

INVESTIGATING LEARNING INTERACTIONS INFLUENCING FARMERS' CHOICES OF CULTIVATED FOOD PLANTS

A case of Nyanga and Marange Communities of Practice,
Manicaland Province, in Zimbabwe

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ABSTRACT

The most critical hurdle on the path to sustainable development in Africa and the rest of the so-called Third World is poverty, commonly manifested as food security. A number of factors threaten food security in Zimbabwe, and these include climate change, an unstable socio-political environment and economic depression. The major debates and initiatives on sustainable development often fail to focus on the eradication of poverty in southern Africa. As a result, the trade liberalisation programmes signed by African countries in economic partnership agreements leave smallholder farmers vulnerable to the influx of hybrid seed and genetically modified organisms (GMOs), which threaten local agro-biodiversity.

This case study has shown that farmers select seed to plant for food as a result of various learning interactions they engage in, which include inter-generational knowledge transfer, farmer to farmer extension and external training by extension organisations and NGOs. A communities of practice (COPs) (Wenger, 2007) framework was used to gain an understanding of the learning interactions among farmers and their stakeholders in Nyanga and Marange COPs of small grain farmers in Manicaland Province, Zimbabwe, who have been working with Environment Africa (A regional NGO). A critical realist causal analysis was conducted to unravel the various causal factors influencing choice. A number of underlying structures and causal mechanisms were found to influence learning interactions and choices in these communities of practice, and they include ambivalence, which influences the changing domain and practice. Climate change, drought and risk were found to affect farmer practice, while power relations affect the community, its practice, domain, sponsorship and the learning interactions in the COPs. The political economy was also found to have a profound effect on the domain and practice.

A space was found for the influence of capacity and knowledge sharing in participatory frameworks of the communities, implying that extension quality can be enhanced to promote locally adapted and diverse seed varieties for food security improvement. The study shows that a deeper understanding of the mechanisms influencing the context of teaching and learning provides a more refined insight into the learning interactions and choices of farmers. This, coupled with the social processes descriptors provided by Wildemeersch (2007) has given me a more detailed understanding of the nature of learning interactions influencing farmer choices.

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Special tribute goes to my late grandfather Benias Njovodzago who inspired me to love and respect productive labour, nature and its creator. He was the first master farmer I knew and worked with, in agro-ecological region 5 in a former native reserve; and my late grandmother Sipiwe, who first demonstrated to me the sensibleness of poly-cultures through her small but outstandingly productive inter-cropped plots. Both always kept their home full of people in need, who left satisfied through much love, giving and sharing typical of what communities of practice ought to be.

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TABLE OF CONTENTS

SECTION	CONTENT	PAGE NUMBER
	Abstract	i
	Acknowledgements	ii
	Table of Contents	iii
	List of Abbreviations and Acronyms	vi
	Explanation of some technical terms	vii
	List of Tables and Figures	viii
	List of Appendices	x
1	CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE RESEARCH	12
1.1	Introduction	12
1.2	The scope of the research– Mutare and Nyanga Districts	13
1.3	Agro-ecological Regions of Zimbabwe	14
1.4	The food security and environment context of the research communities	16
1.5	External intervention: extension and training	17
1.6	Environment Africa and community development	18
1.7	My role in the “uplifting livelihoods” community development programme	20
1.8	Research Purpose and Goals	21
1.9	Overview of the Study	21
2	CHAPTER 2: THE COMMUNITY FOOD SECURITY LANDSCAPE IN A CONTEXT OF RISK AND VULNERABILITY	24
2.1	Introduction	24
2.2	Contextual profile of the agricultural sector in Zimbabwe	25
2.2.1	An historical overview of the Agricultural Sector	26
2.2.2	Agricultural policies and food security in a context of dualistic development	28
2.2.3	Post Independence Agriculture and the Land Reform era: an ethic of Propriety and Political economy	29
2.2.4	The Master Farmer Training Scheme (MFTS) and extension	32
2.2.5	Other Learning contexts of the small holder rural farmer(s)	35
2.2.5.1	Farmer to Farmer interactions	35
2.2.5.2	Sustainable Agriculture training in southern Africa	36
2.2.5.3	Inter-generational knowledge transfer and learning	36
2.3	Social learning	37
2.3.1	Communities of practice as an epistemological lens	39
2.3.1.1	Social learning as a response to risk and complexities in communities of practice	42
2.3.2	Critical Realist theory as an ontological lens	43

2.3.2.1	Reality	44
2.3.2.2	Power and power relationships	44
2.3.2.3	Critical realism as a methodology: causations and causal analysis	45
2.3.2.4	Structure and agency	46
2.4	Food security and the role of the traditional seed bank and traditional learning	47
2.4.1	Seed security a critical factor of food security	47
2.4.2	Learning for food and livelihood security	48
2.5	Threats to the traditional community and household food security system	49
2.5.1	Globalising influences on food security	50
2.5.2	Seed marketing, hybrids and genetic erosion	50
2.5.3	Biological piracy of traditional seed and grain	51
2.5.4	Self-validating reduction	52
2.6	Other responses to risk	52
2.6.1	Formal education: nature study, agriculture, Young Farmers' Clubs, environmental science and Vocational Technical (Voc-Tech) education	53
2.6.2	Reviving traditional cultivation and planting systems: Learning through doing	53
2.7	Summary	55
3	CHAPTER 3: RESEARCH DESIGN DECISIONS	56
3.1	Introduction	56
3.2	Research methodology	57
3.2.1	Research Orientation	57
3.2.2	Case Study Research Design	58
3.2.3	Why use Case Study research approach?	59
3.3	Data generation process	59
3.3.1	Key Informant Interviews and Farmer Semi-Structured Interviews (SSIs)	61
3.3.2	Document Analysis	63
3.3.3	Participant Observation	63
3.3.4	Focus Group Discussions (FGD)	63
3.4	Data management and analysis	64
3.4.1	Data management	64
3.4.2	Data analysis: process and tools	65
3.4.3	Ensuring validity and trustworthiness	67
3.5	Research ethics and values	67
3.6	Concluding summary	68
4	CHAPTER 4: PRACTICES AND LEARNING INTERACTIONS ACCORDING TO FARMERS' EXPERIENCES	69
4.1	Introduction	69
4.2	What is happening with food plants	70
4.2.1	Garden crop preferences	70
4.2.2	Field crop preferences	73
4.2.1.1	The Nyanga communities of practice case	76
4.2.3	Traditional food crops that are disappearing	79
4.3	What are the farmers doing – farmer practices	79
4.3.1	Farmers are sharing/ exchanging information and seed	80
4.3.2	Farmers are working together for a common cause	80

4.3.3	Farmers are participating in and valuing look and learn visits	82
4.3.4	Farmers plan for and participate actively in annual field days, seed and food fairs and agricultural shows	82
4.3.5	Farmers are practising sustainable agricultural practices in their farming	83
4.3.6	Farmers face various risks and get ambivalent messages from training and extension agents in their practices	84
4.4	The roles of the different actors	87
4.4.1	Farmers as facilitators of their own learning	87
4.4.2	Field Personnel as trainers, facilitators and learners	87
4.4.3	Agricultural Extension Officers and Workers facilitate learning as trainers and advisors	88
4.4.4	Seed Companies, NGOs and farmer support organisations as seed providers and promoters	89
4.5	What learning interactions are taking place within the communities of farmers	90
4.5.1	Intergenerational Knowledge Transfer	90
4.5.2	Farmer to farmer knowledge sharing and learning	90
4.5.3	Farmers learn from literature and other printed information	91
4.5.4	Farmers 'pass on' part of their harvests to other farmers	92
4.5.5	Learning from trying things out	92
4.5.6	Learning from risk and responding to risk	93
4.5.7	Learning from training interventions	94
4.6	Learning in a community of practice	95
4.6.1	The domain	95
4.6.2	The community	95
4.6.3	The practice	96
4.7	Concluding summary	97
5	CHAPTER 5: AN IN-DEPTH VIEW ON LEARNING INTERACTIONS AND PRACTICES ASSOCIATED WITH FARMERS' CHOICES OF CULTIVATED FOOD PLANTS	98
5.1	Introduction	98
5.2	Ambivalent influences on farmers' food plant choices	99
5.2.1	A concern with ambivalence	99
5.2.2	Causal analysis of ambivalent messages reaching farmers	101
5.3	Power relationships	102
5.4	Inter-generational knowledge transfer in communities of practice	105
5.4.1	Rekindling memories and practices, learning by discovery	106
5.5	Learning from risk and vulnerability	107
5.6	Training and extension	109
5.7	Structure and agency – reclaiming agency	111
5.8	Causal factors influencing farming and food crop choices	112
5.9	Concluding summary	115
6	CHAPTER 6: RECOMMENDATIONS AND CONCLUSION	116
6.1	Introduction	116

6.2	Revisiting the research question	116
6.3	A summary of the study	117
6.4	Specific recommendations	118
6.4.1	There is need for different stakeholders to be alert to and address ambivalence	118
6.4.2	There is need to strengthen diversity of options available through drawing on experiences and knowledge of farmers and other possibilities and variety of seed.	118
6.4.3	There is need to conceptualise or work within a COP framework in order to maximise learning opportunities	120
6.4.4	There is need to consider and develop capacity to build on to the wide range of learning interactions and learning processes that exist in COPs in extension and support programmes.	120
6.5	Reflexive review of the research process	121
6.6	Conclusion	121
7.0	REFERENCES	122
8.0	APPENDICES	129

LIST OF ABBREVIATIONS AND ACRONYMS

AGRITEX	Agricultural, Extension and Technical Services Department (combined CONEX and DEVAG, July 1981; reinstituted November 2007)
AIDS	Acquired Immune Deficiency Syndrome
AREX	Agricultural Research and Extension Services Department (successor of AGRITEX)
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CONEX	Conservation and Extension Department
COPs	Communities of Practice
CTDT	Community Technology Development Trust
DEVAG	Department of Agricultural Development
EA	Environment Africa
EAG	Environmental Action Groups
EEASA	Environmental Education Association of Southern Africa
FAO	Food and Agriculture Organisation (United Nations)

FGD	Focus Group Discussion
GM / GMO	Genetically Modified / Genetically Modified Organism
HIV	Human Immune deficiency Virus
LPP	Legitimate peripheral participation
LSCF	Large-scale Commercial Farming area
MFTS	Master Farmer Training Scheme
NMMZ	National Museums and Monuments of Zimbabwe
NGOs	Non-Governmental Organisations
OPV	Open Pollinated Variety
PELUM	Participatory Ecological Land-Use Management
SADC	Southern Africa Development Community
STFI Fairs	Seed Technology and other Farming Inputs Fairs
UNDESD	United Nations Decade of Education for Sustainable Development
UPOV	Union for the Protection Of new plant Varieties

EXPLANATION OF SOME TECHNICAL TERMS (SEED)

Breeder seed

Breeder seed is seed or vegetative propagating material (e.g. cuttings) directly controlled by the originating or sponsoring plant breeder of the breeding programme or institution and/ or seed whose production is personally supervised by a qualified plant breeder and which provides the source for the initial and recurring increase of foundation seed. Breeder seed shall be genetically so pure as to guarantee that in the subsequent generation i.e. certified foundation seed class shall conform to the prescribed standards of genetic purity.

Foundation seed

Foundation seed is the progeny (breeding product) of Breeder seed, or produced from foundation seed, which can be clearly traced to Breeder seed. It can be described as Foundation seed stage 1 and 2, depending on stage of breeding.

Certified Seed

Certified seed shall be the progeny of foundation seed. Certified seed may be the progeny of certified seed provided this reproduction does not exceed three generations beyond foundation seed stage-I.

Hybrid seed

Hybrid seed is the first generation resulting from crossing of two varieties or parents. Hybrid (certified) seed is the first generation resulting from the cross of two approved inbred lines or parents, one of which is male sterile.

LIST OF FIGURES AND TABLES

Figure 1.1 ***Maps of (a) Zimbabwe showing Provincial boundaries (left); and (b) Manicaland Province showing District Boundaries (right).....***
.....page 14

Figure 1.2: ***Agro-ecological (Natural Farming) Regions map of Zimbabwe.....***
.....page 15

Figure 2.1 ***Linkages between school, home and community learning environments (left: weakly linked; right: strongly linked). Adapted from Taylor and Mulhall (2001: 138).....***
.....page 36

Figure 2.2 ***Two main axes of relevant traditions constituting a social theory of learning (after Wenger, 1998: 12).....***page 40

Figure 2.3 ***Critical realist view of causation (after Sayer, 2000: 15)***
.....page 45

Figure 2.4	<i>Goals of a Community Food System (after Garrett and Feenstra, 2000).....</i>	<i>page 54</i>
Figure 3.1	<i>Conducting a semi-structured interview.....</i>	<i>page 62</i>
Figure 4.1a	<i>A graphical representation of garden food crop preferences extracted from results of a pair wise matrix ranking) from 20 female farmers in dryland Marange.....</i>	<i>page 72</i>
Figure 4.1b	<i>A graphical representation of field food crop preferences extracted from results of a pair wise matrix ranking) from 20 female farmers in dryland Marange</i>	<i>page 74</i>
Figure 4.2	<i>Terraced farming techniques in the Ziwa area, Nyanga.....</i>	<i>page 77</i>
Figure 4.3	<i>A plot of sorghum SV 4 intercropped with cowpeas (Nyanga).....</i>	<i>page 83</i>
Figure 4.4	<i>A dead (zero-gradient) level contour with water harvesting pits at Sunrise Environmental Action Group in Mutare District.....</i>	<i>page 84</i>
Figure 4.5	<i>A plot of maize in the study area with a not so promising maize crop, typical of many farming plots in semi-arid rural areas.....</i>	<i>page 85</i>
Figure 4.6	<i>Massive soil erosion cutting across a cultivated plot of sorghum in a field with poor conservation works after an unexpected heavy shower in semi arid rural Marange.....</i>	<i>page 86</i>
Figure 4.7.1	<i>Advertising seed and promoting technology, high yield and food security at the Manicaland Agricultural Show.....</i>	<i>page 93</i>
Figure 4.7.2	<i>Advertising chemical fertilisers and agro-chemical pesticides at Manicaland Agricultural and Show.....</i>	<i>page 93</i>
Figure 4.8	<i>Wenger's structural model of a community of practice</i>	<i>page 96</i>

Figure 5.1	<i>A causal analysis of ambivalent messages.....</i>	page 101
Figure 5.2	<i>How underlying structures and causal mechanisms influence learning interactions and choices in COPs.....</i>	page 112
Figure 5.3	<i>Refined dynamics of the Wenger model of social processes.....</i>page 114
Table 1.1	<i>Environment Africa selected Logical Framework for “Uplifting Livelihoods” [adapted from Environment Africa (2004: 42-43)].....</i>page 19
Table 2.1	<i>Structures, policies and associated extension approaches in pre-independent Zimbabwe (adapted from Rukuni, 1994).....</i>	page 28
Table 2.2	<i>The contribution of the agricultural sector to the national economy (adopted from RBZ, 2005: 6).....</i>	page 31
Table 3.1	<i>Data generation process and inventory</i>	page 60
Table 3.2	<i>A preliminary list of categories and sub-categories.....</i>	page 66
Table 4.1a	<i>A summary of garden food crop preferences obtained from a pair wise ranking matrix conducted with 20 female farmers.....</i>page 71
Table 4.1b	<i>A summary of field food crop preferences obtained from a pair wise ranking matrix conducted with 20 female farmers</i>	page 73

LIST OF APPENDICES

Appendix reference	Description	Page
1A	Table 1.A.1 Selected logical framework for community development programme (CP), Manica Project, Environment Africa – (document analysis)	129

1A.1	Document analysis of community development programme	132
1B	Document analysis. Master Farmer Training Scheme (MFTS) documents	134
1D.a	Consent form – MATIMBE	139
1D.b	Consent form – MATSAMBURUTSA	140
2A	Interview schedule AREX	141
2A.1	Interview transcript - AEPI.1	146
3A	Focussed Group Discussion – Sunrise EAG (MFf.a)	148
3B	Focussed Group Discussion – Marange Small Grains Committee (MFf.b)	154
4	Analytic memos	156
5	Participant observation of Mutare District Seed Fair	168
6	Extract of research journal	171
7	A story of ‘most significant change’	172

CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Food security in the context of agro-biodiversity conservation has become increasingly important for Zimbabwe as a nation and at household level, especially during the post-land reform era (1999 to present). For many centuries, traditional open pollinated food plants, careful seed selection and conservation, and traditional cultivation methods have played a vital role in ensuring household and community food security. Such indigenous food security practices were characterised by diversity, variety and exchanges of seeds, crops and vegetables among local farmers. Some of these plants include sorghum, millet, rapoko, brown rice, maize, groundnuts, cow peas, cucurbits, green leafy vegetables, sweet potatoes and yams, giving a good mix of starch, protein, oils, vitamins, minerals and micro-nutrients. A careful combination of some, all or other crops was commonplace in traditional mixed cropping systems (Murwira, Wedgwood, Watson, Win & Tawney, 2000: Food and Nutrition Council of Zimbabwe, n.d.).

Unfortunately, the combination of frequent and prolonged drought cycles, market-oriented agricultural policies introduced during the colonial period, a depressed economy and socio-political instability brought about by the land reform programme in independent Zimbabwe (post-1980) have led to widespread food insecurity. Research published by UNEP (2006) indicates that there have been at least four drought periods hitting southern Africa as follows between 1986 and 2003: the first being 1986/87, followed by the 1991/92 season, which was described as severe; and then the 1994/95 which was described as the worst drought in memory, and lastly the 2001-2003 which was described as another severe drought in the SADC Region. In the UNEP report, the 2001-2003 drought period singled out Zimbabwe in particular (and other countries northwards) as worst affected. The western countries, in a bid to help the region, have in the process included genetically modified (GM) grain and seed in their food aid and recovery packages. Hence rapidly changing climatic conditions, an uncertain political economy and the undetermined impact of genetically modified organisms (GMOs) are risks that countries in southern Africa have to grapple with (Lotz-Sisitka, 2004).

Risk factors affecting food security also include the self-validating reduction of certain nutritious foods due to their false associations with poverty and backwardness (Jickling, Lotz-Sisitka, O'Donoghue & Ogbuigwe, 2006). The Food and Nutrition Council of Zimbabwe (n.d.: 16) observes that "In Zimbabwe today many people are turning away from a healthy traditional diet because they think it is inferior to a western diet. This results in people eating less healthy food". The role of environmental education under these circumstances is to improve the knowledge and awareness of new possibilities and of risk, in order to reduce its impact (Beck, 1999). In addition, education has the potential to improve reflexivity among communities of practice (Wenger, 1998) on some of the dangers associated with modern unsustainable agricultural practices that are increasing genetic erosion, knowledge loss and food insecurity.

While many modern-day agricultural practices can be described as unsustainable or damaging the environment (Shiva, 2000), modernisation and modern agriculture did not bring all the ills. Today the potential exists to combine modern approaches with traditional food production systems to address shortcomings and to provide broader, more holistic approaches to food security. This has been seen to be possible in a system that recognises and promotes the smallholder farmer as a distinguished experimenter and researcher in traditional food security practices (Kruger, 1995). Evidence of research on learning that takes place in communities of practice of rural farmers is scarce, and yet such research could provide pointers to improving agency and food security in such contexts.

My research interest is to understand the learning interactions that contribute to the dual functions of food security and sustainable agriculture within selected communities of practice (Wenger, 2000; see 1.8 below) of communal farmers in rural Nyanga and Mutare Districts of Manicaland Province in Zimbabwe. It is hoped that this study and reflection on such learning interactions will improve the quality of practice of all stakeholders, especially that of communal farmers themselves, extension officers and other development agents.

1.2 THE SCOPE OF THE RESEARCH – NYANGA AND MUTARE DISTRICTS

Nyanga and Mutare Districts are two of Manicaland Province's seven districts in the northern most and central areas respectively. Both districts border with the Republic

of Mozambique to the East, and contain the whole range of agro-ecological regions ranging from 1 to 5 (see section 1.3 below). Below are maps of Zimbabwe showing Provincial boundaries, with Manicaland Province being the easternmost province (see Figure 1.1 below).

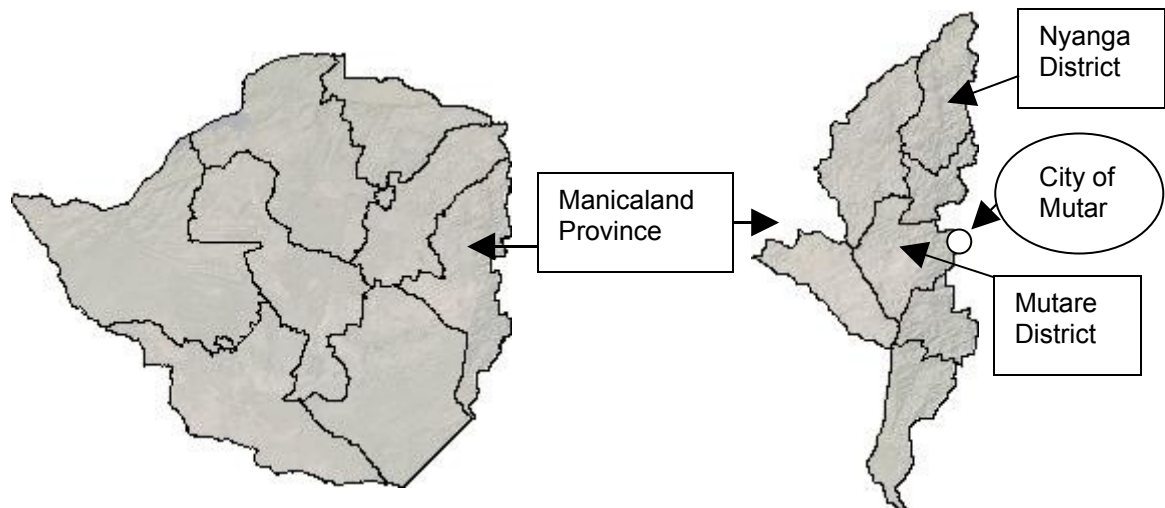


Figure 1.1 *Maps of (a) Zimbabwe showing Provincial boundaries (left); and (b) Manicaland Province showing District Boundaries (right)*

Manicaland is the largest province, with the highest population density in the country. Manicaland is well known for fruit, tea and timber production which arises from the high rainfall watershed areas along the Eastern highlands mountain range separating Zimbabwe from Mozambique. On the other hand, the province is also known for high rates of poverty and incidences of HIV / AIDS due to marginal unproductive lands, unemployment, and the generally depressed economy of the entire country. This research was limited to communities of practice located on two sites; in the “Ziwa local area” (Zimbabwe, 1996) in Nyanga, and in three wards (Buwerimwe, Chindunduma and Kugarisana) of the Marange communal lands in Mutare. The Ziwa local community is 120km north of the City of Mutare, and the Marange community lies about 80km south west of this provincial capital. Both communities of practice lie in rural, marginalised lands.

1.3 AGRO-ECOLOGICAL (NATURAL FARMING) REGIONS

Zimbabwe’s natural farming regions have been defined by a system of agro-ecological zoning (regions 1 to 5) which is based on agricultural potential, that is, the amount of rainfall received and soil type, whereby region 1 would have the highest rainfall and best soils while region 5 has the least of these attributes combined with high temperatures, in that decreasing order (see Figure 1.2 below). These zones

were created by Vincent & Thomas (1960) and are linked to the Rhodesia Native Land Husbandry Act of 1951.

It is important to understand this natural farming zoning system in order to appreciate the agriculture, land and environment dynamics in Zimbabwe. Figure 1.2 (to the right) shows the location of the natural farming regions (1 to 5). Below is a reference key.

Key to Figure 1.2:
1. Specialised and diversified Farming regions
2a, 2b. Intensive Farming Regions
3. Semi intensive Farming Regions
4. Semi-extensive Farming Regions
5. Extensive Farming Regions

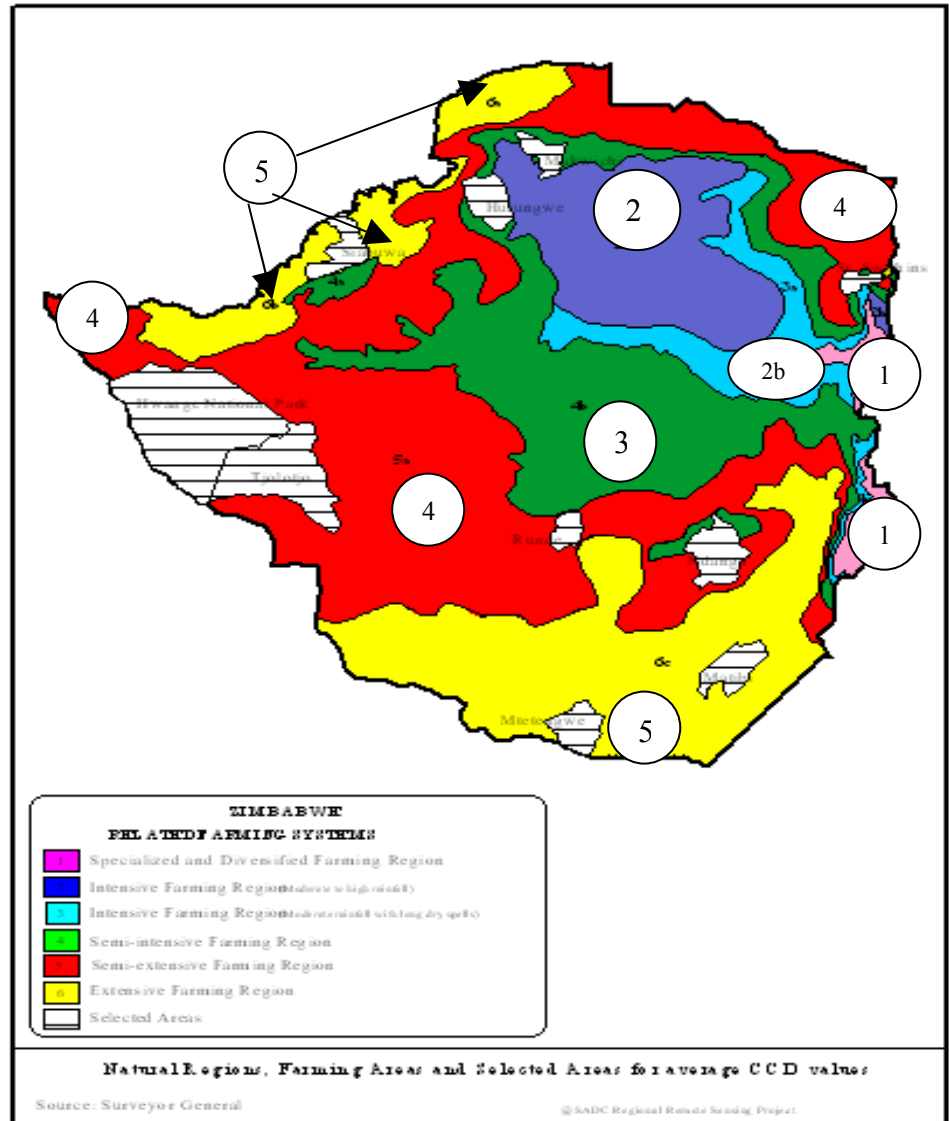


Figure 1.2: Agro-ecological (Natural Farming) Regions map of Zimbabwe

(Source: http://www.sahims.net/gis/sahims_Gis_Data/Agroecological%20zoe%20raster.org)

1.4 THE FOOD SECURITY AND ENVIRONMENT CONTEXT OF THE RESEARCH COMMUNITIES

Research on communities of practice, with a focus on issues of food security and sustainable agriculture, has featured very little in the field environmental education. For the purposes of this research, food security shall be defined holistically as the availability of food at all times, that is safe, nutritious, and culturally acceptable and that is procured in a manner that is socially and culturally acceptable and that does not degrade or endanger the environment. Food security has three main facets that must be satisfied for it to be met, and these are availability, accessibility, and utilization (Mukute, Mnyulwa & Kimakwa, 2002; FAO, 2002).

Communities of practice are defined by Wenger (2007: 2) as “groups of people who share a concern or passion for something they do, and learn how to do it better as they interact regularly”. The Ziwa and Marange small grain farmers are regarded as communities of practice in this research. Both communities lie in rain-fed, dry land areas classified under agro-ecological regions 4 to 5, which are the marginal lands with poor soils, low rainfall, high temperatures and fragile biodiversity. The Ziwa local community is located around a site museum and estate run by the National Museums and Monuments of Zimbabwe (NMMZ). The estate is rich in plant and animal biodiversity, and has a cultural heritage that shows evidence of a history of settlement with organised food production that has had its ups and downs in food security for a variety of reasons.

There are several ethical questions surrounding the nature of resource sharing and ownership between the Ziwa local population and the museum authorities, who are bidding the museum site and estate for World Heritage Site status (UNESCO, 1997; Zimbabwe, 1995). However, Zimbabwe’s successful Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) programme has learnt its lessons of peaceful co-existence in the Ziwa area through a bee-keeping project. The Ziwa Site Museum and Estate is endowed with a rich array of natural and cultural resources, made up by a vast diversity of indigenous trees and other plants, and small antelopes, zebra and other small wildlife; and stone works that show archaeological evidence of organised settlement, iron smelting and jewellery, agricultural activity, decline and eventual abandonment. The site museum is there to preserve this rich cultural heritage.

Marange communal lands are relatively drier and sandier, with sparse vegetation. Recently, diamonds were discovered within 20 km of the research communities in nearby Chiadzwa ward. From August 2006, most able-bodied people spent most of their daytime digging for diamonds in the diamond rush in typical Eldorado fashion. This disrupted the 2006 / 2007 farming season in this area.

However, both the Nyanga and Marange communities face the same agro-ecological challenges, and are serviced by agriculture and forestry extension officers from the Agricultural Research and Extension Services (AREX¹) and Forestry Commission, who advise farmers on what and when to plant, and where to market their produce.

1.5 EXTERNAL INTERVENTION: EXTENSION AND TRAINING

Like most other rural communities, AREX and Forestry Commission are present in both the Marange and Ziwa communities, assisting with extension in agriculture and forestry extension. This separation of agricultural and forestry functions is described by Shiva (2000) as deriving from philosophies typifying monocultures of the mind. However, the Forestry Commission has had an agro-forestry thrust in a social forestry programme that has since lost funding as some donors shifted focus out of Zimbabwe. The Forestry Commission is very thin on the ground, with only one person servicing the entire district, and having no vehicle most of the time. Demonstrations of agro-forestry do exist in isolated cases though. AREX have made efforts to increase staff on the ground since 2005, but they are not mobile and hence also find it challenging to visit each farmer regularly.

In 2001, the National Museums and Monuments of Zimbabwe (NMMZ) Eastern Region requested the assistance of Environment Africa²; a Zimbabwean based regional NGO working in sustainable community development, to respond to the

challenges of working with community neighbours for peaceful co-existence around the museum estate. The result was an agreement between the NMMZ and the

²

¹At the time of completion of this study, the Department of AREX was being reconstituted to AGRITEX the Department of Agricultural, Technical and Extension Services, beginning from October 2007

² Environment Africa is a regional NGO that I work for in the Manica Region (Eastern Manicaland Province of Zimbabwe and Western Manica Province of Mozambique). The organisation facilitates sustainable development activities especially with marginalised rural farmers in Zimbabwe, Mozambique, Zambia, and Malawi.

community on community-based natural resources management, whereby the museum authorities granted rights to the community to graze their livestock, fetch dry dead wood for wood fuel, prevent veldt fires and deforestation, and to use the trees in the estate lands for placing their beehives.

1.6 ENVIRONMENT AFRICA AND COMMUNITY DEVELOPMENT

Environment Africa started working with the Marange and Ziwa communities in 2001 and 2004 respectively, in encouraging and supporting environmental action that aims to improve food security. Its vision is 'To champion the African environment'. What the organisation does is best described by its mission statement, which is 'To work together with all sectors of society, raising awareness, encouraging action and advocating for a better environment that uplifts the livelihoods of current and future generations', which sums up the development goal. Environment Africa's strategy has developed and matured over the years since its formation in 1990. Currently, the organisation is working within a five-year strategic plan (2005 – 2009) (Environment Africa, 2004). This strategy is evidently influenced by holistic perceptions of the environment, which incorporate biophysical, social, economic and political dimensions, as discussed in the Zimbabwe Environmental Education Policy and Strategies (Government of Zimbabwe, 2004). It also subscribes to a notion of sustainable development (EEASA, 2002) that has anthropocentric and ecocentric dimensions, as articulated in its mission statement, and the Millennium Development Goals (Government of Zimbabwe, 2004b).

The specific goals of Environment Africa are as follows:

- Ensure mainstreaming of the environment on the agenda of all formal and informal institutions.
- Raise the level of environmental awareness and direct action among the general public, business sector, schools, community groups, the media and governments.
- Empower local communities to take action for improvements of their own lives through sustainable use of their environments.
- Promote the sustainable use of environments and restoration of degraded areas.
- Work together with all sectors of society for the maintenance and enhancement of biodiversity in areas of conservation need.

- Strengthen the organization by processes of organizational development, developing systems for financial sustainability and building on lessons learnt

(Environment Africa, 2004)

Table 1.1 below is a selected text from the Environment Africa logical framework for 'Uplifting Livelihoods':

Table 1.1 *Environment Africa selected Logical Framework for "Uplifting Livelihoods" [adapted from Environment Africa (2004: 42-43)]*

Objectives , activities	Code	Activities	Indicators
Specific objective	3.5	Improve food security, health and household economy among the urban poor and rural communities within focal areas	Reduced malnutrition cases; Crop diversity; Well conserved & fertile lands; Indigenous crop diversity.
Expected Results	3.5.1	Communities have improved their food production levels through the use of suitable traditional crop varieties	
Activities	3.5.1.1	Assist communities with procurement of traditional open pollinated varieties (OPV) of small grains and OPV maize seed	
	3.5.1.2	Conduct training workshops on seed selection and storage for future use	
	3.5.1.3	Promote seed fairs where farmers can share and exchange seed and information locally	Variety of displayed seeds, Empowered communities (seed bulking, exchange).
	3.5.1.4	Share ideas and knowledge on processing small grains locally	Shared information, Processed small grain
Expected Results	3.5.2	Knowledge on healthy living is shared and used successfully	
Activities	3.5.2.1	Conduct training workshops i.e. intercropping, nutrition gardens and agro-forestry	
	3.5.2.2	Promote farmer to farmer extension work	
	3.5.2.3	To conduct Field Days	
	3.5.2.4	Document and produce user friendly guides	
Expected Results	3.5.3	Availability and utilisation of water improved at community level	
Activities	3.5.3.1	Research on improved water harvesting techniques among farmers	
	3.5.3.2	Document and produce low cost booklet on water harvesting techniques	Booklets, Translated versions

	3.5.3.3	Promote improved water harvesting techniques among farmers	
	3.5.3.4	Link farmer to organisations providing boreholes	
Expected Results	3.5.4	Household economies are improved through production activities	
Activities	3.5.4.1	Research and share skills information on food processing e.g. small grains	
	3.5.4.3	Promote processing techniques that are user friendly among women	
	3.5.4.4	Assist communities in marketing their produce	

Table 1A.1 (appendix 1A) is a recontextualisation of a project proposal text supplied by Environment Africa, by a financial partner. It has the overall objective: “the project reaches about 400-500 families (4500-9000 people) with its activities, who achieve a direct improvement of their living conditions through the implementation of sustainable production and processing methods”. Four project objectives are articulated:

1. Improvement of living conditions
2. Sustainability of projects
3. Spread of impact
4. Organisational capacity of Environment Africa supported

(Environment Africa,
2005)

1.7 MY ROLE IN THE “UPLIFTING LIVELIHOODS” COMMUNITY DEVELOPMENT PROGRAMME

I was employed by Environment Africa in 2000 to initiate a regional branch in Manicaland, as a response to demand by stakeholders. The main ‘uplifting livelihoods’ project to be facilitated by the new branch was on sustainable agriculture. My role was to identify and start up an office to support the programme as a branch manager and programmes coordinator. In addition, I was to identify and make linkages with key stakeholders in local government, agriculture, forestry, and education line ministries, and other relevant NGOs in the field of environment, development and food security. Establishing partnerships and linking into networks was crucial for success, as was the building of relationships with farmers. I also needed to understand their practices better, to enhance the services and support we provide, hence this research project.

1.8 RESEARCH PURPOSE AND GOALS

This research revolves around the key question of what learning interactions take place within a community of practice of rural small grain farmers that influence their choice of cultivated food plants.

The goals of this research were:

- To gain an in-depth understanding of factors influencing Ziwa and Marange communities of practice to make informed food choices,
- To explore the learning interactions among the Ziwa and Marange farmers that shape their farming knowledge and food security strategies within a community of practice,
- To identify the learning interactions between the farmers and external trainers that lead to choice of cultivated food plants.

The broader purpose of the study is to enhance the quality of extension training and farming practice as a contribution to food security.

1.9 OVERVIEW OF THE STUDY

The six chapters in this thesis are oriented towards responding to the research question, as indicated by this overview:

Chapter 1 presents an introduction and background to the research, introducing the study, the principal researcher (myself) and the participant researchers in the defined communities, and my work context within Environment Africa. This chapter also presents the research question and goals, and attempts to introduce the research and the researchers within a community of practice context, briefly reflecting on risk and vulnerability issues associated with food security and environment in southern Africa and Zimbabwe.

Chapter 2 presents the results of a literature review that lays out the community food security landscape in a context of risk and vulnerability within the geographical areas of study, but with a global perspective. The chapter presents a contextual profile of the agricultural sector in Zimbabwe from a historical perspective, and considers the

effects of policies; political change and land reform; climate change combined with economic recession on rural subsistence smallholder farmers. It then looks at farmer training programmes, extension support or lack of it, and the resultant learning contexts of farmers that influence their food security. The chapter then outlines how a community of practice framework has been used to understand the organisation, practices and learning within smallholder rural farming communities, and how critical realism has been used as an ontological lens to provide an in-depth causal analysis, explaining the experience and practices of the communities of practice considered in the study.

Chapter 3 explains the research design decisions I made, describing and justifying the theoretical perspectives and methodology chosen. The research methodology is presented as a case study of two communities of practice. The chapter proceeds to explain how data was generated, managed and analysed, underpinned and informed by the theoretical vantage points presented in chapter 2. Chapter 3 also explains how my methods departed from, or adopted the path intended in my research proposal, and why such changes had to be made, especially in line with respecting what was obtained from the community leadership and the farmers themselves.

The way data is presented in **chapter 4** is influenced by the Communities of Practice concept of Wenger, which helped to organise data such that it could start revealing factors influencing farmers' choices of cultivated food plants. The chapter is organised into four general sub-topics which attempt to present what the different research participants and stakeholders in the smallholder farming process perceived as a) what is happening with food plants (see section 4.2); b) what the farmers are doing, i.e. farmer practices (see section 4.3); c) the roles of the different actors (see section 4.4); and d) learning interactions among farmers and between them and extension agents (see section 4.5). The data is presented based on analytic memos drawn from these initial categories of the study, providing a thick description.

Chapter 5 further analyses the data presented in chapter 4, using analytical statements generated from the raw data (Bassey, 1999), which attempt to answer the research question concisely. The analytical statements helped in managing and giving meaning to the data, and highlighting key concepts. I then drew on critical realist ontological perspectives to probe the data in more depth, as I tried to test and reformulate, interpret and explain the analytical statements, through (fallible) causal analysis.

The issues raised in chapters 4 and 5 are synthesised in **chapter 6**, presenting four key recommendations that suggest how to deal with ambivalent influences on farmers' choices; how to improve the quality of learning interactions to enhance learning in communities of practice.

