Livelihood Resilience Strategies in the face of Water Scarcity: The case of Kenzamba Ward 17 of Makonde District

By

Zingi Godwin K.
Chitongo Leonard
Research Article

Livelihood Resilience Strategies in the face of Water Scarcity: The case of Kenzamba Ward 17 of Makonde District

Zingi Godwin K. and Chitongo Leonard*

1High School Teacher in Rural Development.
2Lecturer in the Department of Rural Development and Resettlement, Great Zimbabwe University, P.O. Box 1235 Masvingo.

Email: 1gzingi@gmail.com, Tel: +263775 225 215
*Corresponding Author’s Email: vachitongo@gmail.com, Tel: +263773 292 343.

ABSTRACT

The study sought to assess the importance of livelihood resilience strategies in the face of water scarcity in the Kenzamba ward 17 of Makonde District in Mashonaland West Province. Kenzamba is a water stressed area which falls under agro-ecological region four with total annual rainfall ranging between 450-600mm. It is characterized by poor sandy soils which makes it difficult for agricultural activities to take place. There is glaring evidence of environmental degradation. People have diversified into resilience strategies such as rural trade, conservation agriculture, migration as well as gold panning activities as a buffer against contingency and uncertainties caused by water scarcity. The research approach included both qualitative and quantitative methods to collect data from respondents as well as key informant interviews, Secondary sources were also utilized, this included literature review from related studies from other authors. The study population according to [CSO 2002] was 5995 people from 1196 households within 28 villages. A sample of 30 respondents was selected using stratified random sampling. The data which was collected from the research was presented in tables, pie charts and graphs. The researcher concluded that the people of Kenzamba have embraced conservation farming in order to increase yields from cereals and maize, natural resource exploitation such as gold panning, petty trading, saving club and repair work as in non agricultural activities. The researcher recommends that the government play a pivotal role in creating an enabling environment for creation of water points given the distance travelled by people in search of water resources especially during dry periods.

Keywords: Livelihood Diversification, Sustainable Livelihood, Resilience, Vulnerability, Human capabilities, Stress,

BACKGROUND OF THE STUDY

According to Nature (2011), about 80% of the world’s population 5, 6 Billion as at 2010, lie in areas with threats to water security. The water scarcity is a shared threat to human and nature and it is pandemic. Smith (2011) postulates that although the overwhelming majority of the planet is composed of water, 97 percent of this water is constituted of salt water, the fresh water used to sustain human life is only 3% of the total amount of water on earth. The earth has limited supply of fresh water stored in aquifers, surface water and atmosphere. The factors which contribute to water scarcity include, rapid urbanization, population growth, green house effects which lead to climate change. The effects of climate change is felt in both agricultural and fisheries sectors which are manifested through changes in soil moisture and temperature, evapotranspiration and rainfall variability, increase in heat stress, Narayan (2002) has it that Africa experiences a high degree of climate variability which has severe and chronic impacts on livelihoods and economic development. Much of Africa is regarded as drought prone because of the regular occurrence of successive dry years, leading to crop failures and famine.

Jackson (2001) has it that water is a limited resource particularly in Southern Africa and it is a vulnerable resource. Its vulnerability stems from several factors including, extreme climatic variability and emerging climate change which in a predominantly rural based society and agrarian economy determines if a season will result in bountiful harvest or a catastrophic event, increasing degradation of water resources due to unsustainable water and land use practices such as over exploitation of surface sources or over pumping of ground water pollution of water,
water shed degradation, loss of wetlands. World Food Programme (2010) has it that Global Warming is already affecting much of Southern Africa. Chenje (2002) observed that records from counter that make up the SADC reveals that temperatures have risen by over 0.05% in the last 100 years with the last decade being the warmest and driest ever. Over the past 20 years, there have been noticeably less rainfall and drought. These disturbing changes are happening despite the fact that Africa has contributed little to the build up of Greenhouse gases in the atmosphere. Such rainfall variability leads to drought which is an overriding factor in the degradation of cultivated lands in many parts of the world. Water scarcity increases soil degradation, while soil degradation magnifies the effect of water scarcity. Such an arrangement has had a negative bearing on rural people’s quest to increase food self-sufficiency since most parts are arid and semi-arid. Carney (1998) stipulates that agriculture which is the mainstay of rural livelihoods remains on high risk due to catastrophic impacts of drought and high temperatures. Narayan (2002) argues that one of the most critical causes of vulnerability for rural communities is rainfall variability. A large number of the world’s poorest people face challenges because they live in environmentally fragile areas such as arid and tropical lands with limited soil fertility. Water scarcity is said to be threatening the existing cultivation of about 12 million hectares of rain fed agriculture in the Sahel Region. The most vulnerable groups would be traditional rain fed farmers. Chenje (2002) observed that, there is a history of drought in Zimbabwe with peak drought years being 1982, 1983, 1984, and 2001. Water shortages have led to the loss of bio-diversity recourses that usually accompanies the decline of natural ecosystem, which robs rural communities of many important assets, Kaseke (2001) observed that an average family in rural Zimbabwe obtains 35% of its income from its natural recourses base. Wild fruits and other resources serve as a safety net, permitting people to survive when crops fail or when live stock decline due to water related diseases. Zimbabwe Vulnerability Assessment Committee (ZIMVAC) together with Nutrition Survey of 2010 indicated that 3.6 million people are food insecure and are in need of relief emergency and recovery. The majority of these people live in drought prone areas where water scarcity is pronounced such as the case with agro ecological region IV and V of Zimbabwe. The communities under which water scarcity is pronounced attempts to reduce livelihood vulnerability and build resilience by engaging in more than one livelihood strategy as to offset risks in the water stressed environments. The strategies may include migration, conservation farming, rural trading, grey economic activities such as prostitution among others.

