of Z\$67,700 in 1994 he was able to buy a pick-up for Z\$18,000.

Sam reckons that with a better location he could sell more carts - but until he manages to get one he has to rely totally on the competitive edge provided by his quality carts made possible through the training he received from IAE.

- **lack of workshop capacity: financial and institutional** - *some workshops just didn't have the working capital or managerial ability to shift from assembling carts to actually fabricating them. This probably accounts for about 25% of those not producing including the 5 in Mutare (who were not selected directly by IAE) The increase in supply prices of materials was mentioned by some as a secondary factor;*
- **competitive situation among workshops locally** - *in Gokwe none of the trained workshops were using the technology because the market was flooded by low cost 'Bambanani' carts; in Rusape smaller producers were also unable to compete against the larger producers. The inability to offer credit or accept payment in instalments also puts smaller workshops at a disadvantage;*
- **trained person no longer at workshop** - *e.g. illness, sacking and leaving to use skills elsewhere were given as reasons in 3 or 4 cases. While there may be some additional safety in training owners rather than employees it seems that it is other factors, as mentioned above, which determine whether the technology is used or not;*
- **amount of time needed to make a wheel** - *this was mentioned twice as a reason for not using the technology.*

### 5.1.3 Wider impact on producers

It is not just trained workshops who use the IAE technology. It is clear from places such as Bindura and Rusape that the informal spread of the technology has widened the impact of the project in terms of the numbers of split-rim devices being manufactured. Box 3 provides an example of the way the IAE technology has spread in Rusape. In summary, the training of one workshop has had the following effect:

- 3 out of 4 cart producers are now using the split rim technology in Rusape;
- the technology brought 2 new producers into the market (as first time producers of scotchcarts);
- a total of 72 carts with split rims have been produced in total (of which only 18 are from the trained workshop);
- the technology has spread through the following channels (apart from IAE):
  - trained welders moving from one workshop to another
  - visual observations - 'copying effect' when success of trained producer seen
  - information dissemination and technology from ENDA and Hlekweni
  - and on the demand side, villagers start asking for split rims once they have seen their neighbours with them.

As far as producers are concerned the project has provided them with more flexibility by increasing the range of products they are able to make and offer. Some workshops have benefited well from this; for others it has enabled them to stay in business. There is no doubt that the

Box 3

Catching On: The Spread of Split Rim Technology Among Rusape Workshops

VAE training + technology

STAR ENGINEERING  
General Welders

- didn't produce scotchcarts before training
- welder does VAE training Nov 1993 starts producing → (23) to date
- 2nd welder trained who leaves to work for Mandeya
- split rim technology observed by visiting welder - starts using at his farm
- cash only
- not in central location

FARM

- no details of type of wheel bender used but mentioned by 2 or 3 people.

MANDEYA

- welding not main business
- got idea of split rim from Star
- had wheel bender made in Mutare at Gideon's Engineering
- experimented with technology while training welder who subsequently goes to CHIKANGA WELDERS
- starts producing scotchcarts, scarvas & water towers to own design.
- also got some ideas from ENDA

CHIKANGA WELDERS

- Not Scotchcart producer
- bought wheel bender from Mandeya in April 1994
- poached welder from Mandeya in June 1994
- starts producing split-rims in June 1994 → (16) to date
- accepts payment in kind
- well placed on main street

NYAMUSAMBA HARDWARE

- Not Scotchcart seller + assembler - but not main business
- 1995 bought axle from Hlekweni
- ENDA - early designs - faults - so didn't follow up.
- enough capital to import in pre-fabricated carts.
- interested in training + buying in components to give more flexibility.

END A

HLEKWENI

PRODUCTION FIGURES of Split rim carts (Traditional in brackets)

	1993	1994	1995
Chikanga	0 (50)	6 (44)	10 (0)
Mandeya	0	25	10 (0)
Star	0	15	3 (0)
Nyamusamba	0 (50)	2 (48)	0 (12)
<b>TOTAL</b>	<b>(.50)</b>	<b>48 (92)</b>	<b>24 (12)</b>

introduction of the IAE technology has increased the supply of carts produced by rural workshops in some area although the absence of figures for the overall market makes it impossible to assess the overall impact. It is also difficult to speculate on the quality of the carts produced by untrained artisans. Like those trained it is probably not unreasonable to assume that quality varies depending on the skill and pride of work.

#### 5.1.4 Conclusion

A number of factors, which vary from place to place, seem to affect the uptake of technology and the degree to which it is used. A rough order of importance might look as follows:

##### *Primary determinants*

- supply of axles and rims
- economic climate
- degree of competition among local competitors - *an additional factor here is the geographical location of workshops - some workshops had adopted the technology but were not in prime site locations (e.g. near the main bus stand/market area) and so were not able to fully exploit potential demand for their products.*

##### *Secondary determinants*

- main product of business - *better take up among those for whom scotchcarts are the main business. This also implies that workshops already producing scotchcarts are more likely to adopt - although exceptions to this were found.*
- financial and managerial capability of workshop
- customer preferences - *some customers still prefer car axles*

These factors are good indicators of what to look for in future assessments of workshops and suggest a broadening of the criteria used to include the wider competitive situation faced by workshops locally and not just technical abilities. The fact that the competitive situation is high on the list of factors suggests that business training might help smaller workshops in thinking through their strategy *vis-à-vis* larger producers and helping them to position themselves more favourably.

As guidelines for monitoring they could help inform where best to focus training efforts as training proceeds over the longer term as well as helping to gauge if initial conditions have changed.

## 5.2 Users

Benefits to users have been documented to some extent in earlier reports<sup>1</sup> showing the positive impact on households and including women. As these earlier discussions were conducted soon after purchases had been made an attempt was made during this evaluation to follow-up users after a longer gap. The follow-up was fraught with a similar problem as encountered in previous follow-ups - that despite there being evidence that many workshops have produced and sold a number of scotchcarts using the split-rim technology, the buyers did not come from the immediate proximity of the workshops, and it subsequently proved difficult to trace a good number of them.

The team however managed to trace 2 users, one in Zvenyika village, about 10 kilometres from

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<sup>1</sup> See Annex 3, Phase 2 Progress Report No 2.



