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Full Length Research Paper

Smallholder gardening as a sustainable livelihood strategy in Chikwanda communal lands, Gutu, Zimbabwe

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This paper seeks to assess the potential of transforming smallholder gardening into a sustainable livelihood strategy in Chikwanda Communal Lands, Zimbabwe through a case study approach. Questionnaires, interview guides and observation guides were used to collect both the qualitative and quantitative data. The questionnaires were administered to 37 household heads from VIDCO 3 with 210 households. Results indicated that smallholder gardening is a viable livelihood strategy as it acts as a source of food, provides income and some form of employment though in varying degrees. However, smallholder gardening can be a sustainable livelihood strategy if people have access to viable markets and receive training on the proper utilisation of natural resources.

Keywords: Livelihood, smallholder garden, sustainability, transformation, viability, sustainable livelihood.

INTRODUCTION

Smallholder gardening (SHG) is an intensive agricultural activity that entails the growing of a variety of vegetables, food crops and fruit trees on a small plot of land. In most rural communities (RC) of developing countries SHG represents a supplementary source of food among rural households with smallholder gardens (SHGs) becoming a major source of income, vegetables and employment (Porter *et al,* 2003 and FAO, 2001). They also make a welcome contribution in rural areas to “green space” and maintaining biodiversity (Garnett, 1996 and Perez-Vazquez, 2002). According to FAO (2005) SHG has proven to be a viable livelihood strategy in most semi-arid environments. SHGs are considered a community's most adaptable and accessible land resource and are an important component in reducing vulnerability and ensuring food security, (Buchmann, 2009) and they form an integral part of rural livelihoods. Sustainability is defined by the Brundtland Commission Report (WCED, 1987) in Anand and Sen, (2000) as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. UN (1997) states the need for integration on economic development, social development and environmental protection as a major attribute of sustainability. It requires that human activities use nature's resources at a rate at which they

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can be replenished naturally by minimizing disturbance and degradation and avoiding destruction (Adey, 2007). This implies that, for SHG to be a sustainable livelihood strategy, people should use resources such as water and soil in a manner that these resources can be replenished naturally by minimising deforestation, stream bank cultivation and careful use of wetlands. For SHG to achieve sustainability it has to integrate economic development, social development and environmental protection. Focusing on social and environment aspects leads to them being bearable whilst focusing on environment and economic aspects leads to viability (Ellis, 1998). Within the sustainable livelihood framework, SHGs can play many roles such as securing access to land, enable a household to produce food stuffs for consumption or trade, acquire skills, increase the family's human assets and improve the family's nutritional status. SHG also has benefits of exchange of information and cooperation with other villagers and strengthens the family's relationships with others since most of them are located at a common place in most communities. Unfortunately, the effects of SHG are often assumed to be insignificant though accepted to be generally positive. This has seen wetlands being threatened as a result of lowland garden cultivation with negative effects on sustainability of water sources such as rivers and dams (Mugabe et al, 2003 and Frost et al 2007). Introduction of exotic vegetables such as rape, covo, cabbages, tomatoes and others has led to new pest and disease problems proving to be difficult to tackle resulting in heavy dependence on pesticides when the natural environment is given little consideration (Sibanda et al., 2000). Smallholder farmers also lack agronomic information relating to soil fertility management methods, resulting in a general decline in soil fertility (Kuntashula et al., 2004 and Sibanda et al., 2000). The decline in soil fertility, sustainability of wetland and water sources result in the decline in vegetable production hence, reducing the potentiality of transforming SHG into a sustainable livelihood strategy.

Background of SHG in Chikwanda

Chikwanda Communal Lands is located in the southern part of Gutu District in Masvingo Province (Fig 1). The area falls under Zimbabwe's ecological Region IV. In the Zimbabwean context Natural Regions (NRs) or agro-ecological regions are areas delineated on the basis of soil type, rainfall and other climatic factors (CSO, 1997, 144).In Chikwanda Communal Lands rainfall occurs in sporadic convectional storms with a 30% chance of a mid-season drought in January or February (Bernard, Kamanga and Shamudzarira, 2001). Annual rainfall averages less than 600 mm. Crop failure occurs in 3 out of every 5 years mainly due to poor distribution of rainfall within a wet season (Hamandawana et al, 2005). Poor distribution is often a cause of crop failure even in years with close to average rainfall, because of dry spells at critical stages of crop growth (Mugabe et al, 2003). Surface and groundwater supplies in region IV are often underdeveloped and unreliable resulting in people relying on dry land farming. Although there is poor distribution of rainfall with underdeveloped ground water supplies people are still engaged in SHG every season and is also acting as a safety net when dry land farming fails. Soils in Chikwanda Communal Lands are predominantly coarse-grained sandy loams ranging in depth from shallow to deep with low organic and mineral nutrients (Hamandawana et al., 2005). Negligible proportions of clay and silt fractions, poor water retention capacity and friable characteristics make them susceptible to erosion (Hamandawana et al., 2005). In most communities, small sizes of the land holdings, the adverse physical conditions which affect the subsistence crop production results in low yields of main land food crops. To complement the low yields of food crop production, the people of Chikwanda engage in SHG in wetlands and along stream and river banks where mainland crop production is prohibited. The entire district (comprising 12.5% of Masvingo Province) covers 7079.42 square kilometres. Its population is about 198,000 in 2002 (CSO, 1992, 2002) giving a nearly constant population density of 28 people per square kilometre for the entire decade. The high population densities reduces the land for agriculture that in the end people use most of the land for dry land cropping leaving a very limited space for SHG making it an unimportant livelihood strategy. This has an effect on the sustainability of SHG as a livelihood strategy.