Statement of the Problem

Vincent and Thomas (1960) argue that the natural region IV is a semi extensive farming region. Rainfall in Kenzamba is low and periodic seasonal droughts and severe dry spells during rainy seasons are common. Crop production is therefore risky except in certain favourable localities. Water scarcity has led to low yields, drying up of water points as well as underground water which act as buffer when rain season is over. Water scarcity is a key element of the vulnerability context which defines their livelihoods. It also damages livelihoods assets and livelihoods which are sensitive to water scarcity such as agriculture and fishery. Groundwater levels have become dangerously low and the quality of groundwater is deteriorating because of leaching from agricultural runoff.

Aim of the Study

To assess the importance of livelihood resilience strategies in face of water scarcity

Specific Objectives

1. To identify the resilience strategies being built by local people.
2. To evaluate how these strategies have reduced vulnerability.
3. To examine challenges faced by people in their quest to build resilience

Justification of the Study

This research unearthed livelihood resilience strategies adopted by the Kenzamba community to buffer against water scarcity. It is also going to highlight the efficacy of these strategies in countering water scarcity. The research is of vital importance to multi-rural stakeholders and ignoring such information will have ramification on livelihoods resilience strategies of the people in question. This information is useful to the NGO’s, Makonde Rural District Council, the Government, Quasi Government Institutions as well as the people of Kenzamba themselves.
CONCEPTUAL FRAMEWORK

Conceptualisation of Livelihoods

Conceptually, livelihoods connote the means activities, entitlements and assets by which people make a living. Elasha (2005) argues that assets are defined, as not only natural that is land, water, common property resources, flora, fauna but also as social that is community, family, social networks, participation, empowerment, human, that is knowledge, creation by skills and physical that is roads, markets, clinics schools and assets are considered to be stocks of different types of capital that can be used directly or indirectly to generate livelihood. They can give rise to a flow of output possibly be coming depleted as consequence or may be accumulated as a surplus to be invested in future productive activities. There are five types of assets which include the financial, social, natural, physical and human capital. Chambers and Conway (1992) postulates that a livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future while not undermining the natural resource base.

Resilience Strategies

Conway and Chambers (1992) postulates that resilience refers to how well the natural and built environment, economic, political other institutions as well as people withstand or recover from likely threats. These also include the level of protection provided to a house hold or community by the natural and built environment, economic, political and other institutions as well as civil society as a whole. Household resilience, robustness and protective capacities refer to how well a household can anticipate, manage, resist or recover from the impact of a threat. A household therefore engage in various resilience strategies to reduce its vulnerability in the face of stresses or shocks such as water scarcity.

On- Farm Resilience Strategies

Johnson (2002) has it that small grains are generally resistant to dry conditions and therefore much reliable. Millet is a tradition crop that is widely used in dry conditions in Africa especially in drought prone areas. Farmers in areas which are prone to water scarcity due to rainfall variability use standard varieties of bulrush millet and finger millet. Intercropping millet with sorghum is a common practice where seasonal rains are not reliable. Nyamadzawo (2005) observes that Nyanyadzi receives 650mm of rainfall per year and it is subject to several seasonal droughts, officially it is considered suitable for extensive livestock and game ranching, supplemented by cultivation of drought resistant crops such as millet sorghum. The dry land soils are shallow, course in texture and possesses weak horizon for development. These characteristic makes them generally infertile and high susceptible to erosion. All the vegetation in the Nyanyadzi area is adapted to low moisture and drought conditions. The general grains are grown in Nyanyadzi village. Cereal play a pivotal role in contributing to household food security and nutritional intake of dry land farmer’s small grains such as millet is nutritious food that is recommended for children, convalescents and elderly. Pearl millet is the most important species of millet in Nyanyadzi in terms of cropped area and contribution to food security.

