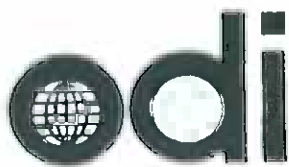
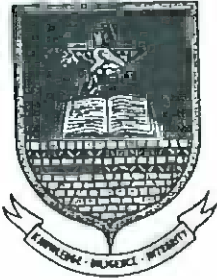




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Crop Post-Harvest Research Programme Zimbabwe

*A Report on Baseline
Data available for Buhera
District, Manicaland
Province*

R6674

A Report on Baseline Data available for Buhera District, Manicaland Province

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List of Abbreviations

AEO	Agricultural Extension Officer
AES	Agricultural Extension Supervisor
Agritex	Agricultural and Extension Services
AFC	Agricultural Finance Corporation
CMB	Cotton Marketing Board
COOPIBO	
CSC	Cold Storage Commission
CSO	Central Statistics Office
DA	District Administrator
DR&SS	Department of Research and Specialist Services
DTC	Development Technology Centre
ENDA-Zimbabwe	Environmental Development Agency-Zimbabwe
E U	European Union
GMB	Grain Marketing Board
IFAD	International Fund for Agricultural Development
MS Denmark	
NEWU	National Early Warning Unit
NGO	Non-Governmental Organisation
NR	Natural Region
NRs	Natural Regions
SNV Holland	
UNDP	United Nations Development Programme
UZ	University of Zimbabwe
ZFU	Zimbabwe Farmers Union

BACKGROUND

Location

Buhera District is situated in Manicaland Province. It is the largest single district in Zimbabwe with an area of 5364 km². Buhera town is about 160 km south east of Harare and approximately 90 km south west of Mutare, the provincial capital. The entire District is classified as communal lands. The District includes land classified as Natural Regions (NRs) III, IV & V in the proportion 32%, 34%, and 34% respectively.

Access to the north west of the District (to Buhera and Murambinda) is good with a tarred road running through from Chivhu to Nyazura. Also the tarred road from Mutare to Birchenough Bridge cuts through the South east corner. A dirt road connects Buhera to Birchenough Bridge.

Recent developments

Following the severe drought years at the beginning of the decade there has been a focus on water-related projects and programmes with several initiatives centered on small dams and boreholes. More recently some focus has emerged on conservation arising out of concern for increased environmental degradation (largely due to increased land clearance and deforestation and consequently river siltation). Other developments include: European Union (EU) micro-projects e.g. building schools, International Fund for Agricultural Development (IFAD) dryland farming project and Environmental Development Agency–Zimbabwe (ENDA –Zimbabwe) which has been working in the South-east corner of the province on a sustainable agriculture project since 1993.

Population

The 1992 Census population gives a district total of 203,739 people of which 45.9% are males while 54.1% are females. Over 50% of the population are below 15 years of age. There is a total of 38,957 households with an average size of 5.2 people per household (compared with a national average of 4.8) and a population density of 38.0 persons per km², which is above a national average of 26.6 persons per km². The dependency ratio is 53% implying that the large dependent population burdens the economically active population.

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1992 Census population data is summarized below

	NRIII	NRIV	NRV	TOTALS
Population (%)*	40	30	30	100
No. of Households (%)**	42	35	23	100
male headed (%)	18	24	34	-
female headed (%)	82	76	66	-
Total	100	100	100	

*Source: Central Statistics Office (CSO), 1993

**Source: Agritex Buhera, 1994

Estimated arable area per household (acres) 57.512

Infrastructure

The infrastructure in this District is not well developed. Electricity is supplied to Dorowa, Murambinda, Maringa and Birchenough Bridge but not Buhera centre. Post Office services are available in several places including Buhera, Dorowa and Birchenough Bridge. There are no commercial banks in the District. There is only 92 km of tarred road in the whole district; the rest are dirt roads.

Three major minerals are produced in the District: Phosphate at Dorowa, Vermiculite mining at Shava Hills and Limestone at Chamutsa. Small-scale industrial manufacturing activities such as bakery, carpentry, grinding mills, shoe & motor repairs, workshops (engineering & metal) are found in several places especially where there is access to electricity.