Purpose of the study

The dominant hypothesis is that conventional knowledge, attitudes and practices in smallholder gardening by the people of Chikwanda Communal lands are inhibiting their transformation into a sustainable livelihood strategy. Hence training in the proper utilization of land and water resources can transform smallholder gardening into a sustainable livelihood strategy in Chikwanda Communal area. This led to the motivation and necessity to investigate the potential of SHG as a sustainable livelihood in Chikwanda Communal Lands. The overall objective is to investigate the perceptions and practices by garden farmers on how SHG can be transformed into a sustainable rural livelihood strategy in the semiarid area of Chikwanda Communal lands. By unveiling the perceptions and practices of people in the communal areas the study will come up with information not only on the socio-economic sustainability but also on environmental sustainability of

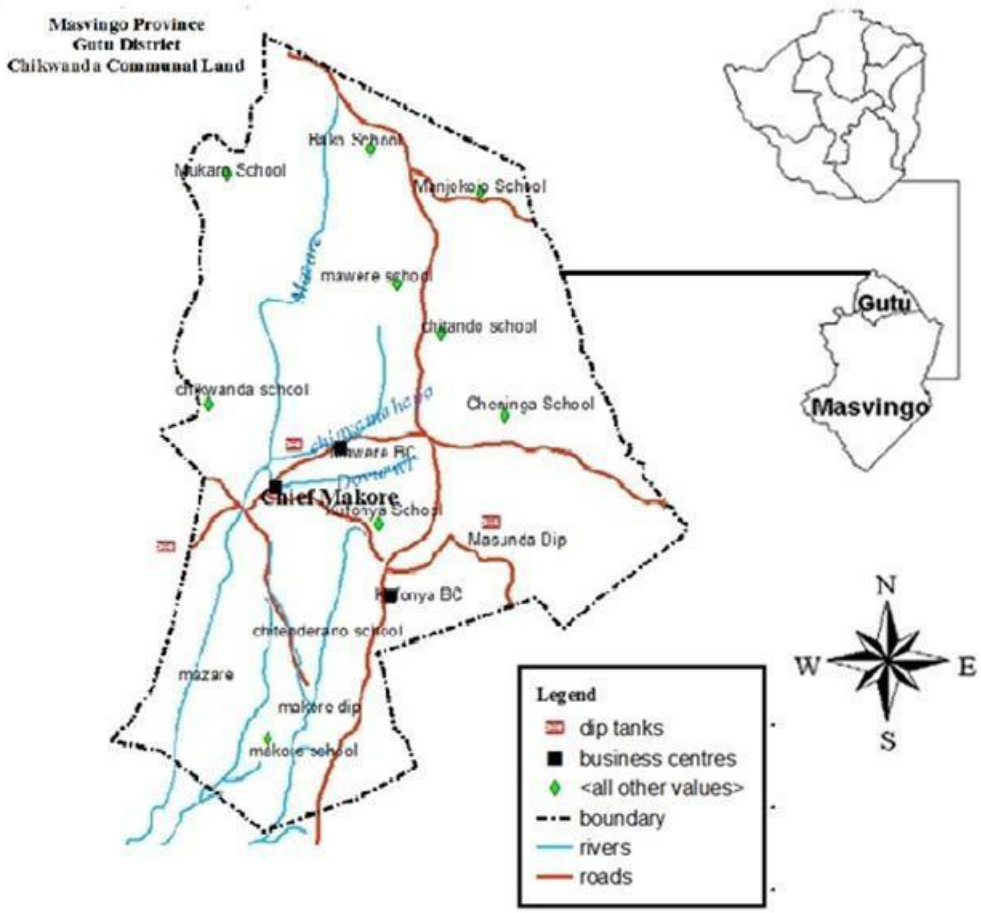

Figure1. The location of Chikwanda Communal Lands

SHGs in Chikwanda Communal Lands. Such information would also stimulate further research on knowledge, attitudes and practices of smallholder gardeners in the various rural areas not only in Zimbabwe but elsewhere too. The information from this study should also stimulate NGOs, Government and other stakeholders to increase funding for research and implementation of existing programmes and diversify garden related projects. This paper therefore seeks to examine how smallholder gardening can be transformed in a sustainable livelihood strategy in the semiarid environments of Chikwanda Communal Lands.

Prevalence of SHGs within the Rural Setting

According to Bird and Shepherd (2003), several households in Southern Africa live in Remote Rural Areas (RRAs) and RCs, where rainfall is low (less than 600mm) and erratic. Crop failure in rain-fed plots occurs in 3 out of every 5 years mainly due to poor distribution of rainfall within a wet season. It has also been shown that, even in years with close to average rainfall, crops still fail because dry spells occur at critical stages of crop growth (Mugabe et al, 2003). Frost et al. (2007) added that even where water is available, both surface and groundwater supplies are often underdeveloped, unreliable, or contaminated and cannot be used, worse still boreholes and good agricultural land are not accessible to most people in RRAs resulting in chronic food shortages and no income generation. In view of this SHGs have evolved as a means of supplementing households from the shocks of crop failure in rain-fed plots (Porter et. al. 2003). However, although SHG evolved as a supplement it is failing to reduce the problems of food shortages in most rural areas of Zimbabwe. SHG has seen the emergency of small plots being established close to reliable water sources. Though these SHGs are located close to reliable water sources production is still low in some of the semi-arid environments which is the issue that motivates this study.

