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DAMBO CULTIVATION IN ZIMBABWE: CHALLENGES FACED BY SMALL-SCALE DAMBO FARMING COMMUNITIES IN SEKE-CHITUNGWIZA COMMUNAL AREA

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ABSTRACT

Sub-Saharan Africa is one region that has been riddled by political, socio-economic problems in the recent times. These problems have been precipitated by erratic rainfall patterns in the region. In Zimbabwe, erratic rainfall patterns and the economic meltdown in the new millennium has resulted in incredible hunger across the country causing, in turn, the intensive cultivation of dambos. While the history of dambo cultivation in Zimbabwe stretches back to the pre-colonial era, this situation has forced the rural population to 'invade' even those dambos that were spared and traditionally reserved for cultural and aesthetic reasons. As such, the cultivation of dambos has met with a number of challenges. It is against this background that the present paper investigates challenges experienced by small-scale dambo farmers and how this has impacted on the nascent environmental, socio-economic developments in Zimbabwe in the recent years. The paper adopts Seke-Chitungwiza communal area of region 2, heretofore referred to as Seke, as a case study. The choice of Seke communal area is not accidental, but premised on the fact that small-scale farmers in this area are among the few who pioneered dambo cultivation in Zimbabwe. More so, dambo cultivation has become a major source of livelihood for the referred people regardless of the challenges met. From the foregoing, we argue for the institution of a robust Environmental Management Agency that is constructively aligned with grassroots (institutional level) implementation in order to foster sustainable cultivation of dambos, equal access to dambos and the development of best practices of natural resource exploitation. We further argue that dambos should become bridging zones for the integration and alignment of locally generated based knowledge and institutional (school) knowledge through creating liberal spaces for dambo cultivators' experimentation with different forms of farming practices that foster sustainable development.

Keywords: Dambo, Seke, communal area, utilization, challenges, Zimbabwe

INTRODUCTION

The Southern African Development Community (SADC) is home to many dambo systems. These [dambos] systems in the region play a key role in supporting fisheries, pasture and agriculture in general. It is worth noting however that, dambos are fragile, and if not properly managed, are vulnerable to degradation.

In the sub-Saharan Africa, Zimbabwe has been reported to have a long history of dambo cultivation (Roberts, 1988; Scoones and Cousins, 1991). Leask cited in Scoones and Cousins (1991) observed a hill surrounded by rice fields in low swampy areas in 1867. This substantiates the belief that the farming system of the Shona of Zimbabwe was dominated by intensive farming of dambos (Scoones and Cousins, 1991). This traditional method of resource exploitation was however well adapted to conservation. Gilland (1938) observed that most native cultivation, other than of mealies, sorghum and sesamum was carefully done on dambo soils. The advent of colonisation in 1890 set in motion competition for land and natural resources thus authorities enacted legal instruments, which banned the cultivation of dambos. Despite its ban, cultivation of dambos has continued to this day. Through the legislation, the state had cast itself in the role of "dambo resource manager" with the Natural Resources Board (NRB) now the Environmental Management Agency (EMA) continuing to execute control of dambos on behalf of the state. Nevertheless, Zimbabwe like many other countries in the region has poor legislation and weak institutional structures that over the years have fuelled over-exploitation of resources (like dambos) (Scoones and Cousins 1991; Breem *et al* 1997).

Zimbabwe's communal areas comprise about 42% of the whole country and support 70% of the country's population (Makombe *et al*, 2001). Small-scale farmers have usufruct rights to land, thus while the land is not privately owned and cannot be sold or leased, it can be borrowed. The Agricultural Research and Extension (AREX) by and large coordinates agricultural activities in the rural areas. Though this body has continued to stress the government's laws against the cultivation of dambos on ground that dambo cultivation promotes environmental degradation, it has met with resistance. Dambos continue playing a pivotal role in ensuring secure household food security and sustainable development in the communal areas in many parts of the country like Seke communal area.

That said, the present study examines the cultivation of dambos in Seke Communal area, particularly the challenges dambo cultivation bring forth in such a socio-economic ridden environment like Zimbabwe. Many rural societies have been forced to utilise dambo ecosystems because of chronic droughts and a declining economy. Rural population sizes have increased over the years yet available land for agricultural purposes has remained static. Consequently this has led to increased dependency on dambos for livelihoods. Although there are legal instruments in place to manage the environment, these initiatives are not working in respect to dambos. Unless factors leading to non-compliance with the legal instruments are understood, sustainable dambo utilisation cannot be realised.