There are two growth points in the district: Murambinda (District Centre) and Birchenough Bridge. There are 15 Rural Service centres and 170 Business Centres. There is a Grain Marketing Board (GMB) depot at Buhera and a collection point at Muzokomba. The Cotton Marketing Board (CMB), now "The Cotton Company of Zimbabwe", has a cotton depot at Birchenough Bridge and the main depot is in Mutare. The Cold Storage Commission (CSC) has established three cattle sales pens. Credit facilities, such as those obtainable from the Agricultural Finance Corporation (AFC), seem not viable because of the risks associated with frequent drought effects.

Climate

The pattern and quantity of rainfall varies widely within the district and within a season. The classification of the NRs shows rainfall as follows:

- NR III - 650-800mm,
- NR IV 450-650mm,
- NR V <500mm.

However, in Buhera (NR III) records for 1990/91 to 1993/94 seasons, show mean annual rainfall was 540mm and that in each of the four years the highest rainfall month was different.

The area can be said to experience "hot" summers (30-40 °C) and warm mild winters (6-25 °C) with mean temperatures of 22 °C.

Soils

The most common soils are granitic sands. There are some doleritic red clays found in NRs III & IV while some brown/reddish clays (gneisses) are found near Birchenough Bridge area (NR V). The sandy soils are generally infertile and highly susceptible to erosion.

It is estimated that 2.6 million tonnes of soil are lost per annum in Buhera, causing serious river siltation and lowering the capacity for irrigation.

INSTITUTIONAL ENVIRONMENT

The Buhera Rural District Council whose offices are at Murambinda heads the local government. The district is divided into 30 Wards (recently reduced from 34) with a total of 204 villages (each village consists of about 200 households). Each Ward is represented at the Rural District Council by an elected councilor. The traditional leadership comprises seven chiefs.

There is presently a move to decentralise government to the districts and the district council is receiving support from two NGOs (SNV, Holland and MS, Denmark). The council has recently produced a District Development Strategy document following a consultancy funded by Planafic Pvt. Ltd. This includes recognition of the need to develop participatory community-led programmes.

The District Administrator (DA), based at Buhera, heads the central government. Most government ministries are located at Buhera although there are plans to relocate to Murambinda.

There are 254 primary schools (with a teacher: pupil ratio of 1:38.8) and 86 Secondary schools. Manicaland Development Association Training Centre near Birchenough Bridge is the only training Centre in the district. There are 18 clinics and 3 hospitals with some of the health problems being malnutrition (due to poor harvests and drought) as well as

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diarrhoea (due to poor sanitation/hygiene).

The Dept. of Social Welfare runs four programmes, namely:

- (i) Food to old & disabled
- (ii) Drought relief
- (iii) Supplementary feeding scheme (for children) and
- (iv) Food for work.

As at May 1992, there were 449 boreholes, 191 wells and 29 dams of which 18%, 66% and 52% of them respectively were dry. About 13% of homes in the district have Blair toilets.

Agritex is based at Buhera and is headed by the district Agritex Extension Officer (AEO). Three AEOs (West, North and South), six Agritex Extension Supervisor (AES) and 34 Agritex Extension workers (AEWs) support him. Most of the AEWs and their supervisors are based in the communities they serve. The approach followed is to work with farmer groups which are generally formed by the Zimbabwe Farmers Union (ZFU).

The District Animal Health Inspector at Murambinda heads the Buhera Veterinary Department with vet. offices all over the district. There are 70 dipping tanks in the District.

There is a GMB depot at Buhera, which in October 1996 had a substantial store of maize that had apparently been brought in from neighbouring districts (maybe a collection point at Muzokomba).

Relevant Programmes, projects and their implementers

There are several non-governmental organisations NGOs working in the district. However, most of the work in the NR sector seems to be focused on water conservation/development. Probably of most relevance is the SNV input to the District Council. SNV have two workers full time involved in village-level consultation and priority setting.

About 5 farmers have been involved with the Department of Research and Specialist Services (DR&SS) trials of millet, sunflower and sorghum. The Ministry of Natural Resources, with funding from United Nations Development Programme (UNDP), carried out an environmental assessment in Ward 14 between August and September 1996.