In most RCs it is more attractive to enhance existing livelihood activities such as SHG and income generated

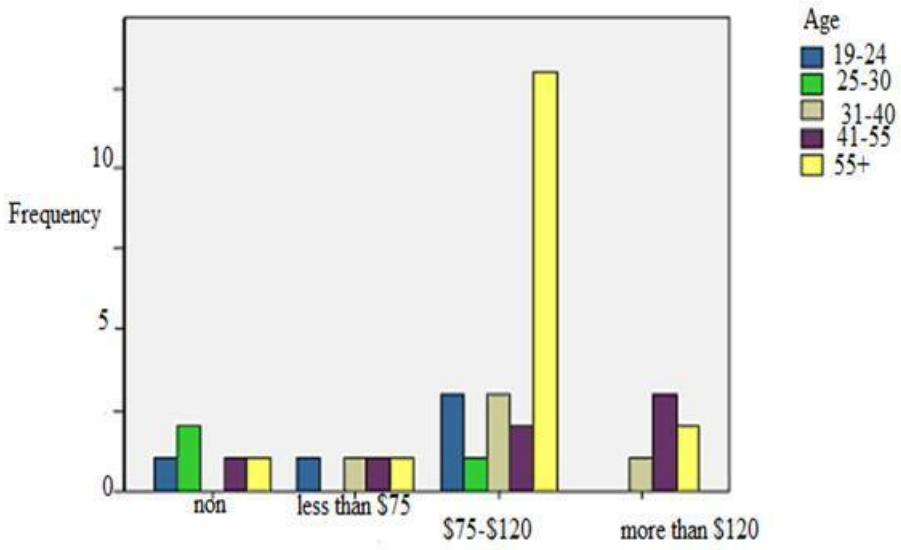

Figure 2. Annual income by age

from these existing activities than starting new ones, since it has proven that most household members are fully employed in household livelihood activities throughout the year, to an extent that any new endeavours have to compete with established activities (Frost et. al, 2007, Waughray et al., 1998). It is important to note that SHGs have been established for centuries and hence incorporated into local people's culture that transforming it into a sustainable livelihood strategy would not suffer "tissue rejection". This study then aims to answer questions such as; what is then required to identify the issues that need to be addressed in order to enhance SHG as an already existing livelihood strategy in most rural communities?

Nature of SHGs

According to FAO (2005), SHG is the growing of vegetables, fruits, herbs and a bit of crops for home consumption and the selling of surplus. Different types of vegetables are grown on the same piece of land for household consumption. They differ from market gardening which is the large scale growing of vegetables, fruits and herbs for commercial purposes (Gautam et al, 2004). According to Jackson et al (1997) the production of vegetables for commercial purposes has remained a low priority activity among the SHG farmers because it has not been seriously considered for its cash potential but only in terms of its nutritional contribution to the household. However, Kuntashula (2004) noted that in Tanzania due to the increasing demand from rapidly urban population SHG has become a fast growing enterprise.Generally SHG is done on landholdings of varying sizes and these can be either self-supporting or externally supported (FAO, 2005). Jackson et al (1997) also noted that in Zimbabwe, SHG is adversely affected by limited access to reliable source of water for irrigation, shortage of good quality seed/planting material, production inefficiency due to lack of technical back up and lack of adequate transport to urban markets.

Sustainability of SHG

The idea of sustainability as presented by Anand and Sen (2000) arose essentially from concerns relating to the overexploitation of natural and environmental resources because species and ecosystems should be utilized in ways that allow them to go on renewing themselves indefinitely. According to Goodland (1995) and Okigbo (1996) cited in Chanda et al. (2003) sustainability is best viewed as the ultimate goal or outcome of sustainable development endeavours whose goal is to satisfy real human needs *ad infinitum* while ensuring the protection of environmental quality, biodiversity and ecosystem resilience by integrating conservation and management with social and economic objectives at various social and spatial scales. Brundtland (1987) in Anand and Sen (2000) defined sustainable development as the development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. Therefore, it requires that human activities use nature's resources at a rate which they can be replenished naturally by minimizing disturbance and degradation and avoiding destruction through

maintaining productivity (Fresco and Kroonenberg, 1992 cited in Adey, 2007). The idea of sustainable development arose essentially from concerns relating to the overexploitation of natural and environmental resources limiting economic activities. IUCN (1980) noted that the early discussions concluded that species and ecosystems should be utilized in ways that allow them to go on renewing themselves indefinitely.