As previously highlighted, about 62% of people in the communal lands of Zimbabwe depend on dambo cultivation for their livelihoods (Dambo Research Unit, 1987). This means that dambos constitute a critical source of livelihood sustenance for the rural communities. This in a way has put pressure on dambos. While certain pressures on dambos are a result of natural calamities such as drought and climate change, among others, it appears anthropogenic activities have significantly altered the nature and rate of dambo change over the years. Alongside the impact of human activities, is a corresponding erosion of the socio-economic base on which dambo communities depend, culturally and economically. Of major concern is what appears to be limited technical expertise required for sustainable of dambos in the country. Efforts to understand dambo utilization by rural communities and its related challenges are a major milestone towards the realisation of sustainable

development. Zimbabwe has not ratified the Ramsar Convention of 1971 which lobbies for the protection and preservation of wetlands such dambos. Ratification of the Ramsar Convention will promote wise use initiatives. If some of the country s' wetlands are made Ramsar sites or exploited in an environmentally sustainable way, they would be studied with more detail. The study, it is hoped, will therefore contribute information, which might help in convincing policy makers to ratify the Ramsar Convention in Zimbabwe.

Overall, this research seeks to promote the sustainable cultivation of dambos in Zimbabwe and elsewhere. The limited awareness of dambo cultivators on how dambos should be exploited and managed has possibly led to the poor public national perceptions of dambos. It is therefore advanced in this paper that the continued productivity of dambos warrants considerable research effort.

Defining dambo

Dambo has not been an easy concept to define with precision. However, technical definitions have been conjured. According to Mäckel (1974) and Bullock (1988), "dambo" is one of several dialectal terms used to describe the seasonally saturated, grassy, narrow depressions covering as much as 20% of the plateau regions of Central and Southern Africa. The latter (Bullock, 1988) specifically defines dambos as valley bottom areas that are grass covered, generally treeless and periodically inundated. They are part of a range of habitat types known as wetlands. For Watson (1964), Webster (1965), Ollier et al. (1969) and Acres et al (1985), dambos-also termed mbugas, vleis, and fadamas-are seasonally saturated, grassy, channelless, gently sloping valley floors that commonly occupy the lowest topographic positions in African catenae or "land systems". In some quarters, dambo also known as "bani" has been defined as a Bantu term used to describe the extensive seasonally saturated, grassy depressions common to Central and Southern Africa (http://www.geo.utah.edu/dambo/index.html). It is worth mentioning that while most dambos are waterlogged for the larger part of the year, most of them dry out especially at the surface during winter season where they receive rainfall in summer. As noted by Mackel (1985), the "sponge-like" center of most dambos stays moist even during the dry season, sustaining the higher-density herbaceous vegetation in this zone. This is to say that what is typical of dambos is that they conserve moisture even during the dry season. This is the reason why dambos are also characterized by dense grassy vegetation.

The other important characteristic feature of dambos is that they are relatively flat (1/2 – 2° slope), which inhibits drainage and the formation of streambeds (http://www.geo.utah.edu/dambo/index.html). This agrees with Acres et al (1985) and Von der Heyden, (2004) who note that the relatively planar topography (½ – 2º slope) typical of dambo wetlands produces little hydraulic energy, which in turn facilitates soil saturation and inhibits channel formation.

RESEARCH SITE AND BACKGROUND TO THE PROBLEM

Dambos are a common feature in Seke communal area, and Zimbabwe or Africa in general. As researchers on environmental issues on Africa in general and Zimbabwe in particular, we have come to the realisation that most researchers on dambos (Acres et al 1985, Mäckel 1985, Bullock 1988, Von der Heyden 2004) are guilty of devoting their attention on the general description of dambos, without tackling some specific important issues that affect dambo cultivators, especially the

challenges they encounter in the cultivation of dambos. They took for granted the inconsequentiality of the challenges faced by small-scale dambo farmers. The history of dambos in Zimbabwe and Africa in general thus "makes a sorry reading with its failure to document, by default or otherwise," (Mawere, forthcoming) the challenges encountered by dambo cultivators. The consequence is that small-scale dambo farmers remain at the "tail-end" of policy making on issues to do with the challenges they meet in their farming activities as the problems that directly affect them are undocumented. This is the situation in which small-scale farmers in Seke communal area are currently in.

Seke communal area is in Natural Region 2, which has rainfall amount of between 500 and 1000mm annually. Seke has an average annual rainfall amount of 545.9 mm (Metrological Services, Harare 2007). The region is susceptible to frost occurrences. The summer season is characterised by temperatures ranging between 18 to 22 degrees Celsius. Natural Region 2 is also characterised by intensive farming of maize, tobacco, cotton and market gardening (Moyo, *et al*, 1993). Seke rural area was chosen because historically it is home to successful market gardening that is practised in dambos. Its proximity to markets in two major urban areas of Chitungwiza and Harare makes it an ideal research area on market gardening and its related challenges. The villages of Fumisi and Chinyanga are located close to a dambo where villages engage in dambo cultivation. The majority of people in these villages mostly depend on the dambo for their livelihoods. The two villages are about 50km south east of Harare. Both villages are in ward 3 of Seke communal lands. Ward 3 has a total population of about 2970 (CSO, 2004) approximately there are about 300 people in the two villages.

