

**Understanding Local Perspectives: Participation of Resource  
Poor Farmers in Biotechnology - The Case of Wedza District of  
Zimbabwe.**

**Munyaradzi Saruchera & Oscar Matsungu**

## **Summary**

Resource-poor farmers in the Wedza district of Zimbabwe are faced with tremendous farming challenges that are adversely impacting on their livelihoods. Beyond climatic, soil and other direct farming constraints, the farmers' options are severely curtailed by lack of material resources and other socio-economic grim realities that have resulted in, among other development interventions, agricultural biotechnologies pilot studies and projects.

This study sought to understand the local Wedza resource-poor farmers' perspectives and participation in agricultural biotechnologies projects being implemented in the area by the Biotechnology Trust (BTZ) of Zimbabwe and its partners. Varied perceptions and attitudes towards biotechnology project activities and the participation thereof exist, depending on several factors, namely awareness and involvement in local development initiatives, management style of the different stakeholders, language and resource accessibility of the new technologies and policy/political environment.

The study notes that despite the challenges, agricultural biotechnologies have a potential to improve the lot of Wedza's resource-poor farmers and impact on the evolving biotechnology policy framework in Zimbabwe if the current stumbling blocs are dealt with. An inclusive and agreed framework for participation is very central to the success of this process.

There are several agricultural biotechnologies policy implications that emerged from the study, and key among them are issues of timely access of update biotechnology information; timeous processing and effective dissemination of such information between technocrats and end users; material and personnel resources and access of such information in an appropriate language. Equally important and central to a biotechnology policy framework are the need to build capacity of relevant government structures and NGOs that service farmers' needs in the biotechnology era; the need for further research that should lead to use friendly and accessible research dealing with survival issues

facing farmers; the need for government to ensure an all-serving biotechnology policy outcome that protects vulnerable groups, despite the dominance of a few 'scientists' in the biotechnology debates.

The problematic challenges of conceptualising and operationalizing the notion of 'participation' is reasonably demonstrated in this study of Wedza. Participation is warm, persuasive and attractive concept that is subscribed to by many, although very few, if at all, ever achieve it. Without a shared vision and meaning of participation, analytical tools, indicators and practical methods, participation remains an elusive pastime 'occupation' and endearing slogan of many development practitioners.

**Author Note:**

**Munyaradzi Saruchera** is a budding researcher in natural resource management issues and with a particular interest in community-based natural resource management (CBNRM), natural resource-based conflict, transboundary natural resource management (TBNRM) and social relations and indigenous knowledge issues in biodiversity conservation and natural resource management.

Munyaradzi is currently employed with the Programme for Land and Agrarian Studies (PLAAS), School of Government at the University of the Western Cape in South Africa, as a Networks Coordinator and currently coordinates 2 initiatives, the Pan-African Programme on Land and Resource Rights (PAPLRR) and Promoting Common Property in Africa: Networks for Influencing Policy and Governance of Natural Resources (Co-Govern). He has been involved with IDS's 'biotechnology and the policy process' scoping study in Zimbabwe, through Jennifer Mohamed-Katerere, since 2001. Thereafter Munyaradzi secured an IDS grant to pursue related research of his own interest.

**Oscar Matsungu** is a graduate of Social Work & Psychology. Oscar is a freelance development worker with extensive experience in participatory research and a keen interest in women's participation in development initiatives. He has been involved in participatory and situational studies on "Gender in rural travel and transport in Zimbabwe", "Women in Mining in Zimbabwe" and "Child Care Practices in Zimbabwe". Oscar indirectly links to IDS through Munyaradzi Saruchera whom he participated in this study.

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## Preface

This paper series emerges from a series of three interlinked projects. They involve collaboration between IDS and the Foundation for International Environmental Law and Development (FIELD) in the UK and partners in China (Center for Chinese Agricultural Policy (CCAP)), India (Centre for the Study of Developing Societies, Delhi; Research and Information Systems for the Non-Aligned and Other Developing Countries (RIS), Delhi; National Law School, Bangalore), Kenya (African Centre for Technology Studies, Nairobi) and Zimbabwe.

Three key questions guide the research programme:

- What influences the dynamics of policy-making in different local and national contexts, and with what implications for the rural poor?
- What role can mechanisms of international governance play in supporting the national efforts of developing countries to address food security concerns?
- How can policy processes become more inclusive and responsive to poor people's perspectives? What methods, processes and procedures are required to "democratize" biotechnology?

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## Abbreviations

AREX	Agricultural Research and Extension
BAZ	Biotechnology Association of Zimbabwe
BRI	Biotechnology Research Institute
BFZ	Biotechnology Forum of Zimbabwe
<i>Bt</i>	<i>Bacillus thuringiensis</i>
BTZ	Biotechnology Trust of Zimbabwe
CBD	Convention on Biological Diversity
CSO	Central Statistical Office
DDC	District Development Committee
DGIS	Directorate General International Co-operation
DR&SS	Department of Research and Specialist Services
ENDA	Environment and Development Associates
FANR	Food, Agriculture and Natural Resources
FAO	Food and Agriculture Organisation
GMB	Grain Marketing Board
GMOs	Genetically Modified Organisms
GTZ	Germany Technical Cooperation
HIV/AIDS	Human Immuno-Virus Acquired Immune Deficiency Syndrome
IDS	Institute of Development Studies
IPM	Integrated Pest Management
IPPM	Integrated Production and Pest Management
IRG	International Resource Group
ITDG	International Technology Development Group
LDCs	Less-Developed Countries
MAS	Molecular Assisted Selection
NGOs	Non Governmental Organisations
RCZ	Research Council of Zimbabwe
RRA	Rapid Rural Appraisal
SADC	Southern African Development Community
SIDA	Swedish International Development Aid
SIRDC	Scientific Industrial Research and Development Centre
SLF	Sustainable Livelihoods Framework
TRB	Tobacco Research Board
VIDCO	Village Development Committee
WADCO	Ward Development Committee
ZFU	Zimbabwe Farmers' Union
ZIMBAC	Zimbabwe Biotechnology Advisory Committee
ZIDS	Zimbabwe Institute of Development Studies

## 1 Introduction

Participation is a warm and persuasive word that never seems to be unfavourably used. Like the concept of community, participation can be easily attached to different sets of relations, and, owing to its warmth and ready acceptance, little attention is given to the nature of those relations.

The policy history of participation is varied across the world, and largely so between the so-called Third and First Worlds. In Europe, popular participation meant the inclusion of a larger number of citizens in local government affairs and public decision making processes. Participatory governing brought in pressure groups, associations and protest campaigns into contact with those making decisions about them without them. The level of participation did not mean making actual decisions, but being merely consulted or helping in implementing activities.

Post-war models of development in the developing countries were based on the belief that capital penetration, commoditization and industrialization would transform traditionally isolated, disenfranchised and subsistence peasantry into participants in a modern economy and the politics of the nation state. The use of participation in the above sense implies that people were not politically and economically active before “development” came along. This notion constructs people as objects of a national programme of development and whose participation was based on their labour, cash or other contribution (Nelson & Wright 1997: 2).

In the 1970's international non-governmental organisations (NGOs) argued for development that generates self-sufficiency, as opposed to depending on state services provision. The World Bank's 1980's structural adjustment programmes confirmed the failure of the post-colonial state's development agenda by moving functions from the state to the private and NGO sectors. The World Bank development policies rhetorically shifted towards human-faced and community as well as family-focused service and welfare emphasis - former responsibilities of the state.

By the end of the 1980's, development evaluation programmes, with pressure from organisations in the South, called for participatory development as an alternative to earlier models. This culminated into the 1990 United Nations' Economic Commission for Africa Arusha Conference whose theme was “popular participation and transformation” and was attended by more than 500 representatives of African grassroots organisations. Thereafter several European bilateral agencies (e.g. the German Technical Cooperation (GTZ) and the Swedish International Development Aid (SIDA)) experimented with various definitions of and approaches to participation (Nelson & Wright 1997: 3).

There are several domains of participation including officialised spaces or public consultations, unofficial spaces, as well as spaces of everyday life. These spaces are not separable and what happens

in one impinges on what happens in others as relations of power within and across them are constantly reconfigured. Whether invited or demanded, the exploration of participation examines how space (new or old) is occupied, negotiated or subverted (Cornwall 2002: 51).

Participation of farmers in development projects is widely viewed as a prerequisite for rural development. Variations in the way participation is interpreted and applied exist, however. Popular participation in development can be viewed as, 'mass sharing of the benefits of development, mass contribution to the development effort; and (mass) decision making in development' (Makumbe 1996).

A review of rural development and beneficiary participation in Zimbabwe since national independence in 1980, confirms the Third World experiences and reveals the challenges of participation. As experienced in Europe, Zimbabwe also experimented with the participation approach in its local government system, a critical public development machinery after independence, with mixed results. Other structures and institutions that provided alternative avenues for participatory development were NGOs, political parties, cooperative societies and other mass movements (Makumbe 1996: viii).

There is growing public debate (or "participation") and a supportive institutional framework on biotechnology debate in Zimbabwe today. The launch of the Biotechnology Association of Zimbabwe (BAZ) and involvement of other organizations has witnessed growing momentum in debates, interest and demystification of biotechnology issues, particularly in modern agricultural biotechnology.

Nevertheless, the absence of resource-poor communal farmers in these developments has been conspicuous. Instead, a number of development non-governmental organizations, commercial and research institutions have emerged with claims of representing the farmers. The extent of these claims is examined in this paper through one case study in Wedza district.