Gutu township where the cart was produced, and another in Chipatsura village in Odzi, about 60 kilometres from Rusape where it was made. In addition, the team talked to a farmer who is waiting to take delivery of a cart from a producer in Gokwe, and a group of cart owners using the car-axle-and-rims type of carts in Tsholotsho market centre.

### 5.2.1 *Benefits of scotchcarts*

The interviews confirmed what are already well known benefits of owning scotchcarts in rural areas. For these, it mattered little whether the cart was the ordinary type or the split-rim type. The main benefits fall into two categories:

- **Time Savings** - benefits are seen primarily to do with savings in time and energy. This is mostly common in households that frequently needed to undertake numerous transport activities for especially bulky products. This could be agricultural produce between the farm and the homestead or between the homestead and the market, fuelwood, water, farm inputs etc. The transport of agricultural produce was especially highlighted as a decisive factor in the purchase of scotchcarts especially in richer agricultural areas of Gokwe, Zvenyika and Marange. While scotchcarts travel at approximately walking speed, their enhanced load carrying capacity means that considerably fewer trips are required than previously; in the case of agricultural inputs and marketing, timeliness of delivery was said to be an increasingly important consideration.
- **Income Generation** - although not given as a primary reason on which the purchase of scotchcarts rested, three interlinked elements related to income generation arose: the first one, related to point(i) above has to do with *ability to carry out more income generating activities* - getting larger quantities of produce to the market at the most opportune time, ability to carry and therefore apply more manure to the farms etc. were seen as widening the scope for increased income generation; the second point related to *savings that would accrue to those who would otherwise have had to hire scotchcarts* to carry out their own activities. This point was illustrated by a farmer in Mawachi village who has bought a split rim cart in Gokwe, although it is yet to be delivered. Currently they not only have to pay a very high hire-charge during harvest times, but their needs come after those of the cart owners, a situation that denies them control over some important elements of the farming operations; thirdly, *scotchcarts owners can generate additional income by hiring them out to non-cart owners*. This was evident in all areas visited. In Tsholotsho, hiring out carts for a variety of activities - including ambulance services - is a lucrative business, earning some people up to ZS100 per day. Through hiring services, the benefits of a cart are spread to non-owners who may otherwise be unable to afford to use a cart, and to those whose transport needs may not justify full time ownership of a cart.

### 5.2.2 *Benefits of other lower cost vehicles*

Discussions were held with people at demonstration sites regarding their views about the other low-cost vehicles, such as water barrows and small hand/donkey carts, being developed and what they saw as the potential benefits.

- **flexibility of use** - both the water barrow and small cart are suitable for a variety of domestic, farm and income generating activities. The water barrow, although

used primarily in carrying water was also useful for taking maize to the grinding mill; manure to the fields; and small amounts of produce from the fields to the homestead. The small cart on the other hand was used for even more varied activities. Its greater loading capacity, flat carrying platform and ease of use both as donkey-drawn and handcart make it very appropriate for the numerous small tasks needing to be performed by the rural households. One of the recipients of the small carts estimates he uses the cart 4 time more frequently than his scotchcart:

- **time savings** - most of the donated vehicles have been allocated to relatively poor people in parts of the country with relatively high levels of isolation. In these cases, benefits are related to savings in time and energy. One-way walking trips of up to 2 hours to collect water and firewood or reaching the grinding mill were not uncommon among interviewees. While both vehicles travel at approximately walking speed, their enhanced load carrying capacity means that considerably fewer trips are required than previously;
- **income generation** - the benefits varied between households depending on the potential for income generation opportunities and the degree of geographical isolation. Households with relatively good access to key resources and facilities - especially water, crop marketing facilities and firewood - assessed benefits in terms of increased economic activities (more livestock kept, greater crop carrying capacity) and greater income.

### **5.2.3 Impact on Women**

Out of the 4 users of scotchcarts interviewed, 2 were women (one already using, the other just about to start using) while the others were young boys. In all these instances, women were the de facto heads of the households. Typically, the scotchcarts had been bought through remittances from husbands working outside the villages. There was therefore no evidence of conflict of use between activities traditionally carried out by women and those carried out by men. In one instance it was explained that use of the cart at any moment depended on the need. In all instances the carts were used as much for water and fuelwood carriage as they were used for agricultural activities<sup>2</sup>.

### **5.2.4 Views on the split-rim technology**

The users interviewed highlighted two main features of the technology that they thought innovative; these are the ease of removing punctured tubes and the strength of the axles. The ease of repairing punctures is a significant benefit because these can occur quite frequently when scrap tyres are used. Apparently, specific features of the technology are not well known to the users and in general therefore, there was little concern on the finer details of the cart among the users. No feedback was given on durability (not surprising given the short time the carts have been on the market). Producers appreciated the ball-bearings but no comments were made by users. The fact that customers in some areas (e.g. Rusape) are actively requesting carts with the split rim wheels is the main evidence that users like what they buy to the extent that they influence their neighbours.

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<sup>2</sup> See the 1991 UNIFEM Report for further discussions on women and vehicle usage.

### 5.3 The Market for Low-Cost Transport

During the survey a number of village visits were made to a) assess the extent to which the current project was appropriate for women and poorer households and b) what market might exist for the new devices being developed.

#### 5.3.1 *Who buys?*

The early project surveys highlighted two income sources for buying carts a) profit from cash crops and agricultural surpluses (common in agro-ecological regions 2 and 3) and b) remittance payments especially common in regions 4 and 5. This still remains true although demand has fallen due to the effect of the drought.

But who buys low-cost vehicles? Discussions held in 4 villages in Masvingo and Matabeleland North<sup>1</sup> found the following to be generally true:

- only the top 10 -15% of households in the villages studied could afford a cart - in some places, such as Binga, it was less and in others, such as Gokwe, far more. Based on findings during this evaluation we would question the figure of 59% cart ownership quoted in one of the early surveys;<sup>2</sup>
- the cart is regarded as a 'status symbol' by many, particularly (but possibly not only) in arid regions where carts are not needed as much for agricultural tasks as in regions 2 and 3;
- ownership of wheelbarrows was higher, typically 20 - 30% of households although it was much lower in Binga);
- purchase of transport devices is non-existent on the list of purchasing preferences of poorer households (concluded from preference ranking and focus group discussions. For the majority of households transport devices are well beyond their reach with even a ZS17 hoe being unobtainable by the poorest group;
- among 'wealthier' households, those who would typically consider and/or be in a position to buy a wheelbarrow, there was interest in the water carrier and donkey cart;
- women were positive about the impact of any transport device brought into the household although access and degree of benefit is not always equal;

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<sup>1</sup> See Appendix 5 for more details about the village visits and methodology used

<sup>2</sup> Report by Dawson and Smith. July 1990, p4.