CHAPTER 2: THE COMMUNITY FOOD SECURITY LANDSCAPE IN A CONTEXT OF RISK AND VULNERABILITY

Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed: to you it shall be for meat (Genesis 1:29)

2.1 INTRODUCTION

There are diverse contexts, intentions and interests that give meaning and perceptions to the term ‘community’. Regional networks of countries with common historical and economic interests have been formed to facilitate trade, coordinate development efforts and build peace from a community context in the aftermath of two global wars. Examples of these regional networks include the European Union (and its predecessor the former European Economic Community) and the Southern African Development Community (SADC), both of which have evolved with an economic and a development focus respectively. The United Nations is a community of nations set up to work together for peace. One of the globalising influences emanating from the United Nations is the United Nations Decade of Education for Sustainable Development (UNDESD) (2005-2014), whose aim is to “create a world where everyone has the opportunity to benefit from quality education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation” (UNESCO, 2004). There are several other world community bodies which are just as powerful, with the potential to promote or derail the food security of nations and local communities. These include among others the World Trade Organisation (WTO), the Food and Agriculture Organisation (FAO), and the Union for the Protection of New Plant Varieties (UPOV).

Community groups can also be identified in their diversity at national levels, such as the commercial farming community, rural and urban communities, resettled farming communities, black and white communities, the business community, marginalised communities, and the medical fraternity, to name a few. Such perceptions of community groups are socially constructed by individuals, interest groups or institutions.

The perceptions may be conventional, polarised, stigmatised, politicised, reductive, and/or found in global discourse. The way communities are perceived or given

meaning has a bearing on the way they develop internally, and are influenced or treated by external agents.

This study shall focus on rural farming communities. For the purposes of this study, rural communities are perceived as groups of people in communal (usually marginal) areas, organised in pre-dominantly subsistence to semi-commercial farming units or groups, at sub-village, village or ward levels. While villages and wards vary in size and scope, government authority has established a definitive range based on averages. According to the Prime Minister's Directive of 1984, a village had about 1000 households, and a ward had 6 villages (Government of Zimbabwe, MoET, 1984a). The scope of this study is limited to farmers working with Environment Africa and other stakeholders in Marange and Ziwa communal lands in Mutare and Nyanga Districts of Manicaland Province in eastern Zimbabwe (see chapter 1).

In this Chapter I present a discussion of the major building blocks of the study. This discussion shall start with a contextual profile of the agriculture sector in Zimbabwe, with a particular focus on the historical and policy fields of influence, and the environmental issues and risks facing the agricultural sector in the current paradigm of the drought – riddled post land reform era. It will culminate with an overview of agricultural training and extension and the learning contexts of the smallholder farmer that have the potential to improve extension quality and food plant choices for food security improvement. This discussion further presents the theoretical framework of the study that shall be used as a guide for generating and analysing data, and to guide further interpretation of the issues emerging from the data. The theoretical framework also provided vantage points for an in-depth discussion of the research question.

2.2 CONTEXTUAL PROFILE OF THE AGRICULTURAL SECTOR IN ZIMBABWE

In this section I present a brief contextual profile of the agricultural sector in Zimbabwe. A summarised historical overview, including the policies and legislation shaping the sector, is given in order to provide landmarks that enhance understanding of the current context. I shall then discuss key environmental issues and risks with specific reference to food security in the context of the vulnerable smallholder communal farmer, and present different learning contexts of farmers. The general aim is to open up possibilities for risk reduction and the strengthening of sustainability, through improved extension quality and farmer-in-community learning,

in an attempt to search for answers to the research question. Further insights into the context shall be provided throughout the study as the research story unfolds.

2.2.1 An historical overview of the Agricultural Sector

According to Marks and Atmore (1980) a good number, possibly the majority of southern Africa's Bantu-speaking peoples, were living off most of the land in regions suitable for mixed farming and pastoralism by the time the first Europeans completed navigation of the African continent at the end of the fifteenth century. In addition to this agro-pastoralism, other livelihood activities included hunting, mining, metal-smithing, jewellery, pottery and trade.

The Agricultural sector in Zimbabwe has a close match to the socio-political and economic developments that the land and peoples have experienced from the advent of farming, through the colonial period, to the post-independence and democracy era. The political economy of Zimbabwe is historically a land and environment issue. People lived off the land growing crops and rearing livestock during the latter years of the pre-colonial period. The farming system was based on a type of shifting cultivation called *chitemene*, which allowed land recovery through fallowing; and free-range grazing or browsing for livestock, while a variety of crops included open pollinated varieties of sorghum, millets, maize, groundnuts, vegetables such as spider plant (*nyevhe / runi / rudhe*), pumpkin leaves, and cow peas. The variety of cultivated food crops is believed to have fallen from about "180 traditional food plants harvested from the wild or grown in gardens, ... to less than 10" between the 1890s and the current period (Food and Nutrition Council of Zimbabwe et al, n.d.).

Wolmer and Scoones (2000: 581) reiterate the farming situation in a Zimbabwean historical context;

Before the colonial period most African farmers were already mixed farmers to the extent that they practised both cropping and livestock husbandry. However, their methods did not fit the idealised technical mixed farming package in which the two 'farm enterprises' were integrated through draft power, manure use, and fodder sources ... For 70 years agricultural extension has tried to correct this.

Colonisation was perceived by the native population as a process of deprivation of land, livestock, food security and wealth. "Agriculture before the introduction of the plough (c 1920) was based on livestock and shifting cultivation. Livestock provided ...

transport and manure but not draught power, and had a major role in the social system” (Hagmann & Murwira, 1996).

There are varying opinions and perceptions as to how land was eventually shared among the new settlers and the native population. Some historians propose that there are at least three different explanations (Proctor & Phimister, 1991), “the colonial explanation, the nationalist explanation and the most recent explanation”. As political power was transferred from the native to the colonial, the native population generally felt unfairly controlled and alienated in view of a series of agricultural policies and legislation limiting their access to adequate and productive land, grazing lands and markets, and compulsory relocation was passed and imposed on them without consultation (Government of Zimbabwe, MHTE, 2002). The colonial system created a centralised system of agriculture and production based on the perceived needs of two populations living together, but cautiously apart. When the present day political boundary of Zimbabwe was created after the Berlin Conference, the country was divided spatially into different systems of agriculture, namely large-scale commercial farming (LSCF), small-scale commercial farming (SSCF), native reserves and purchase areas. With time, the authorities realised that the land-use situation in the native reserves or communal areas (also called rural areas), was causing serious land degradation in the form of sheet and gully erosion and deforestation. Population pressure on these lands, ‘overstocking’, poor soils and poor methods of agriculture were cited as the major causes.

Some response mechanisms employed by Government included re-settlement, and such unpopular methods as de-stocking, forced labour in contour construction (*‘nhamo ye makandiwa’* – Shona), and the “African farmer training’ curriculum.

(Government of Zimbabwe AGRITEX, 1994)

Reductionist problems, such as the shift in planted seed types, for example from open-pollinated small grains (staple starch) to hybrid maize, and from traditional cultivation to conventional agriculture, are not cited in early official narratives, but start to appear with the sustainable agriculture and permaculture / organic farming movements in the 1990s (Mukute, et. al., 2002). Such paradigm shifts in seed preferences were supported by agricultural research stations and reinforced by agricultural training and extension. “The growing of such open-pollinated maize varieties as hickory king was strongly discouraged by such institutions as the grain

marketing board, which favoured hybrid maize varieties” (D2, personal communication, September 14, 2004).

Agricultural extension to the black population was started informally not as an initiative of Government, but as a private endeavour. The development of such extension is further discussed in sub-section 2.2.3 below.

Agricultural ‘instruction’ to black farmers was first provided on mission stations. The agricultural demonstration work of one American missionary, Emory Alvord, at Mount Selinda, was brought to the attention of the Department of Native Development soon after its inception in 1920, and such was his impression that by 1926 he had been appointed ‘Agriculturalist for the Instruction of Natives’

Wolmer & Scoones (2000: 581)

2.2.2 Agricultural policies and food security in a context of dualistic development

According to Rukuni (2004) and Pazvakavambwa (2004), some of the good things brought about by extension, demonstration and training in small-holder agriculture were negated by draconian policies and inhumane practices such as forced conservation implemented by successive colonial governments in Zimbabwe. Some of the unpopular legislation introduced by the successive colonial regimes to reinforce their policies included the Land Apportionment Act of 1930 and the Native Land Husbandry Act of 1951, which respectively divided the land among the different races and was coupled with resettlement and controlled agriculture by the peasantry. The subsequent Agricultural Produce Act limited the tonnage of maize that black farmers could produce (Zimbabwe, MHTE, 2002). The table (2.1) below chronicles some of the structural factors and related policies and how they projected the extension services in the eyes of the peasant farmers:

Table 2.1 Structures, policies and associated extension approaches in pre-independent Zimbabwe (adapted from Rukuni, 1994)

Policy focus	Supporting structure	Extension approach	Year
Nil (no Government support)	Personal initiative (Alvord), technical training	Demonstration, Persuasion, formal agricultural service to black communal farmers	1920
Introduction of formal agricultural extension	Native Commissioners as recruiting agents, Alvord as trainer in general	Demonstration, general agricultural advisory service	1924

	agricultural advise		
Native instruction	Department of Agriculture; Department of Native development	Demonstration, general agricultural advisory service	1926
Political Control	District Commissioners in direct control	Coercion, prescription, law enforcement	1927
Governance and control	Department of Native Development	Coercion, prescription, law enforcement	1929
Governance and control	Division of Native Affairs (administration section)	Coercion, prescription, law enforcement	1933
Governance and control	Division of Native Affairs (Department of Native agriculture)	Coercion, prescription, law enforcement	No date supplied
Governance and control	Ministry of Internal Affairs (Department of Native agriculture), under the Federal government of Rhodesia and Nyasaland	Coercion, prescription, law enforcement	1953
Management of African Agriculture, control, preservation/conservation	Ministry of Agriculture (Department of Conservation and Extension, CONEX), under the new Southern Rhodesia government	Coercion, prescription, law enforcement. Limited inputs	No date supplied
Control, preservation, conservation	Ministry of Internal Affairs (Department of Agricultural Development, DEVAG)	Coercion, prescription, law enforcement, selective. Limited inputs	1969
Control, survival	Ministry of Internal Affairs (Department of Agricultural Development, DEVAG)	Low level to non-existent due to war intensification. Extension workers perceived as government agents ('police', informers, collaborators, sell-outs).	1972-1979

The protracted armed struggle that eventually led to negotiations between warring parties and Zimbabwe's independence was justified by its leaders as a process of emancipation based on addressing the land issue.

2.2.3 Post Independence Agriculture and the Land Reform era: an ethic of Propriety and Political Economy

At independence in 1980, agricultural extension in the rural (and urban) community sector, including resettlement areas, was championed by the Ministry of Lands and Agriculture through the then Departments of Conservation and Extension (CONEX) and the Department of Agricultural Development (DEVAG). Eventually the Department of Agriculture, Technical and Extension Services (AGRITEX), which amalgamated CONEX and DEVAG in 1981, took over the implementation of government agricultural policy, and has itself undergone several structural and policy changes, gradually taking on a more participatory approach to extension (Rukuni,

1994). In 2005, the extension department transformed into AREX (Agricultural Research and Extension Services), when the Ministry of Agriculture split to give way to the Ministry of Lands and Rural Resettlement which champions the land reform programme.

The commercial agricultural sector continued to develop relatively independently from the public sector, with the former dominated by white private land owners and the latter driven by black peasants in rural and resettlement areas, with no title (deed ownership). This separation went on quietly for some time, with the commercial sector producing cash crops such as tobacco and cotton which generated a steady supply of foreign currency, and also food crops such as staple maize, wheat, legumes and horticultural crops. These food crops were usually enough to feed the nation even in a drought year, with the support of reserves. The production, marketing and reserve system was so good that it qualified Zimbabwe as host to the SADC Food, Agriculture and Natural Resources Directorate's Early Warning System, and earned the country the title of 'bread basket' of the region.

The current agricultural sector paradigm in Zimbabwe is dominated by the Land / Agrarian Reform discourse. In 1997 the Government of Zimbabwe introduced legislation to compulsorily acquire land, mainly from commercial white farmers, as a strategy to redistribute land among the populace. At independence in 1980, 75% percent of the land area was in the hands of mostly commercial white farmers. These farms were concentrated mainly in the watershed areas, with high rainfall, good soils and warm temperatures. A variety of crops were being grown on these farms, with a pre-dominance of maize as the national staple, and winter wheat for supplying flour to the local bread market. Tobacco was the major foreign currency earner, and like maize, was grown under irrigation during the dry spells. Other cash crops grown on the commercial farms, and also in communal areas, mostly Gokwe in the Midlands Province, included cotton, which supplied the local textile industry and the export market. Commercial farming areas in the cooler high rainfall areas of Manicaland were under potatoes and fruit trees such as apples and nectarines.

According to the Governor of the Reserve Bank in a Monetary Policy statement for the Agricultural Sector (Reserve Bank of Zimbabwe, RBZ 2005: 6), "Agriculture is at the heart of the Zimbabwean economy, accounting for as much as 17% of GDP, about 27% of employment and 33% of total foreign exchange earnings". The table

below gives an assessment and prediction of the contribution of agriculture to the national economy using output, foreign exchange and employment as indicators:

Table 2.2 The contribution of the agricultural sector to the national economy (adopted from RBZ, 2005: 6)

Indicator	20001	2002	2003	2004	2005 Forecast (drought scenario)	2006 Target	2007 Target
% contribution to GDP	21.4	17.6	14.6	18.1	25	27.5	30
% contribution to Foreign Exchange	39.4	35.9	30.9	22.9	30	35	45
% contribution to employment	24.5	22.9	22.1	20.0	25	27.5	30

Food security, with specific recognition of maize and wheat as key staple food products, is also recognised as a key agriculture factor in the economy and a critical component of disinflation. A strong positive correlation has been noted over the years between drought episodes, pronounced food shortages and higher overall inflation (RBZ, 2005). The Reserve Bank complements Government in its view of agriculture playing a key role in turning around the economy through effective use of the land in the agricultural reform era. According to the Governor of the Reserve Bank (RBZ, 2005: 8, 9),

The battle cry at this stage is, therefore, for all those who hold land to view this resource as an effective means of economic emancipation, rather than as a status symbol. ... The distribution of land has been an emotive subject for the past 5 years attracting international and media attention. **However, there is no need to go back on land reform as that chapter is closed.** What is important now is to focus on unity of purpose and how to enhance productivity. (My emphasis)

The current post-land reform era is characterised by risk and sensitivity to the elements of the weather, mainly drought, due to the break down of the irrigation infrastructure and consequent reduced ability to produce adequate maize in a drought year. Bread has increasingly faced shortages with demand far outstripping supply, as seen by long bread queues. Foreign currency shortages in the country can also be attributed to reduced export of tobacco, where production has fallen sharply. Due to occupation of commercial farm areas, and opening up of previous woodland, a lot of wildlife has been decimated, and a lot of tree species have been clear-felled.

The land reform programme has been viewed with mixed feelings by the international community, with harsh criticism from the Western countries mostly, and indifference or quiet diplomacy from most SADC states. The Government of Zimbabwe, due to the general shortage of foreign currency, fuel, and agricultural inputs, has expressed feelings of resentment against economic sanctions and an embargo. A lot of debate has ensued ever since as to the moral rightness of the procedures that were followed, especially the fast-track land re-distribution programme. In addition, questions have been raised as to whether the land re-distribution programme has benefitted poor farmers crowded in the communal areas enough to relieve population pressure on these lands, improve the natural environment, and improve the people's food security. Whatever the reality is, the land issue in Zimbabwe is based on an ethic of propriety with its roots embedded in the processes of colonisation, settlement, revolutionary armed struggle, land redistribution and resettlement, transfer of ownership, utilisation and productivity.

What this historical and contemporary overview of the agriculture sector projects is a challenge to be reflexive in weighing the costs and benefits of modern agricultural policy and praxis, with specific reference to agricultural training and extension. It gives opportunity to review the effects of omitting indigenous ways of knowing, and reflect on the ways of sustainably addressing the land issue in order to inform quality improvement in agricultural training and extension policy and praxis. This research uses the dynamics of farmers' choices of cultivated food plants as a window to explore the role of learning interactions among farmers and between farmers and extension agents in enhancing food security.

2.2.4 The Master Farmer Training Scheme (MFTS) and extension

The MFTS is today the Ministry of Agriculture's flagship programme for non-formal farmer training in the communal lands. Emory Alvord introduced this Training Scheme in 1926 through the then Department of Native Affairs of the Southern Rhodesia Government, as discussed in sections 2.2.1 and 2.2.2 above. This scheme has been in existence ever since, up to today, having undergone several modifications in policy but maintaining most of the original training approaches, at least in theory. The MFTS approach to farmer training was born out of an initiative to train peasant farmers through demonstrations made on demonstration plots set up by Alvord in 1920. Alvord applied simple scientific techniques of crop husbandry, which

gave good results of exceptionally high yields of maize crop. This improved productivity gave justification to the idea of training peasant farmers on a curriculum based on scientific methods of crop husbandry.

The MFTS was based on training agricultural demonstrators using a training programme at a training institution.

After training, the demonstrators cultivated plots in the reserves they were posted to and showed by example that more scientific and intensive methods of Agriculture could greatly improve the farmers' yield.

(Zimbabwe, AGRITEX, 1994: 1).

The MFTS thus worked through a system of farmer experimentation and demonstration, with assistance from Demonstrators. A certificate is awarded to farmers completing the course and for being a good "example to others" (Zimbabwe, Agritex, 1994: 2). The now Agricultural Research and Extension Services (AREX), then the Department of Conservation and Extension (CONEX), started to officially run the Advanced Master Farmer Scheme in 1981. The qualities of a Master Farmer are that this must be any farmer who (during training) has:

- Grown a grain crop in a specified area for two successive years,
- Grown another crop in a requisite area in two successive years,
- Achieved the target yield (as set by the District Agricultural Extension Officer) in the two years,
- Attended at least 24 of the 30 formal training sessions given by the Agricultural Extension Worker,
- Attended a four-day Veterinary and four-day Farm Machinery course run at district or provincial level in one of the two years,
- Achieved at least 50% in the first year and 60% in the second year by practical assessment in each of the four subjects recorded in the trainee record book, and
- Passed an oral examination at a level of 60% and above in each of the four subjects indicated above at the end of the second year.

(Government of Zimbabwe, AGRITEX, 1994: 1)

The Advanced Master Farmer is defined as a literate Master Farmer who has a fifth subject Farm Management and has passed all enterprises with a certain minimum standard, including completing a farm budget approved by the District Agricultural Extension Officer.

Alvord portrayed the ideal African farmer, termed the intensive "Master Farmer", applying modernistic scientific-based methods to a small land area, which would be a

source of teaching by example. The instructional philosophy was based on the assumption that as trained demonstrators raised crops using improved methods on land availed by interested farmers, more farmers would volunteer to learn by doing through practical instruction, having seen the bigger and better crops produced. Alvord's approach gained ground both politically, as it was perceived as civilising and recommended less land allocation to black farmers on the pretext of avoiding further land degradation being blamed on them, and economically as it staved off land demands by Africans, thus ensuring a steady supply of commercial farm, mining and industrial labour.

We scored a lot of successes in Manicaland Province through dedicated and experienced demonstrators, right through to independence and after. We lost some ground in our individual farmer approach though, because the volunteer farmers were in some cases isolated by their communities and labelled traitors for working with the white man. The agricultural demonstrators were also politically stigmatised and their status degraded by the teachers who labelled their jobs as inferior (AD1, personal communication, June 20, 2006).

An extreme case of such polarisation is illustrated by Nyambara (2002) in the case of immigrants evicted from a farm and translocated to Gokwe district who were called *madheruka* (literally, those evicted from the monarch's land, mimicking the sound of trucks that brought them) by the local population, whom they in turn called the *shangwe* (literally, backward). The *Shangwe*, who among other 'laggard' characteristics were late in adopting the newly introduced cotton crop, which the Madheruka master farmers quickly adopted, viewed the immigrants with suspicion because they brought with them the white man's technology, and despised them as backward. These ethnic labels were further exacerbated by the modelling of *madheruka*, who were given preferential extension and credit facilities. This self-validating reductive tendency resulted in targeting of *madheruka* in the 1970s by the guerrillas during the armed struggle, whom they regarded as colonial collaborators and thus enemies of the people. In comparison, Alvord's agricultural demonstrators were generally called *madhomeni*, a derogatory term used by the people whom they were supposed to serve.

Today the Master Farmer Training Scheme remains the Ministry of Agriculture's main formal extension curriculum for communal farmers. However, because of the apparent lack of training and leaning support materials, this programme's potential is not being fully utilised. On the whole, it remains a preserve for the Agricultural Extension Workers, yet networking opportunities exist for NGOs to assist these

programmes in as much as their training programmes are facilitated by Agricultural Extension Workers.

2.2.5 Other Learning contexts of the smallholder rural farmer(s)

Apart from the learning opportunities provided by the MFTS, subsistence farmers in the rural areas are also exposed to various learning contexts, ranging from farmer to farmer exchange to training offered by NGOs in sustainable agriculture.

2.2.5.1 Farmer to Farmer interactions

A number of farmer to farmer interactions are facilitated by the Department of Agricultural Research and Extension (AREX), and these include Agricultural shows at district and provincial level, including the Master Farmer Training courses. Other training courses, such as improved horticultural production, are also run by AREX according to the farmers' needs, and they appear to be more frequent than the MFTS. The NGOs have also facilitated seed and food fairs over the past 10 years, and Government within the past three years has also mainstreamed these. Before harvest time, the AREX department has also facilitated field days to demonstrate a good crop by an identified farmer. In many cases, such field days have lately included other stakeholders invited by AREX, including NGOs. The Zimbabwe Farmers' Union (ZFU) is also active in facilitating such activities.

According to Kruger (1995), the Farmer to Farmer movement is an approach to sustainable development and 'extension' that arose out of the fall out of Green Revolution technologies in the 1970s compounded by political crises of the 1980s and economic recession of the 1990s in Central America. It has since proved to be successful. From its origins in Guatemala, the farmer to farmer movement spread across Central America to, for example, Mexico, Nicaragua, Costa Rica and beyond to Africa. Another opportunity afforded farmers to interact in a learning context is through look and learn visits or study tours, where farmers' capacity needs can be addressed through an experiential facilitated by AREX or NGOs, or hopefully themselves.

2.2.5.2 Sustainable agriculture training in southern Africa

The sustainable agriculture movement in southern Africa started with NGOs, such as the Participatory Ecological Land Use Management (PELUM) network in the 1990s (Mukute, 1996). It arose as a response to the environmental degradation arising from poor farming methods in the over-populated communal areas. It has raised interest and trust among the rural farmers and Government extension services, to such an extent that much training is conducted through partnerships between Government extension and NGOs. Such techniques as permaculture mimic traditional and natural methods of farming such as inter-cropping, organic manuring, promotion of open-pollinated varieties of seed, and especially local seed. In Zimbabwe such training is done on site for farmer groups or schools facilitated through the PELUM, the FAO farmer field schools, Zimbabwe Institute of Permaculture networks and other NGOs.

2.2.5.3 Inter-generational knowledge transfer and learning

Studies on learning environments by Taylor and Mulhall (2001) indicate that farmers learn from their school-going children, and *vice versa*, and more so if the learning environments of the home, the school and the community are strong. They contend that “these three learning environments are often rather weakly linked and the experiences gained in each, although individually of great value, are seldom drawn together and integrated in the learning process” (see Figure 2.1 below).

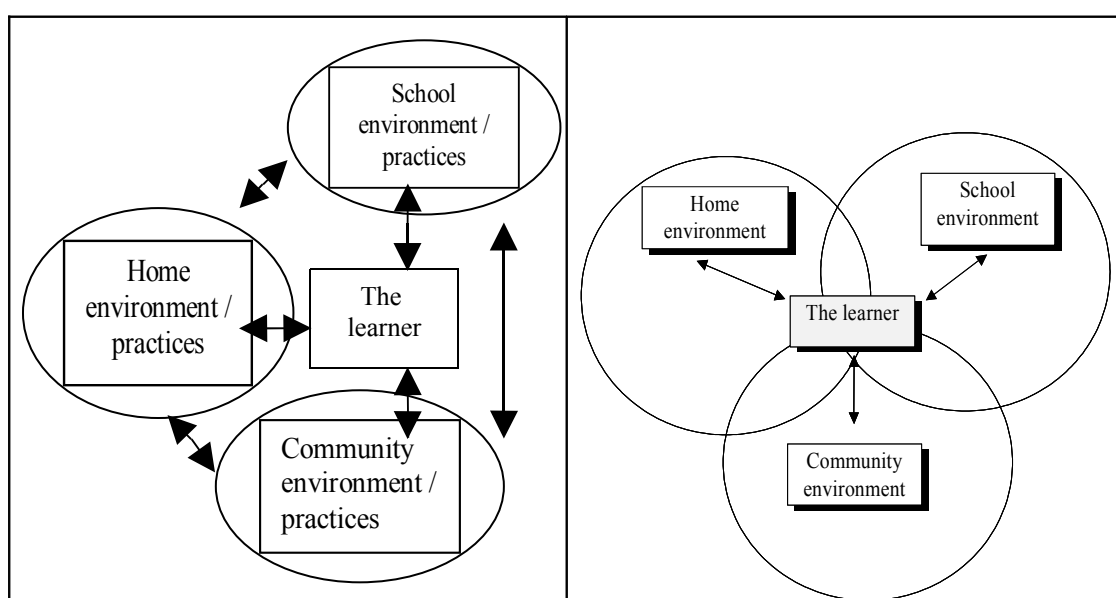


Figure 2.1 *Linkages between school, home and community learning environments (left: weakly linked; right: strongly linked). Adapted from Taylor and Mulhall (2001: 138)*

The diagram on the right shows the ideal situation where the linkages between the learning environments are strengthened and the interfaces between them are

maximised, leading to more effective learning occurring. Agricultural extension workers, teachers, parents and their children have a role to play in strengthening the linkages above in an agricultural context.

Some lessons could possibly be drawn from traditional education. The traditional African learning environment is / was characterised by learning through doing, whereby children learnt the daily household chores and how to do them better from their adult relatives. Historically, the learning process was gender-based, with the girls learning from their mothers and aunts how to prepare food, clean the home and conduct courtship; and the boys learning from their fathers and uncles how to make and use farming implements, among other things. This kind of learning was believed to shape the children's characters for the *ubuntu* / *hunhu* (Government of Zimbabwe, 1999) that society expected. Willemsen et al. (2007: 469) observe that

When certain crops or varieties are not grown anymore, young people do not learn about them and the cultural history related to them disappears as well. As a result, food security and the possibility to live autonomously and with dignity are at risk. The process of losing biodiversity can therefore be seen as a consequence of 'disconnection' between farmers and their crops.

2.3 SOCIAL LEARNING

This section will examine the role of social learning in improving performance of farmers and extension agents in their food security practices. The rapid evolution of knowledge and realities (alluded to in the introduction in Chapter 1), and global imbalances have unfortunately led to the accelerated destruction of earthly biodiversity, but also increased knowledge to mend damage. However it appears there are no quick fix solutions or do-it-yourself corrective manuals for environmental damage. The role of education in this scenario has been debated in two competing strands of thinking in relation to learning which focus on human behaviour and human empowerment (Scott & Gough, 2003).

Socially critical theory challenges the former position by arguing that behaviourist approaches were an "attempt at a technocratic quick-fix of environmental and educational problems". Freire (as cited in Scott & Gough, 2003: 52) argues for an emancipatory role for education. According to Grieshaber (1994: 17) "development is a process of change ... Participatory development enhances human potential through a dual process of education and planned action". My approach is to use

social learning theory to explain the learning interactions apparent among members of the Ziwa and Marange communities. The African context in which these two communities are found has a rich social fabric that develops and strengthens itself through social learning. Social learning is appropriate because it takes account of the role of culture, context and language, which are inherent in the communities under study (Janse van Rensburg & Lotz-Sisitka, 2000). The prior understanding, experiences and points of view of the community and its individuals are valued. Daniels (2001) draws attention to Vygotsky's focus on a dialectical method and the tensions arising between models of internalisation and appropriation of social, cultural and historical influences in (sustainable) development. This emphasis has a bearing on an understanding of the learning interactions within the Ziwa and Marange communities as outlined above.

Relational philosophy underpins the theoretical framework to the study, as it applies to the communities in the study. It is an ontological position that perceives the world as a process and product of dynamic and unfolding relations (Emirbayer, 1997). This differs from substantialist perspectives whose notion is that "it is *substances* of various kinds which constitute the fundamental units of all inquiry". I choose instead the relational perspective. According to Emirbayer (1997: 287), in a relational point of view,

... the very terms or units involved in a transaction derive their meaning, significance, and identity from the (changing) functional roles they play within that transaction. Things "are not assumed as independent existences ... but ... gain their whole being first in and with the relations which are predicted of them. Such things are terms of relations, and as such can never be 'given' in isolation but only in ideal community with each other" (Cassirer, 1953: 36).

It can thus be concluded that "a relational perspective emphasises *mutuality* and *reciprocity* as the underlying principles of existence" (Lupele, 2007: 14, my emphasis). These characteristics are often described as typical of traditional African communities. I shall use the communities of practice concept and critical realism as two related relational theories to inform my methodology, explaining the learning interactions in communities in the study, and to analyse causal relations that influence the experiences and practices in these communities of practice.

2.3.1 Communities of practice as an epistemological lens

Lave and Wenger's (1991) recently conceived **communities of practice** concept and situated learning are useful tools in helping to understand the role of social learning (amongst small grains farmers, nutrition garden groups and bee-keepers). I consider these farmers to be communities of practice because they are learning together, with minimum external support, how to choose and grow appropriate crops for food security and agro-biodiversity. For example, they are growing the same small grains together and passing on seed to neighbours to reduce risk of avian (bird) destruction, but also extending an age-old traditional practice of sharing that ensured community seed security. A community of practice is described as different from a community of interest or a geographical community, because they do not imply a shared practice. Hence, not every community is a community of practice

Wenger (2007: 1) defines communities of practice as “groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly”. A community of practice thus defines itself along three dimensions:

- **What it is about** – its *joint enterprise* as understood and continually renegotiated by its members
- **How it functions** - mutual engagement that bind members together into a social entity
- **What capability it has produced** – the *shared repertoire* of communal resources (routines, sensibilities, artefacts, vocabulary, styles, etc.) that members have developed over time. (Wenger, 1998: 2, my emphasis).

Communities of practice are self-organising systems that develop around things that matter to people (e.g. food security) and also move through various stages of development characterized by different levels of interaction among the members and different kinds of activities. The three characteristics of a community of practice are:

- A shared **domain** of interest. Membership implies commitment to a domain (e.g. crop farming), and thus shared competence that distinguishes members from other people,
- The **community** members engage in joint activities and discussions, *help each other* and *share information*,
- Members of a community of practice are practitioners who develop a **shared repertoire** of resources forming a **shared practice**: i.e. *experiences, stories, tools, ways of addressing recurring problems*. (Wenger, 2007: 2, my emphasis)

An important characteristic of learning in a community of practice is legitimate peripheral participation (LPP). This is a process whereby newcomers or novices

gradually gain identity in their new community by observing the experienced 'old timers' engaged in the practice, and then through co-participation they take on some of the tasks. (It is worth noting that LPP also applies to experienced individuals joining a community of practice).

Learners inevitably participate in communities of practitioners and the mastery of knowledge and skill requires newcomers to move toward full participation in the socio-cultural practices of a community. A person's intentions to learn are engaged and the meaning of learning is configured through the process of becoming a full participant in socio-cultural practice.

(Lave & Wenger, 1991: 23).

Based on this background, Wenger (1998) proposes a social theory of learning that is located at the intersection of intellectual traditions along two main axes (see Figure 2.2 below).

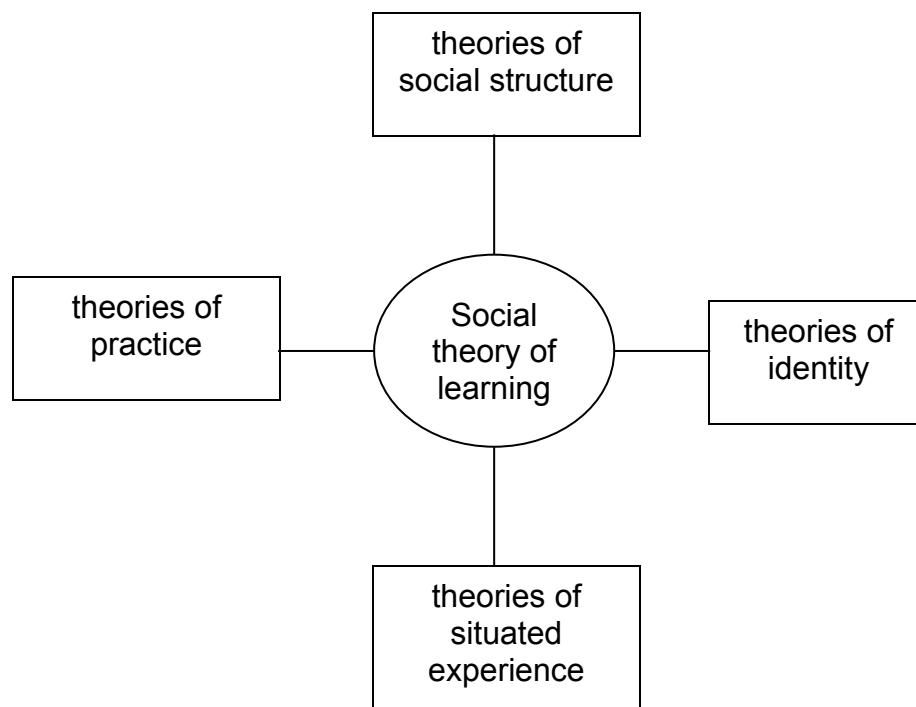


Figure 2.2 *Two main axes of intellectual traditions constituting a social theory of learning (after Wenger, 1998: 12)*

Whilst they recognise that communities of practise form naturally, Wenger et al. (2002) argue that organisations or community groups need to proactively and

systematically develop and integrate them in their strategy. This, they argue, will steward these communities to reach their full potential without dampening their valuable inner drive. They thus propose that *cultivating* communities of practice is the cornerstone of an effective knowledge strategy.

The research orientation and theoretical framework reflects an underlying assumption of an epistemology grounded in shared practice. It also supports the view that there is more than one way of viewing reality (pluralistic ontology), allowing for equal consideration of, and respect for the contributions of members of the communities of practice under study, as they come from different backgrounds, and may bring in different experiences due to social dynamics such as migration and training. Salomon (as quoted in Daniels, 2001: 70) refers to this concept as “**distributed cognition**”, whereby cognition is distributed among individuals and knowledge is socially constructed collaboratively, thus making it essential for a community of practice to share common resources.

Seed security is a moral imperative and the cornerstone of food security in subsistence rural communities. It has seen these communities live and survive over many years in good and bad times. Modernistic developments and climate change have brought with them several challenges for these communities. According to Willemsen, et al. (2007: 465)

.... for more than 800 million people living in the more marginal and heterogeneous areas, food security and poverty continue to be a daily challenge. They have hardly benefited from modern agricultural technologies.

In this research, a farmer is perceived as any adult, male or female, who is involved with tilling the land and cultivating crops for food production and / or marketing, and incorporating a livestock unit or none, using land they own, lease or share. It also refers to non-adult such players, who may be heading households or actively lending a helping hand to parents or guardians. Such farmers have been referred to by various names, such as subsistence farmers, communal farmers, and smallholder farmers (Mukute, 2002).

This research context explores food security systems supported by indigenous ways of knowing, and the value added and disruption brought in by colonial agricultural systems, the establishment of an agricultural market economy brought in by commercial farming, hybrid seed production and marketing by seed houses and

associated inputs, and the loss of agro-biodiversity resulting from genetic erosion and loss of open pollinated varieties due to changes in food production. The reclamation of agency by communal farmers is explored from literature and examined from the field research findings in Chapter 4.

The contexts of risk and vulnerability from HIV/AIDS, persistent and more frequent drought cycles, loss of indigenous ways of knowing, as discussed in this chapter shall be used to question the role of education. Education for environment and sustainability in such contexts will only be relevant if it addresses issues of improving risk perception and risk reduction and clarifying relationships between health, environment and education (Lotz-Sisitka, 2004). For rural communities, risk factors are a daily threat to be reckoned with, and making the right choices may mean the difference between self-sufficiency and dependency, pride and prejudice, life and death.

2.3.1.1 Social learning as a response to risk and complexities in communities of practice

A research commissioned by the SADC Regional Environmental Education Programme (SADC REEP) in 2005 on supporting Education for Sustainable Development (ESD) reports that ESD practitioners need to engage with complex and contested issues (Lotz-Sisitka et al., 2006). Here it is argued that

ESD practitioners are often faced with sensitive and contradictory topics such as gender-related concerns... Environmental issues are also human rights issues, and there is a need to recognise the contradictions and tensions in many of the issues that are dealt with ... (Lotz-Sisitka et al., 2006:23)

For the purposes of this research such complex issues include the passing of ambivalent messages to farmers on what is best to plant, what to plant and when to plant for sustainable food security. The report further argues for the need for capacity building of professionals to deal contextually with complex issues.

Wals (2007) brings in the issues of risk and contested issues at the heart of social learning in response to sustainability issues. He views sustainability emerging within an educational context as both a product still evolving and as a process of engagement. He argues that

Through facilitated social learning, knowledge, values and action competence can develop in harmony to increase an individual's or a group's possibilities to participate more fully and effectively in the resolution of emerging personal, organisational and/or societal issues. In social learning, the learning goals are, at least in part, internally determined by the community of learners itself.

(Wals & van der Leij, 2007 in Wals 2007: 19)

2.3.2 Critical Realist theory as an ontological lens

Critical Realism, like the communities of practice perspective, is a relational theory that I believe will be relevant to help me gain a deeper insight in examining the data. According to critical realism, the world is inherently transformative, that is, there is more than one way of viewing reality. Central to critical realism is a concern with explanation (Delanty, 2005). A critical realist perspective provides me with a model for explaining how effects are brought about (causations), with a view that there are different levels of causative factors. These causal factors can be unpacked through a causal analysis relating potential causes and effects, and in the context of this study, between learning and choices. According to Wilkgren (2004: 13) "critical realists are concerned with ontological depth and identifying causally efficacious mechanisms". She draws from Baskhar's writings and sees critical realism being used to analyse more deeply what the underlying causes are in a wider context.

It is not my intention to discuss the current dualism debates of critical realism, or the key question facing sociologists, whether to choose between substantialism and relationalism (Emirbayer, 1997) for their explanatory powers. Rather, given my interest in learning **interactions** and thus relational dynamics of the learning process, I have tried to identify theoretical vantage points that will assist with a relational analysis. Learning in communities of practice is influenced by structures that may either support the process and result in a positive change, or structures can also constrain the agency of people learning in a community of practice.

To further clarify my understanding and use of critical realism in this study, I shall briefly explain some concepts used, which are central to sociological analysis. These include the perception of reality, power, structure and agency, causations and causal analysis.

2.3.2.1 Reality

According to realists, “an external reality which is independent of human consciousness exists and can nevertheless be known” (Delanty, 2005: 145). They claim that reality is morphologically ‘emergent’, and hence is not easily observable as postulated by positivists, who explain regular occurrences in terms of observable cause and effect. Critical realism perceives the positivist view as reductionist, as it reduces the social world to objects and facts which can be observed. Critical realists thus distinguish *our knowledge of the world* from *the reality of the social world*. The notion of emergence refers to “a condition of contingency by which social reality emerges out of the interaction of different processes” (*ibid.*: 148).

Baskhar identifies three levels of reality, being the real, the actual and the empirical, which define the realist ontology (Delanty, 2005; Sayer, 2000).