Bennet (2005) has it that agro pastoralist in Aba`ala in Nigeria are used to sowing sorghum whenever there is a short rainy season because there was lack of “sorghum” rains for the 1997-2000 period, there has been delay and early cessation rainfall hence people stopped cultivating sorghum due to the fact that they received rainfall only for two months from early July to September. Within these two months the amount and distribution of rainfall is erratic and unreliable. In Aba`ala farmers traditionally divert flood to supplement irrigation to overcome the problem of moisture stress. The flood comes as runoff from surrounding hills and ridges after rains. The people have used this traditional technique to withstand erratic rain by growing sorghum despite water shortage.

However, the amount and distribution of the flood are not predictable. Because of this people in Aba`ala were not able to produce sufficient sorghum. They came up with a sorghum transplantation programme which started in 2000 rainy season which was spearheaded by Oxfam. The transplantation programme had the following objectives, that is to demonstrate suitable nursery density and appropriate seedling age at the time transplanting as well as to introduce to farmers the practice transplanting sorghum seedling from nurseries for extending the effective growing season where there are erratic rains.

Bennet (2000) defines crop rotation as a more or less regularly recurrent succession of different crops on a single piece of land. The crops used are, small grain and grass, legume or legume grass mixture. Crops are rotated in order to preserve soil productivity and maintain crop yields, in an area which receives little or no rainfall. Johnson (2001) argues that crop rotation is a strategy for water and soil conservation. A number of experimental studies show that when crops are rotated, the soil or water loss from a given field is less for rotated field than it would have been had the field remained continuously cultivated.
Burn (2005) observes that at Guturie, and Okla in Ethiopia, a three year rotation of cotton, where and sweet clover covering two rotations or a year period showed the following average annual losses of rainfall and soil.

<table>
<thead>
<tr>
<th>Runoff of percentage of precipitation</th>
<th>Average annual soil loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous cotton</td>
<td>14.22</td>
</tr>
<tr>
<td>Cotton rotation</td>
<td>12.72</td>
</tr>
<tr>
<td>Wheat rotation</td>
<td>13.93</td>
</tr>
<tr>
<td>Sweet cloves rotation</td>
<td>8.0</td>
</tr>
<tr>
<td>Average rate of rotation</td>
<td>11.5</td>
</tr>
</tbody>
</table>

The plots in this experiment were on the virgin sandy loam of 7, 7% on slope. It is evident that the soil loss from rotated field is less that in non-rotated fields as evidence by runoff percentage and annual soil loss. Crop rotation can be used as a livelihood resilience strategy in areas which receives erratic rainfall as is the case with Guturie and Okla. It contributes to maintaining biodiversity above and in the soil as well as improving crop diversity or variety, thereby reducing risks of crop failure disease and pest attack.

Moyo (2001) has it that conservation Agriculture is being promoted in Zimbabwe as a sustainable agricultural technology that increase productivity in areas with unpredictable and erratic rainfall patterns and increased temperature extremes as a result of climate change, areas facing environmental degradation due to unsustainable farming methods which include extension of cultivated area to compensate for low yields as well as low productivity as a result of declining soil fertility and inefficient use of both natural resources and external inputs. A joint COMESA Committee of Ministers Responsible for Agriculture, Environmental and Natural Resources at a meeting in September 2009, agreed that member states should upscale climate resilient food production technologies with conservation agriculture being one of such technologies. With minimum soil disturbance soil is disturbed or opened only when the seeds are be placed. Such practices are being practiced in areas that receive little or no rainfall such as farming region 3 and 4. It is achieved through use of planting basins, ripping and direct seeding equipment. Minimum soils disturbance has the following affects such as reduction in soil erosion due to improved soil erosion due to improved soil structure. Compaction is also reduced. It also increases quantity of organic matter in soil as the carbon is not exposed to oxidation by proving carbon sinks. It improves soils moisture content by enhancing infiltration and soil water holding capacity. Evapotranspiration from inner soil layers is reduced as these layers are not exposed to evaporation through tillage and reduces time, cost, and energy for land preparation thereby increase profitability.

