12 THE OWNERSHIP AND MANAGEMENT OF PRODUCTIVE WATER POINT GARDENS IN A TIME OF DROUGHT, ZIMBABWE

Brian Mathew

Consultant, London, UK (bgfmathew@hotmail.com)

12.1 Introduction

This paper presents practical experiences and new research into the provision and use of household water supplies from communal and family owned productive water point (PWP) gardens, in Bikita district, Zimbabwe.

Traditionally the people of the district are subsistence farmers who rely on rain fed agriculture and livestock. Where shallow ground water is available, households have dug wells to supply their domestic requirements, water cattle and other livestock, and to irrigate small family held garden plots.

Recognising the importance of productive water, the DFID funded Bikita Integrated Rural Water Supply and Sanitation Project and promoted PWP (PWP) gardens, as a pilot project to diversify livelihood strategies and move away from valuing water solely for domestic purposes. A high yielding water point is considered productive when it has the capacity to deliver more water than is needed for the domestic uses of the community it serves. Thirty three communities, who were managing their high yielding water points effectively and had suitable land available, were offered the opportunity to establish irrigated community gardens. The project also supported a significant number of households to upgrade their family wells, many of which were also used to water vegetable gardens.

Bikita district covers an area of approximately 10,000 km², and has a population of around 200,000 people. Eighty-one%of the district is classified as belonging to the poorer natural regions (4 & 5) with mean annual rainfall ranging from 400mm to 700mm. The 2001/2002 rainy season was extremely poor for agriculture with early rains, which allowed seed to germinate, followed by a prolonged period of drought, which then withered the seedlings. When the rains did come they were too late and of insufficient duration to sustain another crop. The result was a total crop failure across the district and much of the country. The rain was, however, sufficient for wild grasses to grow and this has helped to maintain the cattle stocks of the area, unlike the drought of 1991/92 when even the grass died off. The problems brought by the drought have been exacerbated by the political and economic crisis, which because of high inflation has made the purchase of basic necessities including grain increasingly expensive, while at the same time depleting the real value of savings where these have been held.

12.1.1 Historical, cultural and economic perspective

Bikita district is an area of largely communal farming, with some small scale farming areas. The people are predominantly Karanga Shona speakers and fall traditionally under the administration of five chiefs, the smallest traditional administrative unit being the Sabuku or Krall. The district's modern administrative structure consists of a Rural District Council (RDC) made up of elected councillors, representing thirty wards. The wards are subdivided into between five and seven village development committee areas (VIDCOs). In the last two years there has been an attempt to merge the base Sabuku and VIDCO structures into new village assemblies. Agriculture in the communal farming areas is predominantly subsistence rain fed maize and millet farming with small household vegetable plots. Wealthier families also commonly own a few cattle and goats. Approximately a quarter of the land area is covered by locally owned small scale commercial farms. Before 1980 the district was classified as a tribal trust land and during the struggle for independence it was considered a "hot" area for the Rhodesian security forces.

To the east of the district is the Save Valley Conservancy, this is a commercial co-operative venture concerned with tourism and hunting and is made up of 18 former commercial cattle ranches. It was formed following the 1992 drought and covers approximately 18% of the land area of the district. Some of the original ranch was resettled in the 1980s However, because of the lack of water in most of the remaining land, it is unsuited to communal farming.

Minerals are also of economic importance to the district, with Bikita Minerals open cast mine and factory employing a workforce of around 700, mostly local people. The diamond mining group De Beers has also been involved in prospecting in the district and it is hoped that this may lead to further development in the sector in the years ahead.

12.1.2 Water and sanitation

As a result of the 1992 drought DFID, then ODA, provided emergency assistance for water supply to the communal areas through the NGO WaterAid. This was followed up in 1996 by the Bikita Integrated Rural Water Supply and Sanitation project (BIRWSSP), which was also funded by DFID. This project, which came under the National IRWSS Programme, was decentralised to and managed by, the Rural District Council (RDC), with support from the district offices of agricultural extension (AGRITEX), health, environment, community development (MNAECC) and the district development fund's (DDF) water department. The project's main aims were the provision of safe domestic water supplies, sanitation and health education. After a run of seven years it came to an end in December 2002. Since January 2001 the project has operated without the need for in-house technical co-operation assistance and advice. My role from February 1996 until December 2000 was to provide this assistance and so it was with particular interest and enthusiasm that I was able to undertake this research, among the friends, colleagues and scenery, with which I was so familiar.

12.1.3 Logistics and acknowledgements

I conducted the research along with former colleagues from Bikita Rural District Council (RDC) Mr. Robert Mukuwe (the District Health Education Officer) and Mr. Handy Mulambo from the district agricultural extension office AGRITEX. The field research took place between 1 and 7 August 2002. The expenses involved in the study included the hire of a landrover and a driver, Mr. Muzenda, from the RDC and the time of my colleagues, which was given freely. Thanks need to be given to DFID and my former colleague Edson Waramba for providing me with transport down to the district and allowing me to use the Project guest house in Bikita, and to Johnson Mpamhadzi CEO of Bikita RDC for giving me support and providing a lift back to Harare at the end of the research.

12.1.4 Pilot productive water point gardens project

12.1.4.1 Background, potential scope and future possibilities.

The purpose of the pilot PWP project was to promote PWP gardens, to diversify livelihood strategies and move away from valuing water solely for domestic purposes. The idea was not altogether new and had been researched in some detail by the DFID-funded collector wells project based in Chiredzi. Where the Bikita pilot differed, was that it sought to use existing domestic water supplies and in doing so potentially show the way to tap the potential of existing resources. In Bikita district alone there are over 450 functioning waterpoints (boreholes and deepwells) of which anything up to a third (as indicated from BIRWSSP pump test data on project boreholes) might be used for productive waterpoint gardens.

One of the beauties of such an expanded scheme becoming a reality in the future is the modest funding that would be required. AGRITEX has the ability to provide extension advice and community work, Bikita RDC already possesses pump testing equipment and familiarity with analysis of the results. The main expenses required for such a programme to take off in the district would be for transport and the purchase of fencing material, with most other inputs including bed preparation, erection of fencing, management of gardens and the water points coming from within the communities themselves.