- donkeys play a very valuable role in transport and are used as beasts of burden. They are cheaper than cattle and easier to keep. The extent of ownership varies from region to region in the south (related to degree of agricultural surplus and proximity to marketing centres). Some organisations are running interesting projects which include donkeys.

### 5.3.2 *Implications For Project*

It is clear from the discussions that from a commercial point of view the market for transport devices exists among the top 30% or so of households in villages in the arid regions (although local variations will of course occur) and possibly up to 50% in other areas. The development of the water carrier, hand cart and donkey cart will increase the range of choice of transport devices/products available to these households. It will also offer lower cost devices than the scotchcart - thus reaching a wider market than just the scotchcart market.

This is shown in Figure 3 with the existing market located in the higher income, male sector. By increasing the supply of carts the project has helped expand this area - as shown by the arrows. The development of other low-cost vehicles has, however, been aimed at drawing in middle income and particularly women users by offering a wider range of products at lower prices. It is this group at which the dissemination strategy should be aimed initially and understanding its size and characteristics is an essential first step.

But there is a cut-off point below which it is impossible to make good quality devices - IAE engineers agree that this is around Z\$300. Households who cannot afford this amount may well have access to vehicles but will not be able to purchase them directly. It appears that the project has the potential to directly benefit about 40 to 50% of the rural population in the middle to upper income bracket through increased ownership of carts or lower-cost transport devices. It is also clear that there will be flow-on benefits to lower income households through increased availability of devices for hire. The strategy of developing and disseminating lower-cost transport devices can therefore hope to improve access of up to 70 to 80% of the rural population to more effective means of transport either through ownership or hire. However, in targeting lower-income households it will be necessary to go beyond the commercial (supply-side) approach adopted for dissemination of scotchcarts. There has been a move towards this through using partner NGOs to test out transport devices with 'poorer groups and women'. Valuable feedback has been received on products. The issue of **affordability** (raised by J. Dawson, Feb 1995) is still however questioned. To promote these devices among poorer households (who have other priorities in any case) and develop strategies to enable them to buy them requires a community development approach which is considered beyond the scope of the project.

### 5.3.3 *Conclusion*

The objectives of the project are best served by focusing on the development of an improved range (both cost and product wise) of transport devices which are commercially viable i.e. can be produced economically by producers and have a defined market with effective demand. Artisans/small-medium sized workshops and the necessary support network should remain the focus for the low cost transport device manufacturing project. The current transport needs assessment being undertaken by IT Zimbabwe should offer the scope to develop other initiatives which START with the target group.

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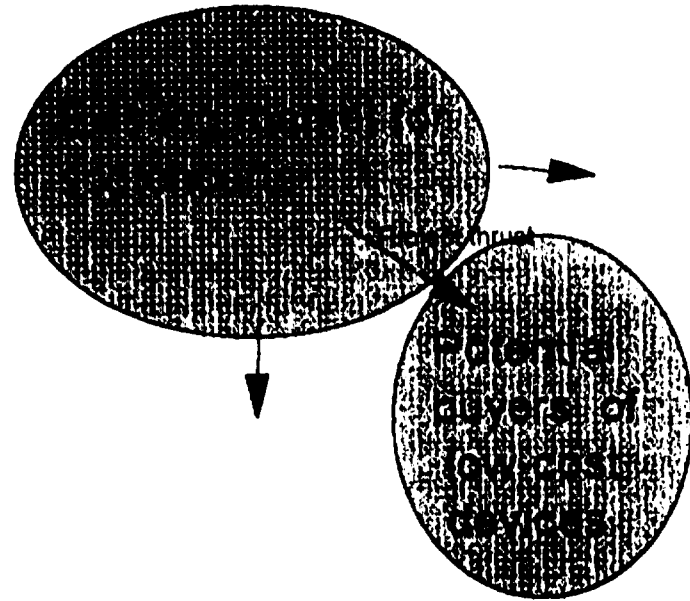
The Draft Supply Input Programme in Binga District is operating an integrated project, targeting women and poorer households, which includes access to carts and donkeys.

Figure 3

# Market for low-cost transport devices

Men

Women



\$300

Cut-off point for low-cost devices  
- not able to produce any cheaper

DETERMINANTS OF USE/ACCESS:  
by low-income groups

- income
- attitudes
- custom
- activity

High

Med

Low

Relative Rural Income

An assessment of demand by means of feedback from artisans and other key informants (for instance UNIFEM and other organisations working with target groups) will be a necessary component of the next stage of developing the 'dissemination'/marketing strategy for these products and will provide guidelines to where resources should be focused. An analysis of markets should provide the project with the following information

- the geographical spread/concentration of demand for transport devices
- the best ways of promoting awareness of transport devices in these areas
- constraints on purchase of transport devices which may need to be addressed
- the different constraints to purchasing decisions

#### 5.4 Sustainability

Has the current project set in place a

*sustainable and long-term strategy for low-cost vehicle manufacture and dissemination?*

Regarding manufacture, the following developments suggest that it has:

- an appropriate technology, in terms of both cost and design, has been developed and introduced into a number of workshops throughout the country;
- a network of organisations is in the process of being developed which will give on-going support and ideas to workshops;
- the supply of complementary parts such as ball-bearings, puncture proof tyres and jigs has been commercialised;
- IAE, in partnership with ITDG, has the capacity to develop and test new technologies.

The second and fourth points above also cover the dissemination of the technology through commercial channels. From this point of view dissemination has been successful to date. Its continued success will depend on how well the support network will function in the future.

Dissemination to rural households and particularly women and poorer households was addressed in Phase 3 which still has some activities outstanding. It is too early to determine the sustainability of this method of dissemination and as noted elsewhere in the report, a clearer understanding of the market is needed and out of that a specific definition of who (which sector) is being targeted.

## SECTION 6: LESSONS LEARNT

Reflection on the project led to a number of areas being highlighted at the Evaluation Workshop as worthy of note for future projects. The following may be regarded as guidelines for similar projects although some 'lessons', such as those on project design, are included because of weaknesses in this area in this particular project.