ENDA-Zimbabwe has been operating in 2 wards of Buhera South working on sustainable agricultural practices and specifically on increasing soil fertility, soil and water conservation and crop bio-diversity including small grains. Other NGOs working in Buhera include World Vision (Wards 20/23), Manicaland Development Association, Christian Care, Lutheran World Federation and most of their activities are related to development of water resources. Christian Care has been involved in water supply and sanitation projects in Buhera since 1987 and has now moved onto rainwater harvesting at rural health institutions and schools.

FARMING SYSTEMS

Crops

The COOPIBO study (1993/94) estimated crop ranking as:

- pearl millet (mhunga)
- maize
- groundnuts
- finger millet (rapoko)
- sunflower
- sorghum
- cotton

Agricultural produce May 1994 estimates

CROP	RAINFED		IRRIGATION	
	Estimated Production (Mt)	Estimated value (Z\$)	Estimated Production (Mt)	Estimated value (Z\$)
Maize	16500	14850000	1430	1287000
Pearl millet	3300	1980000	-	-
Sorghum	3000	1800000	-	-
Finger millet	3000	2100000	-	-
Wheat	-	-	200	300000
Groundnuts	4000	6200000	60	78000
Sunflowers	3000	4200000	-	-
Cotton	4	12000	86	258000

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Edible beans	4	12000	35	105000
Tobacco (oriental)	4	48000	-	-
Bambarra nuts	80	240000	-	-
Rice	3	7500	-	-
Vegetables	2200	1100000	2200	1100000
Chillies	2	10000	-	-
Cattle	2000 animals	2000000	40 animals	40000
<i>Sub-total</i>		<i>33559500</i>		<i>3168000</i>

TOTAL VALUE OF PRODUCE = Z\$36 727 500

GROSS INCOME PER HOUSEHOLD = HOUSEHOLD = Z\$875

Source: Agritex Buhera, 1994

Groundnuts and sunflower are more widely grown in Northern and Central Buhera while maize is grown throughout the district though more suited to NR III in the North. Small grains are predominantly grown in the South (NR V) and are ranked top in terms of cultivated area.

There are 2 established irrigation schemes: Murambinda (35 ha) with 29 plottolders and Devure near Birchenough Bridge (271.2 ha) with 313 plottolders.

Livestock

Livestock statistics (before effect of the 1991/92 drought):

- Cattle 177195
- Goats 97148
- Sheep 30225
- Donkeys 7980
- Pigs 1574

Growth of cattle herd since 1983 = 21.2%

Cattle provide most of the draft power to operate ox-drawn implements although donkeys

are also an important source of power.

Subsistence/cash cropping

Agritex records of crop production and crop estimates are kept for each Ward. Two estimates are made each year, during January and March and are based on EW visual estimates. A new national early warning unit (NEWU) has been set up at Agritex head quarters. This unit sends questionnaire forms to Agritex district offices for completion.

Land availability and access

Land is scarce in this district. Up to 30% of the households have no land. Northern and Central Buhera are under extreme land pressure with nearly 100% of the arable land cultivated. Arable land holdings average 3.0 ha per household.

Use of external inputs

The drought recovery inputs distribution for the 1994/95 season is shown below:

<u>NR</u>	<u>No. of recipients</u>	<u>Pack type</u>
III	10105	1
IV	10854	2
V	6200	2
V	361	1

1 = 1x10kg maize seeds, 2x50kg Compound D and 1x50kg AN

2 = 1x5kg millet, 1x5kg sorghum 1x5kg sunflower or 1x5kg groundnuts seed

Source: Agritex Buhera, 1994

On-farm post-harvest (storage and processing)

Maize, pearl millet and white sorghum tend to be primarily used for stiff porridge (sadza), while red sorghum and finger millet tend to be allocated to beer brewing. A large proportion of farmers still prefer manually dehulling small grains then send it for hammer-milling, mainly because they believe the cost of mechanical dehulling is too high. The pricing of custom dehulling may not be competitive because of limited number of dehullers in the rural areas. In grain deficit areas, loss of grain meal in the bran is of concern to farmers. Some consumers prefer handpounding small grains because it allows for roasting after dehulling, which improves the flavour of the meal.

ENDA-Zimbabwe started to disseminate small grains milling technology in 1988 through:

- (a) Manufacturing, marketing and installation of small grains milling systems in selected communal areas.
- (b) Training owners and operators of the milling system

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- (c) Development of a technical and socio-economic information base on small grain technology.