According to Headman Seke (2007), dambo cultivation started during the pre-colonial era, but intensified during the colonial period especially with the enactment of the Land Apportionment Act of 1930. The cultivation became even more intensive after independence due to the shrinking of the national economy and frequent droughts.

During the pre-colonial and colonial eras, dambos were mainly used for growing crops for domestic consumption during the colonial era. Crops grown included rice and *tsenza* (*Coleus esculentus*). Rice was grown in furrows known in Shona as *mateka*. Dambos were used for dry season cultivation to supplement grain grown in dry fields. During the colonial era villagers used to harvest plants like *chiverevere* (*Senecio erubescens*) and *nyaguru* (*Sesamum angustifolium*) used as relish. Mice *(mbeva*) were also hunted in the dambos during this period. Two elder villagers said that they also harvested *muhute* (*Syzigium cordatum*) fruit so as to supplement their food.

Below is the map of Zimbabwe where the case study (Seke-Chitungwiza communal area) is located (Figure 1).

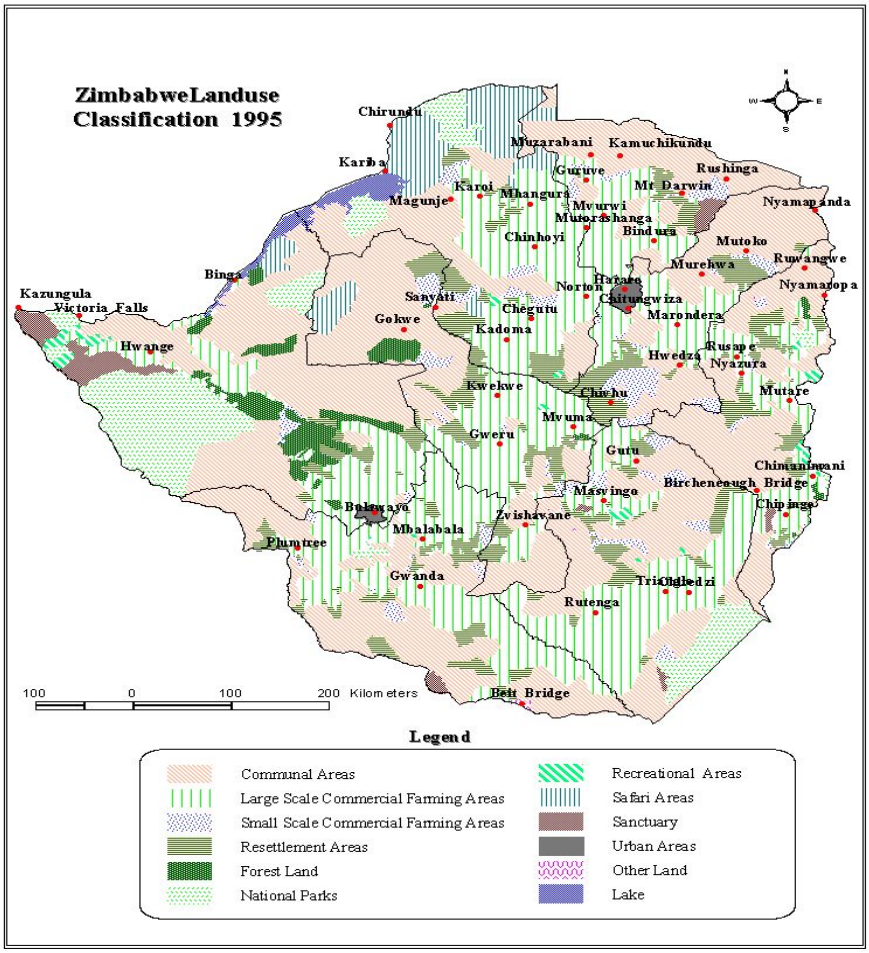

Figure 1: Adopted from Zimbabwe's Land use classification and location of main towns, 1995.

RESEARCH QUESTION AND METHODOLOGY

The present study seeks to address the questions: "What are the challenges faced by small-scale dambo farmers in Seke communal area? How challenges encountered by small-scale dambo farmers can be dealt with?"