The hope in the district was that the pilot PWP gardens project might, along with the collector wells project, become a forerunner of a province-wide livelihoods programme, extending out, not just to the rest of Bikita, but to the five other districts of Masvingo Province. This "Ngadi" or gardens project remains on the drawing board as the political differences between Zimbabwe and Great Britain have, for the moment at least, put a stop to new UK-funded, government to government development projects in Zimbabwe. DFID's current assistance is understandably being directed towards emergency feeding during the present crisis.

12.1.4.2 Criteria for initial selection of communities to benefit from productive water point gardens.

When the PWP gardens pilot project was launched in August 2000, the district councillors themselves were actively involved in selecting villages to participate in the pilot. Each councillor was asked to provide from his or her ward, three candidate villages. These were to be chosen on the basis of three criteria:

1. The village needed to have a water point, which was capable of providing sufficient water over and above that required for domestic purposes.
2. The village had to have an active water committee with a banked water maintenance fund.
3. Suitable land had to be available in close proximity to the water point, with the full agreement of the whole community.

Once the councillors had each submitted the evaluation sheets for their three candidate villages, these were scrutinised by the project team. Visits were made to cross check information and in some cases pump tests were carried out, where older water points were chosen and doubt existed over their capacity. Bore holes constructed by BIRWSSP during the period 1997–2002 had undergone 16 hour pump and recovery tests, so this information was used to assess their technical viability. The information from these pump tests was compared with village population figures to give a good indication of performance and likely ability to provide enough water over and above the domestic requirement.

Once this information was analysed, communities were again contacted and the conditions for involvement discussed and agreed. These are listed on a checklist and presented in Appendix 1.

12.2 Research objectives

The current drought in the region makes the productive use of water, and the ability to grow food under small-scale irrigation, of particular significance to the population of the district. The objective of this research has been to examine the dynamics of this intervention during this drought.

- Evaluating how important the PWPPWP gardens are to those who are working in them and their families.
- Examining the processes that have allowed the gardens to be sustainable, including how collective ownership has been important to their management.
- Questioning what impact the use of community water supplies for irrigation has on wear and tear of the pumps.
- Asking what lessons might be passed on to communities in other places where rainfall is unreliable, but existing communal water supplies can do more than provide for drinking, cooking and washing requirements.

12.3 Methodology

To undertake the research effectively in the limited time available (7 days), a series of visits were made to communities with PWP gardens.

Meetings were held with the membership of the gardens and the crops grown recorded. Resource ranking was carried out by the garden membership as a whole to determine how people benefited in households with different levels of resource base. The division was thus made between:

- Households which owned cattle.
- Households which owned goats but no cattle.
- Households that owned neither cattle or goats.

This helped to create three broadly homogeneous household groups of similar capital ownership. It also avoided the need to talk of ranking by wealth directly, which might have proved divisive and controversial in the current crisis. In a small number of cases people had other sources of income, salaries and pensions for example, however these people mostly owned cattle and so found themselves in the cattle owning group, which removed the need for more openly intrusive questioning or means testing.

Once the groups had selected themselves, pocket-chart voting was used group by group. The pocket voting used a standard health education type sixteen pocket-chart, made from clear polythene pockets sown onto a denim backing. In the pockets were placed pictures of livelihood activities, chosen by the group to represent their main means of making a living. The subjects included:

- Rain fed maize farming
- Cattle farming
- Salaried work
- Communal gardening in the new PWP garden
- Private gardens (usually at home)
- Poultry keeping
- Vending of produce or re-sale
- Goat tending
- Fruit trees (cultured or wild)
- Sewing clothes
- Beer making.

The people were asked to decide in their groups how they would prioritise each activity in importance to their livelihoods, and to show this by allocating a total of 20 stones to the productive activities that were most important to them. The groups were asked to do this twice, firstly for a normal year with normal rainfall, and secondly for the 2002 drought year. The allocation of the 20 stones was then converted into a percentage, thus each stone was equivalent to 5% of total productive capacity.

In the case of the first garden visited more detailed individual interviewing was used to gain understanding of household economies using a checklist, which can be found in Appendix 2. Due to the time that the individual interviews took and the need to cover as many gardens and members as possible, the same checklist was then used as a pointer for focus group discussions (FGDs) at the subsequent gardens. This was done after basic data had been collected from individuals at the beginning of the sessions. The basic information established the size of households, the presence of wage earners, ownership of poultry and other animals, and the amount of rain fed cereals farmed. The FGDs were then used to gain understanding of the ways the gardens were being managed, the number and size of plots per member, and how members gained their membership of the gardens in the first place. Water point community-based management was also discussed to establish the record of repairs on the hand pumps in the past and the importance of community ownership to both the gardens and the water point. There was also more general discussion of the current drought and access to grain supplies from the Grain Marketing Board (GMB).

The four PWP gardens researched were:

- Maniki, Ward 22, Rusoswe Vidco, Grid reference E36630 - S780300
- Nzwiso, Ward 13, Rujeko Vidco, Grid reference E354510 - S7791029
- Mapetere, Ward 10, Bungu Vidco, Grid reference E350168 - S87786828
- Mujiche, Ward 13, Manyanye Vidco, Grid reference E358406 - S7785947

12.4 Results

12.4.1 Membership

Garden membership appeared to be widespread ranging from 49% to 68% of all the households in the settlements surrounding the gardens. The percentage of membership, split between the resource groups in the gardens visited, was (when averaged between Mujiche and Mapetere gardens), 37% cattle owners, 22% goat owners and 40% non livestock owners.

The bulk of members joined at garden inception following meetings called by the Ward AGRITEX staff. Members contributed to constructing the gardens with labour, and cash for ploughing where this was needed. In some cases pooled money was also used for purchasing seeds for the whole membership. In the case of Mapetere garden, the seed purchased collectively was only sufficient to plant half the area of the garden for the first season. Subsequently profits from the sales of the first crop enabled the members to purchase more seed, and thus enthused by their first success the whole garden was planted.