By the end of 1990, 7 dehullers had been installed at 7 sites. The low utilisation of the dehuller was in some of the areas attributed to people preferring to buy food and leaving little cash for dehulling. In Ward 28, where dehullers have been introduced, the technology does not seem to have taken off for unknown reasons.

Small grain consumption tends to be low between January and March due to availability of green mealies and pumpkins. At this time of the year, less cash for dehulling is available because of heavy expenses during the festive season (Christmas/New Year) and because of demands for school fees.

A peanut butter processor was recently installed by the Development Technology Centre (DTC)-University of Zimbabwe (UZ) at Murambinda growth point and performance is being monitored.

Marketing systems

The major crops marketed are maize, sorghum, finger millet, pearl millet sunflower and groundnuts. The GMB depot, located at Buhera centre, is the major buyer of the grain crops. The main sources of inputs are in Harare, about 223 km away; Rusape about 120 away or Chivhu about 90 km away but poorly stocked with agricultural inputs. There is about 200 km across the district from north to south. The southern part is far from the major retail outlets, which are located in the central and northern Buhera.

Most farmers sell immediately after harvest depending on availability of transport. Early sales are done to obtain cash for school fees, purchase consumer goods and purchase agricultural inputs.

Marketing is reported to be inadequate as depots are far, transport expensive and most of the roads, being dirt, are often in poor shape.

Income Source

Households depend on marketed cash and food crop surpluses for most of their income. GMB crop intake data indicate that maize, sorghum and pearl millet are the major cash generators. In southern Buhera, cattle and goat sales are also important sources of income.

Buhera has several irrigation schemes where horticultural crop production is the most profitable enterprise. The main markets are local markets, Birchenough Bridge, Muzokomba, Dorowa and Murambinda as well as external markets like Mutare and Mbare (Harare).

Ups to 70% of the households are resident and therefore there is limited access to remittances. In addition, since there are no large-scale commercial farms near Buhera, households do not have an opportunity for farm-wage employment.

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Income from farming is complemented by other off-farm activities such as:

- (a) Beer brewing
- (b) Crafts - mat-making; tin-smithing, crocheting, sewing, knitting and basketry
- (c) Casual labour - thatching, moulding bricks, building, fishing weeding, digging manure and digging of wells & toilet pits.
- (d) Honey production
- (e) Baobab fruit collection

SELECTED WARDS

Two wards were selected in the District following discussion with Agritex staff based on broad criteria of "representativeness", coverage of Natural Regions, accessibility and Agritex staff capacity. The wards are Ward 6 and Ward 22.

Ward 6, Village 5 Chemuonde

Key characteristics
Population (1992):

Ward 6	Population			Households	
	Males	Females	Total	Total No.	Average
	2094	2335	4429	839	5.3

Ward 6 consists of 7 villages whose total area is 23,800 ha, largely falling into NR III. Two AEWs operate within the area and they report to an AES who is in turn answerable to AEO at Buhera. There are 5 farmer groups working closely with extension staff in the Master Farmer Training Programme or other extension activities. There are also other commodity-specific farmers in the area.

Opportunities for farmers in this village are likely to be broader than in most other Wards in the District as they are both close to a good road and close to the GMB depot. The farmer met in Oct 1996 (Mr. Mawire) was well off (owned pick up) and sold annually to GMB. He seemed largely unaware/unconcerned by the present changes in the marketing system for grains/oil seeds. He is Chairman of a farmers club with around 60 members of whom he reckoned half would not normally have surplus grain for sale. He focused on pre-harvest problems in his opening remarks but displayed a good knowledge of issues involved with storage.

There was a timber-intensive crib with dimensions which do not promote rapid drying of produce. The storage structure, built directly onto the ground, consisted of brick walls, asbestos roof and the inner walls were plastered with earth. The practice of not closing access holes is widespread in the area. There were compartments with access holes which were kept open. The maize was treated with an insecticidal dust but less than 3 months later, the grain was visibly infested with storage insect pests. Effective insect pest control during grain storage was highlighted as a major post-harvest problem.

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A group of women in the ward has acquired a ram press for vegetable oil expression from sunflower. However, success is being hampered by shortage of pressing seed.