Methods and approach

Both quantitative and qualitative research methods were used to collect data on the perceptions and attitudes of smallholder gardeners and other stakeholders on the potential transformation of SHG to a sustainable livelihood strategy in VIDCO 3 in Chikwanda Communal Lands. The research techniques that were used include the questionnaires, focus group discussions, key informant interviews, field observations, photo-visioning and secondary sources of data such as academic literature, official statistical information such as CSO reports and government publications AGRITEX reports. Questions about the location,demographic and socio-economic characteristics were directed to the household heads. Questions that inform the nature and role of gardens, role played by different institutions and the potential of SHG as a sustainable livelihood strategy were conducted with key informants. Questions that gave the view of the respondent towards the transformation of SHG were also included. The researcher used observation guide to identify some of the issues that could not come out clearly during the interview of the respondent to the questionnaire such as the general outlook of the environment around the gardens.

The study was undertaken in Chikwanda Communal Lands in Gutu District, Masvingo Province. Chikwanda communal area has six VIDCOs incorporating 30 villages. VIDCO 3 with six villages was selected using cluster sampling. The villages that were chosen are Mazambani, Musasa, Chiminya, Gono, Kufonya and Musariri. The six villages had a total of 210 households distributed as follows; 40 households in Musasa village; 37 in Chiminya, 35 in Mazambani, 31 in Gono, 33 in Kufonya and 34 in Musariri village. A sample size of about 18 % of the population was used to represent the six villages with 210 households. As a result 37 households were selected. The researcher was given a village list by the village heads. The household lists had all names of the households in VIDCO 3. Then, from the village list the interviewer had to use systematic sampling to come up with the individual households to be interviewed. In systematic sampling to get the k^{th} element from the sample frame (list of all households), the sample frame was divided by the sample size (the number of interviews to be conducted).

$$K^{th} \text{ element} = \frac{210}{37}$$

$$= 6^{th} \text{ element}$$

From the number one household on the list only the sixth household name was selected for interview. Therefore, every 6^{th} household on the list was considered for the interviewed to make a total of 37 interviews. Since the sampling frame was made up of households from six villages the sample size was then divided proportionally among the six villages (table 1). To get the number of respondents to be selected in each village the number of households in the village was divided by the total number of households in VIDCO 3 and then multiplied by the sample size 37. Thus, $\frac{X}{X} \cdot 37$

Where,

x, is number of households in the selected village
X, total number of households in VIDCO 3.

The data that was generated from the questionnaire survey was entered and analysed using SPSS to quantify the results. Data processing for interviews produced more qualitative analysis through coding of interview transcripts.

RESULTS AND DISCUSSION

Demographic and socio-economic characteristics of respondents

A low percentage (less than 40 %) of the respondents are 40 years and below. This shows that there are few young people in VIDCO 3 and this could have a negative impact on the sustainability of SHGs in Chikwanda. The low percentage indicates shortage of labour needed for gardening. From the discussions and interviews respondents pointed out that most of the economically active people had migrated to South Africa while others had gone for diamond mining in Manicaland Province. Still with about 40 % of the farmers below 40 years of age, readiness to accept new technology and ideas could be considerably high. Though this percentage is lower, it compares well with the results obtained by Svotwa et al. (2008) who indicated that with 55 % of the farmers being below 40 years of age readiness to accept new technology and ideas could be very high.

Age plays a very important role in the transformation of SHG into a sustainable livelihood strategy. Age implies the quality of labour available and the technical know-how of how to manage SHG. Where there are more aged people the quality of labour is compromised yet in

Table 1. Number and sample size of households in VIDCO 3

Village name	Number of households	Sample size
Musasa	40	7
Chiminya	37	7
Mazambani	35	6
Gono	31	5
Kufonya	33	6
Musariri	34	6
Total	**210**	**37**

Table 2. Sex of SHG manager and relationship with head of household

		Who manages the garden				Total
		H/head	Wife	son/daughter	in-law	
Sex of respondents	Male	8	0	1	0	9
	Female	11	15	1	1	28
Total		**19**	**15**	**2**	**1**	**37**

the other angle experience of the elderly can help to increase the SHG potential. In the case where there are more young people quality labour is guaranteed and training is easier as they are quick to understand and most of them are educated.

Income

From the results obtained there seemed to be a relationship between the age of the gardeners and the amount of gross annual income from gardening. Respondents with more years in SHG tend to have more income probably due to experience. Results (Fig 1) show that respondents who said that they are getting between $75 and $150 per annum from selling garden produce are above 55 years of age, whilst those below 55 are relatively few. SHG gross annual income can be affected by the age of the respondents. Sometimes the aged tend to get more income than young adults because of the priority given to SHG. This can be an indication that the aged respondents are forced into this situation since they cannot be employed formally or informally because they are close to the retirement age. This can also mean that SHG has little significance to the young people as they can pursue other livelihood strategies. When Pearson's product moment correlation coefficients: r = 0.302, n = 37 was applied the results showed that there was a partial positive relationship between age and annual income from SHG. This shows that many aged people are engaged in SHG as their main source of income and very few young adults.

People have different sources of income and SHG is one of the main sources of income in the area but is not transforming the lives of people in the area. The research findings show that mainland crops and SHG are the primary sources of income, while piece jobs and remittances and SHG among others also follow as major secondary sources of livelihood income. This means that SHG has the potential of being transformed into a sustainable livelihood strategy but now it is failing to improve the lives of Chikwanda people. This means that although the activity is mentioned as the main source of income sometimes the income is too little to make a significant change.