The mine company Bikita Minerals also contributed seed via the RDC at the beginning of 2002 and this was used to assist garden members at a number of PWP gardens across the district.

When people wanted to join the gardens, after they had been set up, this was sometimes allowed by the garden membership, though a fee of between Z$500 and Z$600 was charged to compensate the original members for their construction work. Only a very small number of people joined in this way, including just 2 at Mapetere PWPPWP garden. The small size of the gardens at 0.25 ha, meant that most plots were allocated quickly and seldom was there room for latecomers to join.

12.4.2 Productive water pointgardens as pro-poor interventions

The capital resources of garden members was largely limited to what they were producing from their small holdings, with very few receiving salaries, or pensions of significant value. Broadly households with cattle were larger, had larger amounts of land, poultry and other income opportunities than those without cattle (Figure 1). This was reflected in the assessment of the importance of the PWP gardens to their household economies during the pocket-chart voting exercise, and is shown graphically later (Graphs 3 & 4). The larger proportion of female-headed households amongst non-livestock owning group was evident in the garden with the largest membership visited at Mujiche. Here 28% of the cattle owning households were seen to be female-headed as opposed to 69% in the non-livestock owning group. The fact that the

allocation of garden plots was the same for each household irrespective of household size or influence meant that the poorest members of the gardens were benefiting proportionately more than the wealthier cattle owning households with their larger households. This coupled with what poorer people were indicating through the pocket-chart exercise, showed the pro-poor nature of the PWP gardens.

Figure 1. Differences of household size and capital ownership by livestock owning group.

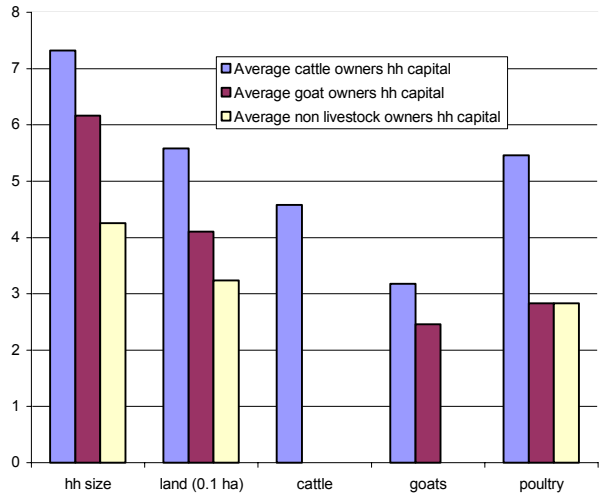
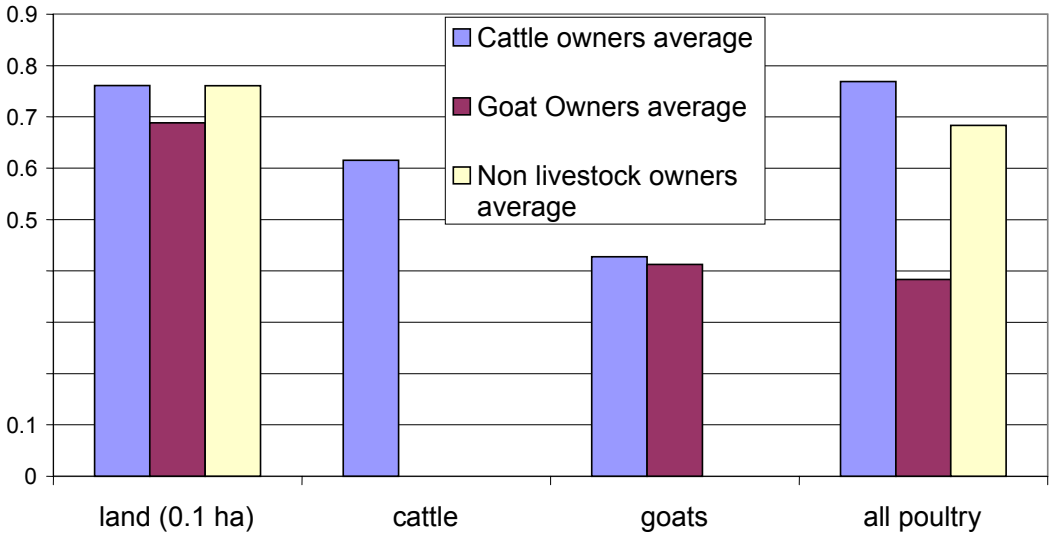


Figure 2. Average capital assets per individual family member



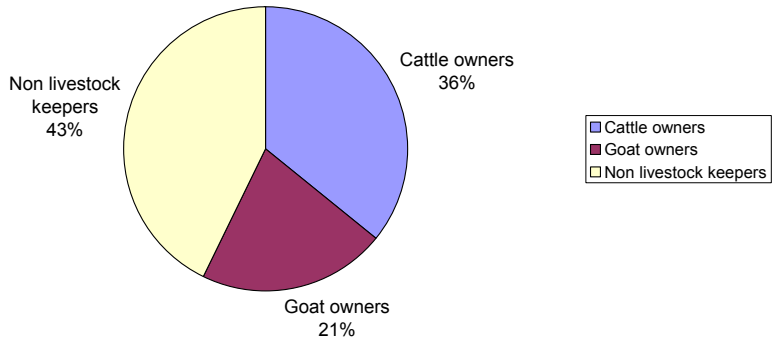
Households owning cattle had an advantage of a greater spread of capital than non-livestock households. By owning cattle they may benefit from milk and meat which can be consumed or sold, as well as from draught power for ploughing their own fields or for hiring out to others, and a source of manure for field or garden. The relative size of capital assets amongst the garden plot owners when divided by the number of people in the household is displayed by individual in Figure 2. Here the area of rain fed fields farmed (marked as land in Figures 1 and 2) and poultry kept, are remarkably similar between the resource

groups, but the greater spread of available livelihood opportunities still makes the livelihoods of cattle owning households more broad-based and thus secure.