### 6.1 Project Design

Successful project implementation is served by good project design which requires the following:

- Clear (SMART) indicators, objectives, outputs and working definition of terms used (such as 'poor' and 'low-cost');
- Establishing the right balance between components and people responsible for those components;
- Overall Project Manager or Officer identified with clear role and accountability;
- Inclusion of space for reflection and consolidation of work in the project design, then go on to spread and repeat (work - consolidate - spread - repeat).

The experience of this project suggests that although a great amount of work went into surveys, the focus of those surveys was sometimes narrow. A broader understanding of the market and customers would have helped to focus the project.

On-going monitoring is necessary not only to keep track of what has been done (e.g. no list of follow-up visits is kept) but also to reflect on and adjust where necessary.

### 6.2 Training and Follow-Up

Training takes a long time and there is a need to develop systems which maximise the possibility of artisans taking up the training. Two areas are identified as being particularly important: the initial selection of trainees and then the follow-up of the trainees.

#### 6.2.1 *Criteria for assessing potential trainees*

These need to be:

- based on technical, financial and managerial factors ;
- carried out by trainers who are:
  - familiar with the technology
  - familiar with the artisans
  - have good common sense
  - good at talking to and assessing people

Through experience the trainers learned to 'feel' if a trainee had good potential or not. In addition, evaluation findings suggest a broadening of the criteria for assessing workshops to include the wider competitive situation faced by them. (Sec 5.1.4)

### **6.2.2 Follow-up system**

Like any training, effectiveness is enhanced through good follow-up. In this project three aspects of follow-up are recommended:

- Follow-up visits to get feedback from artisans and monitor uptake of technology;
- A project-area wide network of contact points to provide artisans with:
  - information about refresher courses
  - advice relating to the technology
  - catalogue of suppliers of ball bearings, production tools, etc
  - a list of other producers of split rim parts or whole scotchcarts to facilitate sourcing of parts and supplying to producers
  - a training manual
  - new designs and technologies
  - credit organisations
- A regular newsletter to update people of latest developments and pass on some of the above information.

### **6.3 Sustainability**

Commercialisation of inputs is good for sustainability but the product has to be fully developed and marketable.

### **6.4 Spread of Technology**

Technology spreads through informal as well as formal channels as seen in the example of Rusape (Section 5.1.3). Some informal channels include:

- copying trained artisans
- trainees moving from one workshop to another
- making or acquiring technology from elsewhere

These workshops should not be excluded from the information available to trained workshops if the spread of the technology is to be maximised.

### **6.5 Evaluation of Impact - allow more time before evaluating impact**



## SECTION 7: CONCLUSION

The project has clearly improved the supply of scotchcarts and has made significant advances in developing other lower cost devices. The degree to which this increased supply has meant improved access particularly to 'low-income households and women' is less clear. Most lower-cost devices are still at the demonstration stage making it too soon to assess the impact.

### 7.1 Consolidation of Previous Work

In order to consolidate developments it is important that the following activities identified in the Dawson Report (1995) are carried out:

- The project needs to consolidate the training done so far and concentrate on building up the support network for producers;
- Prototypes need to be finalised and the technology disseminated through workshops. The focus should be on the commercial (supply-side) strategy rather than the social one for which the organisation is not equipped at present. Evaluation findings also suggest that focusing mainly on the 19 workshops already using the technology would be more efficient than dealing with all trained workshops. However, as demand picks up in the rural sector it is likely that other workshops will take up the technology and training or refresher courses will provide opportunities to disseminate new transport devices.

In addition

- 'Market' research should be used to find out more about the demand for low-cost transport devices. This will help in focusing the dissemination strategy on those who can afford to buy them.

At present there is a proposal for a 2 year continuation of some project activities. Comments regarding the proposal have been made directly to ITDG and it is recommended that they are incorporated into a revised proposal. It is essential that the dissemination strategy should be revised to incorporate a more market analysis approach to clearly identify and locate target groups. This can be most economically achieved through collaboration with artisans and organisations working with the target groups. Without this clarification the project runs the risk of wasting time and energy on activities which do not best meet the objective.

**It is recommended that funding is sought immediately to pursue the revised dissemination strategy and to maintain the momentum of the project.**

### 7.2 Extension of the Project

The project has developed significant experience and capability in identifying transport needs, training workshops in manufacturing techniques and introducing a sustainable production technology. It has confirmed that the wheel-making technology is appropriate for small to medium sized workshops and enables them to improve the quality and supply of animal-drawn carts and other simple vehicles for rural communities. The benefits of improved access to effective means of transport to the economic and social development of rural communities are well proven.

It is known that the transport situations and needs of rural communities in other countries in the region are similar to those in Zimbabwe which indicates that there is good potential for introduction of the wheel-making technology into these countries. Extension of the project into these countries seems a logical step which would significantly increase the outputs and benefits-to-cost ratio of the project. IT Zimbabwe, with the backing of the international transport programme of the Intermediate Technology Development Group, has the capacity and capability to organise and co-ordinate an extension of the project into other countries with IAE providing the training inputs.

It is recommended that this proposal should be discussed at the final TPR for the project. An extension into other countries could take the following forms:

1. Workshops or technical institutions sending technical staff for training courses at IAE. This has already been done for a workshop in Malawi.
2. IAE with support from IT running courses for groups of workshops in host centres in other countries.
3. Training technical organisations in other countries which then provide training and support for dissemination of the technology throughout the country or a large region of the country. This is similar to the model successfully implemented in Zimbabwe where IAE has been developed to be the centre of dissemination.

Although (3) involves the greatest inputs it is considered the best model for long-term sustainability. It is likely that this approach will need an initial preparatory stage in which surveys are carried out to assess areas showing the greatest need and potential for the introduction of the wheel-making technology and to identify appropriate partner organisations.

## SECTION 8: OTHER EVALUATIONS - PPER AND TPR

### 8.1 Project performance Evaluation Report

The final PPER was submitted in July 1995.

This was reviewed by UNIDO headquarters in August 1995. The overall comments and conclusions of the review are summarised in the following two extracts.