There are a number of biotechnology-related projects underway in Wedza district. Most farmers are engaged in at least one biotechnology-related activity of one form or another. Most projects are spread out in different wards of the district. These projects range from mushroom cultivation, maize improvement, sweet potato propagation, biological nitrogen fixation and livestock feed to molecular diagnostic techniques for cattle reproductive diseases.

While biotechnology has potentially a lot to offer resource-poor farmers, its controversies from other parts of the world, especially Europe, are cause for concern among some farmers and consumers in

developing countries, including Zimbabwe. The refusal of Zambia to accept donated GMO food relief from the World Food Programme, in the face of mass starvation, is a case in point. What does this signal for other developing countries?

Today's development landscapes are beset with traces and versions of participation in one form or another. The different approaches and experiments of participation have produced varied results and alliances transcending older boundaries. With demands from below for recognition to meet the proliferation of spaces into which publics are invited, a horde of questions are emerging about the nature of these spaces and the dynamics of participation within them. Questions range from who invites participation and who takes part, to what people think participation should be about or for.

Nelson & Wright (1997: 1) observe that participation involves shifts of power within communities, between people and policy-making and resource-holding institutions, and within the structure of those organisations. Participation means more than taking up invitations to participate and extends to autonomous forms of action in which citizens create their own opportunities and terms for engagement. Advocates of participation argue that development efforts should focus on reconfiguring and opening up new forms of space beyond consultation. This entails opening up of new options for voice, influence and responsiveness. Participation invariably leads to processes of space making for citizen participation, and this includes creation of new spaces, widening of existing ones or opening up of spaces once closed off. (cf. Cornwall 2002)

## **2 The Case Study: Wedza District, Zimbabwe**

In light of the above participatory development experiences, this study sought to investigate the experiences of a national biotechnology NGO, the Biotechnology Trust of Zimbabwe (BTZ), working with resource-poor farmers in Wedza district of Mashonaland East province in Zimbabwe.

Beyond documenting the extent of smallholder farmers' participation in biotechnology development projects, the study also sought to explore how the issue of language (as a medium for communication) of biotechnological science knowledge impacts on the farmers' participation and choice.

Biotechnology is regarded as a western and "modern" science, an alien and largely inaccessible body of knowledge for semi-literate resource-poor farmers in a communal area setting with poor crop yields and minimal livelihood choices.

The BTZ is working with resource-poor farmers in a bid to improve their conditions by exploring alternative farming options using biotechnology techniques. What are the farmers' understanding and

perceptions of this technology? Do the farmers accept and participate in the BTZ biotechnology projects, in what language and with what results? What informs the farmers' decision to participate or not in alien technology-based activities? What livelihood options do they have? These questions and other issues are investigated in this study.

Three projects in Wedza were examined with a view to establishing the extent and nature of farmer participation. These projects were: mushroom production, (source of cheap protein), maize improvement (staple food) and sweet potato propagation. The study focused on both farmers participating in the projects and those not involved. The objective was to assess how the general community perceived the projects and establish the extent of farmer participation biotechnology debate in so far as it concerns the policy development process among farmers and representative organizations.

The study was informed by issues of representation, space for engagement by farmers, construction of knowledge and how a different form of knowledge fares in empowering resource-poor farmers to make decisions, question and challenge issues presented before them to influence policy.

Critical questions regarding the definition of participation, including perception, mode and attitudes towards participatory development were investigated. For the BTZ, and other organizations working with and representing farmers, there should be a medium of communication that allows transmission of information from the generators of biotechnology science to users. What communication methodology is deployed in this transmission of knowledge, with what results?

The study examined how information was communicated between the "scientists/experts" and poor communal farmers and what effect this had on the farmers' understanding and attitude towards biotechnology. Equally important was the issue of unpacking that which informs the farmers' choice of biotechnology over other options, their fears and motivations, and what implications all these factors have for their survival and food security.

The study employed different methodologies, namely Rapid Rural Appraisal (RRA), guided and unguided interviews with key informants, documentary search, questionnaire administration and participant observation of ensuing processes. Where data was inconsistent or disagreed, RRA allowed discussion and clarification of issues that were not commonly agreed between different respondents. Three groups of 10, 13 and 12 participants each took part in the focus group discussions. There was no equal representation of male, female, adults and youths. The majority (20) of respondents were adult females and youths constituted a small number (6), while nine adult males were included in the sample.

Sampling was not systematically and strictly scientifically determined. Availability of respondents at the time of the research was a major determinant although in some cases some loitering or passing-by respondents were asked to participate in the appraisal meetings.

Interviews were also held with key informants who included officers from public and private organizations, as well as NGOs and community leadership. A set of questionnaires was administered to 35 farmers. Twenty of the respondents were directly involved in the BTZ projects, whilst 15 were not participating, but witnessed and were reasonably aware of what was taking place. The reason for including non-project members was to gauge community perception of the project with reasonable objectivity and inclusivity.

The timing of the study coincided with a plethora of social and political events that were happening in Zimbabwe at the time. Most of these factors were generally hindering progress: namely political disturbances, unethical conduct by some interviewees and lack of cooperation by some influential contacts in accessing critical documents relevant for the study. Zimbabwe went through difficult political disturbances since the year 2000. The 2002 presidential elections made the situation worse and, as a result, rural areas, including Wedza, became inaccessible for research work and other politically unsanctioned activities.

The district of Wedza is situated in the southern part of the Mashonaland East Province of Zimbabwe. The district cuts across three natural regions: region 1 is the most fertile with good soil fertility and relatively high rainfall; whereas region V is the least with poor soil fertility and rainfall of less 600mm per annum. Land use activities vary from large-scale commercial farming to resettlement and communal area subsistence farming in the north and south central part of the district.

Wedza district was subjected to tree cutting due to cropland and fuel wood demands over the years, and more than 60 percent of the communal area is deforested (pers. communication with AREX 2002). The physical environment of the district is characterised by 18°C mean temperatures, 450-850 mm rainfall, sandy soils with dolerite intrusions and an altitude of between 920 and 1749m (Bary 1995).

Owing to population pressure most land in the district is now under cultivation, whilst grazing land is increasingly being converted to cropland resulting in overstocking and overgrazing in some places. The 2002 population results show that Wedza district has 70, 604 people of which resource-poor farmers constitute the majority. There are 16, 276 households with an average size of 4.3 people (CSO 2002).

Average land holding in the communal area ranges between 3.2 and 2.5 hectares. However, holders of such land have often had to sub-divide plots to share with their children (often male), resulting in even smaller cropland of 0.4 hectares. Like all communal areas elsewhere in the country, the state owns the land whilst the farmers have usufruct rights on both crop and grazing land. In the resettlement area average land holding is about 4.86 hectares.

Farming is the leading occupation and source of income for communal and resettlement farmers. The people of Wedza practise mixed agriculture, the keeping of livestock and the growing of crops. Agriculture is also mixed in the sense that they grow for both consumption and for sale. The same applies to livestock as well.

Some crops are grown specifically for sale, namely tobacco and paprika, whereas maize, groundnuts, sorghum, sunflower, beans, and wheat are grown for both sale and consumption. *Nyimo, nyemba, zviyo*, and sweet potatoes are grown for consumption on a small scale. *Nyimo, nyemba, zviyo* and sweet potatoes, when in surplus, are sold on the local market, notably intra-village exchanges to meet intra-village deficits.

Due to the recent spate of hardships (drought, expensive farm inputs, poverty and land shortage), some of the farmers (largely women) have formed groups through which they pool resources together, share ideas and seek assistance from donors, extension services and development agencies. It is through such groups and other new ones that the farmers are working with biotechnology-related organisations in their area. Membership to these groups is voluntary and activities can be extended to other areas that are not necessarily farming, e.g. savings society, care giving and brick moulding.

Agricultural extension services are primarily rendered by the Department for Agricultural Research and Extension Services (AREX) among other organisations working in the district, and almost always use the existing local extension service and farmer-based organisations such as the Zimbabwe Farmers' Union (ZFU).

### **3 Biotechnology Activities**

Zimbabwe has made reasonable strides in modern biotechnology research and development, although this much is still at laboratory research level. Biotechnology awareness is generally high among researchers and policy-makers involved in activities related to the technology. Development and public farmers' organisations, communal farmers and consumers in general, remain not as articulate and appreciative of biotechnology issues, although awareness is growing as the debates increase.

NGO attempts to address farmers' concerns have become increasingly important in informing policy and farming practice. One significant player is the Biotechnology Trust of Zimbabwe (BTZ). The BTZ is leading and funding a coalition of institutions namely the University of Zimbabwe's Departments of Soil Science and Biological Sciences, Scientific and Industrial Research Development Centre (SIRDC) and CIMMYT, Tobacco Research Board, Horticultural Research Institute, Grasslands Research Station and the Central Veterinary Laboratories in implementing agricultural biotechnology-related projects in Wedza. Though separate from the BTZ projects, the dairy development programme was also running a dairy project. All these projects are implemented in conjunction with AREX.

According to the Biosafety Board, there were no known GM foods and products on the Zimbabwean market, at least approved ones at the time of the study. Recent reports on perspectives of Zimbabwean industries on modern biotechnology revealed that there were no known food industries using GMOs as raw materials. However, owing to low consumer awareness and lack of stringent food labelling obligations, it is difficult to categorically confirm the absence of GMOs, given that some raw materials were imported from countries that use GMOs and no known companies have genetic origin requirements as part of their receiving inspections (Dube 2001).