The **real** is whatever exists, be it natural or social, regardless of whether it is an empirical object for us, and whether we happen to have an adequate understanding of its nature. The real is characterised by objects, their structures and causal powers; and these may be physical or social. It can be seen as the objective world.

The **actual** is the reality that happens when the real is activated.

The **empirical** concerns the realm of human experience, that is the way in which either the real or the empirical is subjectively experienced.
(Sayer, 2000: 11; Delanty, 2005: 146, 147)

2.3.2.2 Power and power relationships

While substantialist perspectives view power as a possession, and in common talk as “something to be ‘seized’ or ‘held’” (Emirbayer, 1997: 291); in a relational approach

the concept of power ... is transformed to a concept of relationship. At the core of changing figurations ... is a balance of power moving to and fro. This kind of fluctuating balance of power is a structural characteristic of the flow of every figuration (Elias, 1978: 131 in Emirbayer, 1997: 291-292).

Quoting Michel Foucault, Emirbayer (1997: 292) observes “relations of power... as immediate effects of divisions, inequalities and equilibriums which occur in other types of relationship such as ... power relationships and economic processes”.

2.3.2.3 Critical realism as a methodology: causations and causal analysis

According to Delanty (2005: 147),

Critical realists investigate the mechanisms by which effects operate, the powers and properties that they produce and the intricate inter-linkages between the different levels of structures which all make causation very complex and thus, irreducible to single factors.

This approach is supported by renowned critical realists such as Baskhar and Sayer. Critical realism thus provides a model that seeks to explain how something is brought about, instead of reliance on simplistic cause-effect models, which ascribe an observable cause to every observable effect. It thus transcends the concept of problem and objective tree diagrams, for example. In this respect, social scientific knowledge is seen to share with natural science the notion of explanatory knowledge ultimately, as both have this power to generate knowledge of reality “as it really exists” (Sayer, 2000: 14). Bhaskar’s method proposes that phenomena are identified, and then investigated and explanations are proposed and undergo empirical testing. The idea will be to find generative mechanisms. “Explanation depends on identifying causal mechanisms and how they work, and discovering if they have been activated and under what conditions” (*ibid.*). He proposes that “when causal powers are activated the results depend on other conditions (the kind of context, tools, etc)” (*ibid.*), and presents the idea diagrammatically as follows (see Figure 2.2 below):

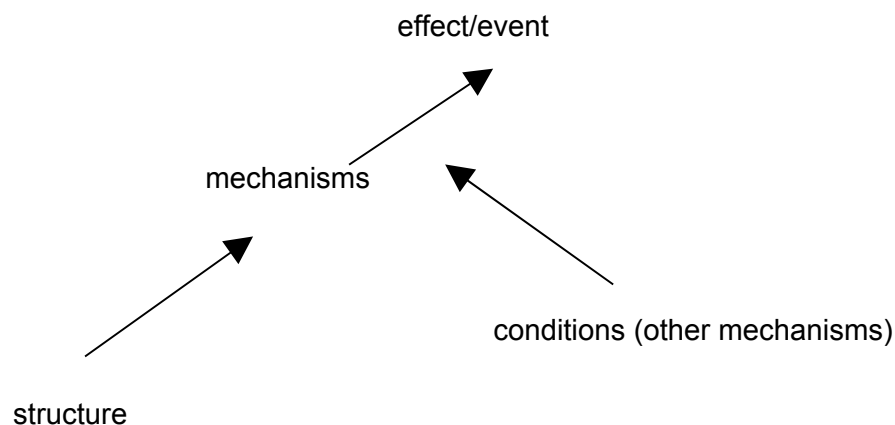


Figure 2.3 Critical realist view of causation (after Sayer, 2000: 15)

Archer (2003) takes these views further by stressing the importance of social transformation through structure and agency (see section 2.3.2.4 below).

With respect to my research goal, I have used a critical realist view of causation to analyse the causes of or influences that may be affecting the choice and agency among farmers’ agricultural food production cycles (see chapter 5).

2.3.2.4 Structure and agency

Archer (2003) perceives the concepts of 'structure' and 'agency' as inter-related but contested terms, with the former having essentially objective and the latter subjective characteristics. A common perception of agency is a notion of

“human will”, as a property that “breathes life” into passive, inert substances (individually or groups) that otherwise would remain perpetually at rest. By contrast the relational point of view sees agency as inseparable from the unfolding dynamics of situations ... Agency entails the engagement by actors of different structural environments [which] both reproduces and transforms those structures in interactive response to the problems posed by changing historical situations.

(Emirbayer, 1997: 294)

Agency then is a way through which different people experience the world in different situations, as they “enter into relationship with surrounding persons, places, meanings, and events”, (*ibid.*). It describes the capacity that individuals have to act independently and collectively and to make their own free choices in relation to the contexts, histories and structures in which they find themselves.

According to Sayer (2000: 14), structure implies “a set of internally related elements whose causal powers, when combined, are emergent from those of their constituents”. He takes the example of hierarchical structures having the potential for delegation and division of tasks. Structures may be physical or social. In social structures, positions of persons are ascribed to certain roles in social relations, which exert a certain influence on what happens. Some of the factors that make up structure include customs, religion, social class and gender, and they may either influence or limit the opportunities of individuals. The actions of individuals and corporate bodies, because they are internally related, then depend on their relation to others.

The influence of structure and agency on human thought and behaviour is a central sociological issue that continues to be debated, but is also an influence that is patently obvious in contexts like Zimbabwe (and elsewhere) where structural factors such as economic change influence choices and associated agency.

2.4 FOOD SECURITY AND THE ROLE OF THE TRADITIONAL SEED BANK AND TRADITIONAL LEARNING

Successful cultivation of food crops depends on the availability, accessibility, acceptability and knowledge of desired planting material (seed), manifested in various forms such as grain; stem, root or leaf cuttings; tubers, rhizomes, corms or bulbs; and root stocks and scions. It is also critical that seed is planted at the right time and supported by the right environmental conditions, especially of soil and water integrity and protection of the plants. This makes seed security for the subsistence farmer a prime factor of food security. Shiva (2005) describes seed saving as not only humankind's ethical duty, but also a human right. She links food security to traditional seed banks through the food chain, "seed is the first link in the food chain. ... The seed means the source of life. Saving seed is our duty; sharing seed is our culture" (Shiva, 2005: 94). In Zimbabwe, the traditional seed and food bank called the 'Zunde ra Mambo' is a good coping mechanism in drought conditions, and for the vulnerable members of society. The chief is the custodian of this structure.

2.4.1 Seed security a critical factor of food security

Farmers usually know what their seed security needs and priorities are from indigenous ways of knowing and practices and acquired new knowledge from extension and advertising by seed marketers. Subsistence or smallholder farmers are constantly watching or being influenced by seed dynamics and requirements that in turn influence their seed security and agro-biodiversity practices, making availability of and access to seed a priority.

Mukute et al. (2005) identify, from studies conducted in southern and east Africa by the PELUM Association, a number of issues affecting seed security, which include types of seeds, sources of seeds, community seed needs, availability and practices, division of labour in seed conservation practices and external forces. Important considerations for seed types include the types of crops traditionally cultivated and the varieties occurring in the area, and why farmers prefer those traits and use the specific varieties. Sorghum varieties, for example, cultivated in one area or household may differ remarkably with the next area.

Smallholder farmers' seed sources usually include their on-farm saved seeds from selected crops by specific family members depending on skill, responsibilities and cultural beliefs. Gender plays a key role in this division of labour, with women often involved in the cultivation and processing of small grains, for example, while men are involved with hybrid maize monocultures. Some of the seed is obtained from exchange with neighbours, friends and relatives, while other seed may be bought. A

number of external forces tend to influence household and community seed systems, and these include national legislation and policies, and international conventions and multilateral environmental and agricultural agreements. Examples of positive influences include the Convention on Biological Diversity (CBD) which promotes (agro-) biodiversity and regulates movement and trade in genetically modified organisms (GMOs), including GMO seeds, and the Food and Agriculture Organisation (FAO) which promotes sustainable agriculture and food and livelihood security. Fair Trade policies are critical in the regulation and marketing of seed.

According to Willemsen et al. (2007 in Wals 2007: 465),

Apart from seed being a private good with direct benefits for the farming and rural communities, agriculture and nature also have functions with a value for mankind in general. Agriculture and nature are sanctuaries of genetic resources ... (and) thereby represent public goods and services...

The commercial production and marketing of certified seed is a strictly controlled enterprise. In Zimbabwe the seed production cycle is controlled by the Seed Services Division of the Department of Research and Specialist Services in the Ministry of Agriculture. Breeder seed (F0 generation) and Foundation seed (F1 generation), which are higher quality seed classes, are developed at research stations, such as the Matopos, who also develop either open pollinated or hybrid varieties depending on demand or Government policy. The seed is then distributed to carefully selected seed producers for multiplication and bulking, who are subjected to strict monitoring for the field preparations, isolation, sanitation, harvesting and storage among other criteria. Certified seed, which cannot be continuously grown from one seed generation to the next, is mostly developed by the seed houses, including the Agricultural Rural Development Authority (ARDA). Local NGOs have also attempted to promote seed security, such as ENDA (Environment and Development Activities) Zimbabwe and Biotechnology Trust of Zimbabwe gene banks.

2.4.2 Learning for food and livelihood security

According to Orr (2004: 117), discussing agro-ecological knowledge in retrospect, people learned mostly “from the experience of growing up on a farm or by (making) periodic visits to nearby farms. ...farms were schools of a sort of natural history, ecology, soils, seasons... and land use”. Orr (2004) goes on to identify farms or living off the land as institutions or sources of instruction where learning occurred that made people appreciate the importance of conserving their ecology, “teaching

directly, and sometimes painfully, the relationship between our daily bread and soil, rainfall, animals, biological diversity and natural cycles, which is to say land stewardship" (*ibid.*).

The traditional African home was the learning ground for growing youth, and a continuous learning class for adults. Such traditional activities as rotational communal weeding of each other's fields ('*Nhimbe*' in Shona) over a pot of traditional beer or '*mahewu*', a traditional non-alcoholic opaque beverage, was a forum for learning and sharing information and stories for food security.

Willemsen et al. (in Wals 2007) consider four phases of learning cycles in social learning and participation involving seeds; and these are experiencing (immersing yourself in the task), reflexion (what did you notice?), conceptualisation (what does it mean?) and planning (what will happen next?, what do you want to change?). They use these phases of a learning cycle to design an understanding of multi-level social learning around local seed in a given context. Such a learning cycle could be useful in understanding the social learning involved in the communities of practice of small grain farmers in this study.

2.5 THREATS TO THE TRADITIONAL COMMUNITY AND HOUSEHOLD FOOD SECURITY SYSTEM

A number of risk factors have manifested themselves as real and serious threats to the traditional food production system in Zimbabwe and these include overpopulation in marginal lands and soil erosion, increased drought cycles, introduction of hybrid seeds, genetically modified organisms (GMOs) of grain and seed, donor dependency, protracted food handouts as a disempowering risk factor, loss of farming and food knowledge, and ambivalent messages reaching farmers.

Due to modernisation the food and agricultural system in the USA has dramatically shifted in the last half of the twentieth century with a dominant trend towards industrialisation, resulting in increased centralisation of food production and processing. The corporation has taken over control of production, marketing and labour decisions from the farmer (Garrett & Feenstra, 2000). According to Garret & Feenstra (2000: 1) "Rural communities nationwide (USA) are deteriorating socially and economically and consumers have gradually lost the knowledge about where

their food comes from. In ... rural areas, many people are not able to access fresh, locally grown food”.

2.5.1 Globalising influences on food security

Apart from the CBD and FAO discourses alluded to in section 2.4.1 above, there are other globalising influences which pose a threat to food security. These include the World Trade Organisation which, among other things, is liberalising trade to an extent that gives multi-national corporations extreme forms of privilege and advantage over others. In addition the World Intellectual Property Organisation has increasingly supported the patenting of genetic information by researchers working for multinational corporations, which includes indigenous plant genomes extracted from traditional African food plants.

2.5.2 Seed marketing, hybrids and genetic erosion

Orr (2005) concurs with Lotz-Sisitka (cited in 2.3 above) when he observes that traditional peasant farming practices are repositories of genetic diversity that often grow many varieties which are unfortunately disappearing. He attributes this genetic erosion to the promotion and uptake of a limited number of hybrids sold by multinational corporations. An interpretation of Orr's (2005) description of the mutual exclusiveness of rapid industrialisation and healthy local adaptations giving stability and agro-ecological health to rural communities, is a type of apartheid that has gone wrong, leading to patronisation and unethical practices.

The southern African context of risk has been well articulated by Uttaro (2004: 2-3):

Many smallholder and subsistence farmers, men and women, are no longer able to produce enough food for their families. They are subsistence farmers who cannot afford the inputs necessary for an abundant harvest. It is a sad reality for far too many families in Malawi today. Even under the most favorable climatic conditions, they cannot afford to purchase fertilizer ever since the subsidy was removed under structural adjustment reforms, which started in 1986 and were not really effective until 1994. Without fertilizer, the soil doesn't produce enough maize. Without fertilizer, they plant less hybrid maize, an expensive but less risky alternative to local maize. And with less maize, the number of households affected by an ever-deepening crisis of food insecurity is steadily increasing. Njala – the Chichewa word for hunger – is heard in villages throughout Malawi. Malawi's soils are losing their ability to produce. Food self-sufficiency is a distant and fading goal. Declining soil fertility is constraining food production and has been for a number of years

now... As the depletion and degradation of Malawi's soils continues people who depend on these soils for subsistence are finding that their options to deal with the crisis are severely limited. ... Two ... options [are examined], the use of inorganic fertilizer and the planting of hybrid maize. Both options are interrelated. Maize is the staple food crop in Malawi with two general categories: local and hybrid. Local maize is very popular and many smallholder subsistence farmers plant it. Hybrid maize was developed to intensify production and therefore improve food self-sufficiency. Compared to local maize, hybrid has two distinct advantages. First, it produces significantly higher yields. Second, it matures much faster than local maize and minimizes the risk of crop loss if the rains should happen to end sooner than normal. In the current economic environment, however, planting hybrid maize has two significant drawbacks. The first is the price of the seed. Whereas local maize seed can be obtained from the previous year's crop, hybrid seed needs to be purchased in order to maintain the advantage of higher yields. The other drawback is the requirement of fertilizer. Hybrid is now an expensive investment. With fertilizer now out of the reach of most smallholder farmers, planting hybrid maize is much riskier... Weather has to stand out as the greatest risk all farmers face for the obvious reason that it is outside human agency. Decisions concerning hybrid maize and fertilizer are riskier for poor households in part because the weather can devastate the household's thin economies. If the rains are heavy and the hybrid crop is washed away or the fertilizer leaches through, a significant loss is incurred... Many farmers fortunate enough not to have suffered from the flood in 2001 may not have been so lucky in escaping the ravages of the current drought. It seems likely that these experiences will affect future decisions concerning planting hybrid maize.

Willemsen et al. (2007 in Wals 2007: 468) observe a similar trend in the Ecuadorean Andes, where

....genetic erosion has become a generally accepted fact. (In three highland provinces of Ecuador) ... many small-scale farmers produce for subsistence and the local market. Crops like ... beans and peas have lost importance and are only grown on a small scale. They have largely been replaced by modern varieties of maize and potato. Farmers say this change is a consequence of a limited demand and low prices in the market for the traditional Andean crops as compared to maize and potato. Farmers do not refer to the ecological effects of such changes.

2.5.3 Biological piracy of traditional seed and grain

According to Shiva (2005), several cases of bio-piracy have been recorded, involving expropriation of traditional varieties of Indian wheat through patenting of genome; stealing of Scottish seed potato breeding rights; and withdrawal of traditional rights to exchange seed varieties among Himalayan, Indian, and American farmers, through 'legal' Acts emanating from unethical alliances between Governments and corporations.

2.5.4 Self-validating reduction

A further factor of risk may emanate from social stigma and the self-validating reduction of certain food stuffs, resulting in the exclusion of certain plants from the fields and hence genetic loss (erosion) of such species and their potential hybrids. Intergenerational knowledge transfer may fail to occur if such critical indigenous knowledge practices are relegated and subsequently forgotten. Certain traditional foods such as millet porridge, are in danger of reduction due to obfuscation with uses in feeding terminally ill patients. According to Jickling et al. (2006), such reduction of things in a downward spiral often happens through “descriptive and discursive” (2006: 12) speech, and is a natural phenomenon.

In her memoir, Maathai (2006: 15) laments on the loss of some traditional Kenyan foods and their replacements and/or incorporation of unhealthy foods from other cultures,

The Indian immigrants also brought with them their traditional foods and cuisine and successfully introduced them to the local populations. Salt, fat, and oil, virtually unknown in local food preparation, tasted good and were heavily promoted. Today, many new diseases associated with nutrition find their roots in this sudden change in people’s diets, which for many communities, ... **had been** largely millet, roots, beans, and green vegetables (my emphasis).

2.6 OTHER RESPONSES TO RISK

A variety of responses to the problem of poverty and food scarcity in Zimbabwe have included food and grain distribution by organisations such as the World Food programme (WFP), European Union, USAID and others. Drought mitigation, appropriate cropping, participatory training and learning, reclaiming agency; resuscitation of IKS, seed banks, seed exchange, and enhanced farmer to farmer interactions are amongst other responses to risk.

2.6.1 Formal education: nature study, agriculture, Young Farmers’ Clubs, environmental science and Vocational Technical (Voc-Tech) education

When formal education was introduced to the local population in Zimbabwe by the colonial Government, one of the subjects that was prominent was nature study, which was designed to instil a sense of environmental awareness among learners. This subject has evolved over the years to become Science, Agricultural Science, and currently Environmental Science in primary schools. In the years before and a little after independence, young farmers' clubs were run in schools with the objective of teaching learners how to grow crops in conventional systems. The secondary school curriculum in Zimbabwe provides for an Agriculture subject, which is optional and is unfortunately often taken up by not-so-gifted students. The subject is also offered at advanced levels (pre-University), and is taught in Agricultural Colleges to would-be extension workers, and at Universities. In the 1980s a compulsory 'Education with Production' policy was implemented by Government, but later abandoned as it faced timetabling challenges that interfered with formal lessons, and was perceived by some as child labour.

Environmental Science at primary school has made various in-roads in promoting sustainable agriculture methods in the formal education curriculum. Various initiatives by NGOs such as the Schools and Colleges Permaculture programme (SCOPE), Action, Environment Africa, the Wildlife and Environment Zimbabwe (WEZ) and FAO, have also been instrumental in promoting sustainable agriculture and food security education in schools.

2.6.2 Reviving traditional cultivation and planting systems: Learning through doing

In the traditional education system, knowledge, skills and attitudes were passed from father to son, mother to daughter, and among other relatives, friends and neighbours. A lot of seed sharing and exchange was done, and people had a culture of saving the good seed and preserving it for the next growing season. Special grain for seed from favoured crops was preserved by the women, especially grandmothers, who among other methods, used the kitchen fireplace as a source of sooty smoke to preserve seed hung above it from the roof, for example maize still on the cob. The women traditionally also had their small plots where they grew varieties of crops together, for example sorghum, round nuts, cow peas, cucurbits and sweet reeds. The granary was known to store both grain for food and seed for the next cropping season. The maize granary was generally managed by the men, who ensured that a certain

proportion of the grain was left for seed. Some granaries were literally sealed using mud to preserve grain for periods of disaster. The chief's role was to maintain a field for communal cultivation of selected crops (*Zunde ra Mambo*), with the produce stored at the chief's homestead to serve a fall back mechanism in case of a food problem in the community, and to feed the disabled or those not able-bodied and with no relatives to help.

Garrett and Feenstra (2000: 1) observe that in the face of reductive trends,

A movement toward more community-based food systems is gaining momentum. A community food system is one in which sustainable food production, processing, distribution and consumption are integrated to enhance the environmental, economic, social and nutritional health of a particular place (see Figure 2.4 below).

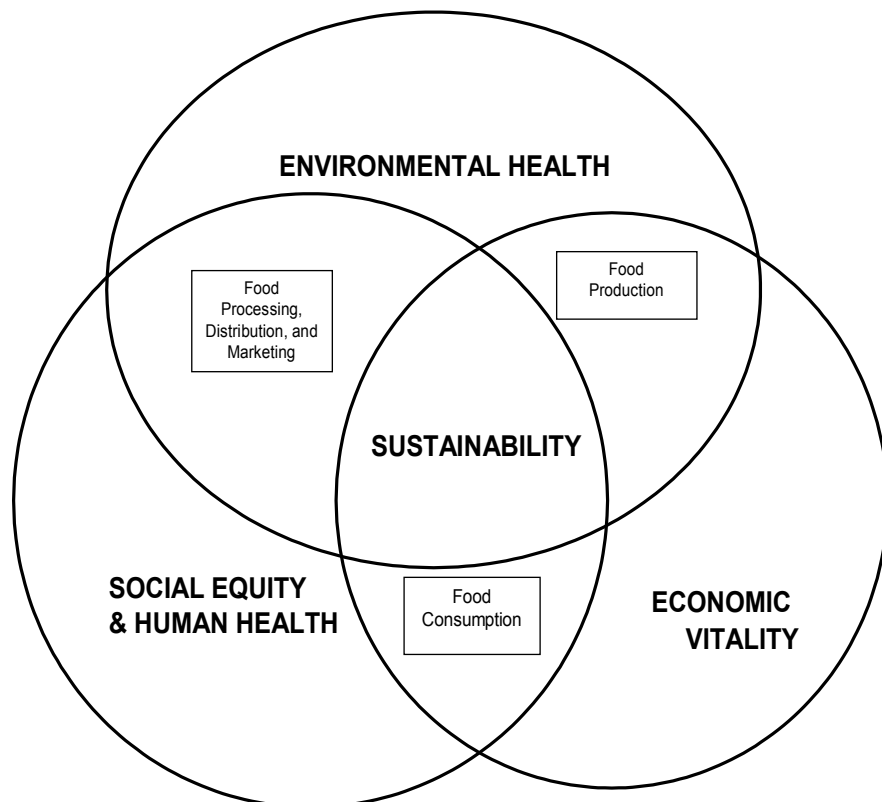


Figure 2.4 Goals of a Community Food System (after Garrett and Feenstra, 2000)

A few NGOs in Zimbabwe, e.g. Southern Alliance for Indigenous resources (SAFIRE), Chikukwa Ecological Land-Use Community Trust (CELUCT), Towards Sustainable Use of Resources Organisation (TSURO Dze Chimanimani), and Environment Africa are assisting communities to produce, process and market their produce.

2.7 SUMMARY

This chapter has looked at the historical context of agriculture in Zimbabwe, in terms of policies and legislation affecting farmer's cultivation and food security practices. It has also given an insight into the Master Farmer Training Scheme, the Government's flagship farmer training and extension programme. The chapter has also highlighted major environmental issues and risks arising from the cultivation of food crops, such as loss of traditional food varieties and soil nutrients, and the effects of globalising influences such the WTO and the risk of genetically modified (GM) seed. The discussion further gives an insight of the theoretical framework that is used as a lens to examine the data at two different levels. Wenger's communities of practice theory is used to look at the knowledge issues, while the critical realist theory is used for in-depth data analysis to provide ontological depth to the study.

CHAPTER 3: RESEARCH DESIGN DECISIONS

3.1 INTRODUCTION

In this chapter I present a discussion of the research design decisions and methodology used in the study. This discussion begins with an overview of a brief epistemology of research methodology and research methods, presents the research orientation of the study (within a participatory framework), and then focuses on the case study research design. I then discuss the methods I employed to explore, describe and explain learning interactions within two small grain farming communities of practice that influence the farmers' choices of what to plant for their food, which is my research goal. The overarching purpose guiding my research was to open up avenues that could lead to an improvement in the quality of extension, training and farmer practice as a contribution to food security and low impact (or sustainable) agriculture.

Since my interest was to gain an in-depth understanding and find explanations for the role of learning interactions in relation to choices made by farmers, I chose an interpretative perspective to approach my study. This chapter explains why I chose case study methodology with an interpretative perspective, and also my role as a researcher. It also explains how I considered research ethics and validity in order to give trustworthiness to my data generation process. The methods I used to generate data were informed by the communities of practice (COP) epistemological perspective and critical realist ontology. I first conducted key informant interviews, which directed me to the documents I needed to analyse to get a good contextual background. I then conducted document analysis, followed by semi-structured interviews (see section 3.3 below) for further triangulation.

For data analysis, I started with member checking (Bassey, 1990), to verify accuracy of primary and secondary data. I then categorised the data using characteristics of a COP, based on recurring themes through analytical memos, and used abductive reasoning to draw out answers and conclusions based on my research question and objectives respectively. My categories changed with time as I found more data (see analytic memos, Appendix 4). I then conducted an in-depth causal analysis based on critical realism as explained in chapter two to understand possible cause-effect relationships and their complexes (see chapter five). My data analysis was concluded

by drawing analytical statements, which I further tested against the data and reformulated accordingly.

The two communities of practice I studied had a number of similarities and also some differences. For the purposes of this research, I studied the two communities in the same way, but used more document analysis for the Nyanga communities of practice, while more interviews were used for the Marange communities of practice. This is because more time had been spent working with the Marange communities of practice than with the Nyanga communities of practice in Environment Africa's development work. In the data presentation (chapter 4) and data analysis (chapter 5), the two communities of practice are discussed together as more similarities were seen than differences, but separate discussions were also made where marked differences were observed. More contextual discussion for Nyanga is thus found in chapter 4.

3.2 RESEARCH METHODOLOGY

3.2.1 Research Orientation

My work in the development field involves assessing and interpreting people's (especially the marginalised) needs and designing programmes with them to respond to those needs sustainably, without creating dependence, nor making unfulfilled promises through raising undue expectations.

It is this background that led to the design of a participatory framework for the research that I hoped would provide authentic data free from the prejudices influenced by what Elias (1988) describes as 'involvement'. To me it was also an ethical consideration (see section 3.5 below). I deliberately constructed a number of research tools that would be used to generate data not only with my presence, but also in my absence or by creating a distance in space and also involving other co-researchers in the process. Co-researchers included work colleagues, both familiar and not familiar with the research participants, and students on attachment who had shown interest in the research topic. This was my way of generating data in a zone of 'detachment'.

Research methodology, which is distinguished from research methods, is described as “a theory (and analysis) producing knowledge through research” (lecture notes, 20 July 2006). The research methodology was informed by the theoretical vantage points discussed in Chapter 2, which draw from the ‘communities of practice’, ‘situated learning’, and ‘legitimate peripheral participation’ ideas of Lave and Wenger (1991).

A case study approach was most suited to an in-depth exploration of the research question and objectives, and it in turn justified the use of particular methods and techniques in relation to the epistemology and ontology sought and implied by the research question. I describe the people within my primary research landscape or case as communities of practice (Lave & Wenger, 1991), because they learn together and from each other those skills essential for the food production cycle and food security. Hence a methodology with a participatory orientation provided a rationale for the way in which I proceeded with the research, in order to generate in-depth data relating to how farmers interact with each other and with outsiders with a view to unravel the choices they make of what to cultivate in their fields and gardens for food.

3.2.2 Case Study Research Design

According to Yin (1994), case study research is a research strategy or tool, usually preferred when trying to answer ‘how’ and ‘why’ questions, when the investigator has limited control over events, and when the focus is on a contemporary phenomenon within some real-life context.

Three types of case studies have been identified, which are explanatory, exploratory, and descriptive. This identity is apparently a departure from a conventional misconception, whose hierarchical approaches limited case studies to only the exploratory phase of an investigation, and at the exclusion of other research strategies (Platt, 1992, in Yin 1994). Several examples exist which show that experimental research, for example, has been used to explore phenomena, whilst case studies have also been used to describe, e.g. Street Corner Society, by W.F. Whyte, 1943 / 1995, (*ibid.*) and explain, e.g. ‘Explaining the Cuban Missile Crisis’, by G. Allison, 1971, (*ibid.*).

Research case studies must be concerned with the rigorous and fair representation of empirical data, and may be designed as single- or multiple-case studies.

3.2.3 Why use Case Study research approach?

Case study research has been used successfully in social science research, psychology, political science, sociology, business studies and planning, among others, (Yin, 1983, in Yin, 1994), and in environmental education (Irwin, 2004). It is useful in seeking to understand complex social phenomena, while allowing an investigation to retain the holistic and meaningful characteristics of real-life events, for example organisational processes and community change. I have therefore adopted a pluralistic approach to this case study investigation, whereby the most appropriate use is made of the different types of case study, for the purpose at hand as my research (story) unfolds and develops.

As indicated earlier, my research interest is focussed on the plant food choices made by two specific communities. This demands a research approach that is context-specific, as provided for by a case study approach. This research is designed as an interpretative case study (Yin, 1994) of communities of practice associated with two external farmer training programmes. According to Connoles (1993) an interpretive case study seeks understanding, allowing for a process of in-depth investigation to capture particular details.

3.3 DATA GENERATION PROCESS

To generate data, I first consulted key informants who led me to relevant documents dating back to the pre-independence era to the current records. I then analysed AREX (then AGRITEX) documents, in particular the Master Farmer Training Scheme (MFTS). Having talked to key informants and analysed documents, I had a good idea who to approach, how, when and where. I used participatory techniques to generate data through relevant stakeholders who included farmers as groups and individuals. This was after obtaining consent to conduct such research (see Section 3.5). In the course of generating data, I kept the research goals and research questions in mind in order to stay focussed, as my research was contributing a small specific aspect of food security in a broad field of environmental education research. In summary the research methods used in this study included:

- Key informant interviews,

- Document analysis,
- Semi-structured Interviews,
- Focus group discussions, and
- Participant observation of training and review workshops, and farmer events.

While these phases of data collection were generally sequential, they were not mutually exclusive and tended to overlap and flow back and forth.

Focus group discussions were not part of my original proposed set of methods, but arose out of need as it provided means for in-depth probing and triangulation of emerging data (Cohen, Manion & Morrison, 2000), especially food choice preferences (see presentation of results in Chapter 4). Key informant interviews were not specifically articulated in the original research proposal, but it became necessary to conduct them as a starting point to get ideas on where to get relevant documents. These included personal communications with retired AGRITEX personnel and current AREX staff. The data generation process is given in Table 3.1 below, and includes an inventory of the data, with pseudonyms of respondents used for confidentiality.

Table 3.1 Data generation process and inventory

DATA SOURCE AND PHASE OF ANALYSIS	PSEUDONYM OF RESPONDENT OR GROUP / NAME OF STAKEHOLDER	CODE	ANALYTIC MEMO	DATE OF DATA GENERATION
Phase 1A Key Informant Interviews				
Former Chief Agricultural Extension Officer	Then AGRITEX	AEPi.2	n/a	April 2006
Former Agricultural Demonstrator	Then AGRITEX	AEPi.3	n/a	May 2006
District Agricultural Extension Officer	AREX	AEPi.4	n/a	May 2006
Agricultural Extension Worker	AREX	AEP1.2	AM.1-5	September 2007
Agricultural Extension Worker	AREX	AEPi.1	AM.1-5	30/08/07
Key Informant Interview	Taku Nyemba (TN)			
Phase 2 Document Analysis				
Document Analysis - Strategic plan 2005 – 2009	Environment Africa	Ed.1	n/a	25/04/07
Document Analysis – Community	Environment Africa	Ed.2	n/a	26/04/07

Programme phase 2				
Document Analysis – Master Farmer Training Scheme	AREX	Ad.3	n/a	April 2007
Document analysis - EAG consolidation report	Sunrise EAG	Med.1	n/a	17/07/07
Phase 1B Semi-structured interviews (SSI)				
SSI Farmer	Garikai Tangenhamo (GT)	MFi.1	AM.1-5	
SSI Farmer	Maria Mushandi (MM)	MFi.2	AM.1-5	
SSI Farmer	Anna Nhimbe (AN)	NFi.3	AM.1-5	
SSI Farmer	Chipo Dube (CD)	MFi.4	AM.1-5	
SSI Farmer	Lizzy Bocha (LB)	MFi.5	AM.1-5	
SSI Farmer	Tinotenda Soko (TS)	MFi.6		
SSI Farmer	Biggy Tafara (BT)	MFi.7		
Phase 3 Focus Group Discussions				
FGD Environmental Action Group (EAG)	Community Nutrition garden group	MFf.a		24 July 2007
FGD Small Grains committee	SeedFirst Small Grains Committee	MFf.b		24 July 2007
Phase 4 Participant observations				
Participant observation of Seed/Food fair	Nyanga (real)	NSo.a		August 2007
Participant observation of Seed/Food fair	Marange (real)	MSo.b		August 2007
Document analysis – MFTS Review	A Review of MFTS by Pesanayi (2006)	AFd.2		September, 2006

3.3.1 Key Informant Interviews and Farmer Semi-Structured Interviews (SSIs)

I consulted key informants who included personnel in the Ministry of Agriculture and Lands, Agricultural Research and Extension Services (AREX) section, and also former staff members who worked for AGRITEX in the pre-independence era. These people included personnel working for AREX in the Province, at District (Agricultural Extension Officers) and at Ward levels (Agricultural Extension Workers). These professionals provided information about how the Master Farmer Training Scheme was structured from its curriculum to participant farmer records. They also highlighted the successes scored by the MFTS and the constraints it is facing in the light of prevailing socio-economic conditions and the land reform programme. The former AGRITEX staff, who championed the MFTS, related its history, trials, successes and challenges during an era of civil war in the country. These included demonstrators who were trained in mission stations such as Mount Selinda in Chipinge by Emory Alvord, and other training institutions such as Domboshawa.

It is worth noting that some senior contemporary informants were less willing to share information, while informants from the earlier extension era were more than willing to relate their experiences and avail their documentation. The reasons for the information blackouts ranged from perceived fears of victimisation, to state security requirements, which tended to stigmatise the NGO and donor communities and created unnecessary tensions. For these reasons, it was important to preserve the anonymity of certain key informants.

Semi-structured interviews were conducted with six farmers from Marange communal lands and two farmers from Nyanga communal lands. Farmers involved with the small grains programme facilitated by Environment Africa were selected from a purposive sample that included females and males, farmer leaders and family representatives, and farmers new and old to the programme. Interviews were conducted by negotiated voice recording, which were accepted and deemed critical, in order to capture everything said by the respondents, and support the interview notes. Four of the interviews were carried out by me alone, two by a research assistant, being a student on attachment with an interest in the research area, and one jointly by the research assistant and myself. No attempts were made to conform to quantitative statistical standards, as this was not essential for the research design. With such a range of different actors, I used a variety of interview techniques, including formal and informal (Murray, 2006).



Figure 3.1 Conducting a semi-structured interview

I only transcribed verbatim and in detail the first interview, which was recorded in Shona and then translated to English. However, this 35 minute recording took very long to transcribe, as I had to rewind the recorder repeatedly over many days in order to capture everything. For subsequent interviews, I only transcribed the relevant information translating directly from Shona to save time (see appendix 6 for an example of an interview schedule and transcript).

3.3.2 Document Analysis

The research methods include document analysis (Boughey, 2006), which was used to understand the Master Farmer Training Scheme curricula and objectives; interpret agricultural policy; analyse the farmer database kept by Environment Africa and understand history of the study area, in relation to the learning process. Primary document analysis focussed on Environment Africa's Strategic Plan, Food Security and Natural Resource Management strategic documents, minutes of meetings, workshop reports, and National Policy documents on food security. Secondary document analysis then followed, focussing on related research reports.

3.3.3 Participant Observation

I carried out participant observation (Cohen et al., 2000) of farmer to farmer and trainer to farmer interactions, and farmer practices to identify how farmers select fields for growing selected crops, and how they select and prioritise certain crops, store and choose some diets over others. These were done through attending one farmer meeting, one training workshop and visiting homesteads to observe cropping patterns in farmers' fields and gardens. As participant observer, I invested some time with the farmers to 'break the ice', whilst recording what I observed and taking a small role, such as being part of a group work session. Photography accompanied observation, where accepted.

3.3.4 Focus Group Discussions (FGD)

Two focus group discussions (Chambers, 1990; Cohen, 2000) were conducted, both by myself with the support of a female colleague [not familiar with the Marange communities of practice] taking notes and also asking questions related to general documentation. These focus group discussions arose after conducting two farmer

semi-structured interviews and were carried out with the purposes of triangulating emerging data relating to food plant choices. The first focus group discussion (MFf.a) targeted a women community environmental action group (Sunrise EAG [not their real name]). The aim of this FGD was to find out the farmers' plant crop preferences in fields and gardens through a pair-wise matrix (see chapter 4). This women's group formed part of the Marange small grains communities of practice.

The second focus group discussion (MFf.b) targeted the small grains committee of the Marange communal lands, of which three active members participated, among them two females and one male (the chairperson). The focus group discussion was organised in advance on my behalf by an Environment Africa female officer working with the community group, who had earlier conducted an EAG consolidation exercise with the same group for an internal planning, monitoring and evaluation purpose with the assistance of a female student on attachment (MEDa.1).

3.4 DATA MANAGEMENT AND ANALYSIS

3.4.1 Data management

My data came primarily from four different data generation techniques as discussed in section 3.3 above. I banked my data in labelled envelopes as it came, with interview schedules in their own envelopes, focus group discussion notes, and documents for analysis in their own envelopes respectively. This was very useful for me in keeping my raw data in one place, for easy fall back and retrieval, which happened quite often as I went from one data generation process to the other.

I faced technical difficulties in trying to transfer digital audio recording from the digital voice recorder to the computer. I ended up re-recording by copying to tape in order to preserve the original recording (see validity and data tracking, section 3.4.3). Transcription of interviews was a tedious process at first, with the need to rewind the recording several times in order to capture what was said to paper. The technique was perfected as I gained experience, and used slow playback motion. I was fortunate that the quality of recording was generally very good. I translated the original Shona language transcriptions to English for two transcriptions, but subsequently used the original language transcriptions used by the respondents to save time. Cohen et al. (2000) recognise the importance of interview transcription and advise researchers to guard against the hazards of distorting, misrepresenting,

reducing, or losing data. From the preliminary categories I had constructed I proceeded to do thematic coding of the transcribed data. I realised that good data management was not only a critical pre-requisite to good data analysis, but an essential pre-condition enabling it.

3.4.2 Data analysis: process and tools

The data analysis process began as soon as I collected a set of data, either from analysing a document or interviewing a farmer, or using some other data generation procedure. I did this out of prudence, and admittedly excitement, rather than 'jumping the gun' of properly organising the data and presenting it, which happened in chapter 4. Preliminary data analysis thus took place mentally, and as I skimmed through each interview schedule, so as to inform the next data generation activity better.

The evolution of the data generation process can be seen in the marked differences in the style and structure of questioning that I used from one interview to the next. I reformulated questions, and focussed on issues that appeared to matter more to the farmers in terms of their choices of food plants to grow, in so far as they addressed my research question, which I constantly referred to (see 3.4.1 above).

Whilst many research text authors make absolute distinctions between data collection and analysis, and while such distinctive lines may be clear for surveys, such distinctions become hazy for the "fluid and emergent nature of naturalistic inquiry", (Patton, 1990: 436). Patton (*ibid.*) goes on to say that "Ideas for making sense of the data that emerge while still in the field constitute the beginning of analysis; they are part of the record of filed notes".

In order to organise my data for analysis, I constructed analytic memos from recurring themes (see chapter 4). I clarified my analytical thoughts by engaging in discussions with research peers with an interest in community development and food security and with food security professionals. I then looked into my data deeply and formulated the following categories and sub-categories (see Table 3.2 below), as a first layer of data analysis.