Tsegaye (2004) observed that in arid and semi-arid areas, the rain falls only for two months and is unreliable even in these two months. In Adiharemele and Irkudi people harvest the runoff on traditionally built open surface ponds. But these ponds serve only for two months and people have to travel long distances to fetch drinking water. Although efforts were made by the government to establish schools in pastoral areas, attempts was not made to incorporate water development along with construction of schools. As a result school children dropout from school escalated. The main reason is attributed to the lack of water in the school and nearby areas. Based on the request from schools, roof water harvesting was initiated with the specific objectives which was to solve the chronic water shortage in the Adilneremele and Ikandi. To demonstrate to policy makers the important of roof water harvesting for school to be built in areas where there is water shortage, the project managed to augment water supply in the area as people now travelled less distance to reach nearby water points.

**Off- Farm Strategies**

Narayan (2002) has it that in struggling farm communities, people make numerous references to seasonal and permanent migration. Men and women travel to areas with greater opportunities for work as labourers and in petty trades and domestic services. Paradoxically, although poor people often acknowledge that remittances from such work are crucial they largely hold negative view of migration as a livelihood strategy, Narayan (2004) observes that in Bangladesh which is a flood prone area, poor get remittances from family members who have migrated to urban areas most families in the villages La Cateria and Janai for instance, are said have male wage earners in the cities who provide primary sources of subsistence. The poor consider migration as a stepping stone to opportunities and vehicle for improved wellbeing, Heyin (2001) in his study in Vietnam observed that remittances are mainly used to meet daily household expenses, in this way, aged and female household members enjoy reduced financial burden.

Remittances also have been spent in reducing vulnerability as husbands can supplement income through provision of inputs, groceries and other basic stuff.
Shocks such as droughts as well as floods coupled with inadequate support provided by government, the private sector or civic groups, poor feel closest and rely most on mutual support and self-help groups which they form themselves. Narayan (2000) postulates that, rotating savings and credit groups are regarded highly in communities of Indonesia. Members of Asian groups meet regularly and contribute small amount to common saving pool. This is continuous until every member has won once. This is the most accessible source of interest free credit available to the poor people and it is a vital means for saving for those who find it difficult to set aside money without regular pulling some out to cover for daily needs. Such associations popular among women especially those involved in petty trade and others who use it for capital needs. Women in Galih Pakuwan view artisans as important as it make possible for them to build a home by providing a loan. They also use this money as a source of financial capital in any eventuality of any disaster. It is therefore livelihood resilience strategy in the case of failed crops and other contingencies. Women use money to form artisans to meet their own household daily needs or their reproductive household needs.

Mazorodze (1999) in his study of the Biriwiri in Manicaland Province of Zimbabwe found out that the area faces perennial water shortages. Crops grown include millet, maize, beans, sunflower and sorghum. The shortage of agricultural inputs particularly fertilizers and seeds forces people into diversifying into their livelihood strategies. Most households in Biriwiri are into craftwork particularly women. Women in Biriwiri are involved in cutting and removing of the bark from trees to make mats and other related artefacts. Most women maintain that craftwork have empowered households in Biriwiri are into craftwork particularly women. Women in Biriwiri involve in cutting and removing of the bark from trees to make mats and other related artefacts. Most women maintain that craftwork have empowered them economically. Mazorodze (1998) has it that 60% of the people who take part in craftwork have managed to educate their children. Some of the children have gone up university level. Some have brought cattle thus strengthening their finances capital which they can liquidate at any time to offset risks which are brought by erratic rains. They have managed to upgrade their homesteads. Their earnings though have not been substantial of late, but they afford vital goods like salt, sugar bread among others.

Challenges

Climate Change

According to the World Wide Fund for nature (WWF), there are indicators of climate change in Southern Africa. Chenje (2002) observes that records from countries that make up SADC reveal that temperature has risen by over 0.05% in the last 100 years, with the last decade being the warmest and driest ever. Over the past 20 years, there has been noticeably less rainfall and drought has increasingly become a serious challenge. Such an arrangement is disastrous for many rural communities as it led to depletion of water resources, making it impossible to grow crops or maintain livestock and such a situation has forced people to walk long distances. Cornway (2000) argues that surface temperatures are expected to rise to 1.4 and 5.8 °C by 2100. Approximately 1.7 billion people already live in countries that are water stressed. By 2025 this number is expected to rise to 5 billion. In Southern Africa, Central Africa and countries around Mediterranean Sea, changes to climate could further diminish river flow, as well as the rate at which our underground water reserves are replenished. Higher temperature and reduced rainfall in regions like Southern Africa are likely to bring poor harvest particularly for crops like maize which depend heavily on seasonal rainfall. Farmers living in arid and semi-arid areas may find themselves battling to protect their families, their animals and their crops from the impact of severe water scarcity. Such an arrangement may limit the household potentials to build resilience especially where livelihood assets are fragile.