As part of research design, the researchers relied on literature studies, content analysis, observation and in-depth interviews. The research was carried out between 2007 and 2009 using a randomly selected sample of 85 people (50 females and 35 males). The sample size of 85 was considered sufficient in providing the general perceptions of the small-scale farmers of Seke communal area, particularly the directly affected individuals.

Using observation data collection procedure the researcher observed the physical environment in the chosen area. The field observation, a method which the researcher adopted from his anthropological studies was used as one of the major collection tools to ascertain the project location and what really happened on the ground. Observation allows the researcher to have access to first hand information that s/he can observe and record in person.

To complement the field observation information and generate an in-depth insight into dambo cultivation in Seke communal area, the research used other several methods of data collection techniques. Data collection techniques included focus group discussions (FGDs), questionnaires, key informant interviews, informal interviews and direct observation. Throughout the study, researchers collected field notes, which were coded. Questions were coded and categories formed around the codes. The categories were then computerised and analysed using the Statistical Package for Social Sciences. Cross tabulations frequencies were used to come up with conclusions and patterns of interpreting data.

Informal interviews were conducted, particularly with the mostly affected (directly or otherwise) members of Seke communal area-small-scale farmers. Such methods can generally be described as qualitative and quantitative respectively. As previously highlighted, such methods were concurrently used in order to obtain more information on the possible challenges of small-scale dambo cultivators in addition to data obtained through observation. More so, the researchers wanted to hear from the affected people –"voice of the suffering" - on what they think could be lasting solutions to the challenges being encountered.

More importantly, it was hoped that the advantages of one method offset disadvantages of the other, hence the reason why a number of methods were employed. The study focused on samples of respondents who utilise dambos in the two villages. Researchers made use of the qualitative method because it is more likely to represent a true picture of dambo resource users in terms of their experiences, attitudes and beliefs. The qualitative method was used in the hope that it would be quicker and relatively inexpensive. Quantitative data gathering technique was used because of its strength to analyse data objectively and scientifically. Quantitative data was also used because the researchers hoped it would enable them to make comparisons of responses on dambo utilisation. Permission to carry out research was sought from the Seke District Administrator and was granted. Research respondents were told that there would not be any financial rewards for their participation. Researchers assured respondents that confidentiality and anonymity would be maintained. Some dambo resource users refused to participate in the study because they suspected that the researchers were AREX officers. The researchers thus faced a number of constraints during the study.

A study of this nature requires a long period to assess the whole production cycle. As this research was carried out for a period of about 3 years, the data are very useful in giving an insight in the dynamics of dambo utilisation. The researchers faced no problems in assembling participants for focus group discussions. The researchers faced financial problems as during the time the research was carried out, Zimbabwe's economy was still unstable. The study was to a large extent financed by the researchers. Also it proved very difficult to gather data on amounts of money respondents realised over the years because of the hyperinflationary environment in the country. Respondents confessed that they no longer remembered how much they were earning from market gardening a few years ago.

Collected data were tabulated to show frequencies before being subjected to evaluative analysis. The Table 1 contains details of major source of income in Seke communal area.

Table 1 of 1: Details of Source of income Total Percent

Source of income	Total	Percent
Marketing gardening	**81**	**98.8**
Remittance from relatives	**0**	**0**
Part-time jobs	**11**	**2**
Livestock sales	**0**	**0**
Others	**0**	**0**

Source: Survey 2008

DISCUSSION BASED ON RESULTS OBTAINED FROM THE STUDY

From data collected during this research, it was revealed that dambo cultivation is not only desirable but a must for communal farmers in Seke's two villages of Fumisi and Chinyanga. In very simple terms, it is the difference between starvation and having enough food. Historical and current trends were the basis for investigating uses of dambos in Seke communal area. About 85.4% of the respondents are not employed and thus survive mostly on market gardening. Most of the respondents sell their produce at Guzha Business Centre and Mbare Musika in Harare as already mentioned. Approximately 60 percent of the households said in a fortnight they earned about US$ 40, 30 % said they earned US$ 50 and 10 % said they earned between US$ 70 and US$ 100. Most of the respondents who said they earned above US$ 50 are below 40 years. The villagers thought the research was meant to solicit for funds from donors despite the fact that the researcher had informed them of the purpose of the study. Villagers had high expectations on what they thought would be financial benefits from the study. Figures of money earned by the villagers therefore are conservative because the researcher's field guide disclosed that respondents had underreported their incomes. Thus managing expectations of respondents is one of the greatest challenges facing environmental practitioners in this generation. Garden cultivation as an income-generating activity has greatly contributed to household food security in these two villages. According to FGDs conducted in the villages, income from dambo produce is used to purchase food, clothes and groceries. During periods of high incomes villagers also can afford to buy luxuries like mobile phones and radios. One villager in Chinyanga has even managed to install a satellite dish at his home.