The pie chart (Figure 3) shows the breakdown of membership at Mapetere PWP garden, the majority, 64% do not have cattle.

The question over whether the very poorest would have been able to join, even at the early stages is valid. Whether they would have felt able to make the investment in terms of time and money may have been questionable. However the numbers of people joining the gardens, compared to the numbers in the surrounding kraals, indicate that a significant proportion, of between 49 and 68% do join. Waughray *et al*. 1996), put the percentage of those who joined similar PWP gardens at collector wells in Masvingo province, and who were among the poorest in the community, as being 49%. This would indicate that garden membership in the Bikita PWP gardens is made up of a fair cross section of the community, and that this does include the poorest.

Graph 3 Breakdown of membership at Mapatere PWP garden



During the research there was no evidence of exclusion of the poorest in the communities. The members certainly included some very poor people, including many from female-headed households, some of whom had lost or divorced their husbands and had no rain fed fields at all. The reason why people decided to join PWP gardens or not, seemed to depend on their personal willingness to work alongside others and their perception of how doing so might lead to a better, or at least more secure, life. Very destitute people may have been excluded from the gardens, but there was no evidence of this during the research and many obviously extremely poor people had joined the PWP gardens.

12.4.3 HIV/AIDs, coping strategies and the benefits of group solidarity

In a number of cases grandparents had joined the gardens, in order to find a way to feed themselves and their grandchildren, as the parents of the children had died, leaving them in their old age with young children to support and bring up. This situation is symptomatic of the effects of the HIV/AIDS pandemic that is sweeping Zimbabwe, and also further evidence of the pro-poor impact of the PWP gardens intervention. According to the latest UNAIDS statistics, 33.7% of the adult population are HIV positive, and 780,000 children in Zimbabwe have lost either one or both parents. During 2001 an estimated 200,000 people died of HIV/AIDS in Zimbabwe, a figure equal to the entire population of Bikita District.

The desire for being part of a group, as mentioned by Selina, was also expressed by others whom we interviewed, especially among the elder members. This reflects the value of the social capital that materialises for those who are willing to work together. There seemed to be a unity among members, which exhibited itself in work at and management of the gardens. Evidence of joint working on plots, sharing of watering duties and inputs such as insecticides was found at all the gardens.

It is clear that the PWP gardens themselves have become a coping strategy to help the members get by during the drought and the other crises, economic and health related that they face. A fear was expressed by some that more dangerous coping strategies such as prostitution were on the rise, and this might further spread the HIV/AIDS menace. The fact that knowledge of these problems was being openly expressed at public meetings was in itself encouraging and a tribute to the work of the health education department.

Box 1 Selina's story

The following is a quote from Mrs. Selina Vanhukwavo, a seventy year old grandmother from Nzwisiso PWP garden. When I asked her how useful she found the garden she told me. "I do not know what I would have done if I had not joined the garden group, my plots in the garden are growing all that myself, my husband and my three grandchildren are eating. We have had no maize meal from the GMB since April and it is now August. My maize, groundnut and roundnut crop completely failed this year and what we grow in the garden is keeping us alive". Selina told me that the chance to have solidarity with others was one of the things that had made her join the group in the first place, before the drought had started. The opportunity to work with others and to meet and talk and help each other out was valuable to her. She said that, before she had become a member of the garden, she had often had to ask others from her extended family for food. Now she was able to help others with what she had. She found the other members helped her as well and this was important for her. Earlier in the year one person had even paid her water fund contribution for the maintenance of the water pump as she had no money at the time.

12.4.4 Production

The production of vegetables varied from garden to garden as did the proportion of the crop used for home consumption or for selling on to generate cash. Table 1 illustrates this.

Table 1. Monthly production of individual household members at PWP gardens in Bikita, Zimbabwe.

Garden	Number of members	m^2 per member	Value of monthly production per member in Z$	US$ (US$1=Z$300)	Proportion sold
Nzwisiso	12	167	1312	4.37	none
Mapetere	18	111	2800	9.33	most
Mujiche	53	38	480	1.6	Half
Maniki	34	59	not listed		Some

The vegetables grown in the gardens included: cabbage, onions, tomatoes, spinach, beans, green maize and a perennial leaf vegetable called covo.

In the case of Nzwiso and Mujiche PWP gardens, members chose what they wanted to grow in their plots independently, in the other two gardens all members agreed to grow the same types of vegetables in the same positions in lines. In Maniki the members had worked on a collective seed bed to raise the seedlings together, prior to planting them in the individual members plots.

The figures for the value of the monthly production were worked out by multiplying the claimed production of bundles of vegetables per month by an average figure of Z$40 per bundle. As can be seen from Table 1, the proportion of produce sold varied. The dynamics of the drought led some people to sell more where this was possible, in order to raise money to purchase maize meal. This was the case at Mapetere and Mujiche PWP gardens where marketing opportunities existed at the nearby townships of Nyika and Duma. At Maniki PWP garden, however, the members claimed the local market was becoming more difficult to sell to, due to a lack of cash amongst neighbours who comprised the bulk of their market.

The production estimates shown above and below compare with those produced by Chris Lovell (2000) in his book "PWPs in Dryland Areas". Lovell estimates the total annual benefits of a productive collector well garden as being US$2,091, the Bikita figures are thus in the same general "ball park". In Table 2, monthly production is calculated for the whole garden and converted to yearly production and again into the US$ equivalent. The exchange rate of US$1 to Z$300 was used as an intermediary between the

official exchange rate, of US$1 to Z$50, and the parallel rate, of US$1 to Z$600, which existed at the time of the research in August 2002.

Table 2. Estimates of production from PWP gardens in Bikita, Zimbabwe.

Garden	Number of members	Value of monthly production per member in Z$	Value of yearly production per member in Z$	US$ (US$1=Z$300)
Nzwisiso	12	1,312	188,928	630
Mapetere	18	2,800	604,800	2,016
Mujiche	53	480	305,280	1,018
Maniki	34	not listed		2,091

The significance of these tables is that they show that PWPPWP gardens can provide a significant input for rural communities. This is obviously all the more important during drought years when other sources of nutrition and income are harder to come by.