One advantage of working in this village is its proximity to the Agritex District Offices and easy accessibility. The full participation of the AEW and senior Agritex staff in the development of programmes with this village is very important.

Ward 22. Village yet to be selected

This Ward was selected to contrast with Ward 6. It is in NR IV, has much poorer access to roads and markets. There are more small stock and small grain production instead of maize production prevalent in Ward 6.

Key characteristics
Population (1992):

Ward 22	Population			Households	
	Males	Females	Total	Total No.	Average
	2632	3228	5860	1049	5.6

Contacts

Mr. A. Mundeiri District AEO Agritex, P O Box 50, Buhera Tel: 24609

Mr. Dube AEO Agritex, P O Box 50, Buhera Tel: 24609

Mr. K. K. Matsindi, Chief Executive Officer, District Council, P/A Murambinda, Buhera
Tel: 121 284/286, Fax: 121 287

Mr. Dube, District Council, P/A Murambinda, Buhera Tel: 121 284/286, Fax: 121 287 (not met in Oct '96 visit)

Mr. Rem Neefjes, Planning Advisor, SNV, P/A Murambinda, Buhera Tel: 121 284/286
Home 121 319

Mr. Tseurayi, AEW, Ward 6

Mr. Bwanya, AEW, Ward 6 (not met in Oct '96 visit)

Mr. Nyawo, Councillor, Ward 6 (not met in Oct '96 visit)

Mr. Mudiwa, Murambinda, AES for Ward 6 (not met in Oct '96 visit)

Mr. Mawire, Farmer Club Chairman, Village 5, Chemuonde, Ward 6

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Mr. A. Muusha, Extension Worker, Ward 22 (not met in Oct '96 visit)

Mr. P. G. Chisoro, AES for Ward 22 (not met in Oct '96 visit)

Mr. Chivizhe, Provincial AEO-field, Agritex, Box Mutare Tel: (120)

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DRAFT FINDINGS OF ROUND TABLE DISCUSSION – CPHP (ZIMBABWE)

Summary of areas for further CPHP research developed from Project A0549 and review meeting 19 – 22 January 1998.

Following the identification of priority research areas from needs assessment and PRA studies, two working groups of Zimbabwean scientists grouped the broad areas and conducted a matrix ranking (Figure 1).

Figure 1: Matrix ranking of researchable priority areas

Criteria Research Area	Low Risk (Chances of success)	High Potetial Impact	High Client Demand	Low Cost	High Gender sensitivity	High Potential Rate of Adoption	Sustaina bility	Total Score	Rank
Pest Control (synth, non-synth, varietal)	9	9	10	5	5	8	5	51	1
Oil Expressing (Including peanut butter)	5	5	6	5	5	6	6	38	6
Drying (Horticultural, legislation)	3	3	2	8	5	7	8	36	8
Market Information (Grain / horticulture)	9 / 9	5 / 9	7 / 10	4 / 4	5 / 5	7 / 10	3 / 3	40 / 50	3 / 2
Market Access (Transport, credit)	3	8	10	6	5	3	3	38	6
Structures	4	5	2	8	5	1	8	33	9
Improved Access to Cost-effective Dehulling and Threshing.	3	7	9	5	5	4	7	40	3
Quality vs Price	8	1	3	7	5	0	2	26	10
Food Contamination (Inc. mycotoxin)	8	0	1	2	5	0	2	18	11
By-products -- Livestock feeds	8	3	1	8	5	7	7	39	5

These areas were the subject of round table discussions with specialists in the respective areas and the following studies were suggested for future funding.

Pest Control

Earlier studies by Giga *et al.* have shown that cereal losses in store were of the order of 15% (without use of grain protectants) and 8% (using synthetic insecticides). Controlled experiments have achieved losses as low as 3-4%. The current monitoring exercise in Zimbabwe indicates losses in the range of 6 – 10% with farmers using either synthetic or natural protectants, both or nothing. These figures are expected to increase in the next month(s). Field losses prior to storage are in the order of 2 –3 %.

Those farmers who are using insecticides appear to overdose and there is some confusion about the different application rates required for the different brands. It was considered that degradation of the active ingredients was not a problem as there is a high turnover of stocks in the shops. Resistance is equally though to be unlikely – simple tests at UZ can confirm this.