HIV and AIDS

Oxfam (2002) observed that HIV/AIDS is one of the main factors contributing to households vulnerability is Southern Africa. Healthy members of the household may try to deal with sickness or death of death of a partner or parent by looking for paid work. This may involve moving to a city in search of economic opportunities. Because this means the household has less labour at home, people may shift to growing lower maintenance food crops that are often less nutritious. They will be forced to draw on savings and sell livestock, although households with drought animals usually try to retain them at all costs. At the same time, the household will “call in” any outstanding obligation from extended family and other members of the community. This may involve following up on unpaid lobola, roora or bride wealth. Household will also consume less and spend less on education and non-essential health care. They may be forced to withdraw children from school because their labour is needed at home. If these measures fail, households may be forced to sell off key assets including tools, draught animals and even land. They even spent even less on health and education and further reduce the amount they cultivate. This limits household portfolio which they can use to diversity into resilience strategies.

Chambers (1983) postulates that, HIV/AIDS lead to physical weakness due to the convalescent inability to cultivate larger areas or to work longer hours, lower wages paid to the weak. It accentuates vulnerability by limiting
the ability to overcome crisis through harder work, new or negotiate for help. It contributes to powerlessness through lack of time or energy for protest or political activities, sick and hungry people dare not bargain harder. Chambers (1983) has it that physical weakness brought about by poor health limits or prevents access to resource from the state, legal redress for abuses and ability to dispute wage or interest rates, it entails weakness in negotiating the terms of distress sales.

**Environmental Degradation**

Rowlands (1998) postulates that, poverty and environmental degradation operate in a vicious cycle. A degraded environment produces less, so people directly dependant on it to become vulnerable to its deterioration as the less it produces the more it is exploited and little regard is paid to the future. Poverty drives rural households to exploit the environment unsustainably. Holloway (1995) observes that deforestation has significantly risen at a rate of 100 000 to 320 000 hectare per year. Moyo (2010) postulates that, gold panning mushroomed in 2000 and involves an estimated one million people who operate mainly along more than 5000km of Zimbabwe Rivers. Panning is carried out unsustainably and unsystematically usually in river beds, banks and flood pains with no concern for the environment. Trees are cut down haphazardly, pits which are several metres are dug and alluvial soil is removed resulting in erosion and siltation as soil and rocks are washed into streams. Unsustainable utilization of the environment is threat to sustainable livelihoods. It makes it difficult for the rural people to cope or recover from shocks, which will lead to deprivation trap. Cunningham and Canninghum (2000) argues that environmental degradation, is also caused by ‘the tragedy of the commons’ in which he argue that any commonly held resource inevitably is degraded or destroyed because the narrow self-interest of individual tend to outweigh public interests. For instance the damage done by overgrazing would be shared among all farmers. According to Hardin (1968) the only solution would be either to give coercive power to the government or to privatize the resource.

**METHODOLOGY**

This study utilized both the quantitative and qualitative research methodologies to gain an insight into the livelihood resilience strategies in the face of water scarcity. The qualitative research methodologies were used to explain qualitative indicators. The quantitative research was essential in the quantification of data in order to gain a pictorial view of research finding and testing of a research hypothesis. This study utilized questionnaires, direct, interviews in order to collect data on resilience strategies being employed by the people of Kenzamba. Stratified random sampling procedure was utilized to reach the respondents. The study population was 5995 people in 1196 households within 28 villages. The sample size was 30 respondents which was randomly selected from 5 out of the 28 villages

**RESEARCH FINDINGS**

**Demographic Profile**

**Age distribution of respondents**

![Figure 1: Showing Age Distribution of Respondents](source: Field survey 2012)
The respondents’ ages ranged from 0 to 61 years. There was a greater percentage of economically inactive people represented by those who were below 14 years and those above 61 year.

**House Headship**

<table>
<thead>
<tr>
<th>Headship</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male headed households</td>
<td>47</td>
</tr>
<tr>
<td>Female headed households</td>
<td>53</td>
</tr>
</tbody>
</table>

There is domination of female headed households in this ward. This shows that women headed households are likely to face vulnerability as they bear the cost of water scarcity. At household level women perform most domestic tasks such as social reproduction and production.

**Level of Education of Respondents**

High school completion rate is very low as represented by 23% for ‘O’ level. The majority of the respondents are semi-literate to illiterate as represented by 47% for the primary level. This information shows that the human capital is much fragile. People are likely to have limited basket of choices to diversify into resilience strategies in a water stressed environment. Most people are likely to diversify into less remunerative jobs given their fragile human capital. However, the percentage of those who have completed ‘O’ level and tertiary education can play a crucial role in the livelihood resilience strategies in water stressed communities. Given the opportunity to access literature about livelihood resilience strategies they can inspire the communities around them to turn their lives for the better.