#### General Comments and Suggestions (I. Farouque - Evaluation Officer)

*The project is nearing its completion and it appears to have made satisfactory progress with respect to have adequately trained the target group in the development and transfer of the technology on improved, durable low cost manufacture of scotchcars as a means of transport in the communal lands.*

*The status of output 2 - "a dissemination strategy aimed at improving the access of women and poor households to scotchcars" is less than satisfactory. Critical assumptions here are, the affordability of women and poor households, linkage factor between women/poor households with institutions offering credit facilities and with other women's organisation; and whether there was a successful crop or not. This issue needs to be addressed at the forthcoming Tripartite Review Meeting. The possibility of co-operating with other organisations and institutions (NGOs) in the region may be pursued to facilitate the process of dissemination to women and poor households.*

#### Issues for discussion at the TPR (C. Gurkok, Head ISED/FM)

*We are sharing the comments made by EVAL with regard to Output 2. After a comparatively long period of project implementation (including its extension), we feel that through the project, as formulated and implemented, no more success in Output 2 could have been achieved. The mainly technical-oriented approach of the subject project could not contribute more in issues like accessibility of women to transport devices, since men are mainly involved in the manufacture of such devices. In addition to that, we are seeing the main reason for the slow dissemination of the newly introduced technologies that no entrepreneurs were involved as a driving force. This may also be the main reason for problems to be envisaged with respect of the self-sustainability of the project after its termination. The technologies transferred through training and workshops organised during project implementation could have been used by private local entrepreneurs to manufacture scotchcars for selling to rural people and thus to create jobs, income and self-sustainability of the project without additional external funding. Any extension of this project foreseen should primarily address this issue and should deal with the private sector.*

These comments generally support the conclusions of this impact study report. The comment that "... the main reason for the slow dissemination of the newly introduced technologies (was) that no entrepreneurs were involved as a driving force". is interesting. If this could have been achieved it would certainly have boosted dissemination, but it appears that in general entrepreneurs do not see the supply of equipment to rural areas as highly profitable because of the seasonal nature of demand and the fact that demand is highly dependent on weather conditions. During the project, demand for carts and other transport devices was significantly restricted by droughts and the effect of ESAP on the rural economy. Attempts to involve larger distributors were largely unsuccessful because the introduction of additional mark-ups would squeeze the profitability of the workshops and to a certain

extent break down the benefits of the direct contact between workshops and users. The trained workshops themselves (SMEs) may be regarded as entrepreneurs but they do not yet have the skills for marketing and promotion. Perhaps these will develop with the business training that some workshops are receiving through courses at IAE. The trained workshops might also benefit from some form of Association to give more muscle to marketing and promotion but it is doubtful if they have the resources to support an Association. There is no doubt that the technologies have been established on an economical and sustainable basis but more widespread dissemination would be boosted by a greater input of entrepreneurial activity.

## 8.2 Tripartite Review (TPR)

The final TPR was held on 14th December 1995. The overall conclusions and recommendations are summarised in the following two extracts from the minutes of the review meeting.

### 5. Conclusions and recommendations

*The participants to the meeting agreed on the following conclusions and recommendations:*

- *the project should be extended for 2 years, with possible funding from UNDP;*
- *other donors have to be approached since some might find it interesting to fit in at this stage;*
- *UNIFEM should be involved, particularly in assisting the project promoters in working with women groups;*
- *the follow-up and "marketing" strategies of the project promoters should be reconsidered; they should very likely be much more "aggressive";*
- *the promoters should work not only with provincial or district authorities but also at a much more ground-level;*
- *the manufacture of new products and particularly transport devices components should be enhanced;*

*Issues for discussion at TPR (C. Gurkok, Head ISED/FM)*

#### Proposed regional extension of the project:

*A new project idea was eventually tabled and it concerns the setting up of a regional network in Southern Africa. Which idea that was initially suggested by Mr. Anestis during his stay in Zimbabwe. What is expected from ITDG and IAE is to collaborate with promoters of similar projects in neighbouring countries.*

*It was convened that it would be interesting to share information at a regional level and also to organise common training programmes.*

*It was also suggested to hold a regional workshop in order to identify areas of common concern.*

*It was finally recommended to come up quickly with a time-frame.*

The review strongly recommends a 2 year extension of the project, hopefully with funding from UNDP, and also the preparation of a proposal for an extension of the project into other countries in the region.

A proposal for a 2 year extension to the project has been prepared by IAE and submitted to UNDP Zimbabwe. A proposal for extension of the project into other countries in the region is being prepared by IT Zimbabwe with support from the international transport programme of ITDG.

## BIBLIOGRAPHY

### A. PROJECT DOCUMENTS

#### *Reports for Preparatory Phase*

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- Dec 1989 Development of Scotchcart Technologies for Future Dissemination in Training Workshops and Preparations for the Fabrication of a Wheel Testing Rig at the Institute of Agricultural Engineering. A Smith.
- March 1990 Finalisation of Funding for the Training and dissemination Programme and Preparation of the First Training Course and Demand and Workshop Surveys. P. Zille.
- July 1990 Results of Project Phase One Activities Regarding Surveys, Training and Technical Collaboration. J. Dawson and A. Smith
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- Sept 1990 Confirmation and authorization of funding for the training and dissemination programme. MoF, UNDP and Project Counterparts. P. Zille
- April 1991 Commissioning of wheel test rig at IAE and follow-up visits to workshops that participated in first training course on wheel manufacture. A. Brewis and R. Dennis
- May 1991 Technical details of wheel test rig installed at IAE. R. Dennis
- 1991 Consultancy Report on Low-Cost Rural Transport in Zimbabwe. UNIFEM, R. Gaidzanwa

#### *Project Document*

- 1991 Proposal No P91/62 for UNIDO/UNDP

### ***Progress Reports***

- Sept 1992      Phase 1: Draft Report. ITDG.
- Sept 1993      Phase 2: Progress Report, June 1992 to June 1993. ITDG
- Dec 1993      Phase 2: Progress Report No 2, July 1993 to November 1993. ITDG
- Dec 1994      Phase 2: Final Report. ITDG.
- Mar 1995      Phase 3: Final Report ITDG.

### ***Consultants Reports***

- Feb 1995      Manufacture and Diffusion of Low-Cost Transport Devices in Zimbabwe. Report by Consultant Socio-Economist 18th January - 9th February 1995. JD

## **B. OTHER DOCUMENTS**

- CSO (1994)      Census Reports from 1991 Census
- CSO (1995)      Stats Flash, Issue No. 4, May 1995
- Lennox, J  
(1994)          Paying for Health: Poverty and Structural Adjustment in Zimbabwe. Oxfam Publications.
- ITDG (1994)      The Impact of ESAP on the Small Scale Enterprises in Zimbabwe. IT Zimbabwe.
- Oxfam              Informal report to Oxfam on field research in Zvishavane District by K.B. Wilson. Report forthcoming.