Biotechnology application in Zimbabwe remains of a generally traditional nature and in areas such as agriculture, medicine, industry and environmental management. The application of modern agricultural biotechnology has largely been limited to the development of transgenic animals and plants carrying desired traits such as disease and insect resistance. Traditional applications such as tissue culture, molecular diagnostics, mushroom production, marker-assisted selection (MAS) in maize improvement and sweet potato micro-propagation are the leading types of agricultural biotechnology with applications on the ground.

Major constraints faced by organisations engaged in biotechnology work, especially public and government institutions include the following:

- Inadequate access to recent and appropriate information systems,
- Inadequate and insufficiently equipped laboratories,
- Inadequate financial resources for equipment and qualified personnel, and
- Inadequate capacity to generate technology transfer to best advantage.

Private and public institutes and commercial seed houses are engaged in a plethora of biotechnology applications of both a traditional and modern nature. The Agricultural Research Trust, the Spawn Laboratory, Agro-Biotech and Bluedale Enterprises are some of the private outfits carrying out

research in biotechnology. The Tobacco Research Board (TRB) is engaged in genetic modification of tobacco for herbicide tolerance, disease resistance and tissue culture (Mohamed-Katerere and Saruchera, 2001).

### **3.1 The Biotechnology Trust of Zimbabwe [BTZ]**

The BTZ is one of the development concerns that are engaged in promoting and facilitating debate, development and application of biotechnology through funding of biotechnology projects at various institutions.

The BTZ works closely with the Tobacco Research Board, the Soil Science and Agricultural Engineering, Biological Sciences and the Biochemistry departments of the University of Zimbabwe, as well as AREX's Grasslands Research Station in Marondera. The joint projects cover a wide range of activities discussed later in this report.

The BTZ, whose projects were the focus of this study, has its roots in the Zimbabwe Biotechnology Advisory Committee (ZIMBAC), formed in 1994 to encourage the development and use of biotechnology for the benefit of resource-poor farmers. ZIMBAC was born out of the national Biotechnology Forum of Zimbabwe (BFZ), which was formed by a group of scientists in 1991/2.

The Zimbabwe/Netherlands Agricultural Biotechnology for Resource-Poor Farmers Programme, as it was known then, evolved over a number of years. In 1989, researchers from the Free University of Amsterdam organized a stakeholders' public debate at the University of Zimbabwe. This was followed by an inventory of biotechnology research activities carried out by the Zimbabwe Institute of Development Studies (ZIDS) and following on the above deliberations, the BFZ was born.

The BFZ initiated the formal process of priority setting with the support of the Dutch Directorate General International Co-operation (DGIS) Biotechnology Programme. A secretariat for the programme was housed at the Environment and Development Associates (ENDA)-Zimbabwe, which supported the BFZ initiatives in the priority-setting phases 1 and 2.

Phase 1 was initiated in 1993 and focused on the following:

- National priority setting for crop production,
- National background survey,
- National workshop to present and discuss findings.

Following on the above, crop production constraints were identified, institutional biotechnology capacities and priorities were identified, a national priority-setting workshop to discuss the national

survey report was held, and a Committee to steer the DGIS Biotechnology Programme activities in Zimbabwe, within the overall national agricultural policy framework, was formed. Thus ZIMBAC was formed in 1994.

The second phase of the BFZ initiatives addressed the following aspects, starting in 1994;

- Selection of target intervention area,
- Farmer consultation through a general agricultural socio-economic survey to further verify the constraints of the farmers and confirm priorities set at the national workshop in phase 1.

Two districts, Buhera and Wedza, in southern central Zimbabwe, cutting across natural farming regions II(b) to V, were selected. A 1995 socio-economic survey study by Coopibo identified priorities and constraints from the two districts. The Coopibo report formed the basis for the project formulation and implementation phase later taken up by BTZ and its partners.

Members of ZIMBAC formed the Biotechnology Trust of Zimbabwe on 22<sup>nd</sup> December 1997, after a realization of the need to form a legally constituted body to co-ordinate biotechnology activities in all spheres and encourage biotechnology development and application in the fields of agriculture, environment, forestry, health, industry and mining. A Bureau of Administration implements the activities of the BTZ/ZIMBAC. Several community projects were established since 1997 and involve a range of implementing agencies as partners. A list of community projects and implementing parties is given in table 3.1, with the focus projects of this study highlighted (\*)

**Table 3.1: Summary of Community Projects**

<b>Project</b>	<b>Description</b>	<b>Implementing Party</b>
Drought resistance in maize*	The main focus of the maize improvement project was to identify major quantitative trait loci [QTL] for insect resistance and drought tolerance using phenotypic and genotypic data generated. Farmers were supplied with hybrid seed to carry out on-farm farmer –managed trials.	BRI (SIRDC), CIMMYT AND Kenya Agricultural Research Institute
Pathogen-free sweet potato stock*	The aim was to produce, multiply and distribute disease-free planting material of sweet potatoes. The project focused on the identification of sweet potato viruses, elimination of viruses and other pathogens and meristem-tip culture, and the introduction of new improved cultivars.	TRB, Horticultural Research Institute, BRI
Biological nitrogen-fixation [BNF]	It aimed at promoting BNF technology as a way of improving crop production in communal areas of Zimbabwe. The objective was to integrate legumes into the maize-based agriculture of Buhera and Wedza.	Dept of Soil Science (UZ)
Livestock feeding strategies	Aimed at improving the quality and the availability of livestock feed for the production of healthier livestock. So far farmers have acquired skills in the production of forage and urea-treated stover, and silage fermentation	Grasslands Research Station
Mushroom production*	The project aimed at producing mushroom spawn, and imparts simple mushroom cultivation technology to smallholder farmers in order to improve their nutrition and income. A mushroom production manual was also developed.	Dept of Biological Sciences and BRI
Control of reproductive	Aimed at increasing the reproductive capacity of cattle by reducing the incidence of reproductive diseases, and to	Central Veterinary Laboratory

diseases in cattle	improve the quality of cattle breeds. Farmers received training on aspects of herd-health and artificial insemination.	
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**Source:** *Biotechnology Trust of Zimbabwe, January 2001 (Vol5 No 2)*

#### **4 Agriculture and Livelihoods: Impacts of Biotechnologies in Wedza**

The level of agriculture and production in Wedza is subject to seasonal conditions and outcomes, available land size, availability of draught power, availability of agriculture equipment and labour, to mention but a few factors. The communal farmers interviewed for this study have, on average, less than 6 acres of arable land for an average family size of 4.3 people compared to 12 acres in the resettlement areas with the same average family size. Only three out of the 35 respondents met did not own any cattle.

Three groups of farmers were interviewed during the study: dry land communal, dry land resettled, and dry land/irrigation resettled farmers. Slight differences in agricultural set-up and conditions were observed. Some of the differences pertain to the size of land owned, availability of grazing land, availability of water all year round and ecological set up. Different opportunities and constraints affect different farmers.

Farmers feel that they do not have much of a choice over biotechnologies given their poverty, growing food demand and dwindling supply. Although some of them express fear with the implications of gene transfers between animals and food plants or effects of genetically grown foodstuffs, such as chicken, beef or fruits, they hardly have a choice.

Site selection for implementation of the BTZ biotechnology projects was on the basis of differential endowments. The maize project, for instance, was implemented in a semi-arid portion of the district, and the sweet potato and mushroom projects were situated in an irrigation scheme. Both sweet potatoes and mushrooms require a steady supply of water, hence the irrigation schemes were found suitable. The livestock projects focus on those farmers with cattle whereas soya beans implementation does not have a particular criterion.

##### **4.1 Cropping pattern**

Both communal and resettled farmers practice a similar cropping pattern, particularly on dry land sites, with maize, ground nuts, *nyimo* (bambara nuts), *nyemba* and sweet potatoes being grown by all. Maize is the staple crop, groundnuts is a source of peanut butter and cash crop sold both to the Grain Marketing Board (GMB) and public market in Harare's Mbare township.

From time immemorial, the farmers used peanut oil for cooking and other medicinal and traditional uses and hence most farmers grow groundnuts. Crops such as *nyimo*, *nyemba*, *rapoko* and sweet

potatoes have no known cultivars and have been grown for years owing to their significance in the lives of the *Zezuru* Shona people of Wedza. Cropping is characterised by use of certified seed, particularly for maize, soya beans, tobacco, paprika and sorghum (*chibuku*).

Apart from using certified seed, some farmers continue to grow their traditional open-pollinated seeds alongside the certified ones. For example, farmers have high regard for Hickory King. However, for the other crops, most farmers use open-pollinated seed saved from previous harvests.

One irrigation scheme visited was growing crops, other than maize, on a trial basis. The farmers rotate maize, wheat, and vegetables. There were about two or three varieties of wheat grown by the farmers on a trial basis. The majority of the farmers could not remember which varieties they had grown and often mixed the names and advantages of each. Table 4.1 highlights some of the crops grown, the varieties, area planted and the known advantages of each.