DRAFT FINDINGS OF ROUND TABLE DISCUSSION – CPHP (ZIMBABWE)

The recommendations for insecticide application are regarded as technically sound in Zimbabwe, but there appears to be a problem disseminating the information through Agritex to the field level. It was recommended that the dissemination pathway is examined (including discussion with farmers), the material available reviewed and methods to improve the system examined in consultation with Agritex. Training of field staff is currently constricted by lack of financial resources – a programme to complete training could have a major impact in reducing household food losses.

There is potential to include some work on the use of botanicals by farmers (in the long term). However, the CPHP is currently working on this in Malawi and Ghana and it was felt this work should continue before its introduction to Zimbabwe. In the ensuing period a collection/list of botanicals being used by farmers in the CPHP districts should be compiled to cross check with the candidate plants currently under investigation.

Biocontrol (with the exception of LGB) was not considered an option at present.

There was discussion about screening of varietal susceptibility to storage pests, with the introduction of new varieties in Zimbabwe by new seed companies. Some work is currently underway at UZ/CIMMYT and this could be reviewed in the future and small-scale tests conducted to fill any gaps. There are two future paths the CPHP could follow – molecular work on varieties (likely to be expensive) or through the use of the biomonitor to screen different varieties. Farmers are well aware of the differences and these could be included into the current recommendation being given by Agritex extension workers.

Oil expressing

The discussion largely centred on the manufacture of peanut butter, although the work of ITDG in the introduction of TinyTech sunflower expressors was acknowledged.

Peanut butter manufacture (exclusive to women farmers) is a very profitable business for those involved. Initial figures obtained by Project A0549 indicate that unshelled groundnuts sell for Z\$50 per 20 litre tin, whilst peanut butter in Harare can fetch Z\$12 – 20 per 250 gram jar.

There has been considerable demand at the Development Technology Centre at UZ from women's groups and micro-enterprise projects for peanut butter machines. There are currently four (prototype) machines available, and these are now being manufactured by Tunroy Ltd. It was suggested that the efficiency of the current machines be assessed and a socio-economic study undertaken to evaluate the uptake of machines in areas where they have been introduced. It will be necessary to include a cost/benefit analysis and explore the impact such introductions will have on the time saved by women in peanut butter making by hand.

There is a genuine concern on the level of mycotoxins that may be present in peanut butter. The current Zimbabwean legislation is stricter than the EU and a study may expose levels of aflatoxin higher than permitted for safe consumption. A study of aflatoxin levels may be important, will be expensive and could only realistically be conducted by the CPHP with joint funding by other donors.

There is also a need to raise the awareness of existing technologies with farmers which can only be done through collaboration with Agritex and UZ. A review of the existing information on oil expression available to extension workers and farmers could be conducted by the CPHP.

Market information

Cereal marketing is in a transient phase with the monopoly of GMB ended in the last few years. The emergent trading situation is still in its infancy and in the CPHP focus Districts farmers still have little choice to market their grains. In the 1997/98 season, it was noted that many households did not market grain, partly because of the poor prices on offer and, possibly, due to concerns about the El Niño predictions.

In contrast, horticultural marketing has been liberalised for decades, but farmers still have difficulty obtaining timely, accurate information on prices. Agritex do attempt to provide this information but are constrained by resources. There are three predominant marketing channels for horticultural marketing in Zimbabwe:

- (a) the export market for large-scale commercial farmers and communal farmers linked to outgrower schemes;
- (b) communal farmers directly into the urban centres (primarily Harare and Bulawayo); and,
- (c) local sales by communal farmers to individuals or intermediaries.

Those farmers in © are often not achieving real market returns due to lack of market information and usually consists of the poorer sectors of society. At the same time horticultural sales are an important source of income at times when cash is required for school fees and purchase of agricultural inputs. The meeting felt that it was necessary to conduct a review of local market information systems and explore the ways in which farmers could use the information to improve their bargaining power with buyers. An initial focal area of interest was confirmed in separate discussions with an NGO (Coopibo) in Mutoko and Mudzi Districts.

The results of the research should consider how such an information system will be sustainable, with no current prospects for donor funding in the long term to support a national information system. The results should also be applicable to marketing of grains.