Sex of SHG manager

Sex of SHG manager shows the importance placed on SHG. If there are more women than men it shows that SHG is of little importance to men and is regarded as the women's activity. This has the impact on the transformation of SHG into a sustainable livelihood strategy. When the sex variable was cross-tabulated with the head of household 28 female respondents indicated that they were in charge of the gardening activities. Table 2 indicates a dominance of females in SHG (24 % male gardeners and 76 % female gardeners). Some males in most cases are in towns in search of employment and the women work in the field as a means for survival and to boost family income because some suggested that they get income from their salaried spouses.This seems to agree with Derman and Hellum (2007) who stated that family gardens have always been the responsibility of women. Svotwa et al (2008) also stated that women actively participated in agro economic activities as laborers and farm managers.

Table 3: The future water supply and reasons for future water shortages

	Reason for future water uncertainty			
Water availability in the coming years	**Not sure/ no reason/ don't know**	**Increase in demand**	**Climate change/ recurrent droughts**	**Total**
Less and less	2	2	14	18
No change	7	0	0	7
No change except drought/other climatic changes	12	0	0	12
Total	**21**	**2**	**14**	**37**

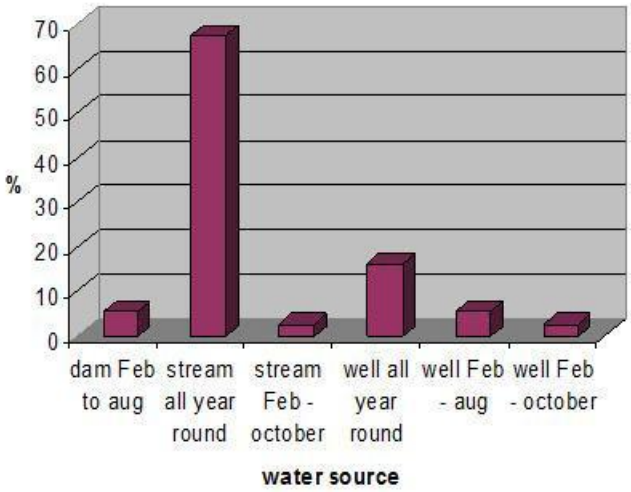

Figure 3. Water sources and reliability

If SHG remains the responsibility of women its potential to be transformed into a sustainable livelihood strategy is limited because it will not get enough attention as people are pursuing other strategies.

Livelihood assets and SHG

The different assets that individuals have can improve and or maintain the foodsecurity situation in their households through SHG and can transform SHGs into a sustainable livelihood strategy. These assets include physical, financial, social and natural capital. The human capital has been discussed under the demographic characteristics

Social capital: Almost all the respondents indicated that sometimes they fail to buy inputs so they get them from friends and relatives within the community. About 73 % of the respondents were getting seeds from friends and relatives while only 27 % got from private suppliers. Social capital refers to the social resources upon which people draw support in pursuit of their livelihood objectives (DFID, 1999). The research revealed that within the social group people help each other in times of need and in acquiring inputs for the SHGs. The strong social ties that exist in the study area help to improve the way SHGs are managed. During focus group discussions people highlighted that they assist each other with seeds, space for SHG and even ideas about gardening.

The food aid is basically from non-governmental organizations such as CARE International and Christian Care and they last for a specific period of time. However, during the time of data collection the last time they received aid was about six months from the date of the interview. Apart from food aid, CARE International also provided some training on nutritional gardens in the study area improving the way SHGs are managed.

Natural capital: access to land, water and fertile soils may transform SHG into a sustainable livelihood strategy. For instance degraded land with depleted nutrients reduces the sustainability of SHG, whilst the availability of water is an ingredient for sustainable SHG.

Water Source and Reliability of the Source

The source of water and its reliability play an important role in the transformation of SHG into a sustainable livelihood strategy. Water is the main ingredient for SHG.

If water is available all year round it is easy for SHG to be transformed into a sustainable livelihood strategy. Without reliable water sources then it is difficult to achieve sustainability in SHG. Sixty-five percent of the gardens are located close to perennial streams, 12% close to perennial wells whilst 33% of the gardens are located close to seasonal water sources (fig 3).

Most people located their gardens close to perennial streams and wells because gardening is practiced all year round in the study area except when there is drought or when the wetlands are logged due to excessive rains. The main water source in Chikwanda VIDCO 3 is the all year round stream that means transforming SHG into a sustainable livelihood considering water availability only might be achieved. From the focus group discussions and interviews with key informants water availability was not a limiting factor to the sustainability of SHG in the study area as water shortage was insignificant (1%). Major problems that were indicated included pests and diseases which constituted 36 % of the sample, while 38 % had problems in input acquisition, 22 % had marketing problems, 3 % lack production know how whilst only 1 % had water availability problems.