Table 3.2 A preliminary list of categories and sub-categories

Categories	Sub-categories
Sorghum is a preferred field crop	<ul style="list-style-type: none"> • Tolerant to drought • Makes nutritious and healthy staple • Can be planted from own harvested seed • Produces good yield
Learning takes place as farmers interact with each other	<ul style="list-style-type: none"> • At field days farmers see what others have done • At seed/food fairs and shows farmers see the range of viable seed available • Farmers demonstrate how to grow seed • Older members of a group pass on knowledge and skills to younger members
Intergenerational knowledge transfer promotes wise choices of food plants	<ul style="list-style-type: none"> • Parents share knowledge and skills of seed selection and nutrition with their children • Parents learn from their children's experiences
Culture and tradition	<ul style="list-style-type: none"> • Communal activities like '<i>nhimbe</i>' bring farmers to learn together • The chief's '<i>zunde</i>' promotes sharing of labour, skill, and food
External trainers and extensionists play an important role in food plant choices and food security practices	<ul style="list-style-type: none"> • AREX recommends what to plant based on Government policy and local conditions • AREX has an extension role only, and no longer has mandate to assist in conservation works • Agricultural engineering department now responsible for conservation works but are not available in the field • NGOs support farmers through AREX in resuscitating traditional seed security practices • The Zimbabwe Farmers' Union (ZFU) supports field days

These analytic memos, based on the categories, form the basis of chapter 4, presenting a thick description of the data. This was then analysed further through drawing on the critical realist framework and through using a set of analytical statements to provide an in-depth analysis of the data. The analytical statements are:

- Various ambivalent messages negatively influence farmers' choices of what to value and cultivate for food,
- Power relations affect farmers' choices of food plants,
- Farmers' choices of crops and technologies are influenced by their interactions with family structures, relations and neighbours,
- Changes in climate and ecology affect farmers' food crop choices,
- Changes in the political economy have an effect on learning interactions and farming,
- Training and extension influences farmers' agricultural practices and food security strategies, and

- Capacity and knowledge influence agency of farmers and their choices.

3.4.3 Ensuring validity and trustworthiness

I ensured process validity by keeping a data trail. I produced a letter of intent and request to conduct the research in the area, which I kept in a working file. Since I received only a verbal nod from authorities, I also produced a consent form for photographs, participation and taped / voice recording in interviews or focus group discussions. I obtained signed consent from local councillors as permission to conduct the research in their wards. Triangulation of data which according to Cohen, Manion and Morrison (2000) is defined as the use of at least two appropriate methods to check on the same information was applied through the use of document analysis, observation and interviews. I invited my work colleagues to critique data presentations at various stages (research proposal in March 2007, research methodology, methods and tools in April 2007, and preliminary data in June 2007) through a process of member checking (Lather, 1986). I have also conducted two feedback sessions with participants to verify the accuracy of interpretations of their discourse in interviews and focus group discussions.

A thick description, necessary for accurate explanation and interpretation of events, has been provided (see chapter 4) to add to the trustworthiness of the study. This data was obtained from my research journal, field notes, descriptions of observed situations, and records of data generated by methods described above. To represent the original data as much as possible, I used farmers' and other respondents' direct quotations, as a way of providing depth. An important aspect of the study was self-reflexivity (Lather, 1986), emphasising my own perceptions, methods and objectivity, which was a continuous process, evidenced with diary notes. The methods I used evolved in the field according to the demands of the situation and upon more literature review.

3.5 RESEARCH ETHICS AND VALUES

After I had scanned through documents, and conducted key informant interviews, I was confident about where to start and who to approach in the community. I made the research intentions and objectives known to the local authorities and traditional

leaders, through a letter of request and intent. Once permission was granted, I negotiated access with the local leaders (the headman, village heads and ward councillors), and made very clear my *modus operandi* which included recognition of traditional procedures and my role as co-learner with farmers as co-researchers. Environment Africa's presence in the Nyanga and Marange communities made it easier and faster for me to obtain the research access I needed, as I had expected and hoped. Once I had access to interview the research participants, I made it clear that there would be no reward or compensation of time as such, through negotiation of process benefits. I made one promise; that I would ensure that the research process and results would be fed back to the community, with the participants' identities protected throughout. This way my research planning integrated ethical considerations (Mertens, 2005; Bassey, 1999). The question of consent, anonymity and confidentiality was considered to protect participants' identities in photographic evidence and avoiding use of specific names of individuals or groups. This social contract was confirmed by use of an easy-to-follow and easy-to-understand signed agreement (see appendix 5). I used participants' mother tongue in conducting interviews to make them feel at ease, participate and understand fully.

3.6 CONCLUDING SUMMARY

This Chapter has presented and explained the research methodology and research methods, data generation techniques and research ethics and values observed. The methods used to analyse the data were also discussed and justified in light of the research question and goals. The way the research methods were used and played out was outlined, and also the data generated was given. The use of analytic memos to organise the data was also explained, and how these led to the drawing of analytical statements for use in Chapter 4 and 5 respectively.

CHAPTER 4: PRACTICES AND LEARNING INTERACTIONS ACCORDING TO FARMERS' EXPERIENCES

4.1 INTRODUCTION

The data I present in this chapter seeks to outline the research findings regarding the learning interactions that influence small grains farmers' practices and selection of certain seed or crops for cultivation for food, within communities of practice context. This data was generated using instruments discussed in Chapter 3, and triangulated not only by intended design, but as the needs unfolded in the study. I selected the respondents for the interviews, focus group discussions and participant observations of workshops and seed and food fairs from my knowledge of the Community Programme of Environment Africa and its Uplifting Livelihoods strategy. For my interviews, focus group discussions and participant observations, I selected farmers and extension officers who had either participated in or were knowledgeable about the Small Grains project facilitated by Environment Africa in two communities of practice. This Small Grains project has been promoting open pollinated varieties (OPV) of sorghum (*Sorghum spp.*) and grain amaranth (*Amaranthus spp.*), since its inception in 2003 (Environment Africa, 2003). The main objectives of the small grains project were:

- To resuscitate communal farmers' interest in open pollinated seed varieties of sorghum and maize (*Zea mays*), for local seed multiplication, bulking, banking, consumption, sharing and exchange of staple starch genome;
- To introduce other nutritious grains, such as grain amaranth, for use as a vegetable and porridge; millets and rapoko;
- To promote sustainable farming methods and indigenous ways of knowing, such as inter-cropping staple starch crops with cow peas, cucurbits, and naturally growing vegetables (such as weed amaranthus and African cabbage or spider plant).

The structure of this chapter is guided by the organisation of analytic memos I constructed (see appendix 4), based on the Communities of Practice theory of Lave and Wenger (1991) and Wenger (2007), which helped me to organise my data. I organised my data using a thematic approach informed by preliminary research

categories which emerged from the data. These categories were informed by my research question and research objectives, to which I constantly referred. I therefore present the data using the following themes:

- The situation regarding **what is happening to the cultivation of food plants** (section 4.2), which forms the *domain* of the communities of practice in the research,
- Farmers' *practices*, that is, **what are the farmers doing**, (see section 4.3),
- The **role of the actors** (section 4.4) in the communities of practice studied, and
- The **learning interactions** (section 4.5) between and among the farmers, and between the extension services and the farmers in the communities of practice (that is, *learning together* in communities of practice).

This chapter provides a thick description of the data generated from the study, by using direct quotations, as alluded to in chapter 3.

4.2 WHAT IS HAPPENING WITH FOOD PLANTS

The situation of food plants was studied with regard to garden and field crops, looking at crop preferences. The situation of traditional and non-traditional food cropping was also studied and some data emerged regarding their cultivation, disappearance and re-emergence. The influences of climate change, for example the constant reference to drought by farmers; seed marketing by Seed houses and Companies; and seed promotion by AREX, the Zimbabwe Farmers Union (ZFU), and NGOs were also apparent in the data. It is quite evident from the data that maize had become the predominant staple crop since its introduction to the communities.

4.2.1 Garden crop preferences

The farmers' preference of garden crops was studied from individual farmer interviews, and triangulated from focus group discussions and pair wise matrix ranking. Five out of the eight farmers interviewed indicated that their first choice garden crop was Covo, a green leafy vegetable of the brassica family. Some of the interviewed farmers presented their preferences as follows, "Covo stays longer, up to

three years. We eat it daily” (MFi.1, MFi.7), “My number one garden crop is covo, followed by cucurbit (leaves), and then spider plant (leaves, for vegetables)” (MFi.1). Agricultural extension personnel interviewed also promoted covo among other horticultural crops, “we promote horticultural crops like rape, covo, tomatoes, and spinach” (AEPi.2).

Observation in the garden of one of the farmers interviewed (MFi.; analytic memo AM.1) revealed that he had a variety of horticultural crops intercropped with moringa, a leguminous tree with edible pods and leaves high in vitamin A, and fruit trees. A similar garden design was observed during a tour of a women’s garden group (MFf.a, see discussion below). The MFi.1 garden tour was led by the respondent and his wife. The same farmer during the interview presented his horticultural practice as follows,

I grow maize because there is good moisture in my garden. I also grow rice, onions, garlic, and covo. I also have orange trees, pawpaw, peach and moringa trees growing in the garden (MFi.1).

A deep well nearly full of water was seen in his garden, where rice was also seen to be flourishing. The possession of such wells in the Marange area was seen to be the exception rather than the rule, as most people did not have such a privilege. This farming couple also had a tree nursery said to belong to an environmental action group, of which they were members, upon request by the group.

A pair wise matrix ranking was conducted with twenty female farmers during a focus group discussion for this nutrition garden group (MFf.a), from the same area as the above interviewees. Out of a list of ten garden crops that the farmers grew mostly individually, and to a small extent communally, Covo again ranked first, with the largest number of occurrences. Table 4.1a below and Figure 4.1a summarise these crop preferences, confirming the trend observed from the individual interviews.

Table 4.1a *A summary of garden food crop preferences obtained from a pair wise ranking matrix conducted with 20 female farmers*

Name of garden crop cultivated by farmers	Number of occurrences	Rank
Tomatoes	16	2
Onion	11	4
Covo	18	1

Rape	11	4
Beans	8	6
Cabbages	6	7
Carrots	3	8
Tsunga	14	3
Butternuts	0	10
Okra	3	8

The Bar graph below attempts to present the data in Table 4.1a in a more visual way that helps to interpret the results better.

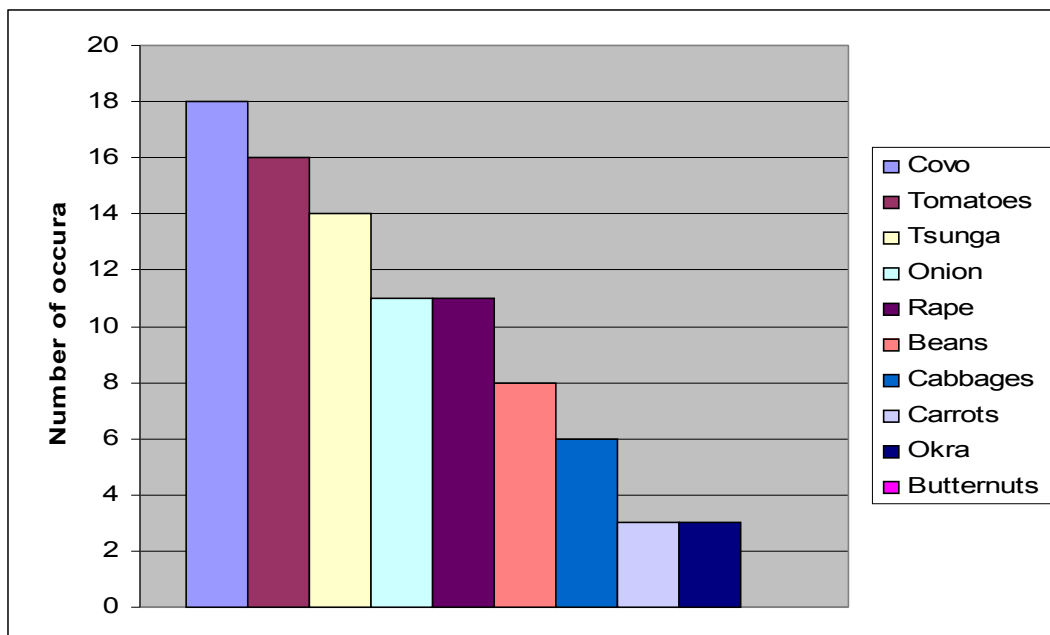


Figure 4.1a A graphical representation of garden food crop preferences extracted from results of a pair wise matrix ranking (see Table 4.1a above) from 20 female farmers in dryland Marange

The reasons given for the higher preference for covo was that covo is perennial and long lasting, that is, plants continue producing good quality green leaves for long periods in excess of two years, and hence are an economic vegetable. In addition, covo was described as a vegetable that can withstand adverse temperature and humidity conditions, such as high temperatures and dryness. It was said to be able to recover quickly from long dry spells, typical of arid area conditions like Marange. The farmers also described the covo as resistant to most minor pests, although they found it to be at times prone to aphid attack, which they however found to be easily cured after spraying or by intercropping with herbs, such as rosemary.

Tomatoes were the second choice garden crop. The reasons the farmers gave for this preference was that tomatoes can be used with all other products in cooking, they are cash crops which generate money for the farmer. Once fruits have formed,

they will ripen and mature without requiring watering of the mother plant or when the fruits have already been harvested.

While the above scenarios were similar to northern parts of Ziwa, the scenario in the wetter or irrigated areas of Nyanga appeared different, whereby such high value crops such as garlic were preferred. “I like to grow garlic and king onion for sale; also *tsunga* as a vegetable to eat at home and sell surplus” (NFi.3). Observations at the Nyanga seed fair showed that many farmers were exhibiting garden crops such as garlic, peas, potatoes and wheat, which were neither as common nor abundant as in Marange, due to the presence of an irrigation system.

4.2.2 Field crop preferences

Among the eight farmers interviewed, who all grow small grains among other things, maize featured in both rain-fed arid areas and the wetter areas (see analytical memo Table AM1, appendix 6). However, sorghum was the most preferred crop among all the eight farmers interviewed. A pair wise matrix conducted independently of this interview with the same women’s group cited in section 4.2.1 above confirmed this trend (see Table 4.1b and Figure 4.1b below), with sorghum having the highest occurrences among the ten field crops they had listed.

Table 4.1b *A summary of field food crop preferences obtained from a pair wise ranking matrix conducted with 20 female farmers*

Name of field crop cultivated by farmers	Number of occurrences	Rank
Sorghum	16	1
Millet	14	2
Maize	9	4
Groundnuts	9	4
Roundnuts	12	3
Millet (rukweza, njera)	4	7
Cow peas	6	6
Water melons	2	8
Cucumber	0	9

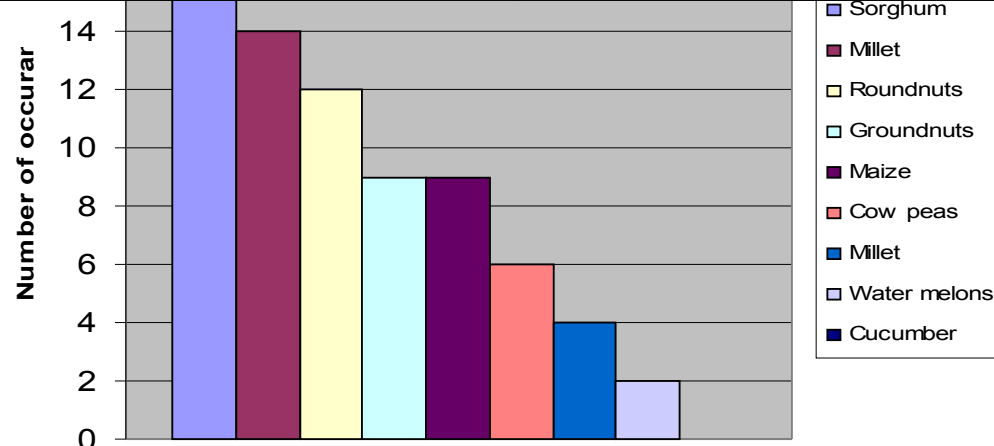


Figure 4.1b *A graphical representation of field food crop preferences extracted from results of a pair wise matrix ranking) from 20 female farmers in dryland Marange*

The reasons given for preferring sorghum included:

- its drought tolerance,
- its multiple and highly nutritional uses, such as meal for sadza (thick staple porridge),
- boiling grain to eat it like rice, and
- making porridge.

Observations made in Marange indicated that many farmers in the more arid parts of the area still try to grow hybrid maize, but with poor results (see Figure 4.3.1, section 4.3.6 below), indicating that maize growing is still a strong culture and habit, despite increasing aridity leading to crop failure (see analytic memo table AM.1, and farmer interview MFi.1). In addition maize fetches a low price at the Grain Marketing Board, being one of the controlled agricultural commodities.

It appears that the rural smallholder farmer has been at the receiving end of drought-induced catastrophes and the political-economy in the context of maize production over many generations. These effects are illustrated in the following brief discussions. “The Maize Control Act of 1931 institutionalized sales to maize depots in white farming areas, increasing transport costs for maize produced in the reserves. Lower prices for African maize producers were the result” (Andersson, 2002: 131). The political economy at play then was compounded by the subsequent acts which limited the maize harvests that the rural smallholder farmer was allowed to produce, while maize and other agricultural production was subsidised and insured for the commercial farmer.

The socio-economic scenario appeared not to have changed much in post-independence Zimbabwe for poor rural farmers whose agricultural practice remained unsubsidised with pro-hybrid seed. Maphosa (1994: 56) of the Grain Marketing Board argues that

Most of Zimbabwe's communal areas are more suitable for the production of small grain cereals because the soils and rainfall are marginal. Despite this many, if not all, communal area farmers grow maize as the major food crop. Some of these areas are not suitable for any crop production at all but can sustain livestock ranching. In the event of a drought, maize can be totally

destroyed, yet drought tolerant small grain cereals e.g. sorghum and millet can yield some food for subsistence. Furthermore, each family must retain adequate food stocks to last for at least one year. There is also need to build stocks of fodder banks which would save livestock during drought years. Export and cash crops, yes; but not at the expense of food crops. There has to be a balance. Peasant communities must be encouraged and facilitated to satisfy household food security in the first instance. This entails appropriate crop types and storage facilities.

The problem of anachronistic pricing policy by the Grain Marketing Board is illustrated by the move of former commercial farmers, who responded to static producer prices by abandoning maize production for its poor market performance, a move that poor rural farmers with little real options were not able to do as quickly.

Changes in producer prices for food crops did not keep pace with changes in input and other marketing costs. For example, the producer price for maize was at a standstill at \$ 180.00/t from 1985/86 to 1987/88. As a result the maize production base was gradually eroded as commercial farmers moved out of maize production into other more lucrative crops, especially tobacco and horticulture (Maphosa, 1994: 53).

It was encouraging to note from observations and interviews made in communities of practice in the study, that a wide variety of sorghums were being grown in both Mutare and Nyanga. Among others these included red sorghum, which was promoted by Chibuku breweries for their opaque beer brand, macia (white) which was promoted by some NGOs, and sorghum SV4 which was being promoted by Environment Africa for seed multiplication and bulking to boost local open pollinated variety (OPV) seed bank (Environment Africa, 2003). These organisations generally introduced the different varieties at different times and for either commercial or food security reasons (see MFi.1, analytic memo AM.1. Also see section 4.4.4 below). (NB: The different varieties of sorghum, if in the same area, may on the one hand imply agro-biodiversity, but may also pose problems for seed purity on the other).

“We are growing a wide variety of crops in our fields, with small grains, especially sorghum predominant” (MFi.1, MFi.2, NFi.3). Two farmers providing this information were from Marange, while the third farmer was from Nyanga. Reasons given for the increase in sorghum production ranged from the active promotion by NGOs cited above, to “our small grains committee promotes the growing of sorghum (SV4) in the three wards that we are supporting” (see MFf.b; analytical memo AM.1). Other reasons given for the preference for sorghum were “sorghum is tolerant to heat from the sun compared to maize. The plant folds its leaves to reduce loss of water” (MFf.a;

analytic memo AM.1). In addition, “sorghum SV4 is the best field crop because they [it] give us sadza and money; we also grow sunflower to get cooking oil” (MF7, MFi.6).

Other small grains were also mentioned in interviews and focus group discussions, as follows;

The main field crops we promote are sorghum, pearl millet (*mhunga*), and finger millet (*rukweza* or *njera*). Also oils seeds, such as sunflower and groundnuts. We consider the climate and region in our advice to farmers (AEPi.2 in AM.2).

Farmers also praised millets because “they have medicinal value and are good for staple diet” (MFi.6). One farmer summed up the emergence of maize as a major staple crop, and the re-emergence of sorghum as follows,

Maize was brought in here by the Manyika (Mutasa people) and the white man. It responded well to good rainfall then, and overtook sorghum. Sorghum has returned due to its better response to drought and heat (MFi.1).

4.2.2.1 The Nyanga communities of practice case

Archaeological studies of the Ziwa local area in Nyanga provide evidence of an agro-based social economy, where the earlier settlers grew sorghum, finger millet and bambara groundnuts among other crops. These crops were grown in artificially raised beds made of stone about half a metre high, with deep soils and leaf mould placed in the centre; more like a trench bed design (see Figure 4.2 below).

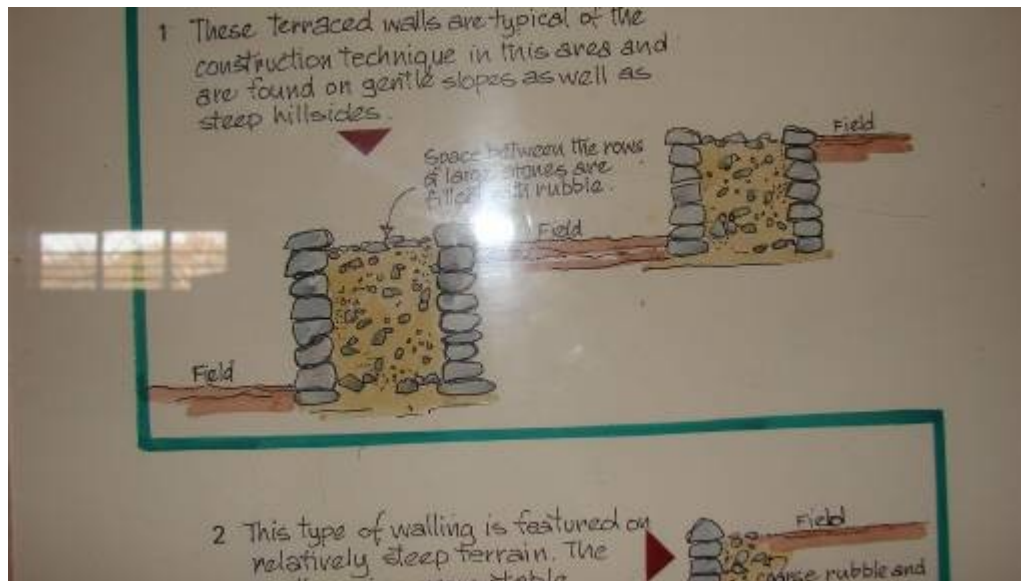


Figure 4.2 Terraced farming techniques in the Ziwa area, Nyanga

According to the National Museums and Monuments (Government of Zimbabwe, n.d.: 1)

The mountainous landscape sustained hunter-gatherer and farming communities over several centuries back. The early farmers infiltrated the areas around 2000 years ago, and later built permanent village complexes. The most widespread are the later farming communities' terrace and pit structure remains covering some 8000 square kilometres. The evidence of terracing points to very intensive and specialised agricultural practices necessitated by environmental constraints. Grinding places are a common feature of the Nyanga agricultural landscape.

Observations of the Ziwa site museum (NSo.a) exhibits and personal communications with museum personnel (PC4, personal communication, August 9, 2007) indicated that some of the major crops grown by the early farming communities included sorghum, finger millet and groundnuts. These crops are still grown in the area, but have been supplemented by maize.

When Environment Africa started working in the area in 2003, it was found that there was very little farming of sorghum and millets, with farmers mostly concentrating on maize, which attracted more money from the Grain Marketing Board. Farmers on the southern part of the Ziwa site museum and estate were growing much more maize because of the presence of a gravity fed irrigation system established a few years before. In addition, the southern part receives more rainfall, given that it is located in ecological region 3 to 4, than the northern part, which lies in region 4 to 5 (see chapter 1). The breakdown of the agricultural system and establishment of a new one

apparently arose from drought cycles coupled with introduction of new crops and technologies when the colonial system was introduced (Government of Zimbabwe, n.d.).

Sorghum was not always the number one field crop preferred in Nyanga, as evidenced by the following, “My number one crop is maize for sadza, followed by sunflower for oil pressing and seed (5 by 50 kilogram bags) and sale (6 by 50 kilogram bags) in 2007 (NFi.3). This particular farmer had her homestead in the southern part of the Ziwa monument, where rainfall was better and gravity-fed irrigation was accessible. The influence of seed houses on Nyanga communities of practice in the southern part appeared to be more direct due to the apparently better response of maize, “I have also learnt about crops to plant from seed houses and other seed providers that compete for the market at district shows, e.g. Pannar and Seed Co. My first choice maize is SC513 followed by SC627, Pannar 67 is also good” (NFi.3); “I was given maize seed by the GMB (Grain Marketing Board)” (NFi.3). Yet another farmer from the southern part of Ziwa indicated that “I have been growing maize for a long time, and so far I have not had very bad experiences. Our family does not grow much of sorghum because of the problem of birds” (PC3, personal communication, July 24 2006).

Observations made at the Nyanga seed fair also showed that more farmers from the southern part, than the northern part, were growing maize (NSo.a). “The results of pair wise ranking on crop preferences indicated that the most preferred crops were 1. Maize, 2. Millet, 3. Sorghum and 4. Beans” (NWR.1).

What comes out in this data is that while the Nyanga community of practice is currently growing maize, there is also an interest in other more traditional crops such as sorghum and millet, which is associated with their cultural heritage. The NMMZ is interested in working with the community of practice to use these dual interests to preserve the site and monuments as a World Heritage Site. “This monument, perhaps more than any other site in the sub-continent, chronicles the agro-ecological and economic endeavours of the iron-age communities. It is for this reason that the site should be strongly recommended for World Heritage site status” (Government of Zimbabwe, 1995). The Nyanga community of practice is strongly linked to the Ziwa site museum and estate monuments. There are strong cultural and religious links to the heritage site, where they also hold most of their planning and farming meetings, agricultural shows and seed fairs. The Ziwa monuments give meaning and identity to

these contemporary communities of practice, despite blurred links to previous communities who later abandoned the site well before the era of colonisation.

4.2.3 Traditional food crops that are disappearing

A number of field crops which were identified by farmers, were no longer being grown as much as they were grown in the not so distant past.

We are no longer growing rapoko due to lack of seed, and pest attack by birds. Rapoko is seen as a difficult crop to process. Finger millet we had stopped growing, but these days it is starting to be grown again. *Uninga* (sesame) seed is no longer available. Sesame has also disappeared from our area (AM.1).

The responses quoted above were contributed by a number of farmers from semi-structured interviews (MFi.1, MFi.4, MFi.5, MFi.6, MFi.7).

One farmer identified local maize seed that had also disappeared, “we are no longer growing *chinyama* (OPV maize variety) due to lack of seed” (MFi.7). This OPV maize is associated with another local variety *mukadzi usaenda* (literally ‘my wife do not go’ because there is enough food around), which was also observed to be disappearing. Observations made also showed that brown rice was getting more difficult to find in people’s homes and fields, with some farmers indicating that they were actually looking for seed. A similar pattern was observed in Nyanga where “The participants appreciated that there were some crops that they still needed to grow but can no longer grow because they have no seed for the crops, for example sorghum and millet, and not many people are growing the crops making the crops prone to attack by birds” (NWR.1).

4.3 WHAT ARE THE FARMERS DOING – FARMER PRACTICES

In this section I present the activities and actions that farmers were engaged in that contribute to food production, processing, nutrition and marketing. The data was extracted from interviews and focus group discussions and participant observations of farmer activities and events. The data was organised into analytical memos (see Table AM.2) using categories that occurred in the data sources, and were informed by defining characteristics of communities of practice.

4.3.1 Farmers are sharing/ exchanging information and seed

Small grains farmers indicated that within the small grains project facilitated by Environment Africa, they are required to, and actually do pass on harvested seed to neighbouring farmers, relatives and friends. “We pass on some seed to neighbouring farmers. Farmers are actually growing sorghum SV4 when we pass on seed to them, we don’t charge them for the seed” (Marange small grains committee). Small grains farmers also expressed the wish to see “seed spread beyond our three wards”, and had a time frame for the next year as a target in which to have that happening. They explained that one of their primary motives for spreading seed to increase the population of sorghum growers was to spread or reduce the individual risk of avian pest attack. It was also apparent that the farming activities that were done in groups were successful because farmers accrued individual benefits from communal efforts. “I don’t know how to thank Environment Africa and my colleagues in our garden project. I asked members of my group if I could bring in my cattle (for grazing), and cut green grass for fodder. Thanks to my group, my dairy is benefiting and I am one of the few (dairy farmers) who still have dairy cattle” (community respondent 2, within Marange focus group discussion [a], MFf.a).

Document analysis of the Environment Africa small grains project contracts indicated that it was a requirement for farmers receiving seed to sign a contract agreeing to pass on 10% of their seed produce to neighbouring farmers (see EADa.2.1, appendix 1C).

The learning interactions that take place when seed is passed on from farmer to farmer are presented in section 4.5.4. Evidence of farmers working together for a common cause is discussed in section 4.3.2 below.

4.3.2 Farmers are working together for a common cause

The spirit of farmers working together for a common cause was highlighted by the case of a women’s nutrition garden project.

We are a group of twenty women growing [various horticultural crops] in a nutrition garden, which is around a wetland we are conscious of protecting. Each [member] has their own plot but we grow similar crops using conservation techniques. Woodlots and some orchards are communally owned (MFf.a).

In doing some of the tougher activities, such as fencing their garden, the women farmers group solicited the help of their grown children and one man, a husband of two of the farmers.

Focus group discussions indicated that farmers were able to plan their work better as a result of learning from training conducted in planning, monitoring and evaluation exercises within a project cycle management training designed to consolidate the groups. In addition, the farmers in their community of practice strategically plan their garden together. “We share duties, for example [some] look for seeds. We plant according to our plans” (MFf.a).

Now we are able to plan our work better, to conserve our crops and natural resources and to work as individuals in a team... We plant according to our plan, for example last year we [produced] our year plan after our [consolidation] workshop. We do our plan in Shona and Environment Africa translates to English.

These women, apart from planning together, also review their activities on a weekly basis at their weekly group meetings, where each member reports on their allocated activities or permanent duties, such as guarding the garden and watering the nursery (MEDa.1). While they have individual plots in the fenced wetland area, the group members grow similar crops using organic and conservation techniques. These crops include sorghum SV 4, open pollinated maize varieties, pumpkins, finger millet, cow peas; covo, tomatoes, various culinary herbs, tree seedlings including indigenous *nyii* (*Berchemia discolor*), moringa (*Moringa oleifera*) and jatropha (*Jatropha curcas*) [MFf.a].

In addition, one of the farmers (Mfi.3 in MFf.a) indicated that members of the group assisted an older member in growing her sorghum in her home field, which produced the highest yield in Marange (MFf.a). The members of the women’s group also conduct outreach activities together at the nearby clinic, teaching about the nutritional importance of herbs in the diet, in support of their chairperson who is a practising home-based caregiver.

4.3.3 Farmers are participating in and valuing look and learn visits

Farmers reported on the value of look and learn visits or study tours, as a contribution to their learning to change or improve their practices. “I have been to

Chikukwa permaculture centre where I learnt how to make green manure” (NFi.3). This farmer was observed using green manure in her field to improve soil fertility, as an alternative to the use of expensive fertilisers, or perhaps as a result of adopting sustainable agricultural practices (see 4.3.5 below). Look and learn visits were also seen as an opportunity to improve household incomes; “we were sent by Environment Africa to learn from another group, now I am [raising] tree [nurseries] at my home. I am selling [seedlings] to get cooking oil” (MFf.a).

4.3.4 Farmers plan for and participate actively in annual field days, seed and food fairs and agricultural shows

Farmers plan to participate in farmer field days, agricultural shows, and seed and food fairs, and these are included in their annual calendars. Field days are normally organised by Agricultural Extension Workers, who identify farmers who have excelled in their production cycle, and have a crop that is of exemplary quality. NGOs, working closely with AREX, have increasingly facilitated the organisation of similar field days for farmers growing crops they are promoting. The Zimbabwe Farmers’ Union (ZFU) also organises field days for farmers. Farmers have grown to like field days, seed fairs and agricultural shows for a variety of reasons. “I like seed fairs because I learn about the appropriate seed for my area” (NFi.3). One farmer at a seed fair refused to sell their seed because they intended to exhibit it at an upcoming district agricultural show where they hoped to win agricultural implements, “I am not selling my seed yet, I intend to exhibit at the district show” (farmer respondent 2, MFf.a).

In response to a question about how else Environment Africa assists the small grains programme, one of the farmers noted that “Environment Africa also brings some eats and drinks” to help in feeding people at the annual seed fair (communal farmer respondent 1, focus group discussion, MFf.b). This could be an indicator of the gravity of the impact of food scarcity in some of the households in these rural communities.

4.3.5 Farmers are practising sustainable (and not so sustainable) agricultural practices in their farming

Farmers participating in the small grains programme participate in training in the production cycles of sorghum, grain amaranth, OPV maize, cowpeas and other crops. They also participate in training in sustainable agricultural practices, such as

soil and water conservation, water harvesting, and soil fertility improvement. “We use manure and termite mounds and not fertilisers in growing sorghum” (communal farmer respondent 1, MFf.b). Other farmers, who alluded to learning from and adopting indigenous knowledge practices, confirmed this practice. “The elderly women teach us... when they cultivated without using fertilisers. They mixed their crops” (communal farmer respondent 1, MFf.a). The photo (Figure 4.3) below illustrates inter-cropping and companion planting.



***Figure 4.3 A
plot of
sorghum SV 4
intercropped
with cowpeas
(Nyanga)***

***The sorghum
acts as a
support for the
running stem
of the cow
peas, while the
latter acts as a
nitrogen fixer.***

Other examples of sustainable agricultural practices observed included composting (NPo.1), dead-level water-harvesting contours (MFf.a), and *Zunde raMambo* in the Nyanga COP. The latter practice was found to be critical for ensuring food security of the disadvantaged members of the community of practice, under the custodianship of Chiefs Hata, and received national recognition when it was awarded second prize in 2005.

All the three gardens visited for observation of farmer practices in the COPs of Nyanga and Mutare had good soil conservation works and water harvesting structures, a lot of these being responses to permaculture training (see section 4.5.6). The photo below (Figure 4.4) is from the nutrition garden of Sunrise

Environmental Action Group, in Marange community of practice, showing water harvesting and soil conservation.



Figure 4.4 A dead (zero-gradient) level contour with water harvesting pits at Sunrise Environmental Action Group in Mutare District.

Unsustainable practices were also observed in both Marange and Nyanga communities of practice. For example, there was a clear absence of appropriate grain and storage facilities in most homesteads of the COPs (MFi.7). Two of the three gardens observed (Sunrise EAG and Endurance garden in Marange [pseudonyms]) had inadequate composting activities. All three gardens observed had little or no integration with livestock, further limiting the cycling of nutrients and energy, and thus reducing the potential of organic manuring. Many sorghum fields observed had a single crop, probably because the training the farmers received encouraged high sanitary requirements for good seed production, according to the requirements of Seed Services, the Zimbabwe Government's seed production governing body.

4.3.6 Farmers face various risks and negotiate ambivalent messages from training and extension agents in their practices

While the small grains farmers go about their business of farming in their fields and gardens, they face various risks, which may be salient or overt. The biggest risk reported by farmers was the occurrence of drought. Farmers noted that the agricultural season had become shorter, with rains coming late and stopping too early. They saw this as a disastrous situation in hot arid areas typical of their farming areas. This is changing their practice, as indicated below.

“We grow small grains preferably to maize because it has become increasingly drier with more droughts” (communal farmer respondent, focus group discussions [a], MFf.b). This was reiterated by another communal farmer (MFi.1) from within the same community of practice, but in a different locality (ward). Observations in the area of study however indicate that farmers continue to grow maize, with poor results at least half of the time.



Figure 4.5 *A plot of maize in the study area with a not so promising maize crop, typical of many farming plots in semi-arid rural areas*

The reasons for the continued growing of maize in stressful conditions shall be discussed in chapter 5.

One farmer observed of her crop “.... my crops suffered from heat and dryness”, (communal farmer respondent 3, NFi.3). The problem of drought had implications for child survival, especially for orphans and vulnerable children. “When there is drought, porridge from rapoko saves the children from starving to death” (NFi.3).

Another risk factor mentioned by the farmers was the problem of crop destruction by straying animals, and marketing. “Straying goats once ate all our vegetables. We were deeply hurt” (communal farmer respondent, MFf.a). This problem was reiterated by another farmer assisting the group, who indicated that their three tier strand fence needed reinforcement with pig mesh wire, or two more strands of wire at the bottom.

Accelerated soil erosion is a further risk factor for farmers especially in semi-arid areas with poor loose soils. In the 2005 to 2006 agricultural season many farmers in Marange communal lands lost a lot of topsoil from their fields to massive soil erosion from surface run-off during heavy showers that came after three successive drought years.



Figure 4.6 *Massive soil erosion cutting across a cultivated plot of sorghum in a field with poor conservation works after an unexpected heavy shower in semi arid rural Marange*

It was observed during one of the seed and food fair events that some ambivalent messages had the potential to confuse farmers on their soil fertility improvement techniques and subsequently their choices of food plants to cultivate. For example at the Nyanga seed and food fair of 2007, several stakeholders contributed prizes for winners. These included the National Museums and Monuments of Zimbabwe, Environment Africa and the local community itself. While this was an excellent example of partnerships working together for action, prizes included fertilisers, which some of the stakeholders were discouraging (see NSo.a, Nyanga seed fair observation and report, July 2007). In addition, every year as much as the community leaders can find it, they will bring in fertiliser, which is subsidised for the farmers to buy. This input provision scheme is also supported by operation *maguta*, which is the national army's contribution to improving food production among the communal farmers.

This way, farmers will fail to see the destructive nature of fertilisers in time, and will receive what is on free offer or affordable at once without reflecting on the long term impact of their practices.

4.4 THE ROLES OF THE DIFFERENT ACTORS

A number of actors who participate in, and influence the COP were identified. These included the farmers themselves and their group leaders, Agricultural extension officers and workers, NGO field officers, the Zimbabwe Farmers' Union, and community leaders. A closer examination of these actors in relation to the farming COPs revealed different roles in the COPs, and in relation to the COPs. These were summarised into an Analytical Memo (AM.3) and are reported here.

4.4.1 Farmers as facilitators of their own learning

Farmers in this study indicated their efforts as active learners, who took responsibility for their own learning through farmer to farmer support, participatory extension and peer supervision, as indicated by this statement: "Our small grains committee co-facilitates in training workshops. We have a supervisor in each ward" (communal farmer respondent 1, MFf.b). The facilitation of workshop training by small grains committees happens in both Marange and Nyanga, but the supervision at ward level was more active in the Marange COP than the Nyanga COP, which relied more on periodic group meetings.

4.4.2 Field personnel as trainers, facilitators and learners

Farmers interpreted the role of field personnel from Environment Africa as facilitators of planning, training and monitoring. Plans, reports and farmer records at Environment Africa indicate that the organisation has facilitated training workshops to help farmers clarify their constitutions, appraise farmers on their project cycle and assist them to conduct their own planning and reporting (Environment Africa PME database, 2007). "Environment Africa personnel visit us regularly to monitor our work" (communal farmer respondent 1, MFf.b). "The first thing they do is to train us" (communal farmer respondent 2, MFf.b).