**Livelihood Resilience Strategies**

**Conservation Farming**

The majority of the respondents 30% are into minimum tillage. Through this type of farming the soil is disturbed or placed where the seeds are to be placed. The high percentage can be attributed to the extension and material supports being provided by the Farm Community Trust works with Agritex in their quest to promote sustainable livelihoods. The small holder farmers were grouped into groups of 20 people, based on their willingness to take part in this project, were supposed to have at least 1.5 hectares of cropping area. An observation into the area showed that most of the respondents who take part in minimum tillage relied on hand power. This is due to the lack of draught power that has fallen victim to water scarcity. In this case, reciprocal groups from areas such as Choto and Kasonde are responsible for land preparation, digging of planting basins for every member in the group. The basins are dug at any time during the dry season so that they are ready for planting at the beginning of the coming season. These reciprocal labour groups allow the farmers to complete agricultural tasks on time.

20% of the respondents are into organic farming or application of anti-hill material. Such practices are more pronounced in Gangungu and Muyamu village. During the dry season the respondents dug up anti-hill material from their fields and spread them over the Sodic soils which are associated with water scarcity. This research observed that only those with anti-hill material in their fields practised this exercise. Respondents concurred that spreading of anti-hill material over Sodic soils has to improve crop productivity in face of soil acidity which affects plant nutrition by inducing deficiencies.

23% of the respondents are into crop rotation. Most respondents alternate maize with cotton fields a move which they say has improved soil fertility of the area. The 23% practise intercropping where they mix different crops in one field. Key informant from the Agritex argued that intercropping maize with small grass, or cow peas in most part of Kenzambara has been recommended by their office as a move to provide cover, reduce soil erosion and ensures a better nutrients balance through nitrogen fixing.
Impacts of Conservation Farming

Average Crop Output Between 2008-2009 and 2010-2011

The above comparison between the 2008/2009 season and 2010/2011 season shows that yields from short seasoned varieties has become dominant in drier natural regions as represented by an increase from 90 kg to 180 kg. Increase in cotton production is influenced by conservation education from Cottco Extension workers who see rotational farming as a panacea for improved yields. Most of it is sold to make shift market points at Kenzamba and Kanyaga. There is growing confidence in small grains by these impoverished and drought weary communities in Kenzamba. There is slow intake of small grains such as pearl millet and sorghum despite its role in improving nutritional status of the households and improving self sustenance. The 60 kg shows that there is a slight increase in its production, most of the reasons which were cited by some respondents. During an interview at Gungungu, it was revealed that slow intake in the growing of small grains is attributed to the fact that they received no support from the Farm Community Trust, which used to provide small holder farmers with seed packs. An observation into the area reveals that sorghum was under attack by quella birds. However, despite a slow intake in small grains, those who devoted much of their energy to small grain production concur they can be a harbinger for better agricultural fortunes in ward renowned for being a basket case as it is synonymous with drought induced food shortages. Nyamadzawo (2008) postulates that, “small grains play a pivotal role in contributing to household food security and nutritional intake of dry land farmers”. Such small grains and millet are high energy foods which are recommended for children, convalescent and elderly.
Non-farm Activities

33% of the respondents rely on remittances from migration. This shows people’s ability to cope with increasing water shortages in Kenzamba. The researcher observes that paid employment options remain limited in Kenzamba and migration to cities presents an important opportunity for some households to improve their conditions through remittances. An observation into the area revealed that migration is a household livelihood diversification strategy rather than a strategy undertaken by an individual.

13% of the people are into rural trade or savings group. This particular group will be engaging in various vending activities such as clothing, agricultural produce, electrical gadgets such as DVD’s and radios, small farming equipment. This activity is not yet regularised and has been spared from harassment from Makonde Rural District Council and police. They faced competition from traders who came from Chinhoyi.

Rotating saving schemes are also dominant in Kenzamba. In a Focus Group Discussion with women at Kenzamba, revealed that rotating saving scheme was a resilience strategy they used to offset contingences such as water scarcity. Such groups are based on network of trusts and reciprocity.

7% of the people engage in beer brewing. Beer brewing plays an important part in reciprocal exchange which maintains social coherence. In Kenzamba especially in villages such as Gungwau and Kapuka, it is done by hand power households. Beer brewing has been used as a payment to working groups or those with draught power for specific time bound labour activities during the peak agricultural periods such as bush clearing, land preparation and harvesting. Repetitive activities like weeding and pests control were also rounded up by a beer party.