Since water was not cited as a limiting factor in the study area one could suggest that SHG had the potential of becoming a sustainable livelihood strategy, for availability of water is an important ingredient in the sustainability of SHG. However, although water seemed not to be a problem at the time of the study respondents indicated (Table 3) that water problems were likely to arise in the future due to recurrent droughts, climate change and pressure because of population increase. Then, if water is going to be a problem in the future due to the different reasons as indicated by 49 % of the respondents it is possible that SHG could be sustainable today and not in the future. The scarcity of water limits the potential to increase food production in the dry rural regions with a high subsequent prevalence of under-nutrition (Laker, 2004 cited inWenhold et al., 2007). At the global level, Rosegrant et al. (2002) cited in Wenhold et al. (2007) predicted that, if current water management policies continue, farmers will find it difficult to meet the world's food demands and projected that the global yield growth rate for all cereals will decline from 1.5% achieved between 1982 and 1995 to 1.0 % per year during the period 1995 to 2025 (Wenhold et al., 2007).

When asked to state other constraints to sustainable SHG 46 % of the respondents indicated that they face water logging problems in wetlands especially during the wet season. That means all those gardens in wetlands and others along streams face water logging resulting in some of the respondents abandoning their gardens until the area is dry. This has affected the level of production of the gardeners. The abandonment of gardens during certain period of the year is an indication of the unsustainability of the SHG as a livelihood strategy in its current status in the study area.

Conservation Works

The variety of crops grown by farmers (leaf, root, fruit and leguminous crops) formed the basis for effective soil nutrient exchange. From the interviews and focus group discussions, soil fertility was cited as another factor that affects the sustainability of SHG. Research revealed that 73% of the respondents indicated that they maintained soil fertility through the use of crop rotation, 51 % compositing, 59 % use animal manure, 46% grow fruit trees, 11% mulching whilst 8% use contours. Those who used crop rotation said that it reduced diseases and pests, prevent soil erosion and at the same time maintain soil fertility. Crop rotation also does not require labour except rotating crops. This was also reported by Mukwada (2000) who said that crop rotation improves the nitrogen status of the soil by leguminous plants. It enhances the nutrient status of the soil when deep rooted crops draw nutrients to top levels of the soil (Grant, 1981cited in Svotwa et al., 2008). If well practiced, crop rotation can promote the transformation of SHG into a sustainable livelihood strategy by improvement and maintenance of soil fertility.

That some of the farmers (59 %) added manure to the rotation seasonally could imply high rate of maintenance of the productive capacity of the fields and this has the potential of transforming SHG into a sustainable livelihood strategy. Manure is a good source of phosphorus necessary for plant development. Apart from maintenance of soil fertility, the manorial effect is important in the control of pests and diseases (Svotwa et al., 2008). This would reduce the budgets for inorganic fertilizers and chemicals needed to control diseases. The low percentage of farmers using manure is lack of livestock and hence no manure. Maintenance of soil fertility and organic matter may be a major problem because of relatively high costs to buy and transport inorganic fertilizer and a shortage of manure resulting from the loss of cattle and goats in the 1991/92 drought (Campbell et al., 2002).

Almost all(95%) of the respondents used one or more conservation techniques which is an indication of conservation awareness. Conservation awareness enables the gardeners to develop the commitment to constructively participate in environmental conservation. Environmental awareness enables community members to develop the commitment to constructively participate in environmental conservation (Baez et al., 1987 cited in Campbell et al, 2002). The development of such an appreciation of environmental quality among wetland farmers promotes in them an attitude of care for their plots and a sense of responsibility for the well-being of

the wetland system as a whole (Muler - Saman and Kotschi, 1994 cited in Svotwa el al, 2008).

As indicated earlier most gardens are located in wetlands along streams due to the steady supply of water. There were variations in the sizes of land cultivated by the farmers in Chikwanda for both mainland cropping and SHG. The majority (60 % of the farmers) cultivate on land pieces varying from 51 – 100m^2 for gardening. The remainder of the farmers grew vegetables on garden portions of less than 50m^2 (14 % of the gardeners) whilst 26 % of the farmers used more than 100m^2 for SHG. For mainland cropping the majority of the farmers used land portions varying from 1 – 2 hectares (62 %), 22 % use less than 1 hectare of land whilst 16 % use more than 2 hectares of land.

The small land sizes indicate that there was pressure on land resources and this could reduce the potential of transforming SHG into a sustainable livelihood strategy. This was also highlighted by Campbell et al (2002) who indicated that access to good-quality agricultural land was often limited, sometimes by high population densities (e.g., Malawi) or by the alienation of better farming land for large-scale commercial concerns (e.g. Zimbabwe). Nemarundweet al. (1998) cited in Campbell et al (2002) stated that land shortage has resulted in a number of infringements of the restriction of cultivation in grazing areas. Furthermore once this land is converted to a garden and is fenced it becomes private property only accessible to kinsman only.

These small pieces of land are also highly fragmented as population continued to increase and more space for village heads to allocate new land to families and farm size declined with each successive subdivision at inheritance (Ellis et al., 2003). This has an impact on output and also difficult for mechanization making SHG not a viable livelihood strategy in the study area. Svotwa et al. (2008) seem to confirm this when they stated that the small land portion sizes in Mwaonazvawo wetland were indicative of the high rate of land fragmentation that was associated with the general increase in the size of the population and the number of families that needed to survive on the wetland. They went on to say that increase in population density could also be attributed to the land degradation expressed as pronounced soil erosion and decrease in soil productivity. In Sub-Saharan Africa due to rapid population expansion, small plots have been sub-divided. This provided a threat to sustainable utilization of the land and is at risk of degenerating into 'the tragedy of the commons' as postulated by Hardin (1968) cited in Svotwa et al. (2008). However it could also be argued that due to high population densities labour availability per unit area is higher which may enhance the viability and hence sustainability of SHGs.