Almost 77% of the respondents acknowledged that they exploited dambo resources mainly for the purposes of market gardening. Respondents also stated that dambos supply water for domestic purposes, provide pastures for livestock and are used for recreational purposes and brick moulding.

Dambos have the advantage of dry season cultivation. The major livelihood strategy in the post-colonial era is market gardening. Respondents said that they cultivate crops all year round. The major crop grown is covo (*Brassica napus*)

specifically for commercial purposes. Indications are that the small-scale farmers are involved in monoculture to a large extent. However, other crops grown are tomatoes, onions, cucumbers, maize, cabbages, beans, sugarcane and carrots albeit on a very small scale. About 10 % of the respondents interviewed grow bananas for commercial purposes and domestic consumption. According to respondents, dambos were mainly utilised for growing crops for domestic consumption during the colonial era. Crops grown included rice and *tsenza* (*Coleus esculentus*). Rice was grown in furrows known in Shona as *mateka*. Dambos were used for dry season cultivation to supplement grain grown in dry fields. It was also revealed that during the colonial era villagers used to harvest, from the dambos, plants like *chiverevere* (*Senecio erubescens*) and *nyaguru* (*Sesamum angustifolium*) used as relish. Mice *(matapi*) were also hunted in the dambos during this period. Two elder villagers said that they also harvested *muhute* (*Syzigium cordatum*) fruit so as to supplement their food.

Besides, cattle pastures were cited as another advantage that dambos bring to the Seke small-scale farmers. About 35.4% of the respondents own livestock. The cattle graze on the dambos mostly during the wet season. However some of the cattle stray into the gardens and destroy vegetables. For this reason the cattle are at times driven to graze in nearby farms. Some of the villagers water their cattle from wells on the dambos especially during the dry season. Villagers who own goats constitute about 26.8% of the respondents. The goats are tied to trees in the dambos and only feed close to the tree. None of the respondents own sheep or donkeys. The proximity of their two villages to Chitungwiza and Harare makes them targets of rustlers. Unscrupulous businessmen buy the stolen cattle at low prices and make huge profits. This explains why some of the households choose not to invest in livestock.

CHALLENGES FACED BY SMALL-SCALE DAMBO FARMERS IN SEKE COMMUNAL AREA

Zimbabwe has been in an economic decline for the past seven years. The inflation rate at one stage exceeded 6000% (the highest in the world) according to The Zimbabwean Newspaper (28 June-4 July 2007). The Zimbabwean economy registered a negative growth rate of 4.4% in 2006 (United Nations Economic Commission, April 2007). According to government sources, unemployment is pegged at 11%. However independent sources say the unemployment rate is 80% (The Zimbabwean Newspaper 26 April-2May 2007). The economic melt-down has seen its attendant vices like corruption rearing its ugly head in the rural areas. Some of the people in the urban areas who have lost their jobs are alleged to be bribing village heads so as to be allocated gardens. Some have settled in rural areas like Seke, which are close to major urban areas. Of the 82 respondents interviewed, 85.4% are not employed. They mainly survive by engaging in dambo cultivation hence putting pressure on dambo resources.

Weak institutions

Traditional authorities are meant to play a key role in natural resource management especially after the 1998 Traditional Authorities Act re-empowered them. However, the traditional leaders are now being used as “sources of political mileage”. Chiefs earn far much more than a university graduate (Mandondo 2000). Some chiefs have had their homes electrified and others have been issued with cars. With the country’s economic decline traditional leaders are more than willing to “sing for their supper” in a bid to please their political masters. Thus they are no longer custodians of “sound” environmental

management. Resultantly, natural resources are exploited in a manner, which ends up with the depletion of these resources. Traditional leaders now have very little time to monitor resource utilisation.

Population increase

Population growth imposes great pressure on water resources and underdeveloped land areas in the dambos. According to the study, the number of dambo resource users increased during the last 20 years. About 56.1% of the households said that they have been utilising dambo resources for about 20 years. This appears to be a result of the Economic Structural Adjustment Programme (ESAP) of 1995. ESAP resulted in the closure of some industries and people losing their jobs. Some of these people went back to the rural areas. About 25.6% of the respondents mentioned that they lost their jobs during ESAP and decided to go back to their villages, Fumisi and Chinyanga.