**Table 4.1: Wedza Cropping Patterns**

<b>Crop</b>	<b>Area Planted in 1994</b>	<b>Area Planted in 1996</b>
Maize	12140	17099
Groundnut	4200	2100
Small grains*	-	1910
Finger millet	1500	-
Sunflower	800	2750
Pearl millet	700	-
Edible Beans	600	275
Sorghum	450	-
Bambara nut	-	250
Cotton	100	280
Sweet potato	-	200
Wheat	-	30
Soyabean	10	10

\*Finger millet, pearl millet and sorghum combined

**Source:** *Drijver-de Haas, 1995*

Maize has many varieties. This emanates from there being multiple seed producing companies in the country. Apart from the usual seed, farmers also try a number of other varieties. Most of the new varieties are introduced to the farmers by seed companies, which go through AREX (formerly Agritex) to introduce the seeds during extension meetings. There is substantial farmer-to-farmer seed introduction on the basis of the performance of the variety.

#### **4.2 Factors affecting productivity**

There is an array of factors, both negative and positive, affecting the level of production for the Wedza farmers. The problems cut across all farming groups. Some of the negative factors are:

- Poor soil fertility, sandy loam soils thus require a high dosage of fertilizer,
- The cost of inputs in the light of rural poverty,
- The low producer prices pegged by government and buyers,
- The effects of droughts and pests,

- Lack of infrastructural development, for example, roads to the market and small dams to enable all year round cultivation for the communal farmers.

To enhance agriculture and thus improve rural livelihoods, farmers felt that government should assist them by way of an expanded input scheme or alternatively regulation/control of the input prices. Discussions held with the respondents, and confirmed by a local AREX officer, revealed that lately the GMB input credit scheme had enabled many farmers to have inputs at low prices they could not afford otherwise. Even though the GMB advances farmers with seeds and chemicals, these are not adequate compared to the number of people in need. This prompts some farmers to resort to sowing uncertified seed, resulting in low yields.

The availability of government extension services was hailed as a boost to production levels of most farmers. Extension services, and the accompanying training on improved agricultural practices, for example early land preparation, the application of cattle manure, crop rotation, and the introduction of certified high breed seed improved production levels.

The farmers raised a concern that they, rather than the buyers, should be empowered to determine the prices of their produce. This really underscores the need for resource-poor farmers to have better information on market dynamics and pricing systems. There was a feeling that the new liberalised market economy was inherently unfair.

Poor farmers take a multi-pronged approach to dealing with the dilemmas of drought and other negative ecological conditions. The effects of droughts were felt most by dry land communal farmers who did not engage in compensatory crop irrigation. The farmers hope that construction of small dams for irrigation purposes can cushion them against recurrent droughts.

Owing to shortage of land, crop rotation is limited. Soils are generally infertile and prone to erosion. However, where crop rotation was practised, it involved maize, groundnut and sunflower/finger millet. Maize dominates crop production, takes up more than 50 percent of available land, and benefits from cattle manure and occasional fertilizer applied by no more than 50 percent of the households in the area. Sweet potato is also sometimes alternated with maize to avoid tuber miner infestation and enhance soil conservation (through maximum soil coverage and ridges).

The timing, frequency and mode of soil preparation, planting and weeding entirely depend on an individual farmer's financial situation. The availability of implements like ploughs and draft power determine ploughing, planting times and weeding. Farmers without farming implements either hire or provide the labour themselves, and such constraints usually mean they cannot use up all their land.

### **4.3 Perceived benefits of new technologies**

Acquisition of better farming practices is perceived as a pay-off for project membership by most respondents. The farmers made reference to their acquired knowledge of maize breeding as a positive outcome that will enable them to produce, manage, and store their own seed. Many farmers complained of the high cost of farm inputs. The knowledge of better farming practices, through biological nitrogen fixation and others, reduce the reliance on inorganic fertilizers while enhancing better yields. Some of the benefits were already accruing to the farmers whilst others needed a policy framework, for example, seed production.

Before the introduction of the BTZ projects in Wedza, there were seasonal fluctuations in terms of cash income and protein supply. The ability to produce own mushrooms at household level has reduced incidents of harvesting poisonous wild mushrooms. The biotechnology projects are also perceived to provide employment to both youths and rural adults.

In comparison with the old practices and technology, some farmers expressed satisfaction with the potential of new techniques and varieties for the following reasons:

- Better farming practices, resulting in better yields; land preparation, fertilizer application and soil testing,
- Improved crop management, big harvest on a small portion of land,
- The certified seed has a higher germination rate than the old ones,
- Improved and certified seed is high yielding, drought tolerant and resistant to pest and diseases.

However, it was not easy to measure and attribute one single factor to the success of the farmers who harvest higher yields. For example, one farmer who harvested 48 bags of maize has a “privileged” background compared to some of the community members. She has better access to resources, farm inputs, local AREX officer and development agencies that enter into the area. The farmer is a retired armchair teacher with a pension income, children with good jobs and she comes from a family with a successful farming reputation. The farmer’s participation in the biotechnology projects was guaranteed due to the fact that she was a known successful farmer and hence invited to participate as a local success example with the hope to motivate others.

An improvement of household income levels from yields is one of the prime benefits accruing to some of the project beneficiaries. The availability of irrigation facilities enables farmers in the irrigation schemes to engage in perennial cropping that in turn enhances their household income. During the study it was not easy to scientifically determine and assess enhanced household income in numerical terms. Nevertheless, accounts of improved lifestyles by the resource-poor farmers were

the basis and evidence for increased income from farming. The livelihood improvements were measured by the ability to send children to school, improve housing structures from grass thatch to iron or asbestos sheets roofing materials and purchase of new clothes, farm implements and other household items. The degree to which such benefits have accrued from biotechnologies per se, or from broader engagement with development initiatives remains, however, unclear.

#### **4.4 Biotechnology awareness**

While it was difficult to find vernacular equivalents of the phrase “biotechnology farming”, the study made reference to the projects to help the farmers recall if ever they had come across the phrase. Overall, community level of awareness can be classified as low for virtually all those farmers, except two, interviewed. Even though their technical know-how was lacking, the procedural knowledge, of growing mushrooms and sweet potatoes for example was high.

The first project members to join the Wedza BTZ programme managed to explain their limited understanding of biotechnology regardless of their limited education. For example, a farmer who sits on the BTZ projects committee joined the maize project with her Standard 6/Grade 7/Year 8 level education. Although the farmers could not define concepts or remember genetic terms, they were able to explain the processes, how biotechnology could deal with some of their farming constraints and identify those who had introduced it to them. Some of the farmers used the same communication examples and specific local materials that was used in the training and awareness sessions held with BTZ and other organisations.

At face value, the farmer’s presence on the BTZ projects committee is viewed positively and applauded by the rest of the farmers as involvement of poor communities in issues of decision-making, project design, implementation and evaluation by development agencies. The farmers viewed this could possibly stimulate active community participation and reasonably fair assessment of projects introduced into their community.

Through use of the discussed communication steps, local materials and concepts, the BTZ makes efforts to culturally digest a body of foreign ideas in order to meld knowledge into the cultural landscape of the users for compatibility with the Wedza farmers’ lifestyle. Box 4.1 gives an illustration of how modern agricultural biotechnology genetic processes were explained in simple every day life through use of basic and functional plant biology knowledge, work situation processes and thought structure process through imagery and local materials.

#### **Box 4.1: Modern agricultural biotechnology genetic processes and explanation**

The thought of cells as building blocks or bricks that make a house, and only the building blocks make a plant. Using the house and bricks image next to plant and cells, discussion on how the first cell divides many times to form small root and leaves and grows into an adult maize plant is carried out. Explanation of how every cell contains genes, coming from both the mother and father is given, with genes likened to factory machines, each of which has a separate task in production (for example making roots, leaves etc). All cells have all the machines (genes) but not every machine is working, some machines (genes) keep silent, depending with their use and job at hand (root or leaf making).

Using the example in box 4.1, concepts, abstract notions and scientific linguistic tools used were more accessible and provided a facility for effective usage because they are grounded in a language that provides a systemic grid for reality interpretation. The employed concepts and terminology was constructed within the local language. The use of local materials and examples that acknowledge local thought-structures and processes seemed to enhance implementation and acceptance of biotechnology by the Wedza community. This is despite the fact that the initiatives and scientific knowledge base of modern agricultural biotechnology is couched in a foreign language.

Much of the procedural knowledge acquired by the project participants came from extension training workshops with AREX and Project Officers of the implementing institutions (NGOs). A few public awareness campaigns were carried out at grassroots level to conscientise the Wedza community on biotechnology issues.

While the majority of farmers admitted ignorance of what biotechnology involved, they expressed satisfaction with their level of procedural knowledge. Apart from the project committee members who received training from BTZ and its implementing institutions, the majority received *in situ* training from fellow members or farmer-to-farmer training. The crop committees selected those who attended the BTZ training sessions. Where no crop committees existed, AREX identified farmers to attend training.

The BTZ farmer training workshops were held at local service centres and in the field and both English and Shona (vernacular) languages were used. Field-level farmers were taught through practice, for example, preparing mushroom substrate. This style of learning was appropriate with their local situation, setting and literacy level, according to the farmers.

Translation of biotechnology literature into vernacular language was cited as the first challenging step in resolving the language constraint in biotechnology training. Other constraints that hinder the farmers' dialogue with biotechnology are infrastructural, socio-economic situation (inadequate land, labour shortages, lack of draft power, poverty, and inputs) and climatic (erratic rains, poor soil). One interviewee noted that, in instances where a theme is conceptualised in a foreign language, problems

of translation were often encountered. For example, the Shona language (spoken by the majority of Zimbabweans and Wedza people) has no agreed translations for terms like gene, germplasm, GMO and others. Under such circumstances, both farmers and commentators fear that language could be an impediment in enhancing full understanding and appreciation of technical agricultural biotechnology issues by resource-poor farmers whose literacy is functionally basic. The translation of biotechnology literature and concepts into the vernacular is a practical constraint that could hamper biotechnology awareness.