Box 2 The value of production at Mujiche PWP garden

At Mujiche PWPPWP garden, where pressure of membership (there are 53 members) means that each member has just 4 plots, the gardeners are producing 4 bundles of leafy vegetables per week each and a further 4 from their private household gardens. By selling half of this production (Z$30 per bundle sold) they were able to raise on average Z$480 per month per family, or enough to purchase a 50kg bag of maize from the Grain Marketing Board (GMB) if grain was on sale. This is enough to provide 83% of the recommended ceareal ration for a family of five for a month (WFP.2003) and thus a significant input to a family budget, especially when, due to drought, the rain fed maize crop has failed.

On the basis of the data collected during the survey, the current 33 PWP gardens in Bikita serve an estimated 5,000 people. If this is multiplied by the number of water points that could potentially supply PWP gardens (around 150), the number of beneficiaries of PWP gardens from existing water points in Bikita District alone is in the region of 23,500 people. There is thus a potential to benefit the livelihoods of over 12% of the rural people living in Bikita district, by using currently existing water points. Using the figures from Table 2, this could generate approximately US$180,000 increased agricultural production per year in the district. Given that the current estimated usage of ground water is only about 4% of annual recharge (Lovell *et al*., 1996) from a hydrological perspective this is also a sustainable development option, though due to local conditions it would not be possible at all the water points.

12.4.5 Pocket-voting exercise results at PWP Gardens

The importance of the PWP gardens, to the livelihoods of the members, was also illustrated by the pocket voting exercise. Here members in their resource groups ranked the relative importance of the various productive activities that they were involved with. The relative importance of the PWP gardens can be seen in Figures 4 & 5, to be more important to the poorer non-livestock owning households than their wealthier neighbours, and of enhanced importance to all groups during a drought year.

12.4.5.1 Mapatere PWP garden

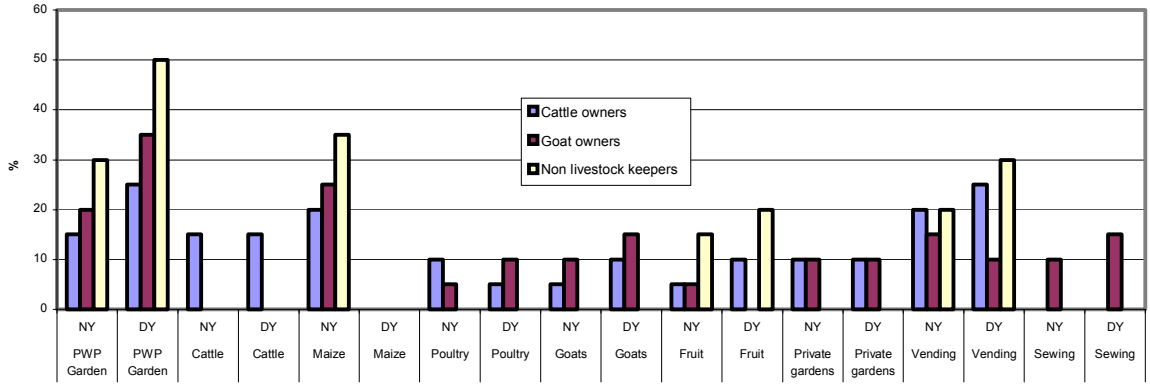
Figure 4 shows how the members of Mapetere PWP Garden ranked their productive activities in both a normal year (NY) and the 2002 drought year (DR)

The first set of columns illustrate that the PWP garden in a normal year is twice as important to the non-livestock owning group as to the cattle owning group. In the drought year the importance of the PWP garden is seen to rise for all the groups. However the proportion remains the same with the non-livestock owning group still claiming to value the gardens twice as much as the cattle owners. The non-livestock owning group setting the productive value of the gardens at 50% of their total productive capacity, this further emphasises the pro-poor nature of this intervention.

Rain fed maize production is also seen to be relatively more important to the non-livestock owning group in a normal year at 35% of productive capacity in a normal rainfall year, compared to 20% for the cattle owning group. However the effect for both groups is striking for the 2002 drought year, with no harvest reducing the value of rain fed maize to zero for both groups.

Gathering fruit also appeared to be more important for the non-livestock group. Production from private gardens in the case of Mapatere was restricted to the cattle and goat owners. One reason for this being the need to have access to water from private wells to water these gardens. Private wells are a valuable asset and at Mapetere were owned exclusively by the comparatively wealthier livestock owners, hence private gardens do not appear as a productive factor in the livelihoods of the non-livestock owners at Mapetere.

Figure 4 Mapatere PWP garden pocket voting results for normal year (NY) and drought year (DY)



The importance of vending or selling produce has increased amongst the non-livestock owning group at Mapetere from 20% in a normal year to 30% during the drought and amongst the cattle owners from 20% to 25%. The goat owners at Mapetere appear to be selling less produce, but doing more sewing work. All groups claimed to need cash to purchase grain from the GMB.