To make matters worse, in May 2005, the Government of Zimbabwe embarked on an exercise ostensibly to clean-up urban areas, an operation code-named Murambatsvina (drive out dirt). The government claims the exercise was meant to get rid of illegal businesses, illegal housing and filth. Over 700 000 families were displaced during this operation (The Zimbabwean Newspaper, 12-18 April 2007). This operation had two effects. Firstly, it resulted in the depopulation of the urban areas like Chitungwiza and Harare. Some of the families affected settled in Seke rural. Some of them are “returnees” i.e. children of the locals who lost their livelihoods in these two major urban areas. The villagers jokingly refer to these people as “new settlers”. These “new settlers” have fuelled a scramble for dambo resources with the locals. Secondly this depopulation of Chitungwiza urban and Harare negatively affected the market of their produce. Most of the people who were displaced by the operation were lodgers and *ipso facto* were the ones who mostly bought vegetables at the urban markets. One can infer therefore that the market for the Seke rural small-scale farmers has shrunk hence negatively affecting peoples’ livelihoods.

Climate change

Recent studies reveal that the world is undergoing serious climate change as global temperature is ever increasing (Mawere, 2011). In particular, the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2001), reveals that the global average temperature will increase by 1.4° C to 5.8° C between 1990 and 2100 if the levels of emissions are not reduced. Zimbabwe has not been spared by the calamities of climate change. The agricultural sector has been adversely affected. As such, dambo resource users in the villages of Chinyanga and Fumisi have been seriously affected by the effects of drought over the years. According to the Harare Metrological Department (2007), Seke’s annual rainfall is about 545.9 mm as shown by Appendix 2. The following seasons received below normal rainfall amounts: 86/87, 90/91,91/92, 93/94, 94/95, 2001/2002 and 2004/2005.This has resulted in lower productions by the people of Fumisi and Chinyanga as water sources on the dambos have dwindled. Lower production in the gardens in turn translates to lower incomes for the villagers. In the month of October and November during the research, about 81.7% of the households said that production in their gardens was decreasing. According to the majority (70%) of the respondents agricultural production was compromised by chronic droughts negatively affecting the livelihoods of the villagers. In January 2007, children at four households in Chinyanga village had been sent away from school because of unpaid fees. Also, money for construction was reported to

have run out because income from market gardening had decreased. During that same period, most of the households had run out of meali-meal due to financial constraints.

Lack of resources

From data obtained, it was revealed that in year 2009 about 37.8% of the households attributed the decline in production to lack of resources (money for buying pesticides and fertiliser). With the country's high rate of inflation most pesticides are now out of reach for many villagers. Most of the villagers said they could no longer afford to buy seed and fertiliser. Since most of the households do not have livestock, it means they do not have access to both organic and inorganic manure. This has negatively affected the dambo farmers. The ban on dambo cultivation is often circumvented through lack of enforcement and loose interpretation of the law. However this has negative implications for garden cultivation in dambos. This has resulted in limited extension services to dambo farmers and this in turn makes dambo agriculture less productive. From data obtained, 74.4% of the households rated the role played by AREX in dambo utilisation as weak. About 48.8% said they did not know the role that is supposed to be played by AREX officers. However, researchers discovered that some of the villagers were involved in stream bank cultivation and these were always on the lookout for AREX officers because their gardens were within the 30 metres range from the river. The researchers held a key informant interview with an official from AREX who cited the harsh economic environment as the major reason why there is very little in terms of extension services. The official said that most of their vehicles had broken down and due to lack of financial resources could not be repaired. 18.3% of the households cited prohibitive transport costs to ferry their produce to the market as the major reason why they were not making much profit. Others cited the fuel crisis in the country as the reason why they were having problems carrying their produce to the market. At times their produce goes bad because of delays in ferrying it to the market. The result is that they suffer losses. This has led to villagers resorting to emerging economic regimes as short-term solutions to the sustenance of livelihoods. Some youths were selling fuel on the so-called "black market" or parallel market in order to augment income from dambo utilisation. This means the fuel, and of course transport, would be more costly for dambo farmers.

Moreover, dambo farmers are not eligible for credit from the Agribank. This worsens the plight of these farmers as seen in the two villages of Fumisi and Chinyanga. 11% of the respondents said one of their major problems was theft from their gardens. This problem of theft is a result of the country's economic decline, which has catapulted high unemployment rate and the two villages' proximity to Chitungwiza urban and Harare where there are ready markets. Most of the gardens in the dambo are fenced with barbed wire and branches of *Mupangari* (*Dichrostachys cinera*) making it easy for thieves to break into the gardens. Villagers suspect that the thieves are within the villages and most fingers point to the "new settlers". Incidents of theft are very high in the dambo farmers' gardens thereby threatening the viability of dambo cultivation. We advised respondents that this problem could be easily dealt with if farmers organise themselves into neighborhoods and make turns to guard their gardens.