However, given the generally low level of literacy among the Wedza smallholder farming community, the methods, materials and language of instruction are a huge challenge, hence the low level of awareness amongst some respondents. A key informant concurred that, where a technology or theme was conceptualised in a foreign language, translation problems were a potential hindrance.

Language provides the key with which the speaker unlocks the meaning and heritage of the particular culture within which the language is constructed, hence language is a total system with shared agreement on significance and meaning to a specific people. However, language can be translated or culturally transposed, but translation remains an approximation, as it never faithfully reproduces the realities originally conceived.

Awareness raising, information training and dissemination strategies being employed by the BTZ are generally yielding positive results. There are a number of reasons why biotechnology awareness is low. BTZ did not employ an information and communications officer at the time of the study and prior to that the position was filled for a short time. Discussions with the organisation revealed that the BTZ was aware of the strategic and central role an information officer could play, but they were faced with personnel challenges. The BTZ is a rather young organisation still growing and yet to establish the necessary programmatic positions. Although they employ their own field officer and work closely with local AREX officers, the BTZ was faced with huge constraints, namely time, too many demands, limited mobility and a rather politically difficult environment to operate in at the time.

The challenges facing the BTZ are common with other organisations, especially the pathfinder ones in any particular sector or field. In as much as the BTZ works and liaises with other players active in the biotechnology field, most of these largely public-mandate organisations (local government agents and university departments), are poorly supported and in some situations in need of the BTZ's material support. The BTZ is the first biotechnology NGO to work directly with resource-poor farmers in Zimbabwe and hence the demands facing the organisation are huge.

Faced with capacity building, information, material, education and awareness needs, the BTZ had to find ways to deal with the non-farming needs presented before them because only that way would it manage to focus on its ultimate objective. In short, the BTZ was expected to deal with the complex and diverse socio-economic and other constraints facing the farmers, but given its resources, timeframe and personnel limitations it could only do so much.

The relationship between communal farmers, the state and NGOs is such that communal farmers view the State and NGOs as providers of free credit support facility (in cash or kind) that should be accompanied with technical assistance and expert knowledge. Community perceptions and expectations of State handouts dates back to the period following Zimbabwe's independence. During this era, the State and or NGOs provided free and subsidized health, education, farm input packs, infrastructural and other services ("development") to communities. This practice created a sub-culture of donor/State dependency.

Since the adaptation of the Economic Structural Adjustment Programme in the 1990s, the State introduced cost recovery. Nevertheless, NGOs continue to support communities with handouts, especially in the aftermath of natural disasters such as droughts. This possibly explains the community perceptions of the State/NGO role as that of delivering "development", in whatever form, to the people. In the State/NGO-people relationship, communities were generally viewed by both the State and NGOs as constituencies/recipients of "development". The power dynamics between the State, NGOs and development beneficiaries invariably relegated communities to more passive recipients of aid. The benefactors become the powerful and key decision makers who dictate the type of development pace, terms and conditions development needs.

Despite being perceived as recipients of development, the Wedza farmers proved intimate local knowledge of their cropping systems and pattern, soils, climatic conditions, the social value of crops, the complex and diverse crop and non-crop constraints in their way to prosperity. The Coopibo baseline study (1994) discusses in detail the farmers' knowledge of their environment and conditions, and provided a basis for the BTZ projects. On the basis of a variety of other challenges raised by the farmers, the BTZ partnered with other stakeholders in a bid to address the challenges.

Although in general agreement on the need to secure sustainable livelihoods by mitigating droughts and achieving food security, slight differences emerged in the importance, emphasis and priority ranking of crops and constraints between the farmers. The youths (both male and female) and middle-aged male farmers emphasised cash crops, markets and infrastructural constraints as opposed to their female counterparts who prioritised food crops and family consumption needs then cash crops. The older farmers (60+ years) bemoaned the disappearance of small grain crops (millet,

sorghum) from the community's diet and considered food security as the cornerstone of any society's development.

## **5 Participation and its Challenges: Experiences from Wedza**

The concept of participation is popular with donors and development agencies for three basic reasons. First, participation is one of the successfully tried and tested people-led development paradigms used in rural development. In short, it is a development dogma subscribed to by many for a variety of reasons. Second, participation is one of the easiest philosophies to subscribe to without necessarily proving its successful application. Finally, development agencies or anyone for that matter, are not always obliged to prove the success of participation in their projects. As a result anyone can claim it, whenever they choose to without the burden of having to prove so.

To understand how people participate in any given development activity requires a closer examination of how would-be participants are constructed in the discourse of participation and how they construct their own engagement and space.

### **5.1 Ownership and partnership**

In the case of Wedza, there was little sense of farmer ownership of the biotechnology projects. The majority of farmers professed they did not know why the projects were introduced although they claimed that AREX had introduced the projects. Some of the farmers, especially where the maize projects were implemented, did not clearly understand what was happening and neither did they appreciate joining the biotechnology projects at some future date. Other farmers were of the mistaken belief that the biotechnology projects were part of a broad government rural development plan meant to improve their livelihoods.

Social relations with individuals seemed to be more important than the institutions. Most farmers do not recall the names of implementing organisations or the word 'BTZ', but recall well the lead persons of the very same projects: for example, a particular university professor who was involved in soya bean projects was continually referred to as the "owner" of the project. The names of organisations behind the persons were not that important to the farmers.

To a large extent, both NGOs and private sector interventions are seen as being in pursuit of their own interests, rather than responding to farmers' needs. A respondent farmer in one maize project indicated that some specific organisations were trying a number of new maize varieties to test their response to Wedza's ecological conditions. Although not part of the BTZ team, Cargill/Monsanto have a presence in Wedza area where seed varieties and agro-chemical promotions are underway. In light of this, one farmer commented that often projects were part of a broad marketing strategy

employed by various developmental organisations and multinational companies like Monsanto to penetrate potential markets.

There are groups of farmers who decided not to engage the biotechnology projects, notwithstanding the initial shortcomings discussed above. Motivations for engagements revolve primarily around perceived benefits. Some farmers in one irrigation scheme do not fully understand why the projects were introduced in their village and others believe it is one way of enhancing their incomes in the same manner the irrigation project was introduced by government.

The study revealed that some farmers in one resettlement village had originally been left out by the initial BTZ projects, and they requested, through their AREX officer, to have the projects implemented in their village. Signs of enthusiasm in adopting new farming technologies and practices in one particular group were comparatively high. The farmers who joined maize trials claimed that project membership was not entirely a personal choice, but based on AREX's selection of so-called local "prominent" farmers.

The duration of membership in the various projects varied from between six months to about three years. The maize project is the oldest of them all. The farmers advanced various reasons for eventually joining the projects, irrespective of whether or not they were invited to, and these revolved around;

- Curiosity,
- Training received and the media promotions on the potential benefits,
- Enhancement of household income and agricultural knowledge base,
- The desire to be engaged throughout the year/employment creation,
- Appreciation of the projects after seeing them at a neighbouring village, and
- The free handouts, namely; fertilizer and the seeds (a sweet potato farmer).

## **5.2 Project Management**

Crop project committees based in the local communities run the BTZ-initiated projects. At village level, a group of participating farmers select a steering committee to lead activities. The project leadership comprises a mixed range of people, each of whom was selected according to desired skills. For example, youths (in or out of school) were selected to some committee structures to provide desired services such as secretarial skills for maintaining of books of accounts, writing of minutes and other documents. The adult project committee members were selected on the basis of other factors such as social status in the community, farming record and position (village head, local councillor or local ruling political party structures). Successful local farmers were also committee members in most

cases and the majority of these were women whose husbands were either employed outside Wedza or were not known good farmers.

The composition of project committees vary between projects and areas. The committees are responsible for handling books of the project, and representing the groups at meetings or exchange visits, particularly when the meetings are held outside Wedza area. Interactions between various project committees are largely informal, informational and project-based. Other local structures and groups minimally interact with the project committees.

The obtaining political environment portrayed most local authority structures as sympathetic to the ruling political party, which effectively vets all activities on the basis of perceived political affiliation of benefactors. Alternatively local ruling party representatives influenced decisions or hi-jacked development efforts to benefit their political supporters. In the case of Wedza, there were no proven political influences, although some community members claimed such cases.

In Zimbabwe it is standard practice that local government structures vet all external development interventions for approval and subsequent implementation. In as much as development efforts need to be coordinated and streamlined in accordance with local priorities and needs, unscrupulous officers have often used the vetting requirement for political gain. Invariably, village, ward or district level officials with allegiance to the ruling party represent development project structures in most rural areas. In Wedza, like most rural areas of Zimbabwe at the time of the study, known political opposition members were hunted down or driven out of the area and not “allowed” to participate or benefit from development projects.

The BTZ project activities and field officer were expected, by local ruling party leadership, to conduct themselves in a way that did not suggest disloyalty to the political order. In carrying out this study, the researchers were subjected to “vetting” and interrogation by supporters of the ruling party and asked to produce ruling party membership cards to prove they did not work for political opposition. A BTZ programme officer coordinates activities of the various projects in conjunction with the various officers or researchers from the different implementing institutions. The researchers and BTZ programme officer work closely with personnel from the department of AREX, which is readily available on the ground to advise communal farmers.