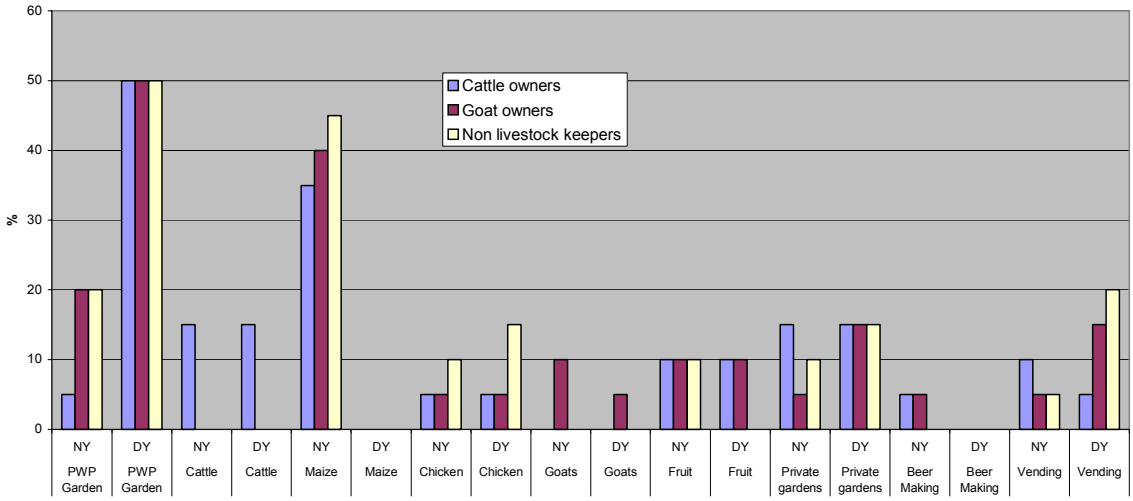
12.4.5.2 Mujiche PWP garden

At Mujiche the PWP garden was vaued at 20% for the goat and non-livestock owners during a normal rainfall year and just 5% by the livestock group. This increased to 50% for all the groups for the drought year. Rain fed maize farming was considered to be the most important activity during a normal rainfall year with steps of 5% leading up between cattle owners at 35%, goat owners at 40% and non-livestock owners at 45%. As with the other gardens, no harvest occurred during the 2002 season. Poultry keeping was considered more important for non-livestock owners than livestock owners, but fruit collecting was not valued by non-livestock owners during the drought, who claimed there was less fruit on the trees. Beer brewing was only being undertaken by the livestock owners, and then only during normal rainfall years, as the drought meant there was no maize or millet to brew with. With vending, the goat owners and non-livestock keepers claimed to be selling more during the drought in order to raise money to buy maize from the GMB. The cattle keepers on the other hand claimed to be selling less and consuming more of their own produce.

12.4.6 Private productive water point gardens at family wells

The owners of two up-graded family wells, visited during the research, were found to be better off than most of the communal gardeners, with more land for rain fed agriculture, more livestock and more vegetable beds. This should perhaps not be surprising, since the capital cost of sinking a private well marks out such individuals as being relatively well off. Both these wells had also been up-graded with concrete aprons, windlasses and closing lids, the work being undertaken in partnership with the BIRWSSP project. The ownership of a private well close to the home saves on time spent collecting water for domestic use and this time can be used in the garden. The limit on the number of beds in the garden, depending on the decision of the owner to make and tend the plots, rather than by the available space in a communal garden, which depends in turn on the number of other members of the garden.

Figure 5 Mujiche PWP garden pocket voting results for normal year (NY) and drought year (DY).



Of the two upgraded family wells visited, one household had increased its vending to get cash to buy grain, while the second had reduced vending, because of the increased home consumption of garden produce. Both had ranked an increased importance in their gardens during the drought as far as their livelihoods were concerned. For Mr. Zinduna Makaranga the drought had another interesting effect, his work as a water diviner and well sinker was in particular demand. This demonstrated a local understanding that drought years were the best years for well sinking, because the water tables were likely to be at their lowest and thus the water in wells dug successfully during a drought tended to last longer than those dug in normal rainfall years.

Box 3 Farming and gardening activities at the two upgraded family well PWP gardens.

Every week Mr. Zinduna harvests from his family well garden:

7 bundles of rape (May till the end of August), 3kg of tomatoes (June till August), 1 bundle of covu a week (year round), 75 pumpkins per year

His household consumes 1 bundle of rape a week and he sells 6 bundles at Z$30 per bundle. All his tomatoes are eaten at home as are the other vegetables and fruit. His main pest problems are aphids, red spider mite, grass hoppers and cut worms. He has 2 cows, but no savings and told us that wild fruit did not produce this year because of the drought.

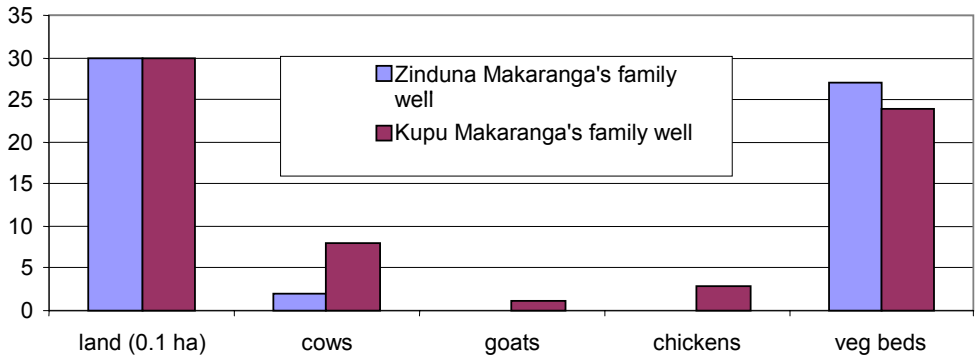
Mr Zinduna's neighbour is his brother Mr. Kupu Makaranga.

He also has an upgraded family well and an impressive garden with the following numbers of vegetable beds and fruit trees:

6 beds of rape, 6 beds of tomatoes, 8 beds of covu, 2 beds of shallots, 2 beds of sugar loaf cabbages, 1 bed of onions, 1 bed of carrots, 4 mango trees, 1 avocado tree, 3 banana trees, 2 pawpaw trees.

The family harvests: 4–5 bundles of rape a week (May–August) for home consumption, 3–4 kg tomatoes a week (April–October) (some sold), 2 bundles sugar loaf per week (August–December).

Figure 6 Resource base of the Makaranga brothers



The scope for family wells to become a meaningful livelihood enhancing asset for their owners, by providing water for private PWP gardens, has to a large extent been met, by the efforts of owners recognising their worth and planting private gardens. To date 1,505 privately owned family wells have been up-graded in Bikita District. These serve around 25 people each for their domestic requirements, as traditionally water cannot be denied to a neighbour. However, for gardening purposes, restrictions commonly apply, so that only the immediate family can use them for this. Given that most of the up-graded family wells have sufficient water for a single household garden, we can expect the current beneficiaries in Bikita District of private family well PWP gardens, to number in excess of 10,000 people.