Conflicts over access to land

Researchers of this study established through focus group discussions that there are serious conflicts over access to gardens in the dambo. AREX officials came to Chinyanga village in 2005 and warned all people engaged in stream bank cultivation to desist from the habit or risk prosecution. This has resulted in some villagers with gardens less than 30 metres from the stream openly clashing with the village head. The village head's garden is also less than 30 metres from the stream yet he is supposed to instruct other villagers to give up the practice. Evidence from our research indicates that allocation of gardens does not indicate a common property management regime. The village heads and their close relatives-"the village elite"- have monopoly over most of the land in the dambo. Some of the "new settlers" have been denied permission to engage in dambo cultivation and in some cases are allegedly reported to pay bribes to secure a garden in the dambos.

Draught power

The other challenge noted during this study is that many dambo farmers in Seke communal area do not own livestock for use as draught power. This greatly hinders dambo farmers' ability to put more land under cultivation. The few villagers who own cattle demand exorbitant charges for use of their cattle as draught power. Many who are enjoying good health resort to zero tillage. The elderly end up utilising small portions of their gardens and this greatly compromises their capacity to enhance their household food security.

The HIV/AIDS pandemic

Two of the respondents confessed that they are HIV positive. The pandemic is taking its toll on the health delivery system of the country. Medical facilities have become very expensive to access given Zimbabwes' current economic decline. This, therefore compromises the patients' capacity to tender their gardens hence negatively impacting their livelihoods. The following section will make recommendations and conclusions of the study.

WHAT NEEDS TO BE DONE AND THE WAY FORWARD?: SOME RECOMMENDATIONS

Use of organic farming

Due to high costs of inputs in dambo farming, the researchers recommend for alternative sustainable methods of farming. One such method is organic farming. Organic farming, as an alternative method encourages farming practices that create environmentally and economically sustainable agricultural production systems. This type of farming generally entails producing crops free from synthetic fertilisers and pesticides. Use of organic manure can boost production as it improves soil structure and fertility. To enhance soil fertility, dambo farmers should practice agro-forestry, which provides nutrients to the soil, for instance, use of *Leucaena leucocephala* and *Sesbania sesban*, nitrogen fixing plants. Crop rotation of different crops like beans, potatoes and maize improves soil fertility and therefore can help farmers increase production. Besides, dambo farmers can practice integrated pest management, which involves the use of pest-repellent plants like lemon grass, garlic, marigold flowers and sun hemp in place of synthetic chemicals. This process makes use of suitable control measures to reduce pest-related losses to an ideal level with the aim of conserving biodiversity and minimising harm to ecosystems and people s' health. Synthetic chemicals are very expensive therefore small-scale farmers cannot afford to buy them especially

in this harsh macro-economic environment. Integrated pest management thus can be economically attractive to dambo farmers. Dambo cultivation plays an important role in promoting the nutritional needs of rural communities. The researchers recommended diversification of the crops dambo farmers grow. In these days of AIDS and HIV the need for herbal gardens cannot be over-emphasised. Herbal plants, which boost the immune system, must be planted in the gardens. There is need to plant indigenous nutritional plants like *tsine* (*Heteropogon contortus*). The following plants with medicinal qualities can also be planted: Moringa, Lemon grass, Rosemary herb, Sweet bazel, Wormwood, Lavender and Aloe. With donor funding available, each village can have one herbal garden and the whole village contributing to its well-being. All members of the villages thus benefit from the project.

Civic education through water conservation workshops

The safe area of cultivation is in the upper dambo area (Dambo Research Unit, 1987). Water in the upper dambo zone is close to the surface. Extension officers should educate dambo farmers to cultivate in these upper areas of dambos. Officials from AREX should demarcate areas in the dambo where cultivation is not allowed because of the potential danger of disturbing the hydrological cycle. There is need to plant vertiva grass in the area around the gullies especially the head of the gully. Vertiva grass will reduce the rate of erosion hence reducing the rate of siltation. Non- Governmental Organisations (NGOs) can implement food for work programmes to reclaim land that has been destroyed by gully formation.

More importantly, farmers involved in dambo cultivation should practice water conservation techniques such as mulching. Dambo farmers can also implement the Keyline Design for sustainable land use. The Keyline Design plan is based on water control and land management, which uses resources for the betterment of the soil and the landscape as a whole (Yeomans and Yeomans 2008). In the Keyline Design, a controlled system of cultivation is used to increase water absorption and minimise run-off. This, in turn, minimises the available water responsible for erosion. Another advantage of this plan is that it improves the fertility structural stability of the land's soil. When properly implemented, the Keyline Design will provide a strong foundation for long-term sustainability and commercial viability within communal societies utilising dambos.