Finally 30% of the respondents, divert into repair work and artificial work such as thatching, shoe repair and building. They diversify into such activities, to offset risks. Most of the people who engage in rural work are rewarded with bags of maize. They exchange their artisanal skills for money or food in the time of need.
Land Degradation

It is crystal clear that there is evidence of Environmental Degradation in Kenzamba. Land degradation is represented by 28%, much of land degradation is attributed to poor farming methods as extensive gold panning which is carried out by 77% people of this ward. Chemicals such as mercury are often used adjacent to the water bodies, contaminating rivers and streams. There is evidence of open pits, gullies in most areas. Mandaza (2002) postulates that deterioration of the economy drove most people in Zimbabwe to more on nature and natural goods than ever before. Kenzamba is not an exception given extensive water scarcity and fragile ecosystem people are bound to over exploit the environment. This limits sustainable livelihoods, as most agricultural crop varieties may not be able to recover from shocks brought about by degradation. Panning in Kenzamba is carried out unsustainably and unsystematically with no concern for the environment thus a true reflection of the tragedy of the commons. Trees are cut down haphazardly, pits several meters deep are dug and alluvial soil is removed resulting in erosion and siltation. Environmental degradation is causing farmers to lose valuable land and their efforts towards soil management. This situation force most people to be inclined to gold panning as an immediate solution for their household needs in the face of unproductive farming. The soil found in Kenzamba makes it difficult for any meaningful agriculture as farmers rarely get surplus from farming activities.

Depletion of Water Resources

Depletion of water resources is represented by 32%. It is primarily due to insufficient and late rains. The distribution, occurrence and availability of water resources are uneven. Siltation of rivers from gold panning is reducing the storage capacity of Gondiya Dam, as well as its operational life. From key informant interviews, the number of Boreholes serving the ward is not sufficient as most people in Besu village are forced to walk a distance of 3km to reach a nearby water point. Although NGOs have drilled boreholes recently near Kenzamba Secondary, there have been challenges by locals in the maintenance of these boreholes. Such arrangements put women at an intercalary position who spent most of their time as water transporters as they had to load it to their homestead for instance, a dip tank which services half of the wards at Nyamupfurira village had to be filled with water every Thursday such that livestock can be dipped on Friday.
Insufficient Government Support

10% of the respondents concurred that government support has not been sufficient to address food deficiency in Kenzamba. The government in February 2012 gave a bag of 50kg maize per each household. Given low yields in Kenzamba, that bag of maize has not been sufficient in addressing food challenges. The government has not committed itself to the rehabilitation and maintenance of dysfunctional boreholes, which has left communities more vulnerable to water scarcity. Water harvesting techniques which were initiated by government through community management is the only faceable water harvested strategy. It was erected in the early 1980s for the Kenzamba secondary school. Even though the government has been providing seed packs, under the Presidential Scheme last year it has not been proactive in promoting drought resistant crop or any drought mitigation strategy. Even though its extension officers have been providing services to rural farmers, most of them tend to confine themselves to communities which are assisted by NGOS, where they get incentives for carrying out extension services.

Lack of Draught Power

30% of the respondents concurred that they lack draught power as most of their livestock have fallen victim to water related diseases. The 2008 hyperinflation environment forced most households to sell livestock in exchange for maize. It was the only asset they could liquidate to meet their immediate needs in an intersection of socio-economic and environmental factors. Lack of draught power frustrated efforts by farmers to take farming seriously as they are bound to venture into gold panning. This exacerbated the environmental degradation as people relied on nature.

CONCLUSION

From the information gathered, it is crystal clear that people of Kenzamba have managed to build resilience to offset risks. They have diversified into on-farm and off-farm activities. The researcher observed that significant number of people have embraced conservation agriculture as an approach to sustainably increase yields from cereals, maize as well as to build up the soil organic matter. There has been a slight improvement on people’s livelihood as they have managed to improve yields by incorporating indigenous practices such as use of anthill material to improve soil fertility. This helped to build up the soil organic matter, retains in nutrients and improve microbial. Farmers have realized a slight improvement in maize crop production after they adopted short seasoned varieties; other activities such as beer brewing have often been used as payment for working groups for specific time bound labour activities during the peak of agricultural periods. Gold panners have acquired property which they have used as buffer against contingencies and uncertainties which characterized Kenzamba.

However, the strategies they have devised are not sufficient in achieving self-sustenance. What they have produced from short season varieties have not been sufficient in meeting the household demands as most of the harvest failed to meet the next growing season. Gold panning has remained illegal as most of the “panners” lack licenses and may lose most of the proceeds to mine claim owners. Given the fragile human capital necessitated by poor academic qualifications, most of the jobs they diversity into have been less remunerative to supplement failed micro agricultural economy of Kenzamba. The affirmation factors makes Kenzamba prone to risks as people diversify into less remunerative strategies.