**Terms of Reference:** Low-Cost Vehicles Project: Zimbabwe

Tasks for the evaluation will be:

**i) Evaluation of Project Performance**

The evaluation team should undertake a review of project reports and documentation; discussions with ITDG, IAE partners and other institutions; and interviews with artisans and rural people in order to assess the following:

- progress against workplan and outputs including
  - study of socio-economic context
  - training of artisans
  - capacity building at IAE
  - supply of scotchcarts and other transport devices
  - development of dissemination strategy
- impact of the project outputs
- contribution to project's immediate objective
- how external factors, including ESAP and public sector reform have affected project performance

**ii) Project Design and Implementation**

Review the effectiveness of :

- the original project concept and design
- the process of project development
- funding through UNIDO contract (compared to normal ITDG financing arrangements)
- project management by IT Zimbabwe
- support from IT Transport and make recommendations as to how these could have been improved.

**iii) Lessons Learnt**

Summarise the lessons to be learnt from this project and make recommendations on the following:

- follow-up work by ITDG, IAE and/or UNIDO in Zimbabwe, including possible extension or amendment of the project;
- future approaches to transport and manufacturing work by ITDG, within or outside Zimbabwe;
- the process of designing and funding future ITDG projects



- management methods for future ITDG projects;
- other relevant issues

If extension of the project is recommended, an outline should be given of the outputs, time scale, inputs and approximate cost of additional work. The level of detail required in this outline should be agreed with ITDG, with a view to it being presented to the final Tripartite Review Meeting of the project.

This is not an exhaustive list of the tasks to be undertaken. The team should investigate other issues which emerge as important during the evaluation.



## People Attending the Evaluation Workshop

### *Evaluation Team*

S. Orr  
P. Njenga  
I. Chatizwa  
P. Sifilongwane  
A. Munyai

### *Others*

T. Koza IAE  
A. Brewis ITDG  
T. Mupfawa IAE  
Representatives from Hlekweni and Silveira House

## Trained Workshops Visited

No	1	Sam's Welding	Bindura
	2	Chipoera Welders	Chiwese
	12	Thomas Mabvumbe	Mutare
	19	Salisios Maimboti	Mutare
	20	Christopher Rakabopa	Mutare
	21	Gipson Ndlovu	Bulawayo
	22	Thomson Sibanda	Tshelinyemba
	23	Orderly Vundla	Tsholotsho
	24	Water Workshops	Bulawayo
	26	Jack Nguna Motots	Bulawayo
	36	Gokwe Youth Welding Proj	Gokwe
	39	Star Engineering	Rusape
	42	Gibbs Engineering	Mupandawana
	43	Soko-Mukanya Welding	Nyika
	44	Murobedzi Welders	Zvishavane

## Other Workshops Visited

Chikanga Welders	Rusape
Mandeya Workshop	Rusape
Green Flash	Rusape
Myamusamba Harware	Rusape
Pumula Repairs	Maphisa
Nhlupho Industries	Maphisa

plus workshops in Mutare (1) and Gutu (2)

## Villages Visited

### *Masvingo District*

Zaka	Demonstration site - visited 3 users
Chitanga	Focus group discussion on transport
Matizenyika	Village Mapping and Wealth Ranking

### *Binga District*

Nsenga	Discussion with cart and wheelbarrow owner
Gande	Discussion with key informants and focus group discussion with 2 groups (one of men, one of women)
Manjolo	Discussion with farmer and household

NOTES ON TRAINING CENTRES

1. **INSTITUTE OF AGRICULTURAL ENGINEERING, Harare**

3 wheel bending instructors

Already run 9 courses (55 artisans, 5 training centres)

Kits supplied at subsidised price (Z\$300) not real cost (Z\$1,500)

Has links with other training centres

Run 1 week business course (under GTZ funded RATE project)

Arranged the import of ball-bearings through ZSTC

Strong links with ITDG

Have institutional capacity and experience to run course but lacking finance for kits and follow-up visits

2. **DRIEFONTEIN MISSION, Driefontein**

Wheel bending since '70s

Training school leavers - 3 year programme to place in industry

No kits given but taught to make kit (quality?)

Produce various products for sale

Scotchcart sales: 1994 - 10 1995 - 5 (selling at Z\$3,900)

Able to give advice to artisans on request providing good local back-up

*Strength:* Good technical base

*Opportunity:* To build on existing relationship to establish as support centre

*Weakness:* Very low possibility of technology being used by trainee

3. **HLEKWENI, Bulawayo**

No training currently being given although proposed for inclusion in longer 1 year (school leaver) course

Have had problems accessing 6mm flat iron but now available

Producing a few axles/rims to order

Had orders for wheelbarrows which people are prepared to buy

May train farmers on shorter course

4. **MASHVINGO TECHNICAL COLLEGE (MTC), Masvingo**

3 staff trained by IAE

Run 3 year formal courses

Currently not training or producing split rims

## *Opportunities*

MTC have on-going project aimed at informal sector headed by Mr. Pote who coordinates INSTARNET, a GTZ driven network of Govt and NGOs working with the informal sector. Individual organisations can negotiate specific training course in college holidays for identified trainees

Wants to build up resource centre - keen to have ITDG input

Also run business management courses

### **5. SILVEIRA HOUSE**

Run 3 week course where participants start by making jigs

16 artisans been trained to date

Charge \$500 for course and get further income from selling products made by participants on the course (wheelbarrow, \$350 and rim \$250). Board and lodging subsidised.

Criteria - need welding machine.

### **6. LIFE SOWING MINISTRIES**

Planning to start training in June subject to funding being available.

School leavers to be trained on 3 month course which includes 1 month of wheel bending. If person no previous experience then 6 month course (= 3 months basic welding. 2 months blacksmithing. 1 month wheel bending)

To produce kits during course - receive at subsidised rate.

Aim is to educate people for self-employment.

### **7. CHINOYI**

A mission trade school like Driefontein

School leavers are trained on a two year metal and woodwork course.