Commenting on their work with farmers, one of the field personnel testified, "Working with this group is a joy. They persevere. They go to training workshops even far

away” (field personnel respondent 1, MFf.a). They also indicated how they have learned from farmers, “whilst I am relatively new, the farmers have good ideas, which I have learnt from”.

4.4.3 Agricultural Extension Officers and Workers facilitate learning as trainers and advisors

Farmers saw the role of AREX personnel as that of training and advising them on the right seed to plant. Some farmers also saw AREX personnel as the authorities of training and therefore felt as farmers they were not at liberty to share their knowledge with other farmers, as indicated here “I did not train other people after the CIMMYT workshop because I was made to believe that is the work of AREX” (Nfi.3). Interviews with AREX personnel confirmed their perceived role as authoritative trainers and advisors as shown here: “We disseminate information to farmers to improve what they are doing, especially yield” (AEPi.1). In addition “My role as an AEW is to impart technical knowledge to farmers, for example MFTS, demonstrations, and monitoring visits” (AEPi.2).

Some farmers felt that AREX had abdicated from their role as trainers of conservation and livestock breeding, and as one farmer lamented “AREX officers are no longer teaching about animal husbandry” (MFi.4). Policy document analysis and interviews with Agricultural Extension Workers shows that as of 2006, the role of Agricultural Extension Workers was reduced to horticulture, and much less animal husbandry, while the conservation function was left to the engineering section, whose personnel are based in town and not in the rural areas where Agricultural Extension Workers are based. The Master Farmer Training Scheme has potential to involve farmers to buy in and own the process of their training since it requires “farmers to contribute towards food and transport during the one week courses” (DA.3, appendix 1B).

4.4.4 Seed Companies, NGOs and farmer support organisations as seed providers and promoters

According to one farmer, “Environment Africa sourced sorghum seed for us from Matopos Research station and distributed freely to selected farmers, [but on the condition that we would pass on some of the harvested seed to other farmers]” (MFi.1). Farmers in a focus group discussion also echoed this observation (MFf.a).

A focus group with farmers indicated that they got information on seed availability from the Zimbabwe Farmers' Union (ZFU), NGOs such as Environment Africa and Plan Zimbabwe, and various seed houses.

Analysis of documents of an NGO supporting seed fairs, and observation of a seed fair supported by the same NGO, but organised by AREX indicated that some non-state actors were taking a cautious approach to the question of seed procurement. This was being necessitated by advice from Government to apply a voucher system, "NGOs who prefer to conduct seed fairs at local level are free to do so but these should be organised by AREX... NGOs must provide vouchers for the identified disadvantaged households" (Government of Zimbabwe, MoARD, 2004). In response to a question on how the voucher system works, a field coordinator facilitating the voucher processes explained that

We buy coupons for needy farmers and give to those farmers, who are selected by AREX. This year the coupons are worth Z\$4 million per farmer. They must buy all their needs at this seed fair. They cannot redeem coupons to cash. It is up to them what exactly they buy here (CDC1 in MSTlo.c).

The cautious approach was also encouraged by bad experiences in direct procurement of seed for farmers, which resulted in poor performance, as indicated here "Our actions on seed provision in good faith may end up being interpreted negatively in the event of some catastrophic happenings... [This is evidenced by the previous] PANNAR sorghum experience ... and general comments aired in the press" (AREX & PLAN International, 2005). The risk associated with direct seed procurement is presented in section 4.3.6 above, and further discussed in chapter 5.

4.5 WHAT LEARNING INTERACTIONS ARE TAKING PLACE WITHIN THE COMMUNITIES OF PRACTICE

Data collected from participant observation of training workshops, seed/food fairs, focus group discussions and interviews, and collated in an analytical memo (AM.4, appendix 4) indicated various levels of learning interactions between farmers themselves, and between farmers and external change agents in the COPs.

4.5.1 Intergenerational Knowledge Transfer

Farmers interviewed individually and data generated from focus group discussions indicate that farmers gain and pass on knowledge and skills to and from relatives. One farmer indicated that her married daughter appreciated a traditional meal she made from small grains and now insists on such a meal every time she visits, “when I prepared sorghum sadza for my daughter who was visiting from Harare, she now insists on sorghum sadza only” (communal farmer respondent 3, MFf.b). The role of the elderly folk in passing on knowledge was reiterated by another (male) farmer who recognised that “the idea of growing sorghum came from our elders” (MFi.1). Another lady farmer added that “I learnt about rapoko from my grandmother” (NFi.3). As a way of triangulating the data, a focus group discussion was conducted with a group of twenty women, and from it one respondent summed up the feeling of the group about the role of the elder members in the group by saying that “the elder women teach us organic farming, intercropping and drought tolerant plants”, (communal farmer respondent 2, focus group discussion [a], MFf.a). In an interview, a female farmer from Nyanga indicated “I have shared these (Master farmer and silage making) skills with my children and brother” (NFi.3).

The Master farmer Training Scheme encourages sharing of information, skills and knowledge between relatives, as expressed in the MFTS documents here, “For illiterate farmers, the course allows trainees to seek assistance from relatives, children or friends to document progress” and with other farmers (as discussed in section 4.5.2 below).

4.5.2 Farmer to farmer knowledge sharing and learning

Farmer to farmer learning extended from inter-generational knowledge transfer to include other farmers. “When I pass on seed to other farmers, I demonstrate / show them how to plant it” (communal farmer respondent 2, MFf.b). Yet another farmer, in an interview, indicated, “I have shared with all my neighbours skills of making green manure and growing herbs” (NFi.3). The headman, who knew much about the activities of environmental action groups working in his area, observed that “In my area, there is Tatenda group, which was born from this Tawanda group” (Headman Tawanda, focus group discussion [a], MFf.a). This observation by the headman is significant in showing that one farmer group was sharing its knowledge and networking with other groups within their broader community of practice.

Seed and food fairs also provided a forum for farmer to farmer extension and learning, as admitted by one farmer, “At seed fairs we learn a lot and see what others are doing” (MFf.a).

4.5.3 Farmers learn from literature and other printed information

An elderly farmer, who holds a Master Farmer’s Certificate from Arex, indicated that “I have a textbook on health which explains that sadza from sorghum has to be eaten because it is very nutritious” (respondent 1, MFf.b). AREX, in their MFTS, use illustrated charts to demonstrate farming principles, which are particularly useful for the illiterate farmers. Each Master Farmer student is provided with an exercise book that has farming information, guidelines and expected standards that need to be met. The books are both a source of information, and a means to document the farmers’ own practice. At the seed fair in Nyanga, farmers were also observed engaging with written text on the museum display boards and charts (NSo.a).

Environment Africa distributes newsletters to farmers, which carry information in the local language promoting sustainable agricultural practices, and include stories of change from farmers within the community of practice (Environment Africa, 2007). During visits to Environmental Action Groups in the communities of practice in this study, farmers were observed engaging with these newsletters and also with Greenline magazine, Environment Africa’s corporate magazine, and some were asking for the next issues. The file of Sunrise EAG contained a number of these publications. Also present in files of all three Environmental Action Groups were handouts from various training programmes, including permaculture training co-facilitated by SCOPE, and herbal training facilitated by Environment Africa. As the group members were explaining how they used their plants, they often referred to their notes for identification and uses, during the focus group discussions or observation visits.

At the District Seed and other Technology Inputs Fair in Marange, I observed that the three seed companies that were selling their products had various pamphlets they were distributing to farmers, which the farmers were observed reading and comparing, and they had posters and charts promoting their products (Participant observation report, MSTIo.c). This same type of advertising was also observed at the Manicaland Agricultural Show. In most cases, what was advertised was either hybrid seed, fertilisers and/or pest control chemicals (see Figure 4.7.1 and 4.7.2 below).



Figure 4.7.1 Advertising seed and promoting technology, high yield and food security at the Manicaland Agricultural Show



Figure 4.7.2 Advertising chemical fertilisers and agro-chemical pesticides at the Manicaland Agricultural Show

4.5.4 Farmers ‘pass on’ part of their harvests to other farmers

As indicated in sections 4.3.1 (practices) and 4.5.2 above, the passing on of seed from one farmer to another brought about learning. The learning interactions that take place through passing on of seed are described by farmers passing on the seed in interviews, such as “I have passed on seed to ten farmers. Four of them are doing very well” (communal farmer interview respondent 7, MFi.7). Another farmer in the small grains project had “given seed to eight of my neighbours...” (MFi.1).

Data from a key informant focus group discussion confirmed this trend, when one farmer summed up the feelings of her support group when she said, “when we passed on seed to other farmers, many originally pessimistic laggards became interested in the sorghum after tasting the sadza prepared from it” (communal farmer respondent, MFf.b).

4.5.5 Learning from trying things out

The evidence in the data suggests that farmers also learn from trying things out or experimenting with new ideas as indicated here: “I like to experiment, so I grow two crops at a time to compare. Like this year (2006/07) the maize crop was destroyed but sorghum did well. They [it] take[s] minimal water” (MFi.7). This is supported by the theory that learners learn best through doing. In addition “Most of the farmers who have received seed from me are now very serious with sorghum growing ... [they] have a bigger size of their fields with sorghum compared to maize. They like the sadza [after having tasted it.]” (MFi.7). This observation is supported by

experiences from the small grains committee in the Marange communities of practice, who indicated that “When we passed on seed to other farmers, many originally pessimistic laggards became interested in the sorghum after tasting the sadza prepared from it” (MFf.b). These observations indicate that farmers appear to want to try out things before they get deeply involved, to the extent that some wait for others to start doing it and after they see good results, then they get more interested and want to join. One farmer confessed that “I like learning through seeing what others are doing” (MFi.4).

4.5.6 Learning from risk and responding to risk

The data shows that farmers learn from risk (see also section 4.3.5), probably more than they learn from training workshops. According to one farmer “The return of sorghum in this area was caused by drought” (MFi1). Farmers who are also members of a small grains coordinating committee, explained the growing of sorghum as follows “We grow sorghum also in this area which is a hardy drought tolerant plant” (MFf.a). Yet another farmer observes that “I learnt that maize is not the best crop to grow in my area. Those people who harvested ... planted *OPV* maize seed which is [more] drought tolerant” (MFi.4), (*my emphasis*).

Not all farmers realising the vulnerability of maize to climate change are abandoning it, but some are simply learning from risk, as shown here “We grow maize in the garden because this is where we can get adequate water from the ground” (MFi.4).

In response to economic challenges and shortage of commodities, some farmers are growing food crops that replaced those commodities they otherwise were used to buying: “I grow sunflower to get cooking oil substitute for oil no longer available at Bambazonge shop” (MFi.6).

Sometimes farmers learnt the hard way after their fields were washed away after unexpected heavy rains caught them unawares after three successive seasons of drought.

4.5.7 Learning from training interventions

The communities of practice in this study received farming and conservation training from the Agricultural Extension Workers (AREX); the Veterinary Services

department; the Environmental Management Agency; Seed companies such as Pristine Seeds; NGOs such as Environment Africa, the Catholic Development Commission and the Community Technology Development Trust; and individuals.

Training from the Master Farmer Training Scheme has provided useful learning to some farmers, as evidenced here: “I undertook a Master Farmer training course and was certified in 1985. I learnt how to keep crop residues on a raised platform as silage to feed my cattle” (NFi.3). The farmers appeared to have a sense of the training and extension quality they desired, as indicated by one farmer who felt that “Follow up mechanisms should be implemented to ensure continuation” (MFi.5).

Look and learn study visits were also cited as opportunities for learning in communities of practice, where one farmer expressed that “I have been to Chikukwa permaculture centre where I learnt how to make green manure” (NFi.3). Other evidence for learning from training interventions was expressed from another study tour experience, where a nutrition garden group appreciated that “We were sent by Environment Africa to learn from another group, now I am growing trees at my home. I am selling to get cooking oil” (MFf.a).

Field days and seed fairs were also recognised as training grounds for learning, whereby “At field days we learn from mistakes and they improve community development” (MFi.6). In addition “Seed fairs are precious because you learn a lot and there is opportunity to win farming implements... Last year I won two axes and at the area show (sponsored by AREX). At seed fairs we sell and we see what others are doing” (MFf.a).

Visiting another nutrition garden group, I observed that the members, who had attended a permaculture design workshop at a different site, were adopting what they had learned, and had constructed half moon beds to harvest rain water in their own plots.

4.6 Learning in a community of practice

From the data, it is evident communities of practice. This below).

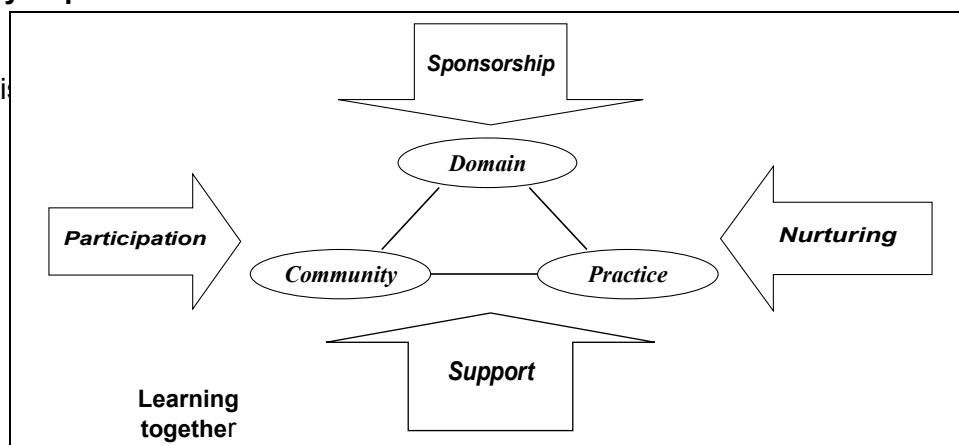


Figure 4.8 Wenger’s structural model of a community of practice (Wenger, 2007)

4.6.1 The domain

In the diagram above, the domain for the communities of practice under study was made up of small grain farming. This domain was also characterised by loss of traditional crops, the growing of maize, and consequent high input expenses and failure of hybrid maize. This domain is also changing due to various constraints discussed in this chapter.

4.6.2 The community

The community is made up of farmers, mostly adult men and women, who are farming both as individuals and some in groups. The community extends further to include NGOs and extension services, which assist it.

4.6.3 The practice

A number of activities shape the practice of the community, and these include the following:

- sharing information and seed
- working together and individually
- look and learn visits
- field days and shows
- sustainable agricultural practices
- facing risks,
- planning and cultural practices

The communities of practice have a number of characteristics, which are participation, sponsorship, nurturing and support. The evidence shows that these characteristics are manifested as follows:

Participation <ul style="list-style-type: none"> • geographically based interactions 	Sponsorship <ul style="list-style-type: none"> • training
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<ul style="list-style-type: none"> • farming • networks of NGOs and support 	<ul style="list-style-type: none"> • seeds
Nurturing <ul style="list-style-type: none"> • Communal relations • Support organisations 	Support <ul style="list-style-type: none"> • NGOs • AREX • Museum • Each other

The diagram above and its interpretation give a picture of the COP learning process which is characterised by the specific aspects detailed above, of participation, sponsorship, nurturing and support for the COPs studied. Farmers learn together as a community of learners, who are kept together by the domain of small grain farming, though in flux due to the changing socio-economic and climatic factors. While the COP processes are clear, there is little explanation on **why** things are the way they are and **why** these learning interactions are taking place. In chapter 5, I try to analyse the reasons why the learning interactions are taking place and lead to the status quo discussed above. The causal analysis which I use helps to structure the explanations.

4.7 CONCLUDING SUMMARY

In this chapter I have presented the data generated from key informant interviews, semi-structured interviews with farmers, focus group discussions with farmer groups, and participant observation of farmer activities, namely seed and food fairs and training workshops. In addition, I have also presented data from analysis of relevant documents provided by Environment Africa and other relevant organisations. Analytic memos constructed from the data summarised what people said in interviews and focus group discussions, what I saw, and what I read from key documents. These analytic memos grouped the data into categories and sub-categories which were based on themes emerging from the data. A number of factors influencing farmers' choices of cultivated food plants were thus presented and these were seen in what was happening to food plants, what farmers were doing, learning interactions within the farming communities at family and neighbour levels, and the roles of the different actors. Certain crops, such as sorghum, were preferred to others in the fields, and Covo in the gardens in semi-arid areas. The influence of drought was prominent.

In the next chapter I analyse further the data presented in chapter 4, using analytical statements based on the data, and conducting an analysis of causations.

CHAPTER 5: AN IN-DEPTH VIEW ON LEARNING INTERACTIONS AND PRACTICES ASSOCIATED WITH FARMERS' CHOICES OF CULTIVATED FOOD PLANTS

5.1 INTRODUCTION

In chapter 4, I presented narratives made up of a thick description of the data drawn from the raw data generated from various case study techniques that were informed by Wenger's communities of practice framework and his theory of social learning. As indicated at the end of chapter 4, this framework provides useful insight into interacting factors and processes involved in social learning amongst farmers and their support groups, but it does not explain adequately why things are the way they are. The Wenger COP framework therefore enabled me to gain insight into goals 2 and 3 of the study (see below). This chapter, therefore, considers the data with an interest in gaining a deeper insight into what influences these learning interactions in the communities of practice (goal 1). This was necessary to fully understand these learning interactions, and to address the research question which, as indicated in

chapter 1, was to understand the learning interactions taking place within a community of practice of rural small grain farmers that influence their choice of cultivated food plants. This study was guided by the following goals:

- To gain an in-depth understanding of factors influencing Ziwa and Marange communities of practice to make informed food choices,
- To explore the learning interactions among the Ziwa and Marange farmers that shape their farming knowledge and food security strategies within a community of practice (adequately dealt with in chapter 4),
- To identify the learning interactions between the farmers and external trainers that lead to choice of cultivated food plants (adequately dealt with in chapter 4).

Drawing on Patton's (1990) advice, this chapter has tried to make sense of what people have said in different places, being vigilant of patterns and tying up loose ends together, to gain a more comprehensive view of what was taking place.

5.2 AMBIVALENT INFLUENCES ON FARMERS' FOOD PLANT CHOICES

5.2.1 A concern with ambivalence

Ambivalence is a complex issue which lends challenges to practitioners grappling with sustainable development, who include Agricultural Extension Workers and NGO facilitators. Lotz-Sisitka et al. (2006: 22-23) observed during research to support ESD implementation in southern Africa that "a strong case was made for the need to enhance capacity of professionals to deal with complex issues [such as]... ideological ambivalence, conflict, tensions and contradictions, poverty reduction and community expectations". They argue that "recognition of the tensions between different ideological positions, however, creates productive spaces for learning..." (*ibid.*: 23). Ambivalence has been described as "reflecting the co-existence of positive and negative evaluations of an attitude object, such as genetically modified foods. [It gives an idea of the] degree to which... reactions were conflicted, mixed and indecisive toward the attitude problem" (Nordgren, et al., 2005). From the Mozambique ESD consultation report, ESD practitioners argue that "we need to acknowledge the controversial and engage with the tensions" (Lotz-Sisitka et al.,

2006: 24). Working with these ideas, the following issues were found emerging from the data.

Analytical Statement 1:

Various ambivalent messages negatively influence farmers' choices of what to value and cultivate for food.

The case of the 2007 Nyanga Ziwa Seed and Food Fair (AM.2; NSo.a; see section 4.3.6 above) illustrates the potential danger of an ambivalent message in action. When partners assisting the same farmers pass different values of agriculture, there is bound to be confusion among the farmers. The causes of such ambivalence are deeper though. Government is currently on a drive to increase productivity among the rural farming community in order to avail food in the household and national storehouses and thereby beat hunger. As part of this policy, 'Operation Maguta' was launched in 2006 with the aim of supplying seed and other inputs to smallholder farmers at affordable prices.

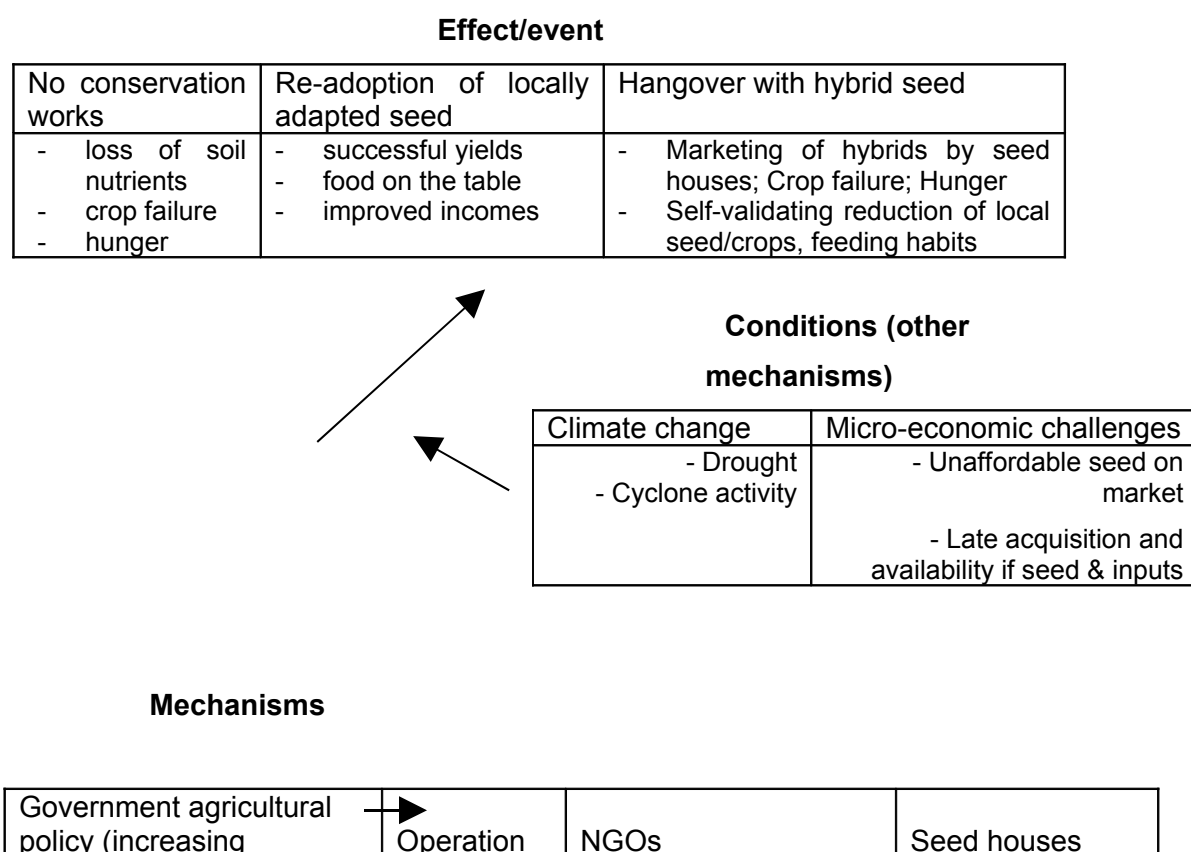
The case of a 'Seed Technology and other Farming Inputs Fair' illustrates further ambivalent messages (see section 4.3.6) where the Agricultural Extension Workers were assisting farmers to buy the best type of hybrid maize available from other hybrid maize varieties that had been brought to the fair by invited seed houses. There was a negligible amount of small grains, the appropriate staple crop that AREX is promoting as most appropriate in the hot, dry area, and which had been brought by smallholder farmers participating in the fair. None of the invited seed houses had brought small grain seed, and only one of the three seed houses present had brought an OPV maize variety. This OPV seed was of the 'certified' class of seed, whose genetic make up quickly deteriorates on cultivation and hence seed from harvests cannot be successively planted.

Observations show that the recent shift in primary staple grown by farmers from maize to sorghum was quite apparent in the small grains farming communities of practice serviced by Environment Africa, and these farmers' neighbours (see photo-documentation Figure 4.3 section 4.3.6). Because maize was heavily promoted by the agricultural policies of the colonial Government, a dramatic shift to growing maize had dominated most communal farming lands, with the attraction of cash from the Grain Marketing Board (GMB), (PC.1, personal communication, April 14, 2004;

MFi.1, Analytical memo AM1). This promotion was so much that even in dry areas where it had become risky to grow maize due to incessant drought spells; the growing of maize had persisted by habit. Many farmers believe that maize originated from Zimbabwe and hence could be grown in most parts of the country.

Figure 5.1 below shows how socio-political, economic and physical structures use various mechanisms to influence farmer behaviour, with positive and negative consequences. The diagram attempts to analyse some of the causal mechanisms that influence communities of practice to do what they do, that is their farming practices, what they choose to plant, and what they value as food. The structures that influence the practices arise from social (for example knowledge systems) and political economy (for example command agriculture and price controls) dimensions. These structures operate through various mechanisms such as policy, political decrees (for example 'Operation Maguta' and price controls), and extension. Coupled with these mechanisms are other uncontrollable conditions that combine to bring about actions and effects that may have been unforeseen (see section 2.3.2.3; Sayer, 2000: 15).

5.2.2 Causal analysis of ambivalent messages reaching farmers



productivity)	Maguta		
<ul style="list-style-type: none"> - Fertiliser promotion - Provincial & District seed fairs; - Local and hybrid seed promotion - Input subsidies accessible to few farmers 	<ul style="list-style-type: none"> - Low-cost fertiliser provision - Hybrid seed provision 	<ul style="list-style-type: none"> - Trainings - Facilitation of farmer to farmer interactions - Promotion of locally adapted / OPV seed varieties - Some promotion of hybrid seed and fertilisers in combination with OPV promotion - Promotion of conservation farming 	<ul style="list-style-type: none"> - Hybrid seed marketing - Supply outstripped by demand - Inadequate consideration of farmer environment for seed performance - Controlled by multi-nationals

Structure

Ministry of Agriculture	Political intervention	Macro-economic challenges	Knowledge systems
<ul style="list-style-type: none"> - Agricultural authority - Separation of extension (AREX) / engineering functions 	<ul style="list-style-type: none"> - Command agriculture - Land issue, agrarian reforms 	<ul style="list-style-type: none"> - Hyperinflation - Seed scarcity - Fertiliser scarce and expensive 	<ul style="list-style-type: none"> - Indigenous way of knowing about appropriate crops - Challenge of dominant western knowledge systems (research stations, top-down extension) - Power-knowledge relationships

Figure 5.1 A causal analysis of ambivalent messages

With such a complex set of competing influences, it is not surprising why farmers continue to grow hybrid maize with consequent crop failures. A great deal of coordination of communal farming and extension is required, which takes into account local conditions, needs and knowledge, and which has a strong bias towards promoting locally adapted open pollinated seed varieties. Official agricultural extension is probably better placed to take the lead, but in a participatory manner, and with active involvement of NGOs, farmer organisations and traditional leaders. This will contribute towards levelling power relations among stakeholders, as discussed in section 5.3 below.

5.3 POWER RELATIONSHIPS

Foucault (in Gordon, 1980) claims that belief systems in society gain entry and power as more people come to accept the particular views associated with that belief system as common knowledge. With such a discourse, which becomes considered as “undeniable truths”, ideas about what is right or wrong are derived by the community, which tend to exclude certain thoughts, views, actions and practices. “... Relations of power are interwoven with other kinds of relations (production, kinship, family, sexuality)” (Gordon, 1980: 142).

Analytical statement 2:

Power relations affect farmers' choices of food plants.

The evidence indicates that power relations arise from authoritative rules and requirements, ability to market or advertise (product, price, packaging and place), financial resources, separation of critical functions and disempowerment of extension personnel, and also who has what seed when planting time comes. As discussed briefly in section 2.3.2.2, power relationships arise from imbalances in knowledge and its diversity, values and application. Shiva (2000: 1) refers to a "politics of disappearance" of traditional seed and crop varieties, which is caused by green revolution technologies passed to farmers by seed companies and extension services.

The Individual, whether he wishes to or not, fits into a network of power relationships which is often very complex. This is true for each individual, whether he holds a position of authority or is subjected to it, whether he has the means to impose his wish upon those who are dependent on him, or whether he is obliged to hedge between the different forces which try to impose themselves on him. The place that he occupies in this network is indicated by a certain number of markers, which define, in a symbolic manner, both his individual identity and his position as regards authority and prestige. (European Science Foundation, 1999)

The case of Marange communal farmers gives evidence that power relations had a significant influence on the way individual farmers look for, source and choose seeds to plant for food for their household requirements and for income generation. This evidence arose out of the coordination of the Small Grains committee (MFf.b), the judging of seed/food fair exhibits by appointed judges, and award of prizes for seed/food fair and agricultural show winners. The nature of these power relations is manifested in different ways; some arose in the challenge of knowledge about farming practices by farmers participating in seed fairs which the judges, mostly from AREX, were using.

Yet other aspects of power relations came out of farmers' exclusion in the decision making for choosing venues for agricultural shows, which they value very much as a seed source and a way of networking and sharing their practice. One farmer expressed their dissatisfaction this way "Some of the agricultural shows are done in

areas which are far away from our area this reduces the number of people attending and learning” (MFi.4)

The AREX extension approach, as discussed earlier, sometimes has a top down element, reminiscent of the early authoritarian days of the forceful demonstrators, when “I trained as a Master Farmer and we were taught how to grow hybrid maize as a mono-crop in straight lines for maximum yield” (Mfd.2). Farmers tended to listen and follow what they were ‘taught’ about the ‘right’ crops, usually without consultation as to what they preferred or had experience in traditionally. The conventional AREX approach is indicated by the following: “We disseminate information to farmers to improve what they are doing, especially yield... The research is carried out by research stations” (AEPi.1). However, this statement also shows that there is an element of recognising what the farmers are already doing and building upon it.

Another case highlighting the influence of power relations is the District Seed technology and other Farming Inputs Fairs (MSTIo.c). The choice of participating farmers and the venues for Seed Technology and other Farming Inputs Fairs (STFI Fairs), and the selection of Seed houses invited to sell by STFI Fairs organisers lends power to the selectors, usually community leaders assisted by AREX, and also to the seed houses who have the economic capacity and fuel to reach the venue. A causal analysis of how farmers buy seed and other inputs at STFI Fairs shows that it is a complex issue. First of all the venues for the STFI Fairs restricted access not only to many needy farmers, but also to would-be seed providers due to long distances and fuel scarcity. The bottom line is that it appears any venue will always be far away from some farmers and seed houses, as long as they are organised by other groups and not the farmers themselves. This is because resources are limited for the adequate provision of extension services and sponsorship, especially in the current economic climate in Zimbabwe, which is struggling with hyperinflation. The effects of the macro-economic environment tend to create an artificial demand for hybrid seed maize, which poses risks to farmers, who end up buying inappropriate seed after travelling long distances to get to the source. “Farmers are also buying fertilisers, hybrid maize and a few OPV maize; from Zimbabwe Fertiliser company, Pannar, Seed Co, and Chanwick” (participant observation of a seed and other inputs fair, MSTIF, analytical memo AM.2).

Seed houses are very powerful in terms of their ability to effectively market their hybrid seeds and other inputs, such as fertilisers. This aggressive marketing

contributes to the self-validating reduction of traditional seed and food varieties. These seed companies also compete for the market at such public farmer events as seed fairs and agricultural shows, “I have also learnt about crops to plant from seed houses that compete with each other at district shows, e.g. Pannar, Seed Co. My first choice maize is SC513 followed by SC627, Pannar 67 is also good” (NFi.3). This promotion of hybrid maize is also a colonial legacy, “The grain marketing board actively discouraged farmers from growing hickory king, an OPV maize variety (in favour of hybrids)” (PC.1, personal communication, September 14, 2004)

Another case of power relations affecting seed choice indirectly is the structure of AREX (see also structure and agency section 5.7 below). In section 4.4.3 above, it was seen that the separation of function in AREX from the Department of Agricultural Engineering made their work difficult, since the latter department were not present to exercise their function of supporting conservation works. The loss of soil nutrients from erosion will determine what may be planted or not planted in such soils. One farmer lamented the effects of such soil losses on his food production (MFi.1; see also section 4.3.6).

Having analysed the various influences on choice, the question that needs on-going reflexivity is whether it is necessary for government extension services, NGO food security programmes and seed houses to have a common approach to seed selection, procurement and provision, without creating a different type of “monoculture of the mind” (Shiva, 2000). It becomes critical that the different extension agents and NGOs coordinate effectively to address farmers’ needs, using the best available local technical knowledge and values in a participatory manner.

Within communities of practice, Wenger (1988: 190) focuses on “one aspect of power as an element of social life by arguing that a social concept of identity entails a social concept of power and... a discussion of power must include considerations of community, negotiation, meaning, and identity”.

5.4 INTER-GENERATIONAL KNOWLEDGE TRANSFER IN COMMUNITIES OF PRACTICE

Analytical statement 3:

Farmers' choices of crops and technologies are influenced by their interactions with family structures, relations and neighbours.

Evidence suggests that non-formal and informal interactions between farmers and their adult or non-adult relatives, and their neighbours in a community of practice have an influence on what they plant for food. The older members of the community appear to command respect in one to one and group settings, not only because of the association between age and wisdom, but because their wisdom has also been seen to work in practice, as reflected in these statements. "The idea of growing sorghum came from our elders" (MFi.1); "I learnt about rapoko from my grandmother. I keep the seed in a clay pot" (NFi.3); "I have shared these (master farmer, silage making) skills with my children and brother" (NFi.1) "The elder women teach us organic farming, intercropping and drought tolerant plants" (MFf.a; see also sections 4.3.1 and 4.5.2). In the focus group discussion (MFf.a), it was noted that the most senior member of the group, who work together in a nutrition garden, had in the previous season harvested the best quality and quantity of sorghum SV 4 in the whole ward.

As Wenger (2007: 4) points out "learning in a community of practice is not limited to novices. The practice of a community is dynamic and involves learning on the part of everyone". The Marange and Nyanga communities of practice show evidence of both older and younger members learning together and sharing knowledge in an atmosphere of respect". This two-way learning also applies to organisations coming into communities of practice to assist efforts already there, as discussed in section 5.4.1 below.

5.4.1 Rekindling memories and practices, learning by discovery

Some memories or discoveries of the goodness of certain foods have been found in the preparation and eating of food, as reported by the woman who prepared sorghum sadza for her daughter who was visiting from Harare (see section 4.5.8). Traditional learning has for many generations taken place in well structured, apprentice-type systems, where a process of legitimate peripheral participation has also been observed especially where young members of the household or community have watched the adults at work, and then in turn tried out the activity and eventually took over. This was observed in this study in the following situation. When the mother shared with her daughter the proper preparation of a meal using traditional grain and

vegetables, the effects lasted for a long time (NFi.1, MFi.2). While these two illustrations are gender disaggregated, as is the case with most traditional knowledge transfer systems, in today's practice they are not exclusively gender dependent.

When NGOs and beverage companies re-introduce OPV small grains and OPV maize, the type or variety may be new for younger farmers, but it is usually a revival of old memories and practices that have been present in the community from time immemorial, as indicated by the farmer who indicated that the idea of growing sorghum came from the elders and the museums displays (MFi.1; see also section 4.5.8). NGOs have re-introduced sorghum and other OPV seed to both Marange and Nyanga communities over the past 7 to 10 years, for a variety of different reasons, which has resulted in farmers taking up the seed for planting. Where there is no external or internal expert due to knowledge loss, the communities will have to rely "heavily on (their) creativity, recollections, learning by doing, and embodied experiences" (Bradley, 2004) to resuscitate indigenous ways of knowing and practice associated with seed choice and use, and reclaim agency (see section 5.7 below).

It was evident that where memories were resuscitated or indigenous knowledge practices were illuminated, people within the community of practice, including those residing outside the area, tended to make choices for sustainable livelihoods, such as choosing local foods. Agency to choose and plant such crops was also ignited, as discussed previously (see sections 4.5.1, 4.5.5, and 4.5.7).

5.5 LEARNING FROM RISK AND VULNERABILITY

Analytical statement 4:

Changes in climate and ecology affect farmers' food crop choices

Several changes have occurred in Zimbabwe, with specific reference to Marange and Nyanga, which have ironically promoted better lifestyle choices through a sense of improved community identity and belonging, shared practice and joint activities. These changes have included a shift and shortening of the rainy season (or long dry spells), and impoverished soils. Many of these changes are related, and could thus be placed on a cause-effect chain, but according to a critical realism perspective (Sayer, 2000) there is more to the causality than such a simple positivist analysis.

The data shows evidence that there has been a marked increase in the re-adoption of introduced alternatives that have a bearing on traditional knowledge as indicated by these quotes. “The return of sorghum in this area was caused by drought”, “We grow sorghum also, in this area which is a hardy drought tolerant plant”, “Sorghum SV4 is my best crop because it’s drought resistant and it matures early” (MFi.1) [and supported by MFf.a, MFi.4, MFi.5, MFi.6, MFi.7, see also section 4.3.6]. Farmers who are growing more sorghum in preference to maize, and other adapted seed crops, have gained confidence in the food security provided by such a practice from interaction with NGOs, with extension services and with each other, and with the validation of indigenous knowledge about their importance in nutrition and health, for example extension workers claim that “many farmers say their ancestors had been growing small grains for years “ (AEPi.2), while some farmers add that “we stopped growing rapoko because there was no seed. We are going to start growing it again because I got some seed at the seed fair” and “rapoko is no longer grown. If you grow it alone in the neighbourhood, then you won’t reap anything due to birds” (MFi.4, MFi.5).

The spread of risk from grain attack by birds through community-wide learning and adoption of similar seed varieties is well articulated by one farmer who gives seed to his neighbours to try out after they taste the food from his small grains, and eventually they start growing similar varieties in the same locality to prevent undesired cross-pollination and consequent dilution of purity (MFi.1, analytic memo AM.2).

In the case of garden crops, the preference of covo by nearly all farmers in the drier areas of the communities of practice of Marange and Nyanga indicate the deliberate reliance on plant resilience, minimal input and ease of growing. The plant can be grown easily from cuttings, with no need to use seed. Farmers in the communities of practice have also indicated that in times of water scarcity, the vegetable takes a long time before it succumbs to wilting. The Nyanga communities of practice in the irrigated southern parts have a greater diversity of plants in their gardens which include garlic, wheat, potatoes, and peas, which improve income generation and household nutrition because of the presence of water. Hence water provision is critical for any interventions in communities of practice trying to grow crops in hot, dry areas.

Analytical Statement 5:

Changes in the political economy have an effect on learning interactions and farming choices

Evidence presented in chapter 4 indicates that a depression in macro- and micro-economic performance, declining buying power, the discovery of diamonds in Marange, scarcity of commodities especially food in all shops due to price controls, and erratic food aid programmes, have changed farming practices. For example, preparations for planting in the 2006 to 2007 season started very late. In addition training scheduled on agreed dates between Environment Africa and the farmers in Marange were delayed by nearly three weeks due to the absence of farmers who had gone to dig for diamonds (Environment Africa, 2007). The depressed economy was manifested by depressed prices of maize, which are set by the Grain Marketing Board (GMB). Maize is one of Government's controlled commodities (Maphosa, 1992) where prices are guarded jealously. In addition, seed and fertilisers, apart from being scarce, are also very expensive for the farmers.

What is striking though in the communities of practice in both areas is that the farmers are held together by common practices such as learning together in training workshops, seed and food fairs, agricultural shows and among themselves. The depressed economy (coupled with drought discussed above) has caused rural farmers in communities of practice to reflect more on their food security situation and become more self-reliant. This has involved considering the relevance of indigenous knowledge and past practices, which farmers have had to re-appropriate after disruptions to these practices were introduced through unsustainable external influences (e.g. hybrid seed promotion). These unsustainable farming practices seem to be good during times of good rains, but when conditions are more stressed, they only deliver short term gains and amount to false promises in the longer term (as shown by the poor sustainability of hybrid seeds for replanting).