Market access

The predominant findings of both the PRA and needs assessment surveys was consistently the lack of access to, or high cost of, transport to market produce. This was highlighted by farmers unable to access transport for even small distances (of less than 20 km). It was recommended that a study to determine the constraints of farmers to find affordable transport is conducted and means to alleviate this bottleneck. The study would necessitate discussions with traders of their current operations and should include an extension element in the production of a package of training for traders.

A second issue affecting communal farmers is access to credit. Previous work has been conducted by NRI on inventory credit and it was agreed that a pilot project to test the scheme could be set up in one of the CPHP focus Districts. Buhera is a predominantly maize growing area, with restricted access to markets and a growth point in Murambinda. This would be a suitable place to test a pilot scheme and should be developed further with local traders, financial institutions and the GMB.

Improved access to cost-effective threshing and dehulling

Threshers for small grains are available in Zimbabwe. Previous experience by ENDA (Zimbabwe) has shown that many of the available machines are now used for shelling maize, to prolong the operational time of the machine. Transport of unthreshed small grains is a likely constraint to their use, since the commodity is bulky in this form. A trial by DTC proved that service threshing could be a profitable business (these threshers were mobile and are moved to different locations) even over a 4 – 5 month operating period. A study to determine the demand for service threshing, including cost/benefit analysis for operators and farmers is required, which should necessarily include socio-economic aspects of how the operation would successfully work within the social structure of villages and possible linkages to ZFU farmer groups. It was agreed that successful introduction will significantly reduce labour demands of both men and women which need to be analysed in the above study. A package of extension material needs to be prepared after a review of current information available from Agritex and DTC.

Project A0549 identified that dehulling is a very labour demanding process for women and children. Dehulling of a 20 litre container of small grains can take over 5 hours, effectively a days work. A

novel approach has been suggested – to use natural occurring enzymes to remove the pericarp of small grains. Zimbabwean collaborators recognised the potential impact this would have on processing small grains for home consumption and agreed that an initial study to test the viability of enzymatic dehulling is completed. Subject to the results of this laboratory study, the technology could be taken to farm level and will have an impact regionally where small grains are produced.

Drying (horticultural crops)

There is some work being conducted on solar driers for horticultural crops, both small and medium scale. However, IAE confirmed that no technical data is available for drier performance and, until this known, future design recommendations are not possible. It was recommended that research into the performance of existing driers to determine optimum design for individual commodities. It was noted that there is a growing demand for niche dried products such as paprika and mushroom.

An important component of future research will be to identify the demand for dried products through a market survey. Some background literature will be available soon (from UZ). The study should determine the demand in urban areas other than Harare and describe the current marketing channels. The study will recommend improved linkages between producers and suppliers, assessing quality requirements, consumer preferences and will consult with companies such as Nutreco (and others) who report increased demand for dried products.

The current legislation for marketing dried products was identified as restrictive to entry for small-scale farmers. It was recommended that a study to determine less stringent legislation is necessary to improve access for communal farmers to the dried products markets. Without this study, any potential improvements may be undermined.

Other

Other areas of potential research discussed during the week included the use of crop by-products as a source of livestock feed, quality/price studies on selected commodities (including maize), and improvements to storage structures (linked to results from Project A0566).

Tim Donaldson
5 February 1998

Post-harvest development project

1. Constraints - p-h losses in grain (8-10%)
low maturity spp. for small grain producers
lack of ability knowledge for basic practices.
2. Needs analysis completed for Zimbabwe, & underlying - FI/biye

Now need to construct a development project to
cover p-h losses & pick up

~~Control training~~

outputs from research

non-researchable areas identified as constraints

post-harvest

Could construct around a training programme to up-grade
skills in post-harvest problem identification & solving.

Units could be NGOs & traders & progressive farmers.

Include innovative ways of getting info. across

- radio broadcasts

posters etc.