12.4.7 Ownership

Ownership was found to be important amongst all the garden members, be they communal or private. Universally members agreed that the gardens belonged to them, and they felt that this ownership made them special and sustainable.

Comments about the water point ownership were less strong. There was usually an acknowledgement of the importance of the water point and of its ownership by the community as a whole. There was also evidence of contributions made by garden members to community water funds, set up to hold money should it be needed for repairs to the pumps. A typical comment was that “the garden belongs to the members, the bore hole to the wider community, the two are linked as without the bore hole there would be no garden”, Selina Vanhukwavo. However, the activities of the water committees were broadly less impressive. Water points were not being obviously well kept. There could not be said to be a great deal of active commitment to the water points.

12.4.8 Technical performance of bush pumps at PWP gardens

The bush pumps that we visited were, apart from one, in good shape and had given long years of service. We found one A type bush pump which had repairs made on it in January 2002 (a section of new 2” pipe had been fitted along with two new leather cups), but prior to this had been operating continuously since its installation without any breakdowns for 14 years. When pumps are as reliable as this, there must be some question within communities over what function a water point user committee actually has, and so perhaps not surprisingly many committees become un-active and forget to supervise the less important tasks of keeping the surround clean.

Only one of the PWP gardens visited was having problems with its pump. This garden was at Maniki and it was fitted with a 2.5 inch diameter extractable version of the bush pump. The extractable bush pump is designed to have the piston removed by pulling its hook-and-eye-connected pump rods up the rising main, thus facilitating ease of nitrile rubber seal replacement on the piston. In this case the seal had become worn and broken and the pump was performing so badly that the community had resorted to collecting water from open wells in a sand river for their garden. They were only using their, now poorly performing pump, for drinking water.

The problem here was not so much that the seal had become damaged (as all seals eventually require replacement), but that the community had done nothing to make the repair. This was despite the presence of trained bush pump mechanics in a neighbouring village and parts being on sale from the Ward Councillor. The committee even had ample funds available (Z$2,999.00) in their water fund

account. In this case two factors seem to have had an influence on the failure of the committee to make the repairs. Firstly the secretary of the committee, a dynamic woman, had left the village to re-marry. As the driving force behind the committee, the other members seemed to have had difficulty in deciding what was to be done after she left. The second factor was the presence of an alternative water source in the sand river, which meant that decisions could be put off.

A further discovery, while removing the pump rods, was that the aggressive water had started to eat away at the rods, especially on the hook connection. This may have been made worse by the increased use of the pump for irrigation purposes. It is likely that the damage to the rod linkages will eventually cause major problems for the bore hole, leading to the need for expensive repairs which, if the WPUC remains inactive, are be unlikely to be done. In the event we replaced the seal in under twenty minutes, with the help of one of the laid-off DDF pump minders who came with us for the trip.

The maintenance service, available to users of all pumps in Bikita district, is under community-based management. Water point user committees have been trained to manage their water points, raising funds for spare parts and spotting problems as they arise. Teams of community bush pump mechanics have been trained from all the VIDCOs in the district, to take apart and replace broken seals and other parts, and keep the pumps in good working order. In addition the District Development Fund's Water Department have 9 "pump minders" equipped with bicycles and tools available to provide more specialised assistance should the need arise. The problem with this "ideal" is that the community bush pump mechanics often get little chance to undertake repairs because of the reliability of the pumps. This means they forget how to do the repairs and lose confidence in their own abilities. Many refuse to undertake repairs without the presence of the DDF pump minders.

The bush pump mechanics also expect to be paid for their services, and this can lead to disputes and problems when the water committees don't want to pay them. The latest problem to hit CBM in the district was when DDF decided in May 2002, to lay off the entire pump minder staff. These highly experienced individuals have day in, day out knowledge of the pumps and the communities. By laying them off, the safety net for the maintenance of village water supplies has effectively been cut away. It was suggested and agreed that the RDC retain the pump minders from their own coffers, though whether this will be accepted as a long term solution to this problem remains to be seen.

Further problems, with the ability of the RDC itself to hold and replace its stocks of spare parts, were noted and discussed. One problem was the quality of locally available nitrile rubber seals needed for the extractable version of the bush pump. In discussions with the Swiss-based organisation SKAT (Swiss Centre for Development Co-operation in Technology and Management) it seems that India has also been facing similar problems with the India Mark 3 pumps. A reputable supplier has in the mean time been suggested to the RDC. Criticisms of using the hand pumps in general and the Zimbabwe bush pump in particular, have been made for this application for watering gardens (Lovell 2000). In terms of the efficiency of using human labour to pump water, it has been said that hand pumps can restrict the productive potentials of the water points they are fitted to, effectively plugging the productive capacity of high yielding bore holes and wells. However the bush pump's main advantage is that it is made in Zimbabwe and does not require fuel to operate it. Spare parts should be thus more available and poor rural communities more able to operate it.

One of the implications of using existing domestic water points for providing water to PWP gardens is that there will be more wear and tear on the pumps, and thus the cost of maintenance will be greater. The question is whether this is a problem or not? If communities acknowledge the increased importance of their pumps, because they are using them for their gardens as well as their domestic requirements, this may be no bad thing. The productive capacity of the PWP garden itself generates financial capital, which can be used to pay for repairs and maintenance. The acknowledgement by a community of the enhanced use of a water pump may lead to greater funds being made available for pump maintenance, to the benefit of all, garden member and non member alike. However if water points are not looked after, then because of their increased use at PWP gardens, they will be more likely to break down faster and more often. One effect of the drought, noticed at all the gardens visited, was that contributions to water point maintenance funds had been suspended because people felt they could no longer afford to pay them. A question remains as to whether once the drought is over, these payments will resume? or whether as Elizabeth Matanda, a member of Nzwisiso PWP garden, put it "people will only realise the importance of the ownership of the water point when there is the next breakdown".

12.5 Conclusions

In conclusion, I would like to go back to the research objectives mentioned in Section 3.