The demand for small grains, especially sorghum, has been increasing over the past five years that Environment Africa has been working with the two communities of practice in Marange and Nyanga. This is evidenced by the increase in the number of farmers receiving seed, either from Environment Africa or from other farmers through the pass-on scheme, and also by numbers of unselected farmers turning up for training workshops (Environment Africa, 2007; [NWR.1, MWR.2]).

Farmers have also resorted to growing crops that provide substitutes for commodities that are no longer found in the shops, such as the growing of sunflower for local oil pressing. “I grow sunflower to get cooking oil, a substitute for oil that is no longer available at Bambazonge shops” (MFi.6).

5.6 TRAINING AND EXTENSION

Analytical Statement 6:

Training and extension influence farmers’ agricultural practices and food security strategies

Evidence suggests that farmers learn from practices through observing and doing. Some of these practices are experimental and the farmers learn from the process and results. Such practice and experimentation would gain more momentum if it was supported by participatory extension approaches. This is supported by Wenger’s social theory of learning, especially the theories of social structure and situated experience. Wenger (1998: 13) in explaining his learning model proposes that “learning as participation takes place through our engagement in actions and interactions, but it embeds this engagement in culture and history”. Here the theories of situated experience emphasise agency and intentions, while the theories of social structure “give primacy to institutions, norms, and rules” (*ibid.*: 12-23). In this case, the structures provided by AREX and NGOs combine with farmers’ local knowledge practices to facilitate improved choices of farming practices and food plants.

AREX’s major approach of group extension is most appropriate considering the meagre human and material resources at its disposal, and can best be applied by taking account of farmers’ local knowledge practices and experiences for sharing in communities of practice. This is cheaper and more effective as it reduces travelling to reach individual farmers, and can build farmer capacity for peer-extension, especially if a training of trainers approach is used with respected, innovative and willing farmers. This group approach also takes advantage of the distributed cognition among farmers, whose diverse knowledge and skills can be pulled together and shared among the community members at low cost. “In the MFTS we face several challenges; we don’t have enough teaching aids, even stationery for conducting tests. But MFT activity record books are available” (AEPi.2).

Training that is conducted by extension services has lasting effects on farmers, and much of it has been driven by Green Revolution technologies. “I trained as a Master Farmer and we were taught how to grow hybrid maize as a mono-crop in straight lines for maximum yield” (MFd.2). While such technologies were the prevailing knowledge system during those times, times have changed fast, and some of the pitfalls of monocultures and inappropriate crops have been experienced by both farmers and extension services, as discussed in chapter 4. It is thus reassuring to find agricultural extension workers now using participatory techniques’ in their extension, and adopting sustainable agricultural practices, as shown by this quote “We worked with a certain farmer to demonstrate to others the growing of finger millet by an innovation of transplanting from a seed bed, which worked very well” (AEPi.2, see section 4.5.2). Farmers themselves have also indicated in the evidence that “we use manure and termite mounds and not fertilisers in growing sorghum” (MFf.a), as a result of learning that has taken place within their community of practice. Another farmer reinforced this idea of improvement from MFTS training, “I undertook a Master Farmer training course and was certified in 1985. I learnt how to keep crop residues on a raised platform as silage to feed my cattle” (NFi.3, analytic memo AM.4).

The Environment Africa community development project in Manicaland, targeting the communities of practice under study, has as its goal “to reach about 4500 – 5000 people with activities, who achieve a direct improvement of their living conditions through the implementation of sustainable production and processing methods”. Activity 3.5.4.1 in the Environment Africa strategic document “Research and share skills and information on food processing e.g. small grains” gives opportunity for organisational learning to occur, which in turn shares the same knowledge with the rest of the communities of practice.

5.7 STRUCTURE AND AGENCY – RECLAIMING AGENCY

Analytical Statement 7:

Capacity and knowledge influence agency of farmers and their choices

Evidence suggests that the farming communities of practice under study will respond to innovations and will adopt previously discarded and more sustainable seed and planting practices, if capacity building is carried out appropriately, for example in a participatory manner. Sections 5.2 and 5.3 above discussed how ambivalent

messages and power relationships confuse farmers and sway them from what could be wiser choices because of the strong influences reaching them, thus affecting their agency.

AREX's main extension programme, the Master Farmer Training Scheme, is largely unimplemented, or poorly implemented because of meagre resources in the department. NGOs could complement the efforts of AREX in this endeavour, by pooling resources together, and adding aspects of sustainable agriculture like focussing on promoting locally adapted seed of vegetables, small grain staple, and oil seed. This holistic approach could restore farmers' confidence in their own crops because the same message would be shared by both governmental and non-state actors. An alternative would be to strengthen farmers' knowledge of options and choices, and therefore their negotiating skills and choices.

In addition, the separation of extension and conservation education functions appears to have detrimental effects on the ground, as farmers officially and effectively lack the conservation support that they desperately need for their fragile soils (see section 4.3 on the impact of such risks).

Evidence shows that the learning capability of farmers for seed security can be enhanced by quality extension and training that recognises the value of farmers' local knowledge.

5.8 CAUSAL FACTORS INFLUENCING FARMING AND FOOD CROP CHOICES

Figure 5.2 below shows diverse causal mechanisms influencing learning interactions in COPs. Learning interactions are caused by complex factors which have several correlations among themselves as discussed in the causal analysis in section 5.2.2. Figure 5.2 therefore brings together these causal factors in the context of learning interactions in a community of practice framework.

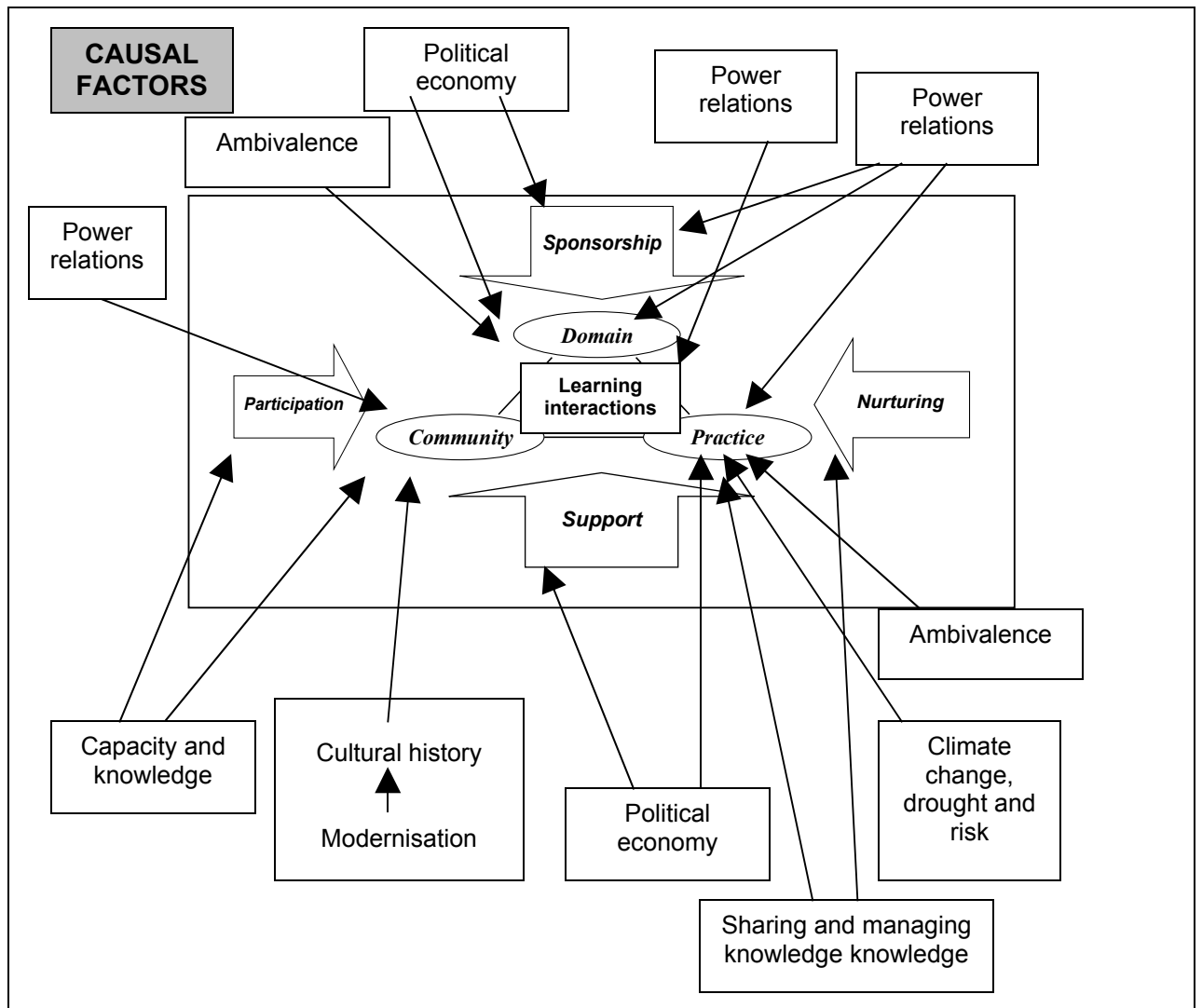


Figure 5.2 *How underlying structures and causal mechanisms influence learning interactions and choices in COPs*

Figure 5.2 shows that the domain is what keeps the communities of practice together, and gives it identity. In this case the domain (growing of small grains) is changing to accommodate more sustainable approaches. However, forces exist that can confuse the knowledge in the domain, and these are ambivalent messages which include promotion of fertilisers, green revolution technologies such as monocultures and inappropriate crops (for example hybrid maize in hot dry areas), while negating traditional locally adapted crops. However, as a community of practice has members learning together, with a little support from extension services and others, the promotion of local knowledge and varieties without such mixed messages as explained above has potential to improve the practice of the community, and hence food security.

The diagram above shows that there is a diverse range of factors that influence learning interactions. These different mechanisms influence how the learning interactions take place, for example, what actions are possible, what negotiations take place, what people reflect on and how people communicate (Wildemeersch, 2007). Actions referred to here are processes of social action linked to social learning, and these include engaging in participatory processes such as farmers planning together to improve their nutrition garden and helping each other in small grains farming (see sections 4.5.2 and 4.6). Such actions “are triggered by a particular need and a set of competencies” (*ibid.*: 100), in this case the need being food security and the competencies including agronomic practices of small grain production, processing, storage and use. Learning thus happens where there is a tension between competence and a deficit of capacity. This way “social learning [takes] place in groups, communities, networks and social systems that operate in new, unexpected, uncertain and unpredictable circumstances... [solving] unexpected context problems” (*ibid.*: 100).

Processes of reflection are triggered by social learning, as a balance between distance and connection with the issue at stake, in this case choice of appropriate food plants. Connection in this case is the exposure or engagement that the farmer gets to different messages, some from extension services, and some from NGOs and others from within the community of practice. Distance means a process of “(dis)identification with particular people, norms or values ...” (*ibid.*: 101), thereby giving space to weigh and consider the options.

The process of reflection is inspired by communication with either a dominant voice or through multilateral communication (i.e. two way). This dimension of social learning is characterised by the participatory nature (or lack of) training workshops, advertising by seed companies and voices and practices within the community. Such messages will hopefully persuade the farmer to negotiate for the best option that will work in his or her context. Learning thus takes place when a creative balance is found along the four dimensions discussed above.

Wenger, in his discussions of his theory of social learning, describes a more refined set of dynamics influencing the learning processes, which include power relations, meaning making processes and collective actions.

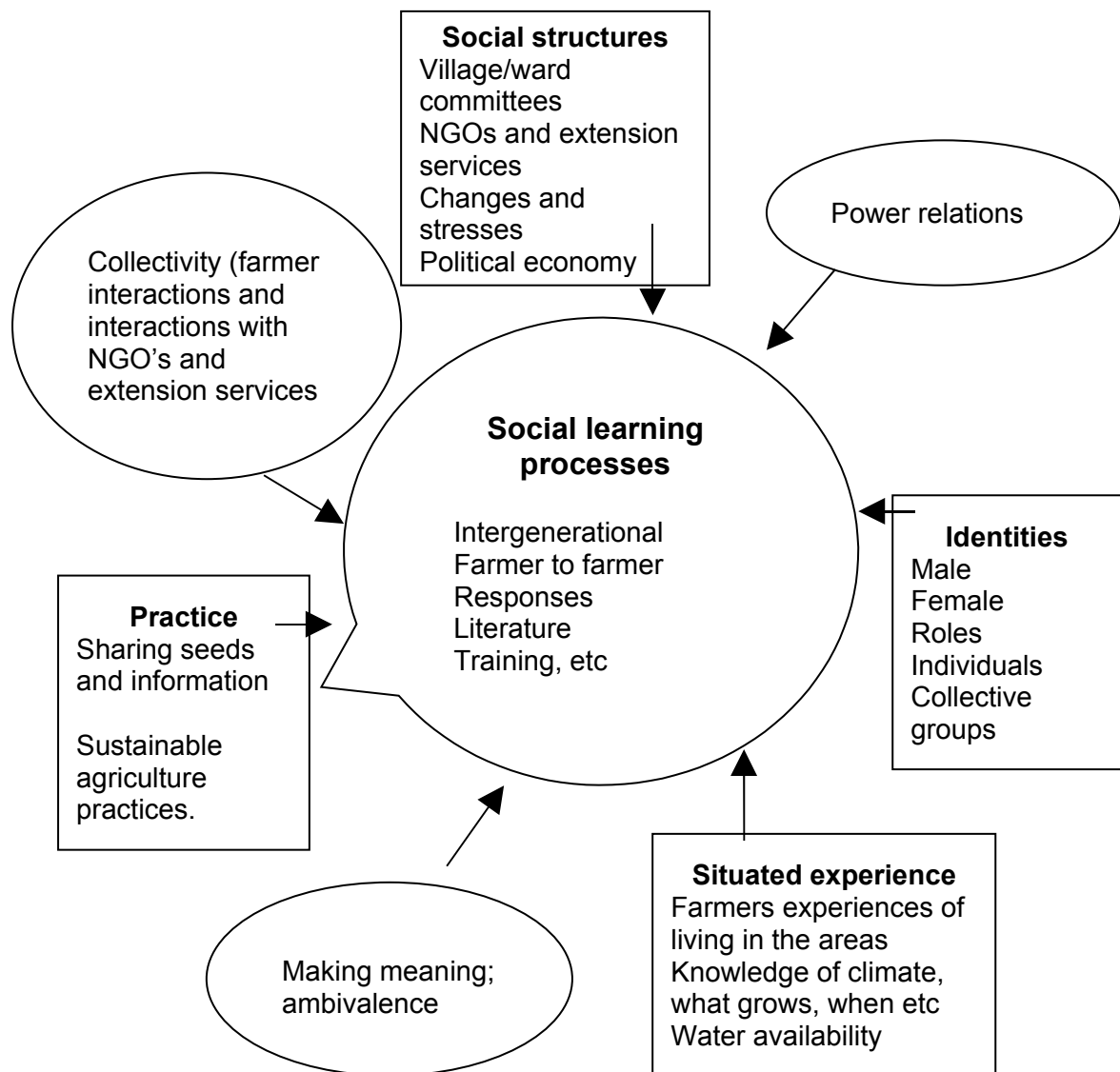


Figure 5.3 Refined dynamics of the Wenger model of social processes

The analysis in this chapter shows that power relations are significant, that meaning making occurs at the interface of existing situated experiences and practices (e.g. negotiating implementation of planting sorghum in drier conditions in response to changing climatic and political economy). A culture of sharing has also influenced the learning process in this study (e.g. seed sharing, sharing knowledge) as has the subjectivities of the actors (gender roles, cultural histories, etc).

Thus it would seem that a deeper understanding of the influencing mechanisms also provides a more refined insight into the learning interactions and choices of farmers. This, coupled with the social processes descriptors provided by Wildemeersch has given me a more detailed understanding of the nature of learning interactions influencing farmer choices.

5.8 CONCLUDING SUMMARY

What appears to be emerging clearly from this analysis is that farmers themselves, extension personnel, NGO's and their personnel involved, have a major role to play in improving learning for food security in communities of practice. It is possible to restore the cultures of seed saving and sharing as these practices already exist and seem to always have remnant custodians within a community of practice, even if the majority adopt "new" technologies. The presence of drought situations and depressed economies create risks that require responses and can provide further opportunities for learning and reflexion within communities of practice. Understanding these complex issues from the perspective of mechanisms provides farmers, educators and development workers with a better understanding of what is possible and how issues can be addressed meaningfully (and not just superficially), thus strengthening possibilities for agency and change. In the next chapter I consider some recommendations that could improve the quality of extension and NGO programmes, and ultimately food security.

CHAPTER 6: RECOMMENDATIONS AND CONCLUSION

6.1 INTRODUCTION

Chapter 5 provided a more in depth view on learning interactions and practices associated with farmers' choices of cultivated food plants. In this chapter, I capture the whole essence of the study, by reflecting on the research question, summarising what I did, and making recommendations based on the analytical statements and synthesis models presented in chapter 5. I also provide a critically reflexive review of the research process, and then provide insight into possibilities and opportunities for further research. The conclusion that I finally draw is an attempt to answer the research question and meet the research goal.

The question as to whose wisdom is best for successful farming may be an issue of debate. However, what is apparent from the study is that farmers' local knowledge and experiences, and the knowledge brought by extension agents may do well to be weighed and considered together, with the good in each tried out and fused together for continuous improvement.

6.2 REVISITING THE RESEARCH QUESTION

As presented in chapter 1, my research question, which was shaped by my workplace context and my own concerns about the apparent lack of sustainability of community food production systems, was:

What learning interactions take place within a community of practice of rural small grain farmers that influence their choice of cultivated food plants?

The broader purpose of the study was to identify opportunities to enhance the quality of extension training and farmer practice as a contribution to food security. My original research goals (indicated in chapters 1 and 5) as expressed in my research proposal did not remain the same, but changed slightly as I interacted with the research communities of practice with whom I negotiated access and focus. My first set of data also influenced the change, which affected mainly the original first goal, which focussed on how the communities of practice came to be established, as it did not seem to be important for the communities of practice I was studying. The Nyanga

and Marange communities of practice were struggling with various survival issues, and a lot of things in their lives had changed due to recent socio-economic decline in Zimbabwe, such that the domain of the COPs was, in fact, changing. This created a dynamic and complex context in which various learning interactions were taking place. It was therefore more important to find out how the COPs were learning together to cope with risk and vulnerability, particularly since the COPs also identified changes in the climate as influencing their practice.

6.3 A SUMMARY OF THE STUDY

My approach to this research was to first seek understanding of the food security and learning contexts of the COPS in the study. I consulted official government literature (agricultural policy, master farmer training scheme, economic policy), literature from inter-governmental organisations, academic research publications and NGO literature. I then carried out key informant interviews with veterans of the Master Farmer Training Scheme (MFTS), NGO field personnel and extension workers. Following this, I carried out semi-structured interviews with individual smallholder farmers and focus group discussions with leaders of small grains committees and farmer garden groups (environmental action groups, or EAGs). I also consulted previous research (for example Pesanayi, 2006). Some, but not all, of the semi-structured interviews with farmers included tape recording. This was because it was found to take very long to transcribe verbatim from the recorder. Only one such transcript was transcribed in full in the original language, and then translated to English. The rest were transcribed with immediate translation to English. The assistance by assistant researchers in conducting interviews helped to minimise the possibility of my own bias. Throughout the whole process, the question of good research ethics was held high, as I obtained informed consent from local leadership, and from the farmers in the COPs themselves.

From these processes, I was able to triangulate data sources, which enabled me to detect consistencies and contradictions in the data. Fortunately there was not much contradiction, except in food preferences, which differed between the Nyanga communities of practice and the Marange COPs, mainly due to piped water availability and accessibility in sections of the Nyanga COPs. The study also provided in-depth insights into learning interactions, and a refined view of social learning processes in COPs.

6.4 SPECIFIC RECOMMENDATIONS

From the analytical statements presented in Chapter 5, specific recommendations that are rooted in the findings of the study were drawn. The thick descriptions provided in chapter 4 gave a sound basis to support the recommendations that have been made below. These recommendations are useful for extension services, farmer training curriculum developers, policy makers, NGOs, communities of practice of farmers, and other researchers. As the broader purpose was to contribute to improved food crop choices, agency and food security, I attempt to keep the recommendations practically useful for Environment Africa's programmes in the first instance, and for the farmers in the COPs. They could, however, also be useful for others involved in sustainable food security programmes.

6.4.1 There is need for different stakeholders to be alert to and address ambivalence

This recommendation is based on the analytical statement number one in chapter 5 (see section 5.2.1), where it was argued that value-laden ambivalent messages conveyed by stakeholders to communities of practice tend to confuse their domain, and expose disharmony among the stakeholders. This may leave the farmers in the COPs more vulnerable to negative forces such as promotion of monoculture practices and dependence upon the misconception of so-called high-yield varieties of seed promoted by seed houses.

The documentation of stories of significant change by small grain farmers in communities of practice can raise the profile of sustainable agricultural practices, and thus help to nip ambivalence in the bud. Documentation processes can be enhanced within COPs through assistance from local schools, where children who are more literate can assist in documenting local varieties of open pollinated crops such as sorghum, millets, bambara ground nuts, ground nuts, African rice, OPV maize, sweet potatoes, and local vegetable and cucurbit varieties, among others.

6.4.2 There is need to strengthen diversity of options available through drawing on experiences and knowledge of farmers and other possibilities and variety of seed.

External interventions such as extension and NGO training have the potential to share power with farmers, by recognising and respecting the farmers' indigenous knowledge of what is best for them to plant in their own area and how they value their foods is important. According to the second analytical statement in chapter 5 (section 5.3), it was argued that farmers will choose seed according to what they are trained to do by AREX and / or NGOs. They will likely disregard and discard locally adapted seed varieties due to self-validating reduction arising from dominating values, which are usually external.

There is value in considering farmers' interactions with family structures, relations and neighbours as a source of knowledge in the selection of food plants. The argument arising from the third analytical statement (see chapter 5, section 5.4) was that farmers gain knowledge, information and planting materials from their relatives, friends and neighbours, through conversation, informal learning and farmer to farmer interactions.

The adaptation capability of farmers needs to be enhanced as a mechanism to cope with risk. There is need for extension workers and NGOs to take advantage of the effects of climate change, manifested as drought situations, to reintroduce appropriate and locally adapted traditional crops. This is based on the fourth analytical statement (see chapter 5, section 5.5) where it was argued that farmers appeared to learn the most from the effects of drought than from training workshops and extension, as they experience direct effects.

The diversity of options can also be enhanced through an emphasis on learning to improve diverse lifestyle choices in communities of practice affected by a depressed political economy. It was argued from the fifth analytical statement (see chapter 5, section 5.5), that farmers in a community of practice appear to make better choices of what to plant and eat for food, because their choices are limited by low buying power and inaccessibility to a wider range of seed and food, whereby the unhealthy foods and inappropriate seeds and inputs tend to be more expensive and otherwise non-essential (for example fertiliser). Communities of practice of small grain farmers are better placed to integrate good crop choice with conservation farming practices and thereby enhance their food security due to economising of moisture, soil nutrients and soil structure.

There is need for Agricultural extension and NGO training curricula to be reoriented in order to be responsive and relevant to farmers' real needs in order for them to choose appropriate food security strategies and sustainable farming practices. This recommendation is based on analytical statement number six (see Chapter 5, section 5.6), where it was argued that quality of extension is determined by farmers' perceptions of what they need, and that it is necessary for external interventions to negotiate with the farmers about the best practices through participatory approaches which include look and learn study visits, farmer to farmer extension, and demonstrations.

6.4.3. There is need to conceptualise or work within a COP framework in order to maximise learning opportunities

The arguments from analytical statement number seven (see chapter 5, section 5.7), which proposed that farmers will respond to innovations and to the uptake of previously discarded seed and practices if they are well trained and exposed to useful knowledge, give base to this recommendation. From the recommendations made above, it could further be recommended that those who facilitate learning in communities of practice must be organised enough to speak with one voice that passes non-oppositional messages so that appropriate agency by COPs uses practices best suited to the farmers' conditions.

6.4.4. There is need to consider and develop capacity to build on to the wide range of learning interactions and learning processes that exist in COPs in extension and support programmes.

The discussions in chapters 4 and 5 showed a large diversity of learning interactions, most of which can be described as social capital for learning and enhancing agency. The refined dynamics of Wenger's model of learning interactions shows that learning interactions are varied and diverse, and are subject to various causal factors. Knowledge of these causal factors has the potential to inform curricula of extension and other support programmes and thereby improve the quality of extension support and ultimately farmers' choices of food plants. Further learning interactions could also centre on farmers' rights, in the context of the potential increase in pressure from economic partnership agreements, trade liberalisation and thus dumping of hybrids and GMOs (CTDT, 2007). A neglect of these factors will leave farmers vulnerable to the various risks discussed throughout this study.

6.5 REFLEXIVE REVIEW OF THE RESEARCH PROCESS

There are a number of changes I would make if I were to carry out a similar research project again. Firstly, I would invest more research time in fully understanding the contextual profile of the farmers. Such a background would provide more information and would provide better pointers for the data generation process. My research question was not particularly robust due to limited contextual knowledge, which resulted in my changing one of the research goals in order to better understand the learning interactions within the communities of practice of rural smallholder farmers under study. With more field-based ethnographic (Geertz, 1973) type research, I am sure that I would also have generated richer data, which would also have provided more insight into learning interactions. Upon reflection, I would also have explored the social processes outlined by Wildemeersch in more depth during the data generation phase as they seem to give more insight into the actual social interactions that take place across the learning interactions identified in this study.

6.6 CONCLUSION

Drawing on the discussions made in chapter 5, it can be concluded that there are multi-level learning interactions that take place within communities of practice of rural small grain farmers, which may have positive or negative effects on their choices of food crops. The research has shown that these are influenced by a range of causal mechanisms, some of which can be addressed in extension and education programmes (e.g. the issue of ambivalent messages and valuing of traditional knowledge) while others cannot (e.g. macro-political economy). External interventions need to capitalise on and improve such interactions in order to assist farmers to make their own informed choices that can be easily adopted and protect farmers' rights that can enable farmers to adapt to changing circumstances (their changing domain).

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8.0 APPENDICES

Appendix 1A

Table 1A.1 Selected logical framework for community development programme (CP), Manica Project, Environment Africa – (document analysis)

Project objective and results	Indicators	Activities
Project objective 1. Improvement of living conditions , through the implementation of sustainable project initiatives: A) the disposable household income of the EAG could be increased significantly B) food security could be significantly improved in the project areas C) the natural and living local environment is managed sustainably		
1A Income generation		
.....
1B Food security		
The degree of self-reliance amongst EAGs has improved significantly: 1.5 The dependency of EAG members from food handouts has been reduced by 30% (source: household economy assessment, HEA).	1.5.1 The number of <i>small grain farmers</i> who are working with CP has increased from 50 to 500	1a. Supervision and assistance of projects on site by field personnel: by-weekly project visits
	1.5.2 Spoilage of food items and seed has been reduced by 50 % through adequate storage and preservation	1b. Bi-monthly training workshops
	1.5.3 EAG members have 30% more grain in their households after harvesting	1c. Development, production and dissemination of didactic training material for the use in workshops
		1d. Improvement and development of training units in: <ul style="list-style-type: none"> • Water management • Processing and preservation of fruit and vegetables • Cultivation and use of herbal plants
		1e. Support of EAGs through material input (e.g. seed, planting material, fencing, solar driers, installation of basic processing plants with adequate equipment)
		1f. Implementation of a transport and marketing structure
		1g. Support of information and experience exchange amongst EAGs (e.g. through bi-monthly meetings, exhibitions, competitions)
		1h. Production of 4-monthly EAG newsletter
		1i. Look and learn visits of

		<p>EAGs with relevant institutions, projects or companies to consolidate important concepts and improve project development</p> <p>1j. Networking and involvement of statal organs</p> <p>1k. Annual household economy assessments</p> <p>1l. Support of the cultivation and utilisation of herbal plants</p>
1.6 EAG members are holding sufficient amounts of seed to plant their fields the following season	1.6.0 EAG members are not dependent on purchasing small grain seed to sow their fields and can therefore plant their crops early in the season and according to the hectarage of fields available to them.	
1.7.0 Diversity of nutritious foods in EAG households has increased	<p>1.7.1 The amount of <i>foods which are being processed in the households of EAG members has increased by 50%</i></p> <p>1.7.2 At least 50% of EAG households have <i>increased the diversity of their diet by 3-5 types of fruit and vegetables</i></p>	
1C Environmental management		
Project objective 2: sustainability of projects The supported EAGs have suitable PME systems in place and are therefore able to continue with their projects independently; building on their experience gained they are able to develop And implement new income generating projects		
.....
Project Objective 3: Spread of impact		
	<p>3.1.1 Cultivation of small grains and OPV varieties in the core areas has increased by 30%,</p> <p>3.1.2 20-25 initiatives have formed, which have taken up CP programmes of income generation and food security and are implementing them independently.</p>	<p>3a. organisation and participation in public events and campaigns in the project areas</p> <p>3b. Bi-annual Environmental competitions</p> <p>3c. Quarterly newsletter: production and dissemination</p> <p>3f. Support of peer training (farmer to farmer, teacher to teacher, teacher to farmer, farmer to teacher)</p> <p>3g. Networking with involvement of statal and non-statal authorities, NGOs,</p>

		institutions, meetings, common activities, development of MoUs, fundraising).
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(Environment Africa, 2005)

Key to document analysis

Colour code	Category
	Sorghum is a preferred field crop
	Learning takes place as farmers interact with each other
	Intergenerational knowledge transfer promotes wise choices of food plants
	Culture and tradition
	External trainers and extensionists play an important role in food plant choices and food security practices

Appendix 1A.1: Document analysis of community development programme

Document Analysis

Name of document:	Community Programme Phase 2 (CP2)
Source / origin of document:	Project Planning Matrix
Date of document:	Environment Africa
Code:	2004 (for the project period June 2005 to December 2007)
	EAd.2

Historical background:

This project document is a follow up to a first phase project that was financed from 2001 to 2003, but effectively spilled into 2004 after a late start. The phase 1 was designed to support rural communities in selected areas of Manicaland Province with sustainable agriculture and natural resource management. Due to economic and political challenges, and the realisation that community empowerment takes longer than a few years, the partners (Environment Africa and WFD) agreed to a project extension of another three years to allow for sustainability mechanisms to be set up for a smooth withdrawal.

Strategy of the Community Programme Phase 2

Issues	Critical comments
1. Structure: The overall Objective of the project (CP2) reaches about 500-600 families (4500 – 9000 people) with its activities, who achieve a direct improvement of their living conditions through the implementation of sustainable production and processing methods. Furthermore the project reaches about 5000 – 6000 students who receive theoretical and practical training in the fields of sustainable resource management	<ul style="list-style-type: none"> ✓ Two components: community and school ✓ Quantitative target of families and individuals; and students ✓ Qualitative definition of livelihood change ✓ Focus on sustainable production and processing' and sustainable resource management ✓ Training as a means to achieve to reach people for change ✓ The project was log-framed for activities, indicators, time and means of verification, implying a constructivist orientation.
1.1 Project objectives and results The project had 4 objectives:	
1.1.1 Improvement of living conditions through the implementation of sustainable project initiatives, A. the <u>disposable incomes</u> of the EAGs could be increased significantly, B. <u>food security</u> could be significantly improved in the project areas	<ul style="list-style-type: none"> ✓ Project assumes that an accumulation of knowledge and experience contributes to sustainability expressed through independent agency (obj2) of the direct (target) beneficiaries and the spread of impact to indirect beneficiaries (obj3) through awareness raising campaigns, public events, media, networking and peer training.
1.1.2 Sustainability of projects. The support of EAGs have suitable PME systems in place and are therefore able to continue with their projects independently; building on the experience gained they are able to develop and implement new income generating projects	<ul style="list-style-type: none"> ✓ Objective 1 (especially sub-objective2 food security) is of direct importance and relevance to this research, with the other objectives providing support of decreasing significance respectively.
1.1.3 Spread of impact. Programmes of income generation, food security and environmental management are being taken up and implemented by people other than EAG members, who have become aware of CP programmes through EA's work with the general public and with schools (e.g. POEMS, campaigns, media, public events,	<ul style="list-style-type: none"> ✓ Sub-objective1 (significant increase in household incomes) of Obj1 is rather too optimistic for the project. [NB. This sub-objective was donor driven in a top down approach by the financial partner. It is a challenging feat for Zimbabwe's current economic dilemma].

1.1.4	networking, peer training).	
Organisational capacity of EA.	The regional office in Mutare has supported the project successfully in regard to the implementation of objectives 1-3 and has sufficient human and technical capacity to continue its work after termination of this project phase.	

Relevant categories and sub-categories identified in the document

Categories	Sub-categories
1. Participatory planning, monitoring and evaluation of food security	<ul style="list-style-type: none"> • The support of EAGs have suitable PME systems in place • EAGs are able to continue with their projects independently • EAGs are able to use experience gained to develop and implement new income generating projects
2. Training curricula and support materials	<ul style="list-style-type: none"> • Bi-monthly skills training workshops for farmers • Development, production and dissemination of didactic training material • Improvement and development of training units in water management, food processing (fruit and vegetables), cultivation & use of herbal plants
3. Learning interactions	<ul style="list-style-type: none"> • Look and learn visits to other relevant projects, initiatives or companies (comp1i, 2f) • Conduct exchange visits with other EAGs (comp1g, 2e) • Support information and experience exchange
4. Farmer practices in food security enhancement	<ul style="list-style-type: none"> • Support cultivation and utilisation of herbal plants

Appendix 1B

Document analysis of Master Farmer Training Scheme documents (DA.3)

Title of document / text 1: **The History and Overview of the Master Farmer Training Scheme (November 1994)**

CONTENT REVIEWED	DATA	CRITICAL COMMENTS
Time and place	1994, Harare, Zimbabwe	
Social and historical context	The history was presented 14 years after the independence of Zimbabwe and 68 years after the launching of the MFTS.	This document was written before the revolutionary agrarian reform programme and hence has a lot of bearing on the initial conception of the MFTS.
MFTS interpretation of the environment for (or with) learners	Among Emery Alvord's ten principles of producing a good crop is included 'manuring', 'rotation', and 'good feed'.	The principles quoted show a desire to maintain a good health for the soil from which crops are raised. These principles were put in place in reaction to poor crop yields and soil erosion observed during the time when overpopulation became a problem in the rural/communal areas.
Value orientation / ethical dimensions evident in the document (explicit and implicit)	Literacy, language, rewards e.g. of rights to purchase small scale commercial farms, awards of certificates as motivation, training of selected individuals	The MFTS was targeted towards the peasant population which spoke the local languages, whilst materials were (and still are) produced in English. On the ground trainers face the challenge of having to translate some difficult terminologies as they have to teach in Shona or Ndebele. The system of rewarding farmers who gained certificates with rights to buy small farms had its positive and negative effects. During the years of colonial rule, the people getting these farms could easily be labelled "collaborators" with the colonial masters. The same applied to the selected trainees, who in many cases were labelled sell-outs due to their association with the 'methods of the white man', (AD1, personal communication, June 20, 2006).

CONTENT REVIEWED	DATA	CRITICAL COMMENTS
Training methodology	Demonstration, examples, action research	The document assumes that the training of individual farmers and their demonstration of good practice will lead to neighbours copying the good work as they see the good. In practice, mixed results were produced, with the influence of politics negatively affecting the programme in some places during the 1950s - 1970s when the seeds of revolution were sown amongst the black population. Today, as shown in the interviews, demonstrations still work quite well and some farmers have been observed to copy or modify good practice with excellent results.
MFTS assessment methods	Practical growing and field assessment of crops in training plots, theoretical written examinations, oral examination. Continuous assessment is also used through the compulsory Master Farmer trainee record books. For illiterate farmers, the course allows trainees to seek assistance from relatives, children or friends to document progress.	The assessment methods are rigorous and span over two to three successive years / seasons. Farmers who cannot read / write have the opportunity of passing the course through the practical and oral assessments.

Title of document / text 2: **The Master Farmer Training Scheme Objectives & Policy (1990)**

CONTENT REVIEWED	DATA	CRITICAL COMMENTS
Time and place	1990, Harare, Zimbabwe. The first MFTS policy was set in 1980, with reviews being done in 1982, 1983, 1986 and 1990.	The policies put in place were largely top down approaches, which were based on the ideas of the technocrats, and took little heed of farmers' local ways of knowing.

CONTENT REVIEWED	DATA	CRITICAL COMMENTS
Social and historical context	Ten years (1990) after Zimbabwe's independence from colonial rule,	The demand for better farmland soared during this period as many people desired to own land for larger-scale farming. In addition, the growing populations in the rural areas

	Zimbabwe's Ministry of Lands and Agriculture embarked on a new MFTS policy replacing the policy of 1986. During this period, resettlement of people from communal areas to larger farming units bought from commercial farming sector had started.	pressed for resettlement on better land. The spirit of being 'independent' and therefore the expectation of land as had been during the civil war had grown as very few people had received the land that had been promised.
MFTS interpretation of the environment for (or with) learners	Policy point number 22 states that "both the Master Farmer and Advanced Master Farmer trainees are required to <i>understand fully the concepts and put into practice the basic concepts of conservation</i> before a certificate and badge can be awarded."	The MFTS policy has an anthropocentric view of the environment that emphasises the stewardship of the soil and therefore the management of water and vegetation. This conservationist view is made a pre-requisite to certification, thus giving it a lot of weight.
Value orientation / ethical dimensions evident in the document (explicit and implicit)	Policy item number 23 calls upon farmers to "contribute towards food and transport during the one week courses".	The requirement for own contribution is a good way of reducing or eliminating dependency syndrome in farmers, and appeals upon their value judgements as they are forced to weigh the importance of the training.

CONTENT REVIEWED	DATA	CRITICAL COMMENTS
Training methodology	<ul style="list-style-type: none"> Objective 1: To give the farmer the necessary technical skills and knowledge 	Objective 1 has anthropocentric and techno-centric orientations but appears on face value to view training as a one-way transfer of information from the technocrat to the farmer. However on discussion with trainers and farmers during interviews, the meaning of "give" (see also objective 4) is probably incorporating farmers' previous knowledge, which apparently is considered in the initial stages of training. This was substantiated by interviews with AD2 (retired training specialist), AEWs in Marange, and Arex officers (training). (Please refer to interview results above).