- new technologies

- dist. learning

- small-scale - study

Matrix Ranking of Researchable Areas and Criteria

Criteria Research Area	Low Risk (Chances of success)	High Potetial Impact	High Client Demand	Low Cost	High Gender sensitivity	High Potential Rate of Adoption	Sustaina bility	Total Score	Rank
Pest Control (synth, non-synth, varietal)	9	9	10	5	5	8	5	51	1
Oil Expressing (Including peanut butter)	5	5	6	5	5	6	6	38	6
Drying (Horticultural, legislation)	3	3	2	8	5	7	8	36	8
Market Information (Grain / horticulture)	9 / 9	5 / 9	7 / 10	4 / 4	5 / 5	7 / 10	3 / 3	40 / 50	3 / 2
Market Access (Transport, credit)	3	8	10	6	5	3	3	38	6
Structures	4	5	2	8	5	1	8	33	9
Improved Access to Cost-effective Dehulling and Threshing.	3	7	9	5	5	4	7	40	3
Quality vs Price	8	1	3	7	5	0	2	26	10
Food Contamination (Inc. mycotoxin)	8	0	1	2	5	0	2	18	11
By-products – Livestock feeds	8	3	1	8	5	7	7	39	5

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Pest Control (synth, non-synth, varietal)	9	9	10	5	5	8	5	51	1

Pesticides - why? resistance?

Resistant

Relation used

Let's try to pre-select non-synthetic

Varietal work.

Check application rate + insecticide strength (check package)

Extension

Sources of info. on insecticides use

Tring for extension staff.

Matrix Ranking of Researchable Areas and Criteria

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Market Access (Transport, credit)	3	8	10	6	5	3	3	38	6

Problems - bulking up
 unreliable traders
 credit availability

Matrix Ranking of Researchable Areas and Criteria

Criteria Research Area	Low Risk (Chances of success)	High Potetial Impact	High Client Demand	Low Cost	High Gender sensitivity	High Potential Rate of Adoption	Sustaina bility	Total Score	Rank
Improved Access to Cost-effective Dehulling and Threshing.	3	7	9	5	5	4	7	40	3

De-hulling - 40% manual

Threshing - sorghum, millet, sunflowers - manual
power operated.

Shelling - maize, grains - traditional practice - 10 bags/hour³⁻⁴
(sticks)

IAE

Multi-purpose threshers available, but v. costly (US \$3-4000)

Sorghum threshers available

De-hulling small grains - problem.

Possibility for engine de-hulling

? Need for market promotion of small grains

- will encourage production
- encourage uptake of technology.

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Market Information (Grain)	9	5	7	4	5	7	3	40	3
Market Information (Horticulture)	9	9	10	4	5	10	3	50	2

Effective system needed

Must be very systems developed elsewhere (FAO)

Very systems tried in Zim. - not succeeding

Traders not able to access prices across the country

Producers do not trust traders

Radio tried, but no very languages - too many sites

N.P. May want to develop local information systems.

Poss. research areas.

Review of market info. systems

Localized market info. systems

Implications of improved market info. systems.

Extension

How to use market information - package / wholesale

Margin between farm gate + retail price is likely to decrease if impact being made.

Matrix Ranking of Researchable Areas and Criteria

Criteria Research Area	Low Risk (Chances of success)	High Potential Impact	High Client Demand	Low Cost	High Gender sensitivity	High Potential Rate of Adoption	Sustainability	Total Score	Rank
Oil Expressing (Including peanut butter)	5	5	6	5	5	6	6	38	6

Peanut butter

Some peanut butter technologies available

Certainly in demand - good market - but low big

Many p.b. machines available

No commercial production - why?

Went:

a) Socio-economic analysis

b) Efficiency of currently available machines

Awareness of selecting clean groundnuts.

(Kinto)

(DTC)

- for the machine

- for the p.b.

Sunflower + sesame (other)

Success

Peanut press depends on correct seed (sunflower)

Soft hulls make extraction easy.

Sunflower not an important crop in our District

(Peanut press for designed for households, not commercial)

- 3 levels
- commercial
 - small-scale - Tray tech
 - household - Peanut press

Socio-economic analysis needed

Matrix Ranking of Researchable Areas and Criteria

Criteria Research Area	Low Risk (Chances of success)	High Potetial Impact	High Client Demand	Low Cost	High Gender sensitivity	High Potential Rate of Adoption	Sustaina bility	Total Score	Rank
Drying (Horticultural, legislation)	3	3	2	8	5	7	8	36	8

Dry horticultural produce.

Widely done (on scales)

Butresco (food aid)

Must select correct produce for drying - markets.

peppers / mushrooms

leafy veg / onions / potato