Institutional reform

Current legislation on dambo utilisation needs to be relaxed. Statutory Instrument 7 of 2007 requires dambo farmers to apply for licences in order to utilise dambo resources. One hopes that EMA will not fall into the trap of the normal bureaucratic red tape in issuing out licences, as this will negatively affect the dambo farmers. Reforming legislation which limits dambo farmers' access to credit will help in increasing productivity because most of the communities who utilise dambos are constrained by lack of financial resources. Land tenure should be reformed as well. Amendment 17 of 2006, which has resulted in the nationalisation of land by the government, needs serious reflection and reformation. We therefore recommend that small-scale rural farmers should be given tenure rights over dambo land. This will greatly motivate them into utilising dambo resources in a sustainable manner. The present scenario promotes practices that might result in depletion of resources in the rural areas. Local management institutions must be strengthened so as to help in sustainable utilisation of dambo resources. According to Murphree (1991) communities can be institutions that can effectively contribute towards sustainable resource management, if they are given bonafide proprietorship. This implies giving communities the right to use and benefit

from resource utilisation. Murphree (ibid) further argues that communities should also implement rules of access. Policies on resource utilisation should therefore embrace these vital components. Dambo resource users' inputs should be brought on board in natural resource policy formulation. Thus a bottom-up approach, sensitive to local practices and needs should be put in place. At the same time, resources should be made available to organisations like AREX and EMA so that they implement extension services in the rural areas. Workshops could be held under the auspices of EMA, AREX and NGOs aimed at educating small-scale farming communities on sustainable utilisation of dambos. Such workshops could be an opportunity for these rural communities to contribute to sustainable utilisation of dambos through indigenous knowledge systems. If funds are available, exchange visits between rural communities especially in areas where there is evidence of sustainable utilisation of dambos are encouraged.

Livelihood options

The study also recommends the need for the development of more livelihood options. If a household has more livelihood options it is less vulnerable to hunger. Rural communities can use income from dambo cultivation to engage in bigger income generating projects like poultry and sell these to closer urban areas. Piggery can be another option. Plant residues can be used to feed the pigs and the manure is then used to improve soil fertility. Such livelihood options can help rural communities to survive especially during the "period of hunger" between July and December when water levels in the dambo wells are very low. The over dependence on one livelihood option like gardening will be done away with if more options are pursued. In short, if rural communities farm ecologically, they will improve their livelihoods and also help regenerate the environment and ecosystem services.

National policy amendment

Zimbabwe still lags behind in establishing a supporting policy framework for the development of the organic movement in the country despite having realized the potential of organic agriculture as both a measure to safeguard the environment and ensure a healthy population. The existing agricultural policy encourages the use of external inputs even in cases where these inputs are not available. There is need for policy formulation and development of advocacy programmes that are aimed at promoting participatory approaches to policy formulations and adoption of strategies that strengthen policy planning mechanisms which promote and provide for issues relating to organic agriculture. The policy should be formulated through engaging key stakeholders from government, the private sector, farmer organization and international development partners such as Food and Agriculture Organisation (FAO), United Nations Environment Programme (UNEP), International Federation of Organic Agriculture Movement and United Nations Conference on Trade and Development (UNCTAD).

Worse still, Zimbabwe has not ratified the Ramsar Convention of 1971 which lobbies for the protection and preservation of wetlands such dambos. Ratification of the Ramsar Convention will promote wise use initiatives of important resources such as dambos. If some of the country's wetlands are made Ramsar sites or exploited in an environmentally sustainable way, they would be studied with more detail. Also, dambo utilisation can play a pivotal role in rural sustainable development and prevention of environmental degradation if the national policy is amended accordingly.

CONCLUSION

This study examined the challenges being faced by small-scale dambo farmers in many communal areas of Zimbabwe and by extension Africa. It has revealed that most researchers on dambo cultivation in Africa, and Zimbabwe in particular have devoted insignificant or no attention to the challenges being faced by small-scale dambo farmers. In the light of this observation, we have argued that the plight of Seke dambo farmers of Zimbabwe are a problem resonant to all dambo farmers all over the continent and should therefore be documented and addressed as a matter of urgency if human suffering is not to be perpetuated.

Most importantly, we have suggested a number of recommendations that are beneficial to both national governments and small-scale dambo farmers. Of the recommendations, we underscored that if the challenges facing Seke small-scale farmers and others across the board are to be addressed, there is need for policy amendments, use of organic farming, civic education and institutional reform. Overall, the merit of this study lies in its quest to tackle the plight of small-scale dambo farmers in ways that illuminate understanding of their practices and promote sustainable development.

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