The variation of sizes of the farmers' garden portions could be a result of unsystematic and uncontrolled fragmentation of fields as farmers shared their land portions with their next of kin. If the land is highly fragmented then production per household tends to decline (Svotwa et al, 2008). Most of these gardens are along river beds with perennial streams and in wetlands and wetland margins which are productive. This was also noted by Svotwa et al (2008) that farmers tend to densely populate areas whose physical environment support agricultural production.

Physical capital

Access to information

Sixty-five percent of the respondents said that they do not have radios and could not afford newspapers whilst 35 % said they had radios but sometimes they could not afford the batteries. This shows that the flow of information was limited. Normally the time the information reaches the communal garden farmers it would be out dated. New varieties of seed may come out but not available in the local shops reducing the viability of SHG as a livelihood strategy. This is in agreement with Jackson et al (1997) observation that at some point lack of updated information reduced the viability of SHG as a livelihood strategy in Mashona land East Province.

Transport and marketing

The most commonly cited problems during the interviews and focus group discussions, included lack of market places and lack of transport to the market. Transport and market play important roles in the sustainability of SHG. If there is no transport to the market and no close markets then people would not produce surplus for sell. They will produce what is enough for home consumption and this has little significance to the living standards of people. Most activities people are engaged in them to get food and money to supplement food and other household chores. If SHG is not giving them income then transforming it into a sustainable livelihood may cause problems.

The results also indicated that 14% face the problem of over-abundance of produce at certain times, 40% faced the transport problem whilst 46% face the problem of locals who do not have cash and end up selling at low prices or barter trade. This was in agreement with what Jackson et al (1997) observed in Mashonaland East. They found out that many times, farmers prematurely harvested the produce to take advantage of any truck coming through the way while others left the vegetables to over ripe in the garden because no transport has been available. As a result farmers end up selling the vegetables at very low prices. All these constraints can

hinder the transformation of SHG into a sustainable livelihood.

Financial capital

Financial capital includes movable assets such as livestock and liquid assets such as regular inflows of money that people use to achieve their livelihood objectives (DFID, 1999 and Carney, 1998). The main source of capital is available stocks and regular inflows of money. When financial capital is available it can be used to build human capital (education), to make improvements in physical capital (fencing for irrigation house improvements and for the purchase of implements and utensils, cattle which in turn produce a number of goods and services (Campbell et al, 2002).

The proportion of the respondents who had no cattle was 32 % whilst 73 % had no goats. Ownership of poultry was found to be more widespread with 95% of households possessing some number of chickens. It was indicated that there were very few goats because of water logging in many parts of the area especially during wet seasons and goats cannot survive under such conditions. Discussions and interviews also indicated that most of the cattle were lost during the 1981-82 and 1991-92 droughts and some households have never been able to restock due to lack of financial resources. Such a trend was also observed by Ellis and Mdoe (2003) in the study of the livelihoods and rural poverty reduction in Kenya. The same was also observed in Uganda by Ellis and Bahiigwa (2003). Lack of cattle means lack of draught power and manure reducing the sustainability of SHG as a livelihood strategy.

Financial assets also include access to debts or loans for SHG and other cash inflows. Out of the 37 respondents none (0%) of them received any loan for SHG because banks insisted on collateral and the nature of SHG is so risky that no financial institution was prepared to lend money to individual SHG farmers. The financial institutions usually lend money to farmers who mainly grew cash crops such as cotton, wheat, maize, beans and other mainland crop (Jackson et al., 1997). This reduced the viability of SHG as a livelihood strategy because communal gardeners usually had low incomes which were not sufficient to buy seeds and other inputs.

Status and role of SHG

SHG in CCL is mostly for home consumption and to sell surplus. Most of these gardens are located close to reliable water sources such as all perennial Mangazva stream and Dovhurwi River. Very few gardens are located close to homemade wells because most of the wells are not reliable and othersin vleis are sometimes affected by logging during wet seasons.

All households are engaged in dryland crop production (100%), with all households (100%) having access to gardens for small-scale irrigated production of vegetables. The most common crops grown include *rape, tsunga, covo,* tomatoes, shallots, king onions, sweetcabbages and okra. Maize, sweet potatoes and groundnuts are also grown in SHGs prior to rainy season. Most of the vegetables are grown mostly for home consumption that is for enhancement of food security. More than 20% of the total produce was kept for family consumption. Fourteen percent of the respondents consumed between 21-40% of the total produce, 39% between 41-60%, 35% between 61-80% whilst 14% consume more than 80% of the total produce. These results seem to tally with the results from other studies for example, in Nepal it was noted that the contribution of fruit and vegetables to the total meal of a household was about 44% and provided 60% of the household's total fruit and vegetable consumption (Gautamet al.,2004). A survey conducted in the Philippines revealed that 20% of the foods consumed by families were produced in the SHGs whereas in Vietnam 51% of their produce is used by household members (Trinh et al.,2003 cited in Gautam et al., 2004).