	<ul style="list-style-type: none"> •Objective 3: To enable master farmer graduates to assist with Agricultural Extension e.g. by passing on technical information acquired during the period of training to fellow members of a group or neighbouring farmers, and simply by example of good crop and animal husbandry practices. •Point 10 of the policy states that “the method of training will be by <i>attendance at formal training sessions</i>..... Each lecture or explanation shall be followed by a demonstration. Training session<i>open to all farmers</i> who wish to attend.” 	<p>Objective 3 emphasises the importance of peer extension as a method of diffusion of initial MFTS training. In adult education, this is recognized as beneficial to both the peer trainer and peer trainee.</p> <p>Point 10 advocates for inclusivity, which in the Marange AEW interviews was shown to happen, as some disabled farmers have been trained and are excelling. AD2 (personal communication, July 2006) always selected and trained married couples together as a way ensuring implementation was successful. Demonstration is made key to training.</p>
CONTENT REVIEWED	DATA	CRITICAL COMMENTS
MFTS assessment methods	<p>A minimum attendance to training sessions is set (24 out of 30). Oral or written examinations and demonstration of good production practices (item 13). Appropriate local languages are also employed (item 18).</p>	<p>To avoid bias, assessment is done by external supervisors and officers from a different area.</p>

Key to document preliminary analysis

Colour code	Category
Blue	Sorghum is a preferred field crop
Green	Learning takes place as farmers interact with each other
Yellow	Intergenerational knowledge transfer promotes wise choices of food plants
Magenta	Culture and tradition
Red	External trainers and extensionists play an important role in food plant choices and food security practices

Appendix 1D.a: Consent form – Matimbe

**Consent Form
(Wirirano)**

Code Number: _____

1. Ini, LUKE MATIMBE, wemuBhuku rekwa Sabhuku TSAISI, mudunhu rekwa MARANGE ndinonzwisisa kuti ndiri kuzvipira kunge ndichibatanawo ne ongororo iri kuitwa maererano nezve 'sarudzo inoitwa ne varimi pane zvimwira zvekudyara' iri kuitwa na Tichaona Pesanayi weku Environment Africa, rinova bato randinoziva.
2. Ndinonzwisisa kuti ndichatapwa izwi rangu nedzangaradzimu ('tape recorder') apo ndichange ndiri kuita hurukuro yezvekurima kwangu.
3. Hurukuro yandichapa inotaridza zvandinoziva kuva zveidi mukunzwisisa kwangu kwakazara uye ichashandiswa nenzira isingaburitsi pachena kuti zvakaabva kwandiri muzvinyorwa, uyezve ichabaritsa kusimudzira kuguta ne kurima kune pundutso.
4. Ndinobvumira kuti mufananidzo wangu utorwe zvakanangana nebasa rangu rekurima ne kuchengetedza zviwanikwa, uye kuti uchashandiswa kusimudzira mabasa aya chete.
5. Ndinonzwisisa kuti zvinyorwa zvichabuda kuburikidza ne ongororo iyi zvichange zvichichengetwa panzvimbo inosvikirwa ne vamwe vaongorori kana vadzidzi, uye ndine mukana weku zvionawo.

Mukunzwisisa nekuzvipira muchirongwa ichi, ndini:

LUKE MATIMBE
Zita rakazara remurimi
Nhamba dzechitupa: 75-115990P 75

LUKE
Siginicha

TICHAONA PESANAYI
Zita rakazara remuogorori
Nhamba dzechitupa: 29-134792-B12

TICHAONA
Siginicha

Zita rakazara remupupuri
Nhamba dzechitupa: _____

Siginicha

Zuva: ____/____/2007 munzvimbo ye _____

Appendix 1D.b: Consent form - Matsamburutsa

Code Number: _____

**Consent Form
(Wirirano)**

1. Ini, Felistas Matsamburutsa, wemuBhuku rekwa Sabhuku John Nyemba, mudunhu rekwa Chief Hapandino zwisisa kuti ndiri kuzvipira kunge ndichibatanawo ne ongororo iri kuitwa maererano nezve 'sarudzo inoitwa ne varimi pane zvirimwa zvekudyara' iri kuitwa na Tichaona Pesanayi weku Environment Africa, rinova bato randinoziva.
2. Ndinonzwisisa kuti ndichatapwa izwi rangu nedzangaradzimu ('tape recorder') apo ndichange ndiri kuita hurukuro yezvekurima kwangu.
3. Hurukuro yandichapa inotaridza zvandinoziva kuva zveidi mukunzwisisa kwangu kwakazara uye ichashandiswa nenzira isingaburitsi pachena kuti zvakaiva kwandiri muzvinyorwa, uyezve ichabaritsa kusimudzira kuguta ne kurima kune pundutso.
4. Ndinobvumira kuti mufananidzo wangu utorwe zvakanangana nebasa rangu rekurima ne kuchengetedza zviwanikwa, uye kuti uchashandiswa kusimudzira mabasa aya chete.
5. Ndinonzwisisa kuti zvinyorwa zvichabuda kuburikidza ne ongororo iyi zvichange zvichichengetwa panzvimbo inosvikirwa ne vanwe vaongorori kana vadzidzi, uye ndine mukana weku zvionawo.

Mukunzwisisa nekuzvipira muchirongwa ichi, ndini:

Felistas Matsamburutsa
Zita rakazara remurimi
Nhamba dzechitupa: 34-015803434

Tichaona Pesanayi
Zita rakazara remuongorori
Nhamba dzechitupa: 29-134792-B12

Mungaradi Samuscha
Zita rakazara remupupuri
Nhamba dzechitupa: 75-343734msv

Zuva: 20/07 /2007 munzvimbo ye Zewa

F Mats
Siginicha

Adza. Blesai
Siginicha

Adza. S
Siginicha

Appendix 2A: Interview Schedule Agricultural Extension personnel

Semi-structured Interview Schedule for Agricultural Research, Training and Extension personnel

Purpose:

The purpose of this interview is to support my research into the training, extension and learning interactions that take place within a community of small grain farmers in Marange and Nyanga (Zewa) communal lands, which influence their choice of cultivated food plants. The specific aim of this interview is to investigate the role of agricultural research, training and extension personnel in food crop choice, production, processing, utilisation and marketing, with a view to understand extension quality and sustainable food security.

The goals of this research are:

- To investigate how the Ziwa and Marange farmers have evolved into communities of practice leading them to make informed food choices,
- To explore the learning interactions among the Ziwa and Marange farmers that shape their farming knowledge and food security strategies,
- To identify the learning interactions and power-knowledge relationships, if any, between the farmers and external trainers that lead to choice of cultivated food plants.

The broader purpose of the study is to enhance the quality of extension training and farmer practice as a contribution to food security.

Provisional Research Title:

An Investigation of learning interactions influencing farmers' choices of cultivated food plants: An Interpretative Case Study of selected communities of practice in Nyanga and Mutare Rural Districts of Manicaland Province, Zimbabwe.

What you are being asked to do:

Please answer all questions to your best knowledge and understanding. Please note that there are no 'right' or 'wrong answers' to the questions in this research. The interview seeks to draw from the varied perceptions and interpretations of stakeholders, and pool together combined experience to inform future practice.

Demographic data:

Date of interview:

Name of interviewee:

Gender: _____ Age: _____

Position/Title of interviewee:

Organisation of Interviewee:

Geographic Area of responsibility:

District:

Name of interviewer:

A. AREX

1. What is the a) Vision, b) Mission and c) Goals of AREX?

a) Vision,

b) Mission?

c) Goals?

2. How has AREX evolved since its original formation before 1980, till today?

3. How is AREX organised / structured, from national to local level?

4. Please state and briefly describe your core duties?

5. What extra duties, if any, do you find yourself performing in the community and why?

B. CAPACITY BUILDING

6. Which capacity building programmes does AREX implement for its AEOs and AEWs (pre-service and in-service)?

7. Which capacity-building programmes does AREX conduct for farmers?

NB: Please name any other capacity-building programmes for farmers facilitated by other stakeholders and how AREX relates to them, if at all.

8. Name and describe your main training and extension curriculum for farmers?

9. What trainings and extension activities did you carry out in the last season and what was your target group?

10. How did you select target farmers for training and extension?

11. What were your training objectives?

12. What other capacity building activities did you carry out?

13. State and describe **learning interactions** that you have facilitated or take place among farmers in your training, extension and research work that influence their choices of cultivated food plants.

14. What trainings, extension and research activities have you planned for farmers in the next season?

15. What research, if any, have you carried out in the past 2 seasons regarding food plants and what were some of the most significant results? How have you used the results? (How was the research carried out, who participated and what were their roles, where was it done?)

16. What is your understanding of
a) Capacity building?

b) Training?

c) Extension?

d) Research

17. What are your own capacity needs?

C. POWER-KNOWLEDGE RELATIONSHIPS

18. What power – knowledge relationships exist, if any, between a) farmers and trainers / extensionists, b) trainers / extensionists and their supervisors in the Master Farmer Training Scheme and how do they impact on the training process and result?

19. What do you consider to be the different sources of knowledge for farming and how do you value them in your training and extension work?

C. ENVIRONMENT, ETHICS AND SUSTAINABILITY

20. How do you consider the environment in your work?

21. What do you understand by 'environment'?

22. What ethical challenges do you face in your training, extension and research work, regarding food security?

23. How do you address these challenges?

24. What sustainability issues do you find in your training, extension and research work, regarding food security?

D. MONITORING AND EVALUATION

25. What are your main training, extension and research successes?

26. How do you measure the quality of your extension, training and research work?

27. What do you attribute them to?

28. What challenges do you face in your work?

29. Perform a SWOT analysis of your training, extension and research work:

STRENGTHS	WEAKNESSES
OPPORTUNITIES	THREATS

30. Please comment on the results of your SWOT analysis

End of Interview Schedule.

Thank you very much for your valued input and time.

Please indicate whether or not you would like this information to be used in my research, and if so, if you prefer to use a pseudonym. I shall make available to you a transcribed copy of this interview for validation.

Please tick appropriate in space / box provided:			
Please use this information in your research	<input type="checkbox"/>	Please do not use this information in your research	<input type="checkbox"/>
(Either) Please use a pseudonym (fictitious name)	<input type="checkbox"/>		
(Or) You may use my name	<input type="checkbox"/>		
Signature:	<input type="text"/>	Date:	<input type="text"/>

Appendix 2A.1 Interview transcript of Agricultural Extension Worker (AEPi.1)

Semi-structured Interview Schedule for Agricultural Research, Training and Extension personnel

Purpose:

The purpose of this interview is to support my research into the training, extension and learning interactions that take place within a community of small grain farmers in Marange and Nyanga (Zewa) communal lands, which influence their choice of cultivated food plants. The specific aim of this interview is to investigate the role of agricultural research, training and extension personnel in food crop choice, production, processing, utilisation and marketing, with a view to understand extension quality and sustainable food security.

The goals of this research are:

- To investigate how the Ziwa and Marange farmers have evolved into communities of practice leading them to make informed food choices,
- To explore the learning interactions among the Ziwa and Marange farmers that shape their farming knowledge and food security strategies,
- To identify the learning interactions and power-knowledge relationships, if any, between the farmers and external trainers that lead to choice of cultivated food plants.

The broader purpose of the study is to enhance the quality of extension training and farmer practice as a contribution to food security.

Provisional Research Title:

An Investigation of learning interactions influencing farmers' choices of cultivated food plants: An Interpretative Case Study of selected communities of practice in Nyanga and Mutare Rural Districts of Manicaland Province, Zimbabwe.

What you are being asked to do:

Please answer all questions to your best knowledge and understanding. Please note that **there are no 'right' or 'wrong answers'** to the questions in this research. The interview seeks to draw from the varied perceptions and interpretations of stakeholders, and pool together combined experience to inform future practice.

Demographic data:

Date of interview:	30 August 2007
Name of respondent:	Farai Chabva (FC)
Code number:	AEPi.1
Gender:	Male
Age:	26
Position/Title of respondent:	Agricultural Extension Worker (AEW)
Organisation of respondent:	AREX
Name of interviewer:	Tichaona Pesanayi (TP)

1. AREX Work Context

TP: Can you start by briefly describing your work.

FC: I come and help farmers with information. The **information comes from research**, which I then **disseminate to farmers** to improve what they are doing, especially yield. The research is carried out by **research stations**. I also **facilitate field days**, where I ask **excelling farmers to explain to other farmers** what they did to produce a good crop and field, and also to disseminate farmer innovations.

TP: What are the main activities on your annual calendar?

FC: I work with a **seasonal calendar** which informs our programme plan. In the irrigation scheme for example, from September to November, **we urge farmers to plant** maize, in March planting of beans,

in May planting of wheat, and in February transplanting of tomatoes. We help farmers in all activities, such as land preparation, fertiliser application, weed control, and planting.

TP: How about harvesting and marketing?

FC: Our input in harvesting is less, but we support the farmers to some extent. We help farmers to market their produce by advising them through their market committees, which are made up of farmers.

2. AREX Staff training and application

TP: Can you please describe the agricultural training that you went through.

FC: I trained for a three year Diploma course at Gwebi Agricultural College in Harare. I did four subjects, namely Animal Production, Crop Production, Agricultural Engineering and Farm Management.

TP: Which of these subjects do you find most useful now and why?

FC: The most useful now is crop production, because I work directly with farmers on horticultural crop production.

TP: Did you train for the Master Farmer Training Scheme at College?

FC: The Master Farmer Training Scheme was not taught at college, but I came across it through **our Arex supervisor who indicated that master farmer training needs to be carried out.**

TP: Do you feel well equipped to train it?

FC: Yes, it's very easy.

TP: Have you started it?

FC: Not yet. As the season starts in September we are going to incorporate it in our programme plan.

TP: Do you foresee any challenges at all in training the MFTS?

FC: **Farmers usually say we are too busy, especially in the irrigation scheme.** Meeting twice a week as recommended is too much for them.

3. Farmer Training and Extension

TP: What do you usually train farmers on?

FC: We train farmers in groups.

TP: How do you go about it?

FC: We hold a **general meeting** on the 10th of each month, where we discuss what to do for the month, e.g land preparation. Then we **follow up individual** farmers **demonstrating** what to do.

TP: To what extent do you actually carry out demonstrations?

FC: Demonstrations are the ones most encouraged by Arex, but **resources are limiting** for doing them, e.g **land**, and liming. **Lime** is usually not available.

TP: What do you understand by the term 'training'?

FC: It means **giving knowledge** to someone who did not have it.

TP: What do you usually do in your extension work?

FC: We carry out **extension** when we go out **meeting and training farmers.**

TP: To what extent do you use farmer' knowledge and skills in your training and extension?

FC: As I said earlier, **if we see good things done by a farmer, we share it with other farmers.** We use these knowledge and skills.

TP: Do you ever give farmers the opportunities to share directly with other farmers?

FC: Yes, especially **at field days farmers share their knowledge and skills** with other farmers. Then we come in and add more from information where they left.

TP: How do you help farmers to access inputs?

FC: We help with **information about where to acquire extra information, seeds, fertilisers, and ploughshares.** We also talk to the (GMB) Grain Marketing Board to sell seed at lower prices to our farmers.

TP: Do you involve seed companies?

FC: Not much. The seed companies approach us with what they have. Some of them include Seed Co, Agri-Seeds, Fresh Co, and Cairns Foods. Agri-Seeds come and buy beans and then promise to supply seed. Fresh Co has promised pop corn and sugar bean seeds.

TP: How are you incorporating sustainable agriculture in your training and extension?

FC: It's difficult the irrigation scheme. It's difficult to change farmers' mindset. We have one of our farmers who went to an organic farming workshop in Harare, whom we are planning to work with to facilitate workshops. At meetings he has been given opportunity to share.

TP: We shall end here, thank you very much for your valuable time.

Appendix 3A:

FOCUS GROUP DISCUSSION WITH SUNRISE ENVIRONMENTAL ACTION GROUP NUTRITION GARDEN

Date 24 July 2007

Venue: Sunrise EAG Nutrition Garden (not their real names)

Code: MFf.a

Sunrise Tawanda EAG Nutrition Garden members present

Name	Designation	Initials
Nester Takaona, Mrs	Chairperson	NT
Agrina Marange	Vice Chairperson	AM
Sipiwe Tenderere, Mrs	Security guard	ST
Mbuya Chipangamazano	Advisor	MC
Mbuya Tawanda, Mrs	Member. (Headman's mother)	MT

Guests

Name	Designation	Initials
Ishe Tawanda	Headman / Ishe	
Marange, Mr	Helper	
Sindi Mhara, Miss	EA ¹ Field Personnel (from different area)	SMh
Zuva Chando, Mr	EA Field Personnel (from different area)	ZC
Samukeliso Moyo, Miss	EA Student on Attachment/Midlands State University (Minuting)	SMu

Discussion leaders present

Name	Designation	Initials
Tatenda Manica, Miss	EA Field Personnel (Main facilitator)	TM
Dahlia Urn, Mrs	EA (Main discussion leader)	DU
Tichaona Pesanayi, Mr	EA Manica Branch manager (Participant observer, lead researcher)	TP

INTRODUCTION

On arrival of the visitors from EA, the members of the Sunrise EAG Nutrition Garden were already assembled at their garden, with the local EA Field Personnel Tatenda, and welcomed their visitors with a song "*Hapana Chinouya Chega*" (literally, 'Nothing Comes out of nothing, without working for it'). The visitors were led to the meeting place under a big mango tree, which is also the site of the group's nursery. The chairperson of the group led in the salutations, opening the meeting by facilitating a **song and a prayer**, both led by different members of the group. This was followed by the **traditional salute of the Headman**, the

traditional leader representing the Chief, through clapping of hands (*"Mawoko"*). The EAG chairperson then led in the introductions of the group members, who then gave Tatenda to introduce EA visitors and outline expectations. She gave a brief outline of the preparations that had been made for the visit and asked Tichaona Pesanayi to give details. He then introduced the EA personnel he had come with, and indicated that the EA (main discussion leader), Dahlia, was on a look and learn tour of the area, and was particularly interested in finding out first hand what this "EAG of the year" was doing on the ground. In addition he also sought permission to take photos of people and their work, which was granted, including the subsequent use of the information gathered in a research report by T. Pesanayi. He recognized the presence of the Headman at this meeting, as at the greater majority of meetings, and thanked him for his unwavering support. He thanked the group for accepting to host EA and for **allowing photos to be taken and information to be used for research**, and then asked the chairperson to outline the group's historical profile.

PROCEEDINGS OF DISCUSSION

NT: We started as a club (Sunrise), with 27 members in 1996. We met with some small organisations which helped us, for example oil processing which was supported by MDA (Manicaland Development Association). **Some members left due to lack of commitment to fines** we charged for lateness to meetings, and we were left with 7 members. Then **we heard that the ZFU (Zimbabwe farmers' Union) were giving out seeds**, but we could not get a share, although it was meant to be ours. We were eventually given a letter by Arex, which we took to Bezely bridge and **bought some seed, 20 kg per member**. On the way back, our member got lift from an EA field officer driving to our area, who talked with one of our members and made an appointment to meet with our group on 5 December, 2001. We met the EA personnel on the appointed date, and showed them our garden, the vegetables and water. Our numbers, which had grown to 52 dropped again to 22 when we **introduced group membership fees**. We wanted to use these monies to make contributions to **make our own contributions** to the erection of a fence to be supported by EA. We eventually got the support of fence wire which we used to **fence our garden on our own. We were supported by Mr Marange, and our children** who had completed their "O" Levels. In 2004 we were given moringa seeds and planting pockets by EA and developed a moringa nursery. We subsequently included a jatropha nursery. We were also given some herbs, which we planted in the garden. Unfortunately our herbal garden became waterlogged, and we had to relocate. We were assisted by EA to develop a water point (well) and then two others. We then organised ourselves into smaller groups to be linked to different water points according to location in the garden. We also constructed our own toilet. There is an **additional two wells which were constructed by group members, with assistance from the rest of the group, as per our custom**.

DU: Which crops are you growing?

NT: **Tomatoes, cabbages, shallots, king onions, Covo (which is in abundance), and rape.**

DU: Where do you sell your produce?

NT: **People come from Bambazonge (growth point/business centre) to buy for example shallots, and also our neighbours come to buy.**

DU: Has this income helped you to change your lives?

NT: Yes.

DU: Examples?

NT: **At my home I am selling my garden produce and buying sugar for my family.**

TM: Other members can also say how they are benefiting.

ST: *Ini ndatosimukirawo kuita munhu. Kubva mukurima mapfunde, ndakatovaka imwe imba ndikatoiekisitenda.* I have risen to be a person. **From growing sorghum, I have built one more house on my homestead, which I have since extended.**

(There was an interrupting applause from fellow group members).

ST: I am selling moringa to get money, and am assisting other community members who are not well.

DU: How about the vice chairperson?

MM: I don't know how to thank Environment Africa. I asked members of our EAG if I could bring in my cattle, and cut green grass for fodder. Thanks to my group, my dairy is benefiting and I am one of the few who still have dairy cattle. I am also growing tomatoes and vegetables.

Member W: We were sent by EA to learn from another group, now I am growing trees at my home. I am selling to get cooking oil.

Mbuya Chipangamazano: Excuse me. I am the oldest in this club. I am overwhelmed. I have no hunger for sadza. I have tomatoes. **Water is the limiting factor.**

(There was an interrupting applause and sounds of approval from fellow group members).

TM: She was number 1 on small grains in Chindunduma ward, excelling above even the younger farmers. How many (50 kg) sacks did you get?

Mbuya Chipangamazano: Ten.

Member X: I am also benefiting. Although **my crops suffered from heat and dryness**, I am having enough to eat.

Member Y: I grew tomatoes and onions. I am enjoying eating my won herbs and tomatoes.

DU: Anyone else?

Mbuya Tawanda: I am the mother of the man sitting on the bench there (headman Tawanda). I am growing crops which are benefiting me.

DU: Who else is doing the same in the area, Ishe Tawanda?

Headman Tawanda: There is (M1) group, which was born from this Tawanda EAG.

DU: Why do you support Tawanda EAG this way?

Headman Bwizi: Vegetables, onions and other crops are being grown and supplying the greater area in these villages. **We appreciate the fence** which is giving protection to the garden from stray livestock. The members also do duties well. When the EA officer and Arex officer came, I was there and am happy with the donation of the fence. I support them. When they become number 1 (EAG of the year 2006 / 2007), I am happy as **Tawanda EAG is now known countrywide. We are benefiting from food and herbs, as me personally, the club as a whole, and the whole community.** Herbs help us where we are not getting medicine from clinics. I wish we can have more guards here. I use Tawanda EAG as an example to encourage others to form groups.

DU: Tatenda, what makes you happy or unhappy working with Sunrise EAG?

TM: Working with them is a joy. Whilst I am relatively new, **they have good ideas.** *Vanoshingirira sezita ravo.* (They persevere like their name). They go to training workshops even far away.

DU: What makes you like to work with Environment Africa?

MM: **We get knowledge from workshops.** Some of the workshops it's us who ask for them.

DU: Where would you say EA has left us behind?

MM: Marketing of herbs is a challenge. We use basil in our cooking.

(Field assistant encourages other group members to speak).

- TP: Where else do you get knowledge?
- MM: Arex, Plan Zimbabwe, Christian Care.
- TP: Where else?
- MM: *Madzimai makuru anotidzidzisa, vaisirima kare vasingaisi fetireiza. Vaisanganisa zvirimwa. Tinorima zvakare mapfunde muno anoshingirira. (The elder women teach us. In the olden years they cultivated without using fertilizers. They mixed their crops. We grow sorghum also, in this area which is a hardy drought tolerant plant).*
- TP: How does the Sunrise permaculture garden design relate to the old ways of cultivation?
- MM: It is similar. **Us younger ones we have learnt it from the older ones.**
- TM: Can you say something about your visit to the clinic.
- ST: We also went to the clinic and we were encouraged to use herbs.
- TM: What is your vision and objectives? After the EAG consolidation exercise, they seem to be clearer. Anyone to explain how we understood our work better.
- MM: Now we are able to **plan our work better**, to conserve our crops and natural resources and to **work as individuals in a team**. We **share duties** e.g. who looks for seeds. We plant according to our plan, e.g. last year we had our year plan after our workshop. We do our plan in Shona and EA translates to English.
- TP: Which seeds / crops are you growing?

Various respondents, led by vice chairperson:

Field Crop (Shona name)	English name	Garden Crop (Shona name)	English name
Mapfunde	Sorghum	Kovho	Covo
Rukweza / zviyo	Pearl millet	--	Sweet cabbage
Mupunga	Rice	--	Rape
Nyimo	Round nuts	Tsungu	
Maiswe	Water melons	--	King onion
Matikiti	Pumpkins	--	Shallots
Magaka	Cucumbers	--	Soup onion
Mapudzi	Pumpkins	Derere raNyatandwe	Indigenous okra
Madima / mbambaira	Sweet potatoes	Bhinzi	Sweet beans
Madhumbe	Yams	Ipwa	Sugar cane
Nzungu	Groundnuts	--	Banna grass
Chibage cheChiManyika	OPV maize	--	Velvet beans
Chibage chakatemngwa ku Bambazongwe, Farmers' Coop, kunyanya Seed Co. (shoko), S413, S513	Commercial maize	Ndodzi	Pigeon pea
		Mhurapwa	Local egg plant (yellow)

The group then led the visitors on a tour of their garden.

A number of crops, as listed above, were seen. In addition, a few other crops seen included:

Field Crop (Shona name)	English name	Garden Crop (Shona name)	English name
	Moringa woodlot		Herbs (various types)

During the tour, Mr Marange observed busy cutting some thorny brush wood for fencing. He then joined the tour and the last segment of the focus group discussion. He indicated that water was vital for the garden (*"kushanda imvura"*). He indicated that two things were critical for the garden, adequate water and mesh wire fence. This was raised as an issue by three other members of the garden. After the tour, the group led the visitors to a display of some of their produce and processed foods. The vice chairperson led the display tour upon the chairperson's request.

MM: We can start with our produce here. We have 'mandwide' juice, lemon drinks, dried herbs, dried papaya. We use lemon as a preservative. We also have 'derere' 'coffee' from crushed okra seed, and also 'coffee' powder from baobab seed.

DU: How do you make the drinks?

MM: In brief, we squeeze out the juice from the choice fruit into a pot and add some white sugar and dissolve it in the juice. We add water to fully dissolve the sugar, and then bring the solution to the boil. The hot liquid is then poured into clean bottles, which are sealed whilst hot.

(The group invited the visitors to taste their jams, dried fruit and juices, which were of a good quality and taste).

TP: Can we buy 'Mandwide' jam?

MM: No, not today. It is **going to the seed / food fair**.

TP: What encourages or motivates you to go the seed and food fairs with your produce?

MM: Seed fairs are precious because **you learn a lot and there is opportunity to win farming implements**, such as garden wares, cans, picks, pots and plates. Last year I won two axes and at the area show (sponsored by Arex). At seed fairs **we sell and we see what others are doing**.

TP: What is the jatropha nursery for?

MM: Jatropha is for live fencing.

NT: We experienced a failure before we realized that it also needs big, well fed and watered holes. We learnt from a **look and learn tour** to Victory farm.

TP: How do you handle **new people who are interested in joining** your group?

MM: *Vanotanga vachiona. Vanouya voona zvakanaka. Vanozvifarira vanobva vabatana nesu. Asi vamwe havagari nokuti vanotya mari dzekuva nhengo, asi havanonoki kuda kuzodzoka, vachizowana havo kuti mukana hapasisina.*

(They start off by seeing what we do. They usually like the good things that we do, and stay. However, some leave because they are not used to paying joining fees. Many of them eventually want to return but only to find that there are no more places for them).

- TP: Ndeapi matambdziko amunosangana nawo?
(which problems are you facing?)
- MM: Ndufu dzakawandisa, dzimwe nguva vhiki mbiri dzichiteverana tisipo. Mbudzi zvakare dziri kutirwadza. Dzakambotipedzera muriwo. Deno taive ne 'mesh wire' kana kuti 'pig wire mbiri' dzinowedzerwa pazasi zvaitibatsira.
(**Too. many funerals**, sometimes we spend two weeks in a row away. We also have a **problem of stray goats**, which go in. If we had mesh wire fence or two extra pig wire lines below, it would help us to keep them out. They once ate all our vegetables).

End of transcript.

The focus group discussion was then concluded with thanks from the visiting team. It was agreed that a further focus group discussion session would be conducted to perform a pairwise ranking matrix to compare crop preferences from the garden and the field, which the Field Officer TM would facilitate.

Reflexive notes:

1. Some areas still needing assistance for the group were related as a) roofing material for the toilet, b) mesh wire fencing to keep out stray goats. They deserve such assistance because they have shown initiative in many areas (toilet, wells), they have complied with wetland demarcation zones, they have stayed intact for many years, and they have kept their fence with no damage or vandalism for 6 years running. Goats are a real destructive problem, which is causing the cutting of brushwood to keep them away.
2. Group makes use of herbs in their cooking and apparently medicinally. On reflexion: an ethical quandary arises here - how do we encourage use of herbs for nutrition only, and not from a medicinal point of view, we are not medical experts. In addition, the national garden working group is raising alarm on the promotion of herbal use for medicinal purposes by NGOs (see attached newsletter).

Appendix 3B: Focus Group Discussion with Marange Small Grains Committee (Code MFf.b)

Date 24 July 2007

Small Grains Committee members present

1. ED, Chairperson
2. NT
3. M

Discussion leaders present

1. DU
2. Tichaona Pesanayi, Environment Africa Manica Branch manager

TP: Makadini va(ED), naAmai?

ED: Tinofara makadidniwo

Mrs dahwa: Tiripo hedu makadiniwo. Sunungukayi kuve pano.

TP: tinotenda ne kutibvumira kuita musangano uno mumasuwo enyu. Musangano wedu uchaita mupfupi. Chinangwa chedue ndechekuti muenzi wedu, mai (DU) vanzwisise mashandiro ekomiti yenyu yema "small grains", kuitira kuti vagonyora zvinyorwa zvenhau zvirimani maererano nebasa renyu. Pamusoro pazvo, zvichabuda munhaurwa iyi zvichashandisiwawo zvkare muongororo yandirikuits yema sarudziro amunoita zvirimwa zvenyu kuchengetedza chikafu. Tingaenderera hedu mberi here?

ED: Hongu, sunungukayi.

DU: Komiti yenyu ye small grain inomboita basa reyi?

ED: Inokurudzira kurimwa kwe (mapfude) SV4

DU: Vanhu vanojoina nekuda kwavo kana kuti vano sarudzwa?

M: Tinotora vashoma kubva kumatunhu matatu?

DU: Vanenge vasarudzwa seyi?

M: Kana nguva yasvika tinotora manhamba anobva kugroup kana dunhu regarega.

DU: Iye zvino muri vangani?

M: More than 140 this year.

DU: Zvakanakireyi kusima mbeu diki idzodzi?

ED: Anoshingirira zuva, asiyana nechibage. Rinovharira mashizha kana kwapisa.

DU: Sadz racho mudzimba ..

NT: Takatanga 2004, tichikohwa 2005. ndipo pairasika vazhinji, asi vakawanda vasina kumbiridya. Pataiita 'pass on' tichizodya sadza navo, vakazoti tasarira. Mwana wangu akabva ?Harare akati chingindiitirayi sadza rebvunde iri chete. Kana kubvisa nzara.

DU: Chimbondiudzayi nezve 'pass-on scheme'.

ED: VARI kutozviita.

NT: VARI KUTIRIMA. SV4 tinoirima tisingasanganisi. Hativanhadharisi.

ED: NDINE rimwe bhuku re'health' rinoti sadza re mapfunde rinofanira kutodyiwa.

DU: EA irikukubatsirayi seyi panyaya dzema 'small grains' ?

ED: Inouya nguva dzese dzese payaya dzekumonita.

DU: Ko zvimwe zvavanobatsira pa 'small grain programme' ?

ED: Vanouyawo nezvimwe zvidyiwa nema 'drinks'.

Du: Hapana zvimwe here sedzidziso ?

M: Vanototanga vatidzidzisa.

DU: Ane markert' here?

M: KuGMB anotengwa.

DU: Pane here zvamunoshuvira kuti deno zvaita kuti chironzwa che small grains' chibudirire?

M: Deno mbeu ye 'small grain' yabudawo mumatunhu matatu vamwe vaiwana. Ndizvo zvatakatotarisa gore rino.

ED: Tikawanda shiri hadzinyanyi kuti vhiringa ba.

DU: Mapfunde anoda here mishonga yakawanda kuti arimwe?

ED: Techidzidziswa zvuninzi tinondoshandisa mapfunde nezvidzere. Hatiisu mafetiraiza kwete. Fetiraiza hagari uye inokanganisa ivhu mukufamba kwenguva.

TP: Komite yenyu ine vanhu vangani gore rino?

M: Tanga takawanda tichitanga gore ra2004. vamwe vakaneta nengari yekupiswa nezuva.

TP: Munodzidzisawo here vamwe se c 'small grains committee'?

ED: Panoitwa ma'workshop' komiti inobatsira. Pa'ward' yega yega tina 'supervisor'.

kuKugarisana tine vaviri, va(BT) na va(N). kuBuwerimwe tinava(LM), kuChindunduma mai (M).

TP: Munobatsira seyi vamunenge maita 'pass on'?

M : Ndinovadzidzisa marimirwe acho.

Appendix 4

Table A4.1 A SUMMARY OF DATA SOURCES

Data source	Pseudonym	Code
SSI Farmer	Garikai Tangenhamo (GT)	MFi.1
SSI Farmer	Maria Mushandi (MM)	MFi.2
SSI Farmer	Anna Nhimbe (AN)	NFi.3
SSI Farmer	Chipo Dube (CD)	MFi.4
SSI Farmer	Lizzy Bocha (LB)	MFi.5
SSI Farmer	Tinotenda Soko (TS)	MFi.6
SSI Farmer	Biggy Tafara (BT)	MFi.7
FGD	Sunrise EAG	MFf.a
FGD	SeedFirst Small Grains Committee	MFf.b
Document analysis - EAG consolidation report	Sunrise EAG	MEd.1
Participant observation of Seed/Food fair	Nyanga (real)	NSo.a
Participant observation of Seed/Food fair	Marange (real)	MSo.b
Document analysis – Arex MFTS Review	A Review of MFTS by T. Pesanayi, 2006	AFd.2
Key Informant Interview	Taku Nyemba (TN)	AEPi.1
Key Informant Interview	Peter Ngara (PN)	AEPi.2
Personal communication (September 14, 2004)	D2	D2
Participant observation of Mutare District Seed Technology and other Farming inputs Fair	MDSTIF	MSTIo.c
Data Analysis Nyanga Workshop report	Nyanga Small Grain Workshop Report	NWR.1
Data Analysis Marange Workshop report	Marange Small Grain Workshop Report	MWR.2
Document Analysis – Farmer contracts	Small grains farming contract	EADa.2.1

ANALYTIC MEMO (AM) COLLATING RESPONSES FROM THE INTERVIEW SCHEDULES ADMINISTERED TO FARMERS, OBSERVATIONS, FOCUS GROUP DISCUSSIONS AND WORKSHOPS CONDUCTED IN THE TWO AREAS: MARANGE (MFd.X) AND NYANGA (NFd.Y).

The analytic memos below give a summary of the main issues emerging from the interviews with farmers, which were conducted in two areas, being Marange communal lands (MFd.X) in Mutare District, and Ziwa local communal lands (NFd.Y) in Nyanga District.