Evaluating how important the PWP gardens are to those who are working in them and their families, this research has shown that the PWP gardens are of great importance. Not only as a coping strategy during the current drought, but also as a newly established means of production within the communities, which seems likely to be perpetuated to the betterment of the lives of the members. Furthermore this intervention has been "pro-poor" assisting the poorest members of the community more than the wealthy.

The processes that have allowed the gardens to be sustainable have been related to collective ownership and the development of a common purpose. Recognition within communities, of the value of a social capital that materialises for those that are willing to work collectively, has itself been an incentive to work together and make the PWP gardens work. The unity amongst members, which is exhibited in joint working on plots, sharing of inputs and management duties, is inspiring and offers a ray of hope in an otherwise depressing political and economic environment.

The impact of the use of community water supplies for irrigation on the wear and tear of pumps is an issue. Communal use of the pumps for gardening as well as for domestic requirements is, however, likely to increase the perceived value of the installations in the eyes of the community and this may lead to increased community contributions, especially from garden members, when the need arises. Increased focus on what communities can do for themselves should not, however, abrogate district authorities from their responsibilities, to provide a safety net in the form of trained personnel and a supply chain of spare parts, to help communities keep these installations working.

If we ask what lessons might be passed on to communities in other places, where rainfall is unreliable, but existing communal water supplies can do more than provide for drinking, cooking and washing requirements, the answer is simple. Such water supplies can, if the conditions are right be used for PWP gardens. And what are the conditions? Communities must be fully involved from the outset and empowered to take advantage of what is available, in a spirit of unity and equality. There must be full agreement of all parties prior to work commencing over the change in the use of the land, and all plots held by members within the garden should be of the same size. Taking conventional domestic water supplies and using them to supply water for gardens is already a reality, scaling up is the next thing to be done.

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12.8 Appendix 1 Checklist for community meetings

Checklist for community meeting, once productive capacity of water point is known to exceed domestic requirement and meet aditional requirement for PWP garden.

12.8.1 Setting up the Garden

- Will the garden be sited next to the water point?
- Who owns the land currently, is there agreement for the garden to be developed on the land?
- How and when will the current owner be compensated?
- Who will erect the garden?

12.8.2 Membership

- Who will be members
- Who won't
- Why they won't
- What will domestic users pay?
- What will garden users pay?
- How will these moneys be managed (see operation section below).
-
- A) Will new members join later & how?
- How much space individual members can have in the garden? Will this be equal per member? If not is this fair?
- Payment for plots, will this be equal per member?
-
- B)Will plots be rented annually or owned continuously?
-
- Is there a conflict between A) & B) above?
- Will beds left unused be reallocated to new members?
- Payment for domestic users/by the month/year
- Payment for garden allotments/ by the month/year
- Defaulters, how to deal with non-payment?
- What will be the arrangements to deal with theft from the gardens?
- Will the WPUC be the sole decision maker?
- Is there a danger that others may undermine the WPUC?
- What can be done about this if it happens?

12.8.3 Drought

- What will the arrangements be when others come because their own water points have failed?
- Will irrigation be reduced to cope with increased domestic demand throughout the day?

12.8.4 Disadvantaged

- What arrangements will there be for the disadvantaged in the community?
- How will the disadvantaged be defined? (infirm, orphans, old, disabled?).
- Will the disadvantaged be allocated free plots?

12.8.5 Operation

Which operations will be collective or individual?

- Choice & timing of crop
- Buying seeds
- Nursery beds for seedlings
- Pest & disease control
- Pumping/irrigation schedule to allow for domestic use and garden use to avoid queuing for water at the pump.

12.8.6 Marketing

- Is marketing expected to be important?
- Is marketing going to be a problem?
- Can crops be scheduled to make the best use of markets?

12.9 Appendix 2 Checklist for individual interviews

The following checklist of questions was used for individual interviews and as a pointer during focus group discussions.

Name of garden holder
Sex of garden holder
Size of household
Men
Women
Girls
Boys
Grand parents
Other dependants, old people, disabled, sick etc
If no men where are they, do they send remittances?

Size of rain fed fields
Normal year yield, what is grown?
This year yield what grown?
Reserves how much? Of what and estimated to last how long?
Inputs – labour + fertilizer, seed etc. How much and when.

Size of watered gardens, each plot, are all plots the same size?
Details of yield: what planted? month by month, how much harvested?, how much consumed? how much sold? how much bartered?
Comparisons between this year and last.
What are the benefits of the garden?
Why are you a member of the garden?
Are all householders in the village members? If not why not?
How much time spent in the garden by who?
Are there any theft problems at the garden?
Are there any arguments amongst the members? if so over what?
Systems used for joint purchasing of seed, fertiliser, insecticide etc.
Systems used for joint work on seed beds/maintenance of garden systems fence/pipeline/ground tank etc.
What problems do you face (pest and disease etc.)?

What animals do you have?
Indicate number, cows, oxen, goats, sheep, rabbits, doves, chicken, turkeys, dogs
Other income?
Work?
Savings?
Pensions?
Family members in town? Are they sending anything? Are they taking anything?
Wild fruits, what types available normally? this year?

Pump & borehole maintenance issues
Reliability of borehole to provide enough water?
Reliability of pump?
Number of repairs carried out?
What repairs were carried out?
Any problems with repairs?
Any problems with accessing spare parts?
Do you notice a need for more repairs now the water point is being used for gardening?
What do members pay/non members pay per month/year.
How many garden owners?
How many other users?
How well is the water committee functioning?
Is there a separate committee for the garden or does the WPUC serve for both?
Are funds being used just for maintenance or are they being used for other things, like loans?

Felt importance of PWP gardens previously and now?
Who owns the water point?
Who owns the gardens?
Is it important who owns the water point and gardens? And if so why?
Do people have commitment to keeping the gardens and water point running? And, if so, why?
How has the current year differed from previous ones? Weather etc.
How has this impacted on the garden, prices up/down, inputs more difficult to get etc? (especially comparing with the last bad drought year, 1992).