Scotchcarts made by students are sold locally.

**Demonstration Sites**  
**Distribution of Lower-Cost Vehicles**

<b>Organisation</b>	<b>Location</b>	<b>Vehicles</b>
ORAP	Zhombe	Small cart
	Tsholotso	Waterbarrow
	Binga	Waterbarrow
ITDG	Chivi	Waterbarrow
	Chivi	Small Cart
	Nyanga	Scotchcarts (2)
Christian Care	Zaka	Small Cart
	Zaka	Waterbarrow
Life Sowing Ministries	Chiredzi	Small Carts (2)
	Chiredzi	Waterbarrow
ARDA	Murombedzi	Small Carts (2)
	Murombedzi	Waterbarrow
Private Farmer	Murombedzi	Waterbarrows (2)
	<b>TOTAL</b>	<b>8 Waterbarrows</b> <b>7 Small Carts</b> <b>2 Scotchcarts</b>

## VILLAGE VISITS

Village visits were carried out in addition to a range of other methods including a survey of trained and untrained workshops; visits to training centres, demonstration sites and users; review of project documents and discussions with key informants on various issues.

### 1. PURPOSE OF VISITS

The purpose of the village visits were twofold:

1. to gather some indications from villages about the changes in conditions over the past 4 - 5 years (the life of the project including preparation)
2. to conduct focus group discussions on transportation issues and devices

One of the main questions that the team was interested in addressing in these village visits was the extent to which the current project was appropriate for 'women and poorer communities' and what market might exist for some of the new devices being developed (including exogenous factors affecting demand).

### 2. CHOICE OF VILLAGES & METHODOLOGY

Four villages were visited, the first three in Masvingo District and the last in Binga:

- **Zaka** where a water carrier and donkey cart are currently being tested. Discussions with the users were held.
- **Chitanga** in Masvingo District where a focus group discussion on transport was conducted.
- **Matizenyika** in Masvingo District where village mapping<sup>6</sup> and wealth ranking<sup>7</sup> exercise was carried out along with discussions on transport.
- **Gande**, where discussions were held with key informants (chief, councillor and village secretary) in addition to focus group discussions with male and female groups relating to purchasing decisions.

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<sup>6</sup> Village mapping is a technique where villagers themselves map out their village on the ground. In this case we mapped households and transport resources. A discussion was then held with the map as the focal point.

<sup>7</sup> Wealth ranking involves placing all households in a village in some sort of order based on how villagers see each other. Different groups (e.g. men, women, old and young) are asked to do the same exercise to reveal different perceptions and as a cross check. The wealth ranking complemented the mapping as each household could be assigned a rank. There was a high degree agreement about the rankings among the different groups in Matizenyika.

The villages were chosen because they were in areas where the project had 'demonstration sites' of its low cost transport devices (water carriers, handcarts and donkey carts). Four of the 6 sites fall in Masvingo or Binga district which were chosen, usually by partner organisations, because of the relative and absolute poverty in those areas. The choice of poorer communities for the demonstration sites was a deliberate response to the 'wealth' bias of the scotchcart component (i.e. only wealthier villagers could afford to buy scotchcarts). This shift in focus for the Phase 3 of the project came from discussions about project impact during the 2nd Tri-Partite Review held in June 1994. What follows is a summary of findings from all these visits.

### 3 CHANGES IN CONDITIONS

- **Drought** - although the areas are drought prone, the 1991/2 drought was particularly devastating. Cattle, the main source of wealth and non-remittance income, died in their thousands. (Official figures confirmed that 1/2 million died in Masvingo province alone). In Matizenyika, where most people owned cattle before the drought, only 10 households out of 72 now own. From a village with 'hundreds of heads of cattle' (exact numbers unobtainable but different villagers told their stories) only 18 exist. The current drought is also taking its toll, not directly in cattle deaths but in distress sales of assets.

**Effect on project** - the resource base of villagers has declined during the period of the project resulting in reduced sources of income. The reduction in agricultural activities of the wealthier villagers has had a two-pronged effect - there is less labour work available for poorer households and less demand for transport devices for productive use.

### 4. THE MARKET FOR TRANSPORT DEVICES - Village Mapping & Wealth Ranking

In order to find out more about the distribution of transport devices in a village a village mapping and wealth ranking exercise was carried out in Matizenyika village (less detailed ones were also carried out in Chitanga and Gande which revealed very similar patterns). The ranking revealed 2 main groups. The first being dependent on remittances (implying a high number of de facto female headed households) and the second relying on livestock and subsistence agriculture. Within the second group three sub-groups were identified by villagers. It should be noted that these were perceptions based on a historical perspective and not just on the specific drought situation now. However, the results do show which groups are in the best position to deal with drought situation. The following is a summary of the characteristics of these groups. The attached bar chart shows the distribution of transport devices across these groups.

#### **GROUP 1** 35 households

Head of household works in town or mine - sends remittances to village  
Have good land for ploughing  
Have equipment to use or can afford to hire when required  
Have access to oxen for ploughing

These conditions do not hold true for all the households but the villagers see this group as distinct. From observations, follow-up discussions and analysis of data afterwards it is clear that about 50% of the households in this group are no better off than their fellow group 2 or 3 households. 19 of the 35 households in this group own at least one of the transport device (including donkey) and 11 owned 2 or more devices).