Surplus tomatoes, king onions and sweet potatoes are sold along Chiredzi road nearby to generate income. This seems to tally with what was observed by Friesen (1998) and Gari (2003) who postulated that in the SLF, SHGs represent a supplementary source of food and a basis for nutritional quality in rural households, a source of income and are helpful to cope with food shortage periods and failures of staple crops.

Farmers who earn $75 – $120 per year had a highest frequency (60 %); those who earned more than $120 had 16 % while those who had little or no income from gardening had 14 %. The lowest (11 %) had less than Z$75. The role of SHG as a source of income in the study area seems to agree with the findings of Gautam et al (2004) who observed that in Sri Lanka clove production in SHGs in Sri Lanka was found to contribute an average of 42 % of farm income. This was also observed in Bakool, Somalia where 34,000 people benefited from the USAID's support of the Adventist Development and Relief Agency (ADRA) Emergency Water and Livelihood Support Project (EWLSP) and vegetables sold in local markets generated an average of US$5-US$7 per week (ADRA, 2007). This was also observed by Wong (2005) who postulated that between 70 % and 100 % of garden produce grown in Kapit was sold to local consumer markets confirming that gardening has a role as an income generator in the study area.

Interviews and discussions indicated that income from SHG is used to buy supplementary food stuffs and other household needs such as paying taxes, to pay school

fees and buy stationary. Most of the SHG income ensures food security (76 %). This shows that most of the RRAS in Zimbabwe suffer from food insecurity. Very few (11 %) use the income to pay fees and buy stationery while 13 % do not have income from SHG they consume all (100 %) of the produce indicating that SHG helps to ensure food security in the study area.

The results have shown that about 60 % of the respondents had fruit trees in their gardens and about 54 % also had live fences around the SHGs. In slopping lands, it helped in conserving the soil and water through the use of soil and conservation works such as the construction of contours. Moreover, SHGs also supported the recycling the household organic waste through the use of composts.

Summary of research findings

The results have shown that the introduction of new ideas through training could transform SHG into a sustainable livelihood. Although training is important in transforming SHG into a sustainable livelihood strategy results indicated that only 43 % of the respondents underwent some training whilst 57 % were not trained. As a result of a considerable number of farmers not having been trained some of the key activities like record keeping are not being done in the study area. Only 10 % (4 respondents) keep records whilst 90 % did not keep any records. This could be the reason why SHG was not viable in the study area. The results also showed that the transformation of SHG in the study area could be affected by gender factor since SHG in the area is the responsibility of women and children whilst men are engaged in other activities thereby weakening its contribution to sustainability as a rural livelihood in the study area. With an average household size of five and average garden size area of 100m^2 it might be asserted that if this available labour was effectively used SHG might be transformed into a sustainable livelihood strategy. The existence and functioning of social institutions can facilitate the transformation of SHG into a sustainable livelihood strategy provided that the institutions are functional. People in the area shared ideas and help each other with seeds, chemicals and information on how to increase production. Social capital helped to reduce free rider problems associated with public goods and this promotes natural resource management promoting the sustainability of SHG.

The availability of water means that SHG has a great potential of becoming a sustainable livelihood. Water logging in some parts of the study area caused the abandonment of some SHGs affecting the level of production. The abandonment of some gardens shows that SHG was not a viable livelihood in the affected area. The fertility and conservation methods that are being practiced such as mulching, crop rotation, contour ridges, animal manure and composts promoted the transformation of SHG into a sustainable livelihood strategy. These were the popular techniques used in horticulture (FAO, 2005). The existence of small land sizes indicated that there is land pressure that could lead to land fragmentation. As a result there are numerous but small gardens in the vleis and river banks in the study area and these might not be viable. Physical capital such as access to information had an impact on the sustainability of SHG in that it led to limited flow of information such as agricultural programmes and outbreak of diseases and pests and the existence of new seed varieties. This has a potential of hindering the viability of SHG as a sustainable livelihood strategy. The lack of adequate transport and marketing infrastructure in the study area forced people to sell produce from their gardens within the local community at low prices. This has reduced the sustainability of SHG. Non availability of capital such as livestock and access to loans impacted negatively on the viability of SHG in that 32 % of the respondents did not have livestock and were deprived of draught power and manure hence reducing productivity. People indicated that they had no access to loans or credits. None of the respondents in the study area has ever received any loan or credit for SHG. This hinders the transformation of SHG into a sustainable livelihood strategy due to lack of financial resources to purchase the inputs.

CONCLUSION AND RECOMMENDATIONS

This paper concludes by affirming that SHG can be transformed into a sustainable livelihood strategy in Chikwanda Communal Lands and other semi-arid environments if the community has access to viable markets, trained on the sustainable use of natural resources such as water and land and has access to livelihood assets (human, financial, physical, natural and social).Constraints such as poor markets, lack of garden inputs, land degradation and climate change if addressed SHG can be a viable livelihood strategy. There is need for all the stakeholders such as the government and NGOs to develop and promote awareness campaign programmes in the context of sustainable development in order to raise awareness on the potential of SHG to become a sustainable livelihood strategy and knowledge on how to transform it into a sustainable livelihood strategy. There is need for AREX officers to offer extension services to smallholder farmers on how to manage SHG in a sustainable manner such as conservation techniques, use of fertilisers and pesticides and the use of high yielding variety seeds.

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