The local power dynamics obtaining in Wedza favour the comparatively well off, perceived as successful cases with influence and the skills to drive projects to success. Invariably most of these are subsequently connected politically or reputable farmers whose presence and experience are valued and held in high esteem by the general community. In any case, the materially poor and unsuccessful

farmers were largely regarded as “lazy” and with “nothing to contribute” to the successful outcome of the community projects.

Project members are expected to contribute financially towards the local AREX officer’s travel costs. Usually the AREX officer travels by motorbike and receives a minimal fuel allocation for limited extension and training services across the whole district from local government. Where BTZ projects need the AREX officer’s help, outside the scheduled visits, project members meet the costs of travel over and above other project running costs, such as spawn purchase in the case of mushroom growers. In cases where community members are too poor to afford such financial contributions, most of them stay away from the projects for these reasons.

The general community has no specific role except for those who are on the project and are responsible for providing labour. Project committees draw up duty rosters for the smooth running of the projects. The project set-up functions well in one resettlement village that lobbied for the projects to be initiated in their area.

### ***5.3 Communication challenges***

The participation of resource-poor farmers in biotechnology is, however, hampered by communication challenges to an extent. Communication is a necessary and powerful tool to engage in any subject matter. The delivery of knowledge or information flow makes assumptions that militate against effective communication for informed choice and decision.

Communication is a two-way flow of information with potential to empower those receiving it to effect change. To this end, communication is an integral part of any development initiative and determines the level and form of participation from such undertakings. Communication techniques are varied and determined by the social status, cultural norms and values and economic appropriateness, requirements and circumstances of the receiving audience. Resource availability, flexibility and type of audience determine appropriate communication strategies of any development undertaking (ITDG 2000).

Prah (1995: 20) argues that technologies that originate from outside need to be appropriated by the target group into their indigenous knowledge base, melt into their everyday language, world, experience and understanding. Such technology should become part of local creation if its adoptional success and adaptational effectiveness is to be guaranteed. If modern technology is to reach the grassroots, it must not subvert the cultural order of the receiving community. Rather it should integrate into the locals’ indigenous systems and become wholly part of their local culture.

In a bid to integrate modern biotechnology knowledge into the thought and action process of the Wedza people, the BTZ deployed different communication methodologies. Through use of baseline survey data compiled by earlier studies (Coopibo 1994; ITDG 2000), and frameworks, namely the sustainable livelihoods framework, the BTZ employs a series of communication steps in its work with resource-poor farmers. For example, in carrying out fieldwork, the BTZ employed a six-step methodology outlined below:

**Step 1:** Group discussions on farming systems, and looking at crop production opportunities and constraints were held and biotechnology projects introduced.

**Step 2:** Information on transgenic crops (*Bt*-maize) technology was shared with one group of farmers, while another group shared information on non-modern agricultural biotechnology such as Integrated Pest Management (IPM) and Integrated Production and Pest Management (IPPM). Through use of local materials that did not require profound biology knowledge, explanations of genes and modern agricultural biotechnologies were given in simpler illustrations and examples. Prior to sharing information, participants were asked to give their knowledge on and associations with the technologies.

**Step 3:** Farmers' responses, questions and clarifications about the technologies were discussed.

**Step 4:** An assessment of the technologies (*Bt*-maize, IPM and IPPM) was carried out using the sustainable livelihoods framework. Based on information from step 2 and earlier scoping studies, farmers formulated questions on the financial, dietary and health, physical and social aspects of the technologies and discussed their presentations in smaller groups.

**Step 5:** Farmers discussed overall assessment of all their discussions and summarised possible impacts of the various technologies on their daily livelihoods using the sustainable livelihoods framework. Conclusions and mitigatory measures were evaluated in a subsequent group discussion.

**Step 6:** Feedback on the communication package and process. Materials, methods and group processes were evaluated at this stage to identify areas for improvement.

A collection of various methods, procedures and steps accumulated from other studies and development agencies were used to explain concepts of cell, gene, genetically-modified organism and genetic engineering, for which there are no known and agreed direct translations in the vernacular. These were further explained through the use of local materials and in relation to human life biological processes. To cite an example, two maize plants (with tassel and ears) and maize seed with

comparative pictures of a woman, man and child were used to explain how a maize plant starts life as a single cell after an egg has been fertilised by the sperm (pollen from the tassel).

The experiences of the Wedza community demonstrate the challenges of meaning, belief, assumptions and practice embedded in the notion and practice of participation. Without a shared and agreed meaning of participation between the BTZ and other stakeholders, it proved exceedingly difficult (and somewhat unfair) to embark on a study of this nature. To assess and measure the level of participation in biotechnology projects and eventually trace the participation of farmers into the biotechnology policy formulation influence processes was not an easy task. However, the beneficiary population views participation as relatively minimal, particularly with regards to exercising their choice for engagement in the pilot project activities.

The community members who were not engaged in the projects alleged that local AREX officers pre-determined who was to get involved, based on an unshared definition of a successful farmer. In other words, the selection process was deemed unfair and not participatory from the very onset according to them. Other community members preferred an open process whereby the projects should have been openly discussed, and processes and procedures of selection negotiated and agreed. However, for those engaged in the projects, it is generally agreed that project management decisions are jointly and openly taken and hence participation from that perspective is reasonably satisfactory.

For the aspects of participation the study sought to measure, there were no identified linkages and strategies to make direct and formal biotechnology policy links; and processes outcomes. Whatever outcomes and processes emerging from the field are captured through the BTZ structures and programmes. For example the BTZ's field officer, and BTZ interactions with AREX and the ZFU feed into the formal biotechnology policy process through the Biotechnology Association of Zimbabwe (BAZ housed at the BTZ Secretariat offices) public awareness debates and biotechnology meetings that take place in Harare.

#### ***5.4 Local perceptions and politics***

Project management practices and inter-relationships between the various project and other local structures in Wedza reveal varied perceptions, attitudes and participation of farmers, both members and non-members of the projects. By and large, most project members are excited and hopeful for successful farming, food security and prosperous lives in the fullness of time. In this category are comparatively successful farmers (largely female) who believe that with more access to land and material support (from government, donors and other development agencies like the BTZ), they could farm successfully.

There are non-project members who, although unsure of any material changes and biotechnology benefits accruing to present project members, remain curious to participate in the projects just in case they miss out on potential benefits in future. Given changes in their material and labour challenges, some of the non-project members express willingness to join the project activities just in case huge successes may result in future and a desire to be viewed as “good” and cooperative community members.

However, some of the farmers who are sceptical of the projects and cite political purging, intolerance and interference, domination and control of development initiatives by individuals who occupy influential positions in VIDCO, WADCO and other local structures. The selection of would-be project members by an AREX officer is a contentious issue for those not selected and hence feel they are deemed less hardworking, unsuccessful and not belonging. Open criticism of authority structures, especially those supported or approved by government and ruling party locals is tantamount to opposition and hence is cautiously aired.

Shepherd (1998) contends that often projects are used by nascent political parties to consolidate the rural vote, often at the expense of the poor, women and children. According to some respondents, the mere fact that the BTZ projects are allowed to operate and recruit community membership means that the projects are “approved” by traditional and local government authorities (often partisan at time of study). This leads some pessimistic community members, often non project members, to believe and suspect that the projects are sanctioned by the ruling political party and government hence the projects are not supposed to be criticised. In other words, the BTZ and AREX represent government development interests that are supposed to be legitimate and politically approved, otherwise they would not be allowed to operate.

Misinformation, suspicion and risk aversion and manipulation by some community members for individual gain seem to fuel negative perception and attitudes in the Wedza community. Although these sentiments are not publicly aired, the majority of those who are negative are generally youths and male non-project members. Arguably, the dominant youth and male criticism towards the projects represents gendered resistance to projects perceived to be driven and dominated by women members (majority project members and farmers), an unsurprising dynamic in a patriarchal society.

### ***5.5 Challenges for participation***

Sustained and collective project participation can only be achieved when beneficiaries perceive the opportunity cost of their participation to offset the returns brought about by the project. This study reveals that, irrespective of their social and economic status, the Wedza resource-poor farmers are

rational people who seek benefits that are greater than the cost of their participation. Nelson and Wrights (1997: 193) call this the rational free choice model.<sup>1</sup>

This argument could explain why the very poor community members who do not “afford” the financial contributions for project running costs did not join the projects. At the same time, the BTZ projects are still in a trial phase and evolving, there is no solid biotechnology evidence to resolve the farming challenges raised by the farmers. Without such evidence the farmers may be exercising caution by playing the waiting game and not investing whatever income and assets they have into the technology and projects whose returns are not guaranteed.

However, market forces are not the only determinant factor. Unequal power relations and differential economic and social status shape the way in which communities respond to and get involved in development projects. For example, it could be argued that sociality is an innate human characteristic whose social and cultural forces can induce participation.

A political explanation for little or non-participation in Wedza could be that participation of all or some of the beneficiaries may not be in the political interests of some community members, notably the ruling party local structures which were bent on ridding the district of perceived political opposition. It could also be argued that participation is ineffective or lacking because the process is more frustrating than it is advantageous for the powerless (the poor, landless, and unsuccessful farmers). The existence of high status and powerful local elites (materially well-off, political, traditional and master-farmers leadership) on the projects and committees may be rendering participation channels ineffective for other community members, especially the unsuccessful farmers and those sympathetic to political opposition.