What has worsened the challenges faced by small holder peasant farmers in Kenzamba is the inability by the government and farming organizations to setup strategies for small holder peasant farmers to respond to water scarcity. This is the reason why people are quick to venture into gold panning as an immediate solution to their household needs, in this case poverty which is fuelled by inadequate support from the state makes people over exploit and over subscribe the natural resource base. The research also observed that panning is being carried out unsystematically usually in river beds and banks with no concern for the environment. Chemicals such as mercury and cyanide are harmful to human health. There are evidences of soil erosion and siltation which can be seen in the case of Gondiya River which has fast become an intermittent stream. Such an arrangement put most communities around Gondiya at an intercalary position as they have to endure a distance of seven kilometres driving cattle during dry season that is from June to mid-November. However even though the government initiated the nationwide Chikorokoza Chapera spearheaded by ZRP, the operation was short lived and generally ineffective as most panners were given the green light to continue with their unsustainable activities following an appeal by the Local Councillor for the people to continue with their illegal mining activities. This has fuelled environmental degradation in this ward which has led to:-

www.gjournals.org
• Low productivity as a result of declining soil fertility and ineffective use of both natural resources and external inputs
• Unpredictable and erratic rainfall patterns and increased temperature extremes as a result of climate change which led to reduced water scarcity. The issue of low rainfall and suffering crops is typical.

RECOMMENDATIONS

Sustainable Gold Panning

The present situation regarding gold panning is out of control. Conventional methods of control such as imposing fines and clamp down operations have little impact because they provide short term solutions to the problem. There is need for an integrated approach which mainstreams the panning activities incorporating them into formal, legal administrative and economic structures managed at district and ward levels. If control is devolved to the local level management of small scale mining it would be more effective, resulting in reduced environmental degradation and better rehabilitation.

Promotion of Sustainable Agriculture

Given the background of fragile ecosystem characterized by poor soils and depleted water resources it is crucial for various stakeholders to promote biodiversity activities that increases ecosystem richness and improve nutrient and water efficiency by creating more favourable micro climate. The biodiversity activities include farm landscaping for example using hedges, vegetation buffers, strips and trees. Conservation agriculture should be promoted as a sustainable agricultural technology that increases technology and at the same time conserve the environment. This will lead to benefits such as fertility enhancement, reduced production costs, reduced vulnerability to water scarcity and increased yields and profit and margins. Dissemination of information on extension should be promoted as to enhance sustainable development.

Adoption of the resilient crop and livestock production

Through various NGOs and the government, people in Kenzamba can be incentivized to adopt resilient livestock and crops via the distribution of small grain seeds of millet and sorghum which thrives well in the face of water scarcity. Distribution of small livestock such as goats is also crucial as they thrive well under these conditions. The information on nurturing of these livestock should be made readily available to the people.

Promotion of internal savings and lending

The various stakeholders should come in to help rural people in Kenzamba to establish credit and savings associations. Training should also be provided to equip the people with knowledge on the running of savings and credit projects through Ministry of Medium and Small Enterprises in the same vein there should be recognition of micro enterprises and there should be easier registration of these to facilitate access to markets. This can curb rural–urban migration.

Community based pump maintenance

The greatest single threat to the success of rural water supply program is the question of operation and maintenance of boreholes. Communities should be provided with requisite skills on the maintenance of pumps as to promote the availability of water. This will go a long way in promoting garden irrigation in Kenzamba.

Gender mainstreaming in resource governance

The problem of environmental degradation can be addressed if women are able to participate more effectively in planning, management and preservation of the environment and use of natural resources. Given the resources, women are better environmental managers, this can reduce feminization of poverty since environmental degradation is inextricably linked to poverty.
Provision of safety nets by government

Against the background of poor education that affects human capital, the government should intensify its BEAM programmes to bail out children who want to sit for their final examinations. This will go a long way in building stronger human capital base.

Rehabilitation of infrastructure

The poor road network makes rural stakeholders to shy away from travelling to Kenzamba as most of the experts tend to follow areas where there are tarmac roads. The Kenzamba - Chinhoyi road need to be revamped such that government officials can easily disseminate information on livelihood resilience strategies.

REFERENCES

Bourdilien M (2001) working children in Zimbabwe, Weaver Press Harare
Moyo S (2010), Fast Track Land Reform Programme, Base Line Survey, University of Zimbabwe Publications, Harare
Narayan D (2002) The poor wiles can anyone hear us, oxfarm publication oxford,
Oxfam (2002), Oxfam Handbook of Development, Oxfam publication, Oxford