Table AM.1 A summary of the main issues emerging from the interview schedules, focus group discussions and observations of farmers: (WHAT IS HAPPENING WITH FOOD PLANTS? – leading to section 4.2)

Category	Response in summary	Respondents (farmers)
Food crop choices / preferences: garden	<ul style="list-style-type: none"> • Covo (18) most preferred garden crop. followed by tomatoes (16), tsunga (14), onion (11) and rape (9) • Covo stays longer, up to 3 years. We eat it daily • We are growing Tsunga and cabbage • My number 1 garden crop is covo, followed by cucurbit (leaves), and then spider plant (leaves, for vegetables) • Beans for protein • We promote horticultural crops like rape, covo, tomatoes, spinach • I like garlic, king onion for sale; also tsunga as a vegetable to eat at home and sell surplus • I grow maize because there is good moisture. I also grow rice, onions, garlic, covo. I also have orange trees, pawpaw, peach and moringa trees. • Horticultural crops intercropped with moringa and fruit trees (3 farmers' gardens) 	<p>Mec.1-pair wise matrix of 20 farmers. (Numbers in brackets are frequencies of occurrence), MFi.7</p> <p>MFi.1</p> <p>MFi.6</p> <p>AEPi.2</p> <p>NFi.3</p> <p>MFi.1</p> <p>MFi.1, MFf.a</p>
Food crop choices / preferences: field	<ul style="list-style-type: none"> • A wide variety of crops being grown in fields, with small grains, especially sorghum predominant • Our small grains committee promotes the growing of sorghum (SV4) in the three wards we assist • Sorghum is tolerant to heat from the sun compared to maize. The plant folds its leaves to reduce evaporation. • Sorghum SV4 is the best field crop because they give us sadza and money; + sunflower, cooking oil 	<p>MFi.1, MFi.2, NFi.3</p> <p>MFf.b</p> <p>MFf.b</p> <p>MFi.7; MFi.6</p>

	<ul style="list-style-type: none"> • Sorghum (16) most preferred field crop. followed by millet (14), round nuts (12), maize (9) and groundnuts (9) • My number 1 crop is maize for sadza, followed by sunflower for oil pressing and seed (5bags)and sale (6 bags, in 2007) • The main field crops we promote are sorghum, pearl millet (mhunga), finger millet (rukweza / njera) 	<p>Mec.1 -pair wise matrix of 20 farmers. (Numbers in brackets are frequencies of occurrence) NFi.3</p>
Traditional food crops that are no longer grown	<ul style="list-style-type: none"> • Finger millet, but these days it is starting to be grown again. • Rapoko, due to lack of seed and bird pests • Rapoko ..seen as difficult to process • Uninga (sesame) seed no longer available • Sesame has also disappeared from our area • We are no longer growing chinyana (OPV maize variety) 	<p>MFi.1,MFi.4,MFi.5, MFi.6, MFi.7</p> <p>MFi.7</p>

Key for the respondents:

MFd.X --- Marange Farmer, data source, farmer code number x

NFd.Y --- Nyanga Farmer, data source, farmer code number y

D --- data source, where i = interview, f = Focus Group Discussion, o = Observation, w = workshop

Table AM.2 A summary of the main issues emerging from the interview schedules, focus group discussions and observations of farmers: (WHAT ARE THE PRACTICES GOING ON / WHAT ARE PEOPLE DOING? – leading to section 4.3)

Category	Response in summary	Respondents (farmers)
Farmers are sharing / exchanging / growing seed, and adding value	<ul style="list-style-type: none"> • We pass on some of our harvested seed to neighbouring farmers • Farmers are actually growing sorghum SV4 when we pass on seed to them. We don't charge them for the seed • I have come to seed fair to ... look for seed • Our wish is that this small grain seed spread beyond our three wards. This is our aim this year. The more we are the less the risk from bird pests • I don't know how to thank EA. I asked members of my group if I could bring in my cattle, and cut green grass for fodder. Thanks to my group, my dairy is benefiting and I am one of the few who still have dairy cattle. I am also growing tomatoes and vegetables • As a group we sell or exchange seeds of seeds 	<p>MFf.b (small grains committee member1)</p> <p>MFf.b (small grains committee member2)</p> <p>MFi.4</p> <p>MFf.b (small grains committee member1), MFf.b (SGC chairperson)</p> <p>MFf.a</p> <p>MFi.7</p>
Farmers working together for a common cause	<ul style="list-style-type: none"> • We are a group of 20 women growing a nutrition garden which is protecting a wetland. Each has their own plot but we grow similar crops using same conservation methods. Woodlots and some orchards are communally owned. • I am chairman of a project trying to develop a community resource centre • We fenced our garden with the help of Mr X, our vice chairperson's husband, and our children who completed their "O" levels. • Now we are able to plan our work better, to conserve our crops and natural resources and to work as individuals in a team. We share duties e.g. who looks 	<p>MFf.a</p> <p>MFi.7</p> <p>MFf.a</p> <p>MFf.a</p>

	for seeds. We plant according to our plan, e.g. last year we had our year plan after our workshop. We do our plan in Shona and EA translates to English.	
More look and learn visits /study tours needed by or be farmers. Farmers benefiting from it	<ul style="list-style-type: none"> I have been to Chikukwa permaculture centre where I learnt how to make green manure We were sent by EA to learn from another group, now I am growing trees at my home. I am selling to get cooking oil. 	<p>NFi.3</p> <p>MFf.a</p>
Agricultural shows, seed / food fairs and field days as learning and marketing opportunities	<ul style="list-style-type: none"> I like seed fairs because I learn about the appropriate seed varieties for my area No, I cannot sell you my jam today, it is going to the food fair I am not selling my seed yet, I need to exhibit it at the district show Seed fairs are precious because you learn a lot and there is opportunity to win farming implements.. Last year I won two axes and at the area show (sponsored by Arex). At seed fairs we sell and we see what others are doing. At field days we learn from mistakes and they also improve community development 	<p>NFi.3</p> <p>MFf.a</p> <p>NFi.3</p> <p>MFf.a</p> <p>Mi.6</p>
Farmers practise sustainable agriculture methods	<ul style="list-style-type: none"> We use manure and termite mounds and not fertilisers in growing sorghum. The elderly women teach us from experience in the olden years, when they cultivated without using fertilizers. They mixed their crops. 	<p>MFf.b (SGC chairperson)</p> <p>MFf.a</p>
Risks farmers face	<ul style="list-style-type: none"> We grow small grains preferably to maize because it has become increasingly drier with more drought When there is drought, porridge from rapoko saves the children from starving to death. my crops suffered from heat and dryness Fertilisers don't stay, damage soil, and are expensive. Straying animals (goats) once ate all our vegetables, we were deeply hurt. 	<p>MFf.b (3 SGC members), MFi.a</p> <p>NFi.3</p> <p>MFf.a</p> <p>MFf.b (SGC chairperson)</p> <p>MFf.a</p>

	<ul style="list-style-type: none"> • The more we are the less the risk from bird pests • Birds can destroy the rapoko crop if you grow alone • Marketing of herbs is a challenge. We use basil in our cooking. • Maize is failing because soil fertility is poor • Winning farmers at seed / food fair awarded with bags of fertilisers 	<p>MFf.b (SGC chairperson) MFi.5</p> <p>MFf.a</p> <p>MFi.6</p> <p>NSo.a</p>
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Table AM.3 A summary of the main issues emerging from the interview schedules, focus group discussions and observations of farmers and extension and field officers: (WHAT ARE THE ROLES OF DIFFERENT ACTORS – leading to section 4.4)

Category	Response in summary	Respondents (farmers – F, field officers – FO, extension officer – EO, extension worker - EW)
Farmers as facilitators of own learning	<ul style="list-style-type: none"> Our small grains committee co-facilitates in training workshops. We have a supervisor in each ward. 	MFf.b (SG chairperson)
Field officers as trainers and facilitators	<ul style="list-style-type: none"> Working with this group is a joy. They persevere..... They go to training workshops even far away 	MFf.a
Extension Officers and Workers as trainers and advisors (monitoring)	<ul style="list-style-type: none"> Follow up mechanisms should be implemented to ensure continuation We disseminate information to farmers to improve what they are doing, especially yield. The research is carried out by research stations. I also facilitate field days We carry out extension when we go out meeting and training farmers. 	<p>MFi.5</p> <p>AEPi.1</p> <p>AEPi.1</p> <p>AEPi.1</p>
NGOs as training and monitoring facilitators	<ul style="list-style-type: none"> Environment Africa comes in regularly to monitor our progress The first thing they do is to facilitate a training workshop 	<p>MFf.b (SG chairperson)</p> <p>MFf.b (SG committee member)</p>
NGOs as learning organisations	<ul style="list-style-type: none"> Whilst I am relatively new, the farmers have good ideas (which I have learnt from) 	MFf.a
Organisations providing seed, farming information	<ul style="list-style-type: none"> ZFU (Zimbabwe farmers' Union) were giving out seeds Environment Africa sourced sorghum seed for us from Matopos Research station and distributed freely to selected farmers Sorghum SV4 seed was brought in by E Africa Arex, E Africa and Operation Maguta (ZNArmy) teach us right crops to plant 	<p>MFf.a</p> <p>MFf.b</p> <p>MFi.1, MFf.b</p> <p>MFi.6</p>

	<ul style="list-style-type: none"> • I was given maize seed by the GMB • We also talk to the (GMB) Grain Marketing Board to sell seed at lower prices to our farmers. • The seed houses and companies approach us ... include Seed Co, Agri-Seeds, Fresh Co, and Cairns Foods. • The grain marketing board actively discouraged farmers from growing hickory king, an OPV maize variety 	<p>NFi.3</p> <p>AEPi.1</p> <p>AEPi.1</p> <p>D2</p>
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Table AM.4 A summary of the main issues emerging from the interview schedules, focus group discussions and observations of farmers and extension and field officers: (WHAT LEARNING INTERACTIONS ARE TAKING PLACE? – leading to section 4.5)

Category	Response in summary	Respondents (farmers – F, field officers – FO, small grain- SG, extension worker – EW, focus group-f, interview-i)
Farmers 'pass on' part of their harvests to other farmers; empirical testing of the quality of seed and grain, learning by doing	<ul style="list-style-type: none"> • When we passed on seed to other farmers, many originally pessimistic laggards became interested in the sorghum after tasting the sadza prepared from it. Pass on improves seed access • I have a good experience with sorghum...good crop, harvests • I shared my first harvest (2004/5) with 4 of my neighbours. So far I have passed on seed to 10 other farmers. • Most of the farmers who have received seed from me are now very serious with sorghum growing ..have a bigger size of their fields with sorghum compared to maize. They like the sadza • Have shared sorghum seed with 8 of my neighbours • I like learning through seeing what others are doing • I like to experiment, so I grow 2 crops at a time to compare. Like this year (2006/07) the maize crop was destroyed but sorghum did well. They take minimal water 	<p>MFf.b, MFi.6</p> <p>MFi.7</p> <p>MFi.7</p> <p>MFi.7</p> <p>MFi.1</p> <p>MFi.4</p> <p>MFi.7</p>
Intergenerational knowledge transfer	<ul style="list-style-type: none"> • When I prepared sorghum sadza for my daughter who was visiting from Harare, she now insists on sorghum sadza only • The idea of growing sorghum came from our elders • I learnt about rapoko from my grandmother. I keep the seed in a clay pot 	<p>MFf.b</p> <p>MFi.1</p> <p>NFi.3</p>

	<ul style="list-style-type: none"> • The elder women teach us organic farming, intercropping and drought tolerant plants. • I have shared these (Master farmer, silage making) skills with my children and brother 	<p>MFf.a (vice chairperson)</p> <p>NFi.3</p>
Farmers' learn from literature (interactions with published texts)	<ul style="list-style-type: none"> • I have a textbook on health which explains that sadza from sorghum has to be eaten because it is very nutritious 	<p>MFf.b (small grains committee chairperson)</p>
Farmer to farmer learning (demonstrations)	<ul style="list-style-type: none"> • When I pass on seed to other farmers, I demonstrate / show them how to plant it • I have shared with all my neighbours skills of making green manure and growing herbs • I have come to learn from others (seed/food fair). I have come to learn from others ..I came to see what others are doing • In my area, there is Musamba group, which was born from this Bwizi EAG • At seed fairs we learn a lot and see what others are doing • At field days I .. learn from others how to prepare for planting in time and farming knowledge. 	<p>MFf.b (SG committee member), NFi.3, MFi.4, MFi.5</p> <p>MFf.a (headman)</p> <p>MFf.a</p> <p>MFi.5</p>
Farmers' learning from and perceptions of training and extension services (interactions with extension services / attending training workshops)	<ul style="list-style-type: none"> • I did not train other people after the CIMMYT workshop because I was made to believe that is the work of AREX • I undertook a Master Farmer training course and was certified in 1985. I learnt how to keep crop residues on a raised platform as silage to feed my cattle • I trained as a Master Farmer and we were taught how to grow hybrid maize as a mono-crop in straight lines for maximum yield • AREX officers are no longer teaching about animal husbandry 	<p>NFi.3</p> <p>NFi.3</p> <p>Mfd.2</p> <p>MFi.4</p>

Table AM.5 A summary of the main issues emerging from the interview schedules, focus group discussions and observations of farmers and extension and field officers: (WHAT ARE KEY INFLUENCING FACTORS TO FARMERS' CHOICES OF CULTIVATED FOOD PLANTS? – leading to section 4.6)

Category	Response in summary	Source of information (farmers – F, field officers – FO, extension officer – EO, extension worker – EW, Document analysis - D)
Economic and political	<ul style="list-style-type: none"> Beer brewed from rapoko is sold to generate income If I grow covo this year the crop will stay a long time in the garden before deteriorating or replacement, at least 2 years Farmers have been growing red sorghum because they get money from Chibuku breweries who promote it In my garden I like to grow garlic and king onion which I grow for sale, and also '<i>tsunga</i>' as a vegetable for eating and for sale At my home I am selling my garden produce and buying sugar for my family. From growing sorghum, I have built one more house on my homestead, which I have since extended. People come from Bambazonge (growth point/business centre) to buy for example shallots, and also our neighbours come to buy. Farmers save their processed foods and good seed up to the seed/food fairs and district agricultural shows expecting to win some prizes (motivation) I grow sunflower to get cooking oil 	<p>NFi.3</p> <p>MFf.1</p> <p>MFf.1</p> <p>NFi.3</p> <p>MFf.a</p> <p>MFf.a</p> <p>MFf.a</p> <p>NFi.3, MFf.a, MFf.5</p>

	<p>substitute for oil no longer available at Bambazonge shop</p> <ul style="list-style-type: none"> I like traditional seed which does not require much input 	<p>MFi.6</p> <p>MFi.7</p>
Climate and land, local adaptation	<ul style="list-style-type: none"> The return of sorghum in this area was caused by drought We grow sorghum also, in this area which is a hardy drought tolerant plant Sorghum SV4 is my best crop because it's drought resistant and it matures early Millet is next because it tolerates drought more than maize) My best crops are roundnuts, sorghum SV4 and tomatoes because they are drought tolerant Sorghum requires minimal rainwater for growth. If it rains twice only it will mature We grow maize in the garden because this is where we can get adequate water from the ground I learnt that maize is not the best crop to grow in my area. Those people who harvested .. planted OPV maize seed which is drought tolerant Water is the limiting factor 	<p>MFi.1, MFf.a, MFi.4, MFi.5, MFi.6, MFi.7</p> <p>MFi.4</p> <p>MFi.1</p> <p>MFi.4</p> <p>MFf.a</p>
Social, gender	<ul style="list-style-type: none"> Women had to pound rapoko in pestle in mortar. With the mixing of different tribes through marriage this custom is no longer popular. People are now more used to grinding mills 	<p>MFi.7</p>
Culture and History	<ul style="list-style-type: none"> We stopped growing rapoko because there was no seed. We are going to start growing it again because I got some seed at the seed fair Rapoko is no longer grown .. if you grow it alone in the neighbourhood, then you won't reap anything due to birds In the past I didn't like being forced to labour, digging storm drains 3 metre width of a bus. Agriculture demonstrators troubled us with 'nhamo yemakandiwa' (NB also political) 	<p>MFi.4, MFi.5</p> <p>MFi.7</p>
Structure and Agency	<ul style="list-style-type: none"> Some of the agric shows are done in areas which are far away from our area this reduces the number of people attending and learning AREX no longer mandated to teach farmers 	<p>MFi.4</p> <p>AEWi.2</p>

	<p>conservation. It is the job of Agricultural engineering</p> <ul style="list-style-type: none"> • AGRITEX split to give AREX, Engineering and others. AREX on ground, Engineering in town – no contact with farmers. • Many conservation works no longer maintained. Massive sheet erosion in 2005/06 season when unexpected heavy rains fell. 	<p>AEPi.2</p> <p>Observations/photo</p>
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Appendix 5:

Report on Participant Observation of a Seed Fair

Title of event: "Mutare District Seed Technology and other Farming Inputs fair"

Event theme: Farming for sustainable household food security

Date of event: 20 September, 2007

Report presented by: T. Pesanayi

Code: MSTlo.c

1.0 Background

Since 2005, the Government has launched the concept of district and provincial seed fairs, and for Manicaland it started with a provincial seed fair held at the Manicaland Agricultural Show grounds held in Mutare City in August 2005. PLAN Zimbabwe has ever since sponsored vouchers of a set value for distributing to needy farmers selected by Arex (Agricultural and Extension Services), which they use to buy seed and farming inputs. The idea is to bring seed and farming inputs as near to the farmer as possible, "but over the years this concept has become increasingly challenging due to inadequate fuel for seed houses, who are invited to bring their inputs", (PLAN Zimbabwe Community Development Coordinator 1 [CDC1], 20 September, 2007). Environment Africa was invited to participate in the Mutare District Seed/Inputs Fair, which was broken down into a three day programme with the first day (19 September) at Mount Dema Secondary school and the final two days (20 to 21 September) at Bezeley Bridge, 10 km from the main highway from Mutare to Masvingo cities.

2.0 Observation guide used

- i. Who is present for the event
- ii. General observations of set up and activities
- iii. What are the people doing and saying
- iv. Who is influencing events, that is the selling and buying
- v. What learning interactions are taking place:
 - a) Among farmers
 - b) Between Arex and farmers
 - c) Between PLAN Zimbabwe staff and farmers
 - d) Between Seed and Other Input houses, and farmers





3.0 Observations made

- i. Who was present at the event

- a) Several farmers, male and female, from Marange and Zimunya communal lands
- b) Arex staff
- c) PLAN Zimbabwe staff
- d) Seed houses: Seed Co; Pannar; Chanwick Services (Greenhouse Farm Supplies)
- e) Other Input providers: Zimbabwe Fertiliser Company (ZFC), An individual entrepreneur (Mr Sable of Hurudza company [not their real names])
- f) Invited guests, e.g. Environment Africa (represented).

ii. General observations of set up and activities

- a. Swarms of people queuing, trading, discussing, exchanging seed, carrying out purchases, waiting for transport
- b. Advertisements of event, seed, agro-chemicals, farm implements:

Organisation	Messages / banners / posters
PLAN Zimbabwe / AREX banner	<p>“Mutare District Seed Technology and other Farming Inputs fair</p> <p>Farming for sustainable household food security”</p> <p>PLAN Zimbabwe - AREX</p>
PANNAR Seed company banner/ posters	 
Seed Co seed posters / messages	  <p>“Productive farmers only use SEED CO seeds”</p>
Zimbabwe Fertiliser Company (ZFC) poster	Selling inorganic agro-chemicals: fertilisers, pest control
Chanwick Services (Pvt. Ltd)	Selling mostly certified OPV maize

iii. What are the people doing and saying?

c. PLAN Zimbabwe CDCs

Announcements made from a loudhailer: “Varimi tiri kuku kurudzirayi kuti mutenge neungwaru”, CDC2. [“*We appeal to you all farmers to buy wisely*”]. PLAN Zimbabwe CDCs assisting farmers to organise their coupons; recording farmers having coupons; trouble shooting; reconciling coupons given away with purchases.

Brief interview with CDC1:

TP: Could you please explain to me how this seed fair was organised

CDC1: These seed fairs were initiated by Government in 2005, and are supposed to be organised by AREX. The idea is to bring seed and farming inputs as near to the farmer as possible. Unfortunately here in Manicaland we find that AREX take their time to organise the event, and we have to push them to do so. This year we had two sites, an improvement from the one last year, but still they are not enough since the farmers are too spread apart. This site here is still a transport challenge for farmers coming from Zimunya who have to get on at least two different transport routes to get here.

TP: How does the voucher / coupon system work?

CDC1: We buy coupons for needy farmers and give to those farmers, who are selected by AREX. This year the coupons are worth Z\$4 million per farmer. They must buy all their needs at this seed fair. They cannot redeem coupons to cash. It is up to them what exactly they buy here.

TP: I have seen a number of seed houses here, you invite them?

CDC1: Yes we do, but over the years it has become increasingly challenging due to inadequate fuel for seed houses, who are invited to bring their inputs. We are aware that we should be promoting OPV seed, especially sorghum, in these hot, dry areas. However we stopped distributing seed after we had a problem with a sorghum macia variety, which kept growing tall without producing. The seed house had to compensate later.

TP: Which seed companies are present here?

CDC1: There is Pannar, Seed Co, Chanwick and this business enterprise Sable. We also invited Joy Seed Company but they failed to come this year as they failed to secure fuel.

d. Farmers:

- a) Queuing to buy seed at the different seed houses; buying fertilisers from fertiliser companies
- b) Buying from and selling to each other: sorghum seed, grain amaranth seed, pumpkin seed, water melon seed, millet seed, etc. in the background. Less aggressive, but some, marketing activity in this farmer to farmer trading area, where seed exchange was also happening.

e. Arex Officers / Extension Workers


- Assisting farmers to buy seed (explaining coupon use, directing where to go)
- Advising farmers on the maize varieties to buy

f. Seed and Other Input houses

- A purely business relationship with farmers;
- Actively selling their seed. Only maize varieties being sold: OPV dwarf (Chanwick); Hybrid maize seed (Pannar); hybrid maize seed, e.g. SC413, SC513 (Seed Co)

Key to observation preliminary analysis

Colour code	Category
	Sorghum is a preferred field crop
	Learning takes place as farmers interact with each other
	Intergenerational knowledge transfer promotes wise choices of food plants
	Culture and tradition



External trainers and extensionists play an important role in food plant choices and food security practices

Appendix 6: Extract of a research Journal

RESEARCH JOURNAL

12 - 14 / 03 / 2007

Participated in a multi-stakeholder training workshop on participatory impact monitoring (PIM) at Silveira House in Harare. Discovered that PIM is often not come out by most organisations, yet it brings out the socio-cultural changes which should be based on qualitative indicators. The starting point is expectations and fears whereby the most significant (say 5) are selected for monitoring. Such techniques as story telling and testimonies were found to be effective in bringing out impact (tend to be vivid & forceful).

25/03/2007

The possibility of cultivated food plant choice being affected by what seed is available at time of planting crossed my mind, even if it is not a traditionally cultivated plant for the farmer. This could be influenced by Government promotion or NGO promotion through seed handouts / packages or pass-on by other farmers.

01/04/2007

Conducted a SII with a farmer in Marange, Mr. Luke Makumbi. Used a digital voice recorder.

Appendix 7: Extract of a story of 'most significant change' (MSC)

Context

A group of participants from the EED assisted Theory and Practice of People Centered Development (TPPCD) course, doing a practical exercise on MSC visited one of the Environmental Action Groups working with Environment Africa. The visit was led by Tichaona Pesanayi and co-facilitated by him, and Field Personnel who organised the visit. Below is the story they wrote. The visit was conducted in September, 2007. Please note that names of all persons, except the editor of the story and researcher, have been changed to protect their identities.

SUNRISE ENVIRONMENTAL ACTION GROUP GARDEN: Written by TPPCD participants in an MSC course. Edited by Tichaona Pesanayi

INTRODUCTION

Many traditional food varieties are becoming extinct from mainstream production and are being replaced by new exotic staples. Maize is the “staple” food of Zimbabwe and all farmers want to produce it. Unknown to many development facilitators however, maize originates from Mexico but it has replaced many traditional foods such as small grains that are better adapted to the harsh conditions of many parts of the country. Environment Africa under its efforts to promote appropriate natural resource management supports community development initiatives that promote proper use of natural resources. **Sunrise EAG** garden in Mutare district is one of such projects.

BACKGROUND TOSUNRISE TAWANDA GARDEN

Sunrise EAG Garden was started by seven women from Marange communal area, **Tawanda village** Mutare District, who initially used to bake bread that consumed lots of firewood. Environment Africa personnel approached the women and informed them about Environment Africa and its activities, emphasizing the value of environmentally sustainable agricultural practices and viable income options. Subsequent discussions and support led to the formation of the garden group, and it attracted additional members. At the time of the visit, the group had 17 members. The objectives of the group were to improve nutrition, food security, income and provide medicinal options at household level. The garden initiative was so appreciated by the local leadership, who generously allocated them three and half hectares of land that they have utilized effectively. Besides small grains, the women were also involved in vegetable, fruits and tree planting.

Below is a detailed account of what visiting participants learned.

A team of three participants of the Theory and Practice of People Centered Development (TPPCD) practitioners visited this garden to learn from the members how the garden had changed their livelihoods. The team used an analytical flow diagram to assess the results of the intervention and their impacts on livelihoods of the people. The team was impressed by the importance of small grains in the restoration of food security in the area. This led them to propose that probably food security activists needed to look into the national policies that support the production of such crops for the marginal communities.

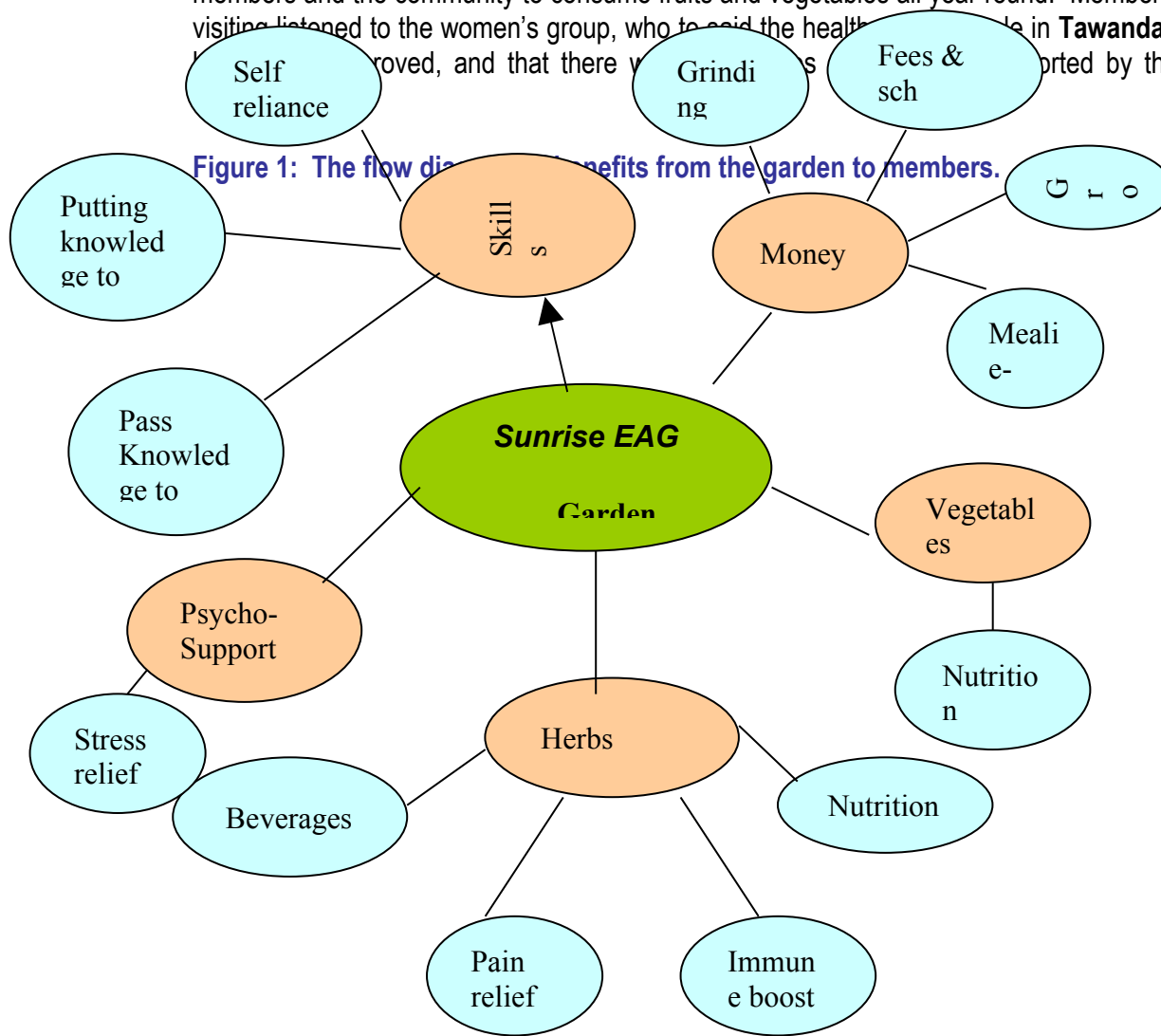
The first objective of the group was to improve the nutritional status of beneficiaries and their household members.

In order to achieve this objective the group engaged in planning, preparation of seed beds, budding and grafting, collection of grass for mulching, watering, weeding, pruning, food processing and storage. The group was also trained in food processing and storage.

Achievements

The group's main achievements were under the area of food processing with a solar drier provided by Environment Africa. At the time of the visit, there were a lot of processed foods like lemon jam, dried paw-paws and bananas, mulberry drink and dried vegetables (*mufushwa*) prepared for exhibition at the upcoming Manicaland Agricultural Show. Processing enables the members and the community to consume fruits and vegetables all year round. Members of the visiting listened to the women's group, who told the health benefits of the garden in **Tawanda** village. They also learned that the garden had improved, and that there were many more people supported by the local

Figure 1: The flow diagram showing the benefits from the garden to members.



The second objective is to improve food security at household level.

Most of the activities under this objective were similar to those under the first objective; however there were additional activities such as digging contour ridges, and training on small grains farming, conservation farming methods, crop rotation, and soil fertility management which are also important for this objective.

Achievements

Perhaps the highest achievement of the group at the time was recognition by the District. Two members won the first and second positions as best small grain farmers this year (82 year old Mbuya Mercy Chipangamazano first and Maria Shiri came second.).

Access to water enables members to plant crops early and harvest before the rest of the community. Changing cropping patterns to emphasize small grains has improved their food security. Millet, Sorghum, Red and white “rapoko”, do much better in this area than maize and have been key in reducing the intensity of the hunger periods. The crops were making their way back into the diet of the community not only as hunger-beating crops, but as staples. Members also got sufficient relish for consumption of fresh and preserved vegetables from the garden.

The group members were at the time constantly called on to provide knowledge and support on natural farming methods by people from near and far. At the time two groups had already been born out of **Sunrise EAG** Garden. The group members still provided technical and moral support to the new groups.

The third objective was to improve income at household level

The main activities under this objective were processing of food and herbs, pricing and marketing; collecting and selling of wild fruit seeds and seedlings, and selling garden produce, including fruits.

Achievements

From the earned incomes, members were able to send their children to school, buy scholastic materials as well as utensils, clothes and groceries. The group members said that they assisted their husbands in fending for their families. The women boasted of being able to give pocket money to their husbands for personal use.

The fourth objective of the group was to enhance health options at household level.

Cultivation of herbs is integrated in the garden. Activities under this objective are the same as the garden except training on the types and uses of different herbs.

Achievements

Group members said “regular consumption of herbs has boosted immunity levels of community members”. The local health centre recorded reduced incidences of people detained for minor ailments. They said that most people in the community were aware of the uses of herbs and used them as first aid, before going to the clinic.

Challenges

Using the seasonal calendar, the teams facilitated members to list and discuss some of the challenges they faced.

- Access to water in general and droughts were the most pressing challenge at the time. The water source nearest to the garden dries up early into the dry seasons, while the all seasons well is a distance from some of the plots.
- Raiding by thieves as well as birds were also a challenge for small grain production.
- The market is very limited, Environment Africa had undertaken to assist with the marketing of processed foods but this requires certification from Ministry of Health which was a long process.
- Secondly, there were pests: crop raiding by livestock, stealing by thieves who also ruined the fence. The group was trying to plant a live fence to reinforce the strand fence which was rather porous at the bottom to the small livestock.

The certification challenge to marketing also affects this objective. Samples of the group products need clearance with the Ministry of Health before they can be released to the open market, which apparently is waiting for such products. Herbs are also affected by pests, and water shortage. Members also face shortages of polythene for packaging and seedling of some varieties.

Livelihood Analysis

The team carried a livelihood analysis to assess the impact of the project at household levels. Three homes were visited.

Fig. 1: Family size and composition

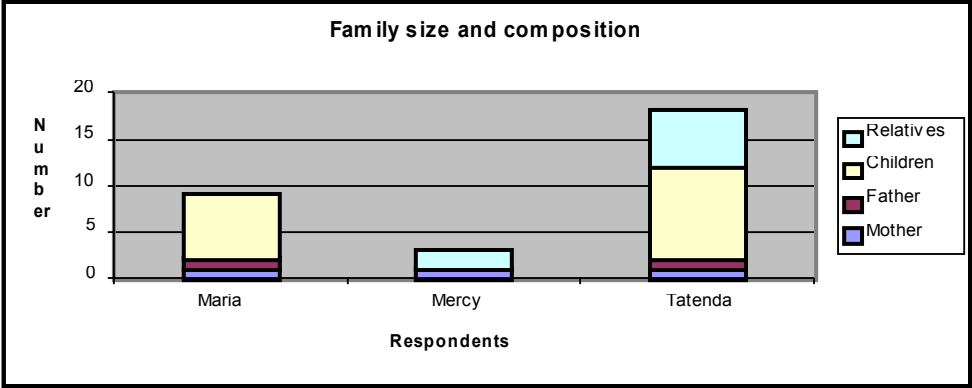
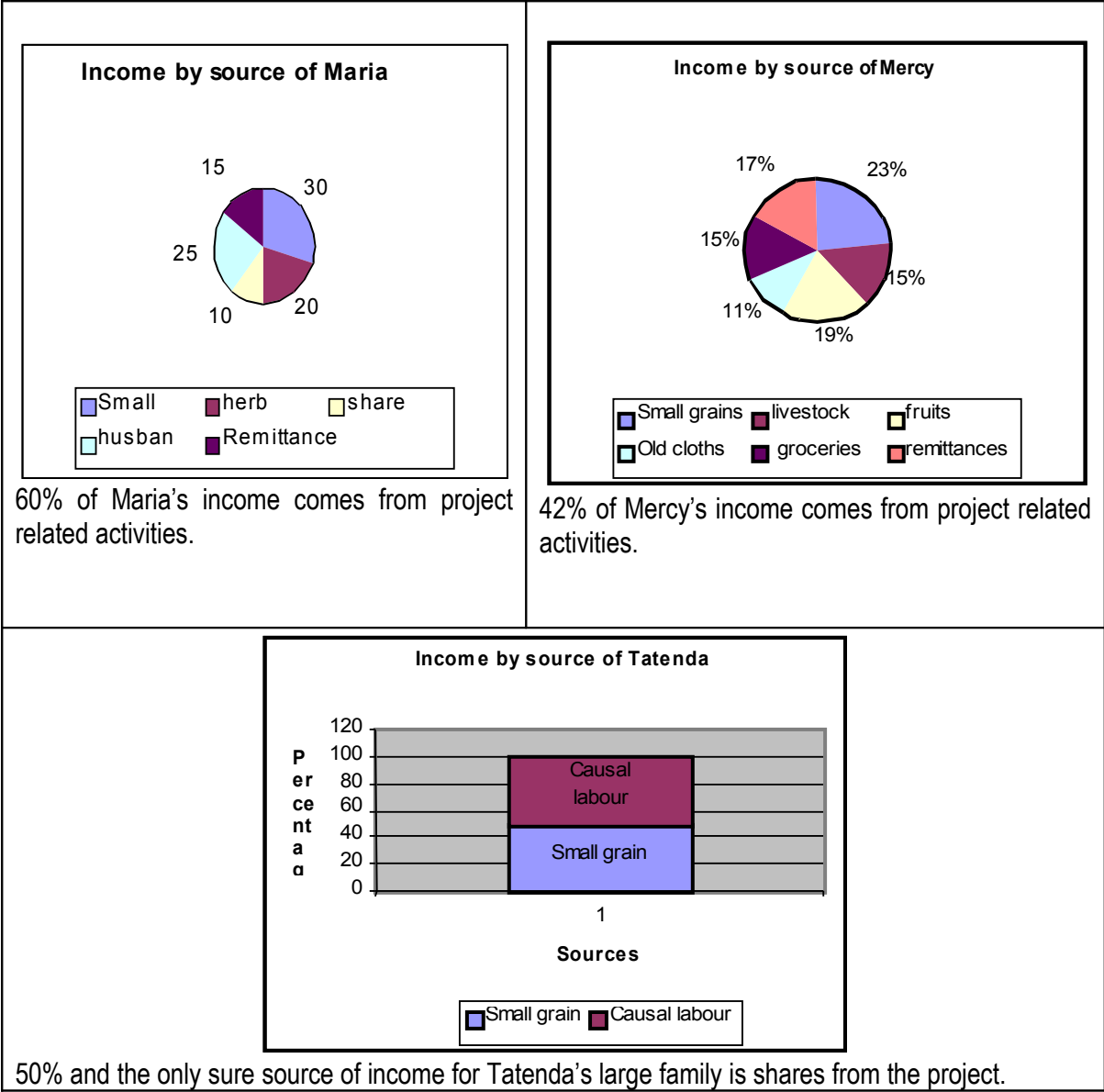


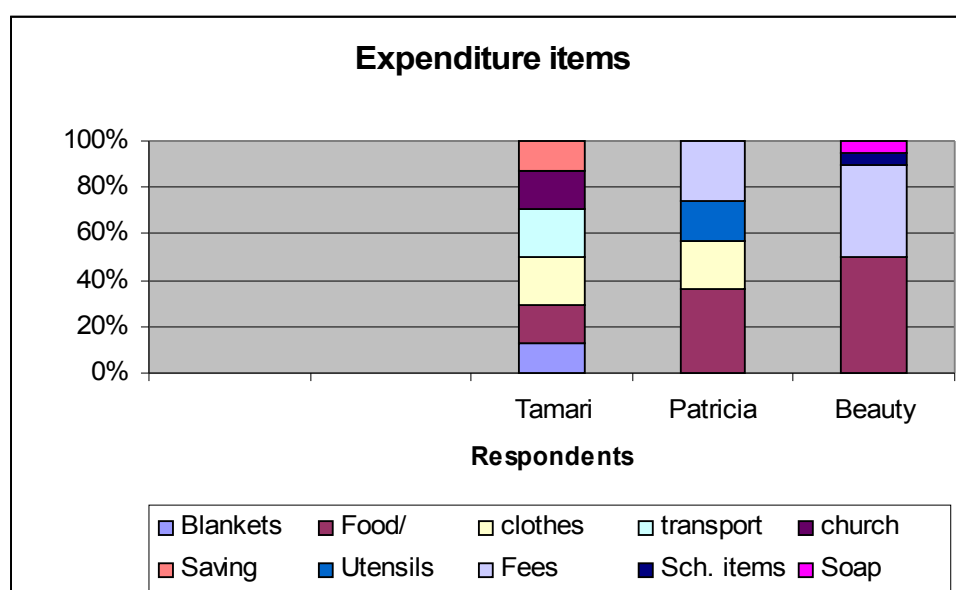
Fig. 2: Income by source of the three respondents



The project was one of the main income sources of the members. This proved the relevance of the project to the community economy and perhaps the market need for the group's products.

Small grains traditionally grown in the area, plus natural herbs were becoming essential cash crops to producers.

Figure 3: Expenditure items by respondents



According to economic growth models, expenditure items are a good pointer to the economic status of a household. Figure 2 that shows income by source, Tatenda's household with only one source of income also spends on bare essentials and includes soap as a key item, while other respondents did not even show it as a stand alone item. Secondly, while all spent on food, tatenda with 18 members in the household and one source of income, spent most of her income on food. Only Mbuya Mercy saved. She was also an active business old woman. From her various source, she was able to list 6 key expenditure items while the others listed only 4 items. Mbuya Mercy also owned more items than the other two. Unfortunately because the field work was only one day, the team was not able to explore more households and to probe more on assets acquired as a result of being in the projects. Below are the detailed results from the three homesteads.

MARIA SHIRI

Maria Shiri was married and a mother of 7 children (3 boys and 4 girls). Her husband was a trained professional and worked with in another district some 200km away. However he hardly visited the home although he sent some support.

Maria got most of her income from selling Sorghum (30%), Husband contribution (25%), Children's contribution (15%), herbs selling (20%) and shares from group garden (10%). The sorghum, herbs and shares from group garden made up 60% of her income and were all from EA related activities. The initiative therefore helped diversify her income sources as well as increase her total earnings. It was noted that selling small grains were her highest source of income.

Maria's household spent most of its income on mainly groceries- salt, sugar, floor, cooking oil (36%), Fees and scholastic (26%) for her 2 school going children, clothes and uniforms (21%) and kitchen utensils (17%).

Besides these Maria invested in some assets with income from the project: she put up a 4 roomed house, 1 round hut, 1 latrine, a well, purchased 4 heads of cattle, 5 goats, ox cart and farming equipment.

Her main challenges at the time were thefts and lack proper fencing around her fields, thus allowing stray animals in.

Mbuya MERCY CHIPANGAMAZANO

Mbuya Mercy Chipangamazano an 82 old widow (born on 25 March 1925) stayed with two grand children aged 3 and 14. The three year old attended pre-school while the 14 year old was in grade seven.

Mbuya Mercy bragged of having had increased the harvest since joining the group and applying the knowledge to her fields. She harvested 720 kg of groundnuts compared to the period before the garden where she hardly harvested anything; she harvested 250 kg of maize from the early crops planted in the garden; and 100 kg SV4 Sorghum. Consequently she said "I no longer have hunger!" She had managed to feed her family and sold the surplus to others. Her household also enjoyed improved health as they no longer suffered common ailments.

Mbuya Mercy's sources of income included selling of crops (tsunga, groundnuts, sorghum (*mapfunde*) SV4 and maize) - 23%; selling of small livestock (chicken and goats) -15%; remittance from children in Harare provide 17%; selling of fruits provide 19%; selling second hand clothes provide 10%; petty trading (sells sugar, soap, flour) 15%. Forty percent (40%) of her income came from project related activities.

Mbuya Mercy spent on expensive blankets (13%), 16% on food (sugar, flour margarine, peanut butter), 21% on clothes for her grandchildren, 21% on transport, 16% on church offering, 14% on church dues and she banks 13%.

Mbuya Mercy owned assets such as a black and white TV set, a 3 piece radio, sewing machine, wardrobe, sofas, double bed, single bed, dining table, 2 kitchen units, 3 roomed house and 5 goats.

TATENDA MARANGE

Tatenda Marange was married, produced 13 children but 3 of them died and she was left with 10. There were 16 people living at her homestead, 6 were her children but only one was in school. The other 5 completed 'O' level but were not working. There were 7 grandchildren, six of whom were orphans. All grandchildren were in school and Tatenda paid their fees.

Tatenda had only 2 sources of income: shares from the garden and doing piece works for people in the community. Therefore during the analysis of income by source, the garden scored 10/20 (50%) and piece works scored 10/20 (50%).

Tatenda did not have access to animal draught power to help her to prepare her land on time.

As such, she prepared late, planted late and every year she harvested little, which compelled her to depend more on the market for food. The analysis revealed that food took 50%, fees 40%, soap 5%, and scholastic materials 5%.

In terms of assets Tatenda had a 3-roomed house and a hut, a goat with 2 kids, a cow and its calf as well as a plough (but without a draught span to enable her use it effectively in land preparation).

Her main challenge at the time was feeding the 16 people in her home. She used to supplement her income with money from selling produce from the kitchen garden but due to recurrent droughts, the well at her homestead had dried up and she was forced to halt the gardening activities. The garden therefore was the only sure source of income for her and her family.

Unexpected Results

- Winning of a trophy as the best Environment Action Group nationwide
- Two new groups formed out of their groups: A and B group.
- They were able to purchase garden uniform for identity and this enhanced unity amongst group members.
- Latrine construction by group members on their own
- The group received fencing material and support to construct three wells in the garden by Environment Africa

Participants' reflection

"Awareness building is essential for changed behavior and practice. Environment Africa successfully manages to help the group change from bread making to a multi-skilled project that is proving to be more environmentally appropriate for the group. Members received training and sensitization on the importance of growing small grains, herbs etc. Implementation was entirely by the members and not Environment Africa or local leaders or donors, which proves that members owned the programme as their own and took full responsibility for its success".

"The relevancy of the programme to the local livelihoods was proven but 2 other groups starting something similar on their own. One of the members won a national award and other district awards. There was evidence of improved income and general livelihoods of members. Members looked healthy. I particularly liked their water harvesting schemes."

"The most important lesson for me was how the project was developed. While Environment Africa provided knowledge and awareness, the community reserved the right to take it on or not. The project was therefore initiated by the group members and training was integrated from the beginning. Implementation was based on the needs of the community, with skills development before implementation. I still wonder as to what can be done to ensure sustainable water supply."