Another factor that also seems to hinder participation in Wedza is the paradoxical approach of donors and development agents. Popular participation models stress the importance of empowerment, which entails sharing power and raising political awareness and strength for marginalized people. Many development organisations, BTZ included, have difficulties using such an approach as an explicit project objective because their product/service nature does not entail political space and power to share.

The degree of participation is also determined by the nature of product and desired output. The nature of agricultural biotechnology development primarily benefits the community via individual farmers. This could affect the community's desire to participate. However, the delivery of

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<sup>1</sup> Ignoring social relations and norms, the model assumes that people will only choose cooperative action when it is inefficient to be non-cooperative. This view assumes that, if agents keep to agreed assignment of actions, the individual pay-offs will be greater than if they do not cooperate.

biotechnology development to communal farmers could lead the development of common interests among the farmers. Owing to land constraints and unavailability, exchanges and trials are done and explained on individual farmers' plots. Successful individual farm trials are often used as demonstration or field day sites.

Lastly, professionalism seems a real challenge that could also be hindering effective participation. The professionals "employed" in the biotechnology projects are largely AREX and BTZ officers, and other partner staff who occasionally go to the field. According to some community members, the AREX officers, together with the BTZ and others, involved in the role of identifying beneficiaries' needs. Although these professionals mostly consult and involve communities, technical government staff tends to operate a top-down approach when working with communities on farming extension and training services.

There seems to exist a technical knowledge gap between the AREX officers/BTZ field officer (professionals) and beneficiaries. A problem arose when the professionals presumably determined the line between what the communities wanted and need to know and what they did and should not. The sticky issue for the community members is the alleged selection, by an AREX officer, of members to participate in the projects. Whilst some members feel strongly about this issue, others are indifferent and literally handed over their "participation rights" to the professionals. On the surface, this development seems unfortunate but, on further investigation, it reveals that the community members who gave their "participation rights" up believe they save themselves time, energy and conflict that way.

One farmer is a projects committee member of the BTZ projects. Her association and involvement with an earlier study (1994 Coopibo) to which she participated in the baseline surveys and meetings puts her ahead of her community peers. As a result, her situation, awareness, appreciation and level of participation are significantly different from that of the majority of community members. This particular farmer is socially regarded highly and accorded influence in the community by her peers. Nevertheless, the community values their representation on the BTZ projects committee through the farmer, although a few query how the farmer could sway the BTZ's position and policy outcome in resource-poor farmers' favour when such a need arises.

The politics of consensus in participation is central to development, as it involves people in the process by which policies are developed, listening to what people have to say and adapting development approach and projects in the light of these changes. By so doing, development agencies win the consent of development beneficiaries and, with that consent a conviction in the rightness of the course being pursued and a commitment to see this through successfully.

Most respondents view the inclusion of their peer on the BTZ projects committee as a positive development. Although it was not easy to assess the farmer's strategic role and pro-poor farmers' stance on the BTZ committee, there were sentiments that her presence demonstrates transparency, goodwill and a willingness to engage with poor communities by the BTZ. The resource-poor farmers believe that their appreciation of biotechnology developments, concerns and related policy developments could partly be addressed by their peer's close participation in BTZ and subsequent public forums on biotechnology policy debates.

Some of the farmers suggested use of political party structures and local government structures, often politically-biased, namely the Village Development Committee [VIDCO], Ward Development Committee [WADCO] and the District Development Committee [DDC] as alternatives to channel their participation for agricultural biotechnology policy formulation. This suggestion seems to reflect a heavily politicised rural population. While the majority of farmers were not sure of ways to strengthen their voices, those in support of political party structures' involvement felt that political party membership and attending public biotechnology awareness meetings were effective ways of strengthening their representation. One possible explanation for this suggestion is that local structures (WADCO, VIDCO and DDC) are heavily politicised and used by political functionaries to interact and influence the rural masses. It is through these channels that issues are communicated and development projects vetted.

Participation is thus an ambiguous and unpredictable process. Particular spaces for participation are facilitated or produced by the powerful and discursively bounded to permit limited influence and stifle dissent. Equally, space may be created with one vision and purpose, but maybe used up by those with a totally different agenda. The political settings of participation require an exploration of why and who opens and fills up given spaces. For example, there were questionable issues about the suggested structures pointed out by the respondents. AREX and ZFU are public organisations faced with material resource constraints and hence are not currently performing to full capacity in their public mandate and roles; to expect them to deliver on additional roles may not be quite realistic.

The ZFU is a membership-based organisation that does not represent non-member farmers. At the same time, ZFU has not really taken a functionally meaningful and leading role in the biotechnology debate, in a way that informs and builds capacity of its membership (smallholder farmers) on the existence of biotechnology, its pros and cons and other related issues. This is despite the fact that ZFU is represented on the BTZ board.

Shepherd (1998) argues that the propagandist approach and use of participation models and its emphasis on community is a hangover from colonialism, which relied on hand-picked community leaders to keep discipline and ensure implementation of colonial laws. This approach served colonial governments well because they were unwilling to incur the expenses of delving beneath the level of community leaders in interacting with rural people. Parallels into this analysis could be argued to be evident in Wedza today. Despite the contradictions and paradoxes, it is generally accepted that participation helps to assure tranquillity, enhance the efficiency and effectiveness of planned development interventions and shore up the moral and political legitimacy of those who use it or claim to.

Cornwall (2002: 49) argues that the opening up of political space for direct public involvement is premised on the belief that doing so would result in more acceptable and better government, decisions and citizens. Over time, the move away from “expert-driven” processes towards participatory alternatives has given rise to new forms of interactions and institutions. Subsequently, new configurations of citizen power and boundaries should be created. The degree to which such an ideal has been realised in Wedza is, however questionable.

## **6 Biotechnology and Policy: Emerging Issues from the Local Level**

The advent of modern agricultural biotechnology is viewed as a double-edged sword in Wedza. Whilst the technology might be necessary and appears to potentially solve the agricultural production problems, its long- term effects are largely unknown, and, if misused, is feared to have adverse effects.

In the smallholder sector, the problems of poor livestock performance that lead to poor carcass grades, low milk production and marketing problems that all eventually lead to low incomes and ultimately poor family welfare are expected to be addressed by modern biotechnology. Poor livestock production is closely linked to crop production, as most farmers rely on draft power.

The cost of inputs for crop and livestock production is rising and makes it difficult for the farmers to access the inputs and subsequently realise good profits from the marketed produce. Whether biotechnology can bridge the gap for resource-poor farmers in Zimbabwe remains to be proved beyond reasonable doubt. Preliminary findings of this study suggest that the technologies currently available will not immediately bridge the gap and deal with the specific socio-economic challenges associated with farming. However, the potential is high. No technology works in isolation and studies

have demonstrated that improved varieties and better farming practice complement the achievement of good yields.

If indeed biotechnology empirically proved that it could reduce resource-poor farmers' production costs, farmers would opt for it without any hesitation. In other words, there is need for a demonstrable cost-benefit analysis that takes into account the particular context, conditions and circumstances (poverty, cost of inputs, agro-ecological issues and livelihood) of smallholder farmers and proves the tangible and practical benefits of different biotechnologies. For example, if genetically engineered products were aimed at meeting the growing challenge of feeding the hungry, the companies behind seed development should be expected to ensure that the seeds grow on marginal soils, where the majority of farmers live, and produce more high quality yields per unit without increasing the cost of inputs. In particular, the farmers expect the seed to be affordable to them without restrictive licensing requirements. To date this has not occurred, and farmers in Wedza remain understandably sceptical of such grand claims.

The lack of evidence of the characteristics suited to local conditions therefore serves to fuel scepticism. Put simply, the smallholder farmer would not see any value in biotechnology if it does not provide higher yields on poorer soils, with less water and cheaper inputs. The terminator technology, for example, that does not allow use of old seed for replanting in a context where smallholder farmers rely on seed from previous harvests is cause for worry for resource-poor farmers in Wedza.

New technologies or practices that result in the disappearance of indigenous knowledge and varieties that are consistent with the resource base of smallholder farmers are not favoured. The fear of a major overhaul change in farming and livelihoods can be understood, especially given that the farmers would have to undo cumulative learning, loyalty and reliance on old varieties acquired over many generations and throw all that away in favour of new varieties they have no experience with. Once the traditional systems and varieties are lost, they are unlikely to be recovered and the prospects of such a future are cause for weary, like any drastic change process.

The strong presence of central government in Zimbabwe's communal people is reflected by the Wedza community's reference to central government as having the legitimate function, expertise and "right" to act on their behalf. This research argues that farmers' effective involvement in policy debate and influence are severely limited by the following factors;:

- A weak process of generating biotechnology information,
- Where information is available, it is not easily accessible to the various stakeholders, especially smallholder farmers,

- Lack of robust information feedback processes from end users to policy technocrats,
- With lack of local empirical evidence on biotechnology, it is difficult to document and package readily available information, and
- Lack of adequate information in the appropriate language makes it difficult to prioritise needs and influence policy.

With specific reference to Wedza, there appears to be mixed and inconsistent issues emerging. Depending on level of awareness and involvement in the current project activities of the area, responses varied. For example, whilst some respondents confessed to not having a clue of any biotech-related activities (in modern or traditional form), some of the respondents were reasonably aware of developments.