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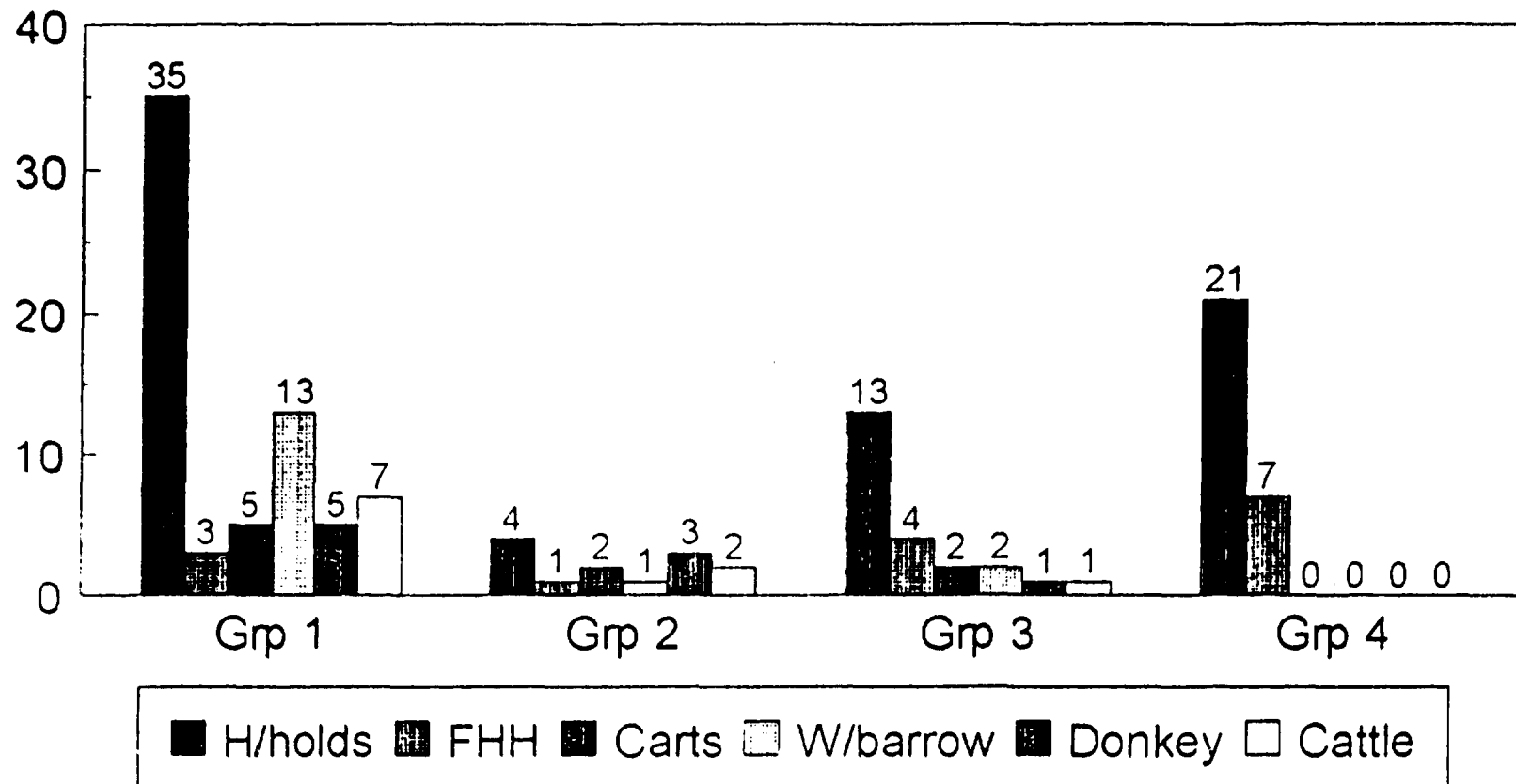
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- purchase of transport devices is non-existent on the list of purchasing preferences of poorer households (concluded from preference ranking and focus group discussions. For the majority of households transport devices are well beyond their reach with even a Z\$17 hoe being unobtainable by the poorest group - which means using hands instead of a hoe for these people. (a situation also found by Oxfam researchers - see Oxfam report in Bibliography))
- among 'wealthier' households, those who would typically consider and/or be in a position to buy a wheelbarrow, there was interest in the water carrier and donkey cart.
- women were positive about the impact of any transport device brought into the household although access and degree of benefit is not always equal.

# Matizenyika Village, Masvingo

## Ranking and Transport Distribution



## Appendix 6

Workshop No. <i>Note 1</i>	Location	Course Attended	Technology Uptake		
			Whole Cart	Component Manufacture	Not Using
1	Bindura	1	✓		
2	Chiwese	1	✓		
3	Guruve	1	✓		
4	Mutoko	1		✓	
5	Gazaland <i>Note 2</i>	1			✓
6	Matapi	2			✓
7	Willowvale	2		✓	
8	Hatcliffe	2	✓		
9	Tynewald	2	✓		
10	Msasa <i>Note 3</i>	2			✓
11	Mutare	3	✓		
12	Mutare	3		✓	
13	Mutare	3			✓
14	Mutare	3			✓
15	Mutare	3			✓
16	Mutare	3		✓	
17	Mutare	3			✓
18	Mutare	3			✓
19	Mutare	3		✓	
20	Mutare	3		✓	
21	Bulawayo	4			✓
22	Tshelinyemba	4			✓
23	Tsholotsho	4	✓		
24	Bulawayo <i>Note 4</i>	4			✓
25	Bulawayo	4			✓
26	Bulawayo	4			✓
27*	Bulawayo	4			✓

Workshop No. <i>Note 1</i>	Location	Course Attended	Technology Uptake		
			Whole Cart	Component Manufacture	Not Using
28	Nyanga	5			✓
29	Magunje	5			✓
30	Karoi	5			✓
31	Nharira	5			✓
32	Kwekwe	6	✓		
33	Kwekwe	6	✓		
34	Gweru	6		✓	
35	Gokwe	6			✓
36	Gokwe	6			✓
37	Gokwe	6			✓
38	Nkai	6			✓
39	Rusape	7	✓		
40	Dzivaresekwa	7		✓	
41	Mutoko	7			✓
42	Mupadawana	7		✓	
43	Nyika	8			✓
44	Zvishavane	8	✓		
45	Chiredzi	8		✓	
46	Chivi	8			✓
47*	Driefontein	8	✓		

Workshop No. <i>Note 1</i>	Location	Course Attended	Technology Uptake		
			Whole Cart	Component Manufacture	Not Using
48	Nyika	8			✓
49	Bulawayo	8		✓	
50	Jerera	8			✓
51*	Masvingo	8			✓

\* Training Centres - see Appendix 3 for further details.

#### NOTES

**Note 1:** The numbers used here are taken from Annex 3 of the Phase 2: Final Report. The location of the workshops can be seen in Figure 3.2 of the same report.

**Note 2:** The technology was previously used but was stopped because, they said, it took too much time. There is a possibility that they will re-start in partnership with DIC Engineering in Harare.

**Note 3:** Went out of business.

**Note 4:** Although the two original 'Water Workshop' trainees (nos 22 and 24) are not using the technology the Director of Dabane Trust has reported that a number of its groups are successfully using the technology. Further details were still awaited at the time of writing this report.