Regarding their effective involvement in the biotechnology debate and policy formulation process, some farmers perceived engaging AREX officers as one channel to have their agricultural concerns represented to government. Even though the ZFU, a communal farmers' organisation, has structures in Wedza, none of the farmers interviewed mentioned it as a possible channel to participate in biotechnology policy formulation. It could be well known and evident to the farmers that the ZFU is removed from central biotechnology issues and evidently struggling to cope with current demands and responsibilities.

Whilst some farmers saw their role in the policy formulation process through public debates and general awareness-raising campaigns, logistical, informational and structured practical mechanisms for doing so were identified as constraints. Some of the respondents thought their views and perspectives could be captured through AREX and the ruling political party structures. This is because the farmers are far removed from the usually urban-based public debates and policy consultative processes and, given the local presence of the suggested structures, the farmers felt their views could be better captured that way. The same respondents also pointed out that, with access to objective information and preferably in the vernacular, they could make meaningful submissions to the biotechnology debate.

Although public-mandate organisations like the ZFU and other such support structures have served communal people well in the past, today they are faced with huge resource and personnel challenges that militate against fulfilling their mandate and role. This could possibly explain why the farmers do not view the ZFU as playing a role in biotechnology education dissemination, awareness raising and policy formulation input.

The BTZ efforts to widen participation by inclusion of ZFU and a communal farmer on its committees raise efficacy questions regarding the assumptions of the representative participation approach. Issues that arise include settings and context of policy-making; effective representation system; dynamics, obligations and rights; and awareness on the part of the represented. The dynamics of policymaking, in a largely inaccessible and urban setting, on communal farming issues and for communal-based smallholder farmers seem to render representative participation ineffective. There is a strong rural-urban divide at play, and, given the infrastructural and literacy challenges obtaining in most communal areas, it is not easy to overcome the policymaking and participation challenges between urban and rural-based people and activities.

Some of the AREX officers were observed to be “moonlighting” for some of the development organisations working in Wedza. The impartiality and objective assessment of biotechnology by such officers thus becomes questionable. Whilst the AREX and ZFU officers are well-acquainted with the local farmers’ situation, conditions and issues, their deployment to disseminate and facilitate biotechnology is hampered by training gaps, the need for appropriate communication aids, poor material support from their respective line organisations/departments. Given these limitations who then is best located to serve communal farmers’ biotechnology interests among other needs?

The key emerging perceptions on modern agricultural biotechnologies policy issues among the farmers are best summed up as follows:

- While the policy process may be shaping up, there are few people involved and hence the emerging policy may serve the interests of the few, at the expense of the generality of poor farmers who are not being effectively consulted. Selective benefiting of powerful individuals and companies/organisations from the final policy output cannot be ruled out.
- Although the farmers are not aware of any biotechnology policy, especially that protecting their interests as a vulnerable group from possible danger or rip offs, they nevertheless are concerned about the need for such policy in the country.
- Concern about the “rumoured” Seed Company patents that would not allow them to use saved seeds from previous harvests. Given their poverty situation and related socio-economic complexities, the farmers’ fear being pushed out of farming altogether by seed protection laws (terminator technology).
- It is the government’s responsibility to ensure that policy outcomes protect and serve the public at large, including communal farmers.
- The need to adequately build the capacity of AREX and ZFU to service the needs of communal farmers in the biotechnology era.

The evident lack of a structured and viable mechanism to involve resource-poor farmers in biotechnology debates and the subsequent policy-making framework could lead to a situation where scientists and technocrats would decide for them. Such has been the norm and practice of past policy decisions. The smallholder farmers have a role to play, given their dependence on agriculture, in the biotechnology debate and policy-making process. Although there can never be adequate participation of people in development processes, striving to achieve the best should be an ideal every development agency aspires for.

Although a legal framework for biotechnology policy is slowly taking shape in Zimbabwe (Mohamed-Katerere and Saruchera, 2001; Keeley and Scoones 2003a,b), none of the interviewed farmers were aware of the policy development process and therefore not surprising that some of the farmers had not been involved in biotechnology debates. The participation of the resource-poor farmers in the general biotechnology national debates remains minimal. Most respondent farmers share the view that policy-making is a function of central government and therefore they do not see their role in the process of biotechnology policy formulation through public debates. There are reasons for this position that could explain the low participation. This raises the issue of marginalisation of weaker and powerless people from policy-making and other national key decision processes.

There have not been any significant policy-related consultations with the farmers for purposes of biotechnology policy formulation in the country before. The only time the farmers remembered being involved in any meaningful policy-related consultation was during the 1999 constitutional consultative process that looked at issues not directly concerned with biotechnology and agriculture. Having contributed to the constitutional reform process, it is not clear why the farmers continue to imagine and expect that policy-making is an exclusive role of central government alone. The country's political history, where the general masses were disenfranchised from governing, by not making demands or questioning government's policy decisions over the years, might be an explanation for this perception. The Zimbabwean civil society, and especially the rural folk, hardly lobbies and challenges government on key policy decisions or make a meaningful contribution to such processes. They have been more political subjects than active citizens. However, this civil society and policy making scenario in Zimbabwe is situation changing fast.

## **7 Conclusions**

Notwithstanding the highlighted challenges, the BTZ is facilitating the implementation of potentially popular projects that could enhance the average farmer's life in Wedza, although a lot needs to be done to take the biotechnology debate to the rural areas. Investigations into mechanisms that incorporate both urban and rural people's views, make available relevant and new information as well

as engaging qualified personnel and accessing financial resources are some of the envisaged ways that could improve the biotechnology debate.

Every change process creates opportunities and constraints that may both entice or hinder the intended beneficiaries from participating or reaping benefits immediately or in the future. The following summarises some of the opportunities and constraints encountered by the farmers:

***Opportunities:***

- Recurrent droughts,
- High cost of seed and other agricultural inputs,
- Use of available local and cheap materials in biotechnology projects,
- Possibility of improving local varieties,
- Depletion of natural resources, and
- Low costs but high returns

***Constraints:***

- Lack of timely and appropriately packaged information,
- Fear of the unknown (aversion to risk) from potential risks of biotechnology and total disappearance of indigenous knowledge and crop varieties,
- Growing poverty that feeds the vicious circle,
- Lack of adequate land, labour and draught power, and
- Fragility of technology, for example spawn requires refrigeration,

Overall, project management of the BTZ biotechnology activities is working reasonably well and those actively engaged are generally satisfied and hopeful. The excitement of trying out new methods and crop varieties seems to be a strong motivation for those whose hopes for a better livelihood remain centred on farming. The farmers already reaping good crop yields are excited to share their experiences with fellow community members and development agencies. However, there are diverse and interconnected factors, particularly complex socio-economic ones, that impede the extension of farming technology.

Experienced and public-mandate support organisations for communal farmers, like the ZFU, are faced with operational challenges to bring the often forgotten rural poor into the policy fold. What chances exist for people whose livelihoods are dependent on farming to be meaningfully engaged and influence agricultural biotechnology policy?

There are many reasons why participation fails in development activities. Lack of a shared and deeper understanding of participation is one major reason. The concept is seemingly an easy one that anyone and everyone can make claims to ascribe to it without necessarily proving or measuring its extent. Gathering of stakeholders and “consultations” can be misconstrued as participation, or the term can be seen as an end in itself. These are some of the impediments encountered in operationalizing participation. Participation involves building blocks at the right time in a methodical manner, but following it in a rigid way may lead to prescriptive formulas.

Like most rural development initiatives, thinking about participation of ordinary people has remained at an idealistic and ideological level and lacks creative analytical tools, indicators and practical methods. For this reason, participation has degenerated into propaganda to convince audiences that development agencies and government recognise the necessity to involve people in project activities.

This study alludes to the problematic conceptualisation and implementation of the notion of participation. The lack of agreed benchmarks and the difficulty encountered in proving its existence or lack of it makes participation not so easy to measure. There is need to develop and apply indicators of how participation should happen, what its effects should be on participants and the wider society. Participation can be either system-maintaining or system-transforming, and this should be very clear from the onset of development projects.

One difficult challenge of development work is to remain relevant to current times and future needs, whilst at the same time resolving current challenges in a robust and policy amenable manner. The biotechnology debate in Zimbabwe is of course bigger than the BTZ and hence there is need for other players to systematically engage rural farmers in a well-coordinated and complementary manner that allows informed decision-making and choices. The role of civil society in policy development matters and other crucial governance issues is pertinent. There is need for relevant and viable structures and organisations to stir up the process of rural development in a meaningful way that unlocks the huge potential of communal lands, resources and masses to support life.

Science and technology have become an important yardstick for measuring the level of development yet development should take into consideration the socio-cultural context of beneficiaries. Often adoption of innovative technologies is undertaken without sufficient recognition of the need for the adaptation process to relate meaningfully with local practices, usage, language and people. The process of generating technical knowledge should be seen as a process which empowers people, giving them a voice in society and a window to the wider world. Without incorporating indigenous knowledge systems, culture and language, science technology remains transfixed outside the people's sphere of existence, and cannot be understood or sustained.

When development interventionists and researchers talk about a better life for the down-trodden people, these people are presented as an abstract and homogenous entity whose needs are similar. This just does not work because these people have different needs that require solutions. Blanket recommendations for the Wedza farmers will not work, given the different, complex climatic variability and diverse socio-economic conditions obtaining in the district. The introduction of technology alone does not ignite significant improvements to the living conditions of resource-poor farmers, if other constraints are not addressed. A more integrated, holistic approach to understanding the range of livelihood and farming options is required before technology choices can be made.

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