MIDLANDS STATE UNIVERSITY

FACULTY OF ARTS

DEPARTMENT OF DEVELOPMENT STUDIES

RESEARCH TOPIC

THE IMPACT OF IRRIGATION FARMING IN TRANSFORMING LIVELIHOODS IN RURAL COMMUNITIES. THE CASE OF NYANGA DISTRICT, WARD 12

BY

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Our hands, Our minds, Our destiny

RESEARCH SUPERVISION ACKNOWLEDGEMENT FORM

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I, the undersigned do/do not acknowledge that the above student has consulted me for supervision on his/her research project/dissertation until completion. I therefore do/do not advise the student to submit his/her work for assessment.

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DECLARATION

I, Rachel Nyakatawa, declare that the work I have submitted is my own effort and it has not been submitted anywhere for any degree purposes in any other university. I certify that the information in the dissertation which is not my own has been identified and acknowledged. It is being submitted in partial fulfilment of the requirements of the Bachelor of Arts in Development Studies Honours Degree at Midlands State University, Zvishavane Campus.

Signature…… Date……...

DEDICATION

This work is dedicated to the Almighty God and to all irrigation farmers. Also to the entire Nyakatawa family which was committed to the attainment of this honours degree, for tending me with love and for their partnership in the success of life.

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ABSTRACT

The study examined the impact of irrigation farming in transforming rural livelihoods. The research's case study was Nyamaropa Irrigation Scheme located in Ward 12 of Nyanga District, south east of the district. Qualitative methodology was used during the study, and two types of data gathering instruments that are questionnaires and interviews, were used to obtain a sample of one hundred irrigators, forty-nine non-irrigators and one AGRITEX officer. A total of one hundred questionnaires and fifty interviews were carried out. The results were based on information captured in the questionnaires and face to face interactions. Also purposive type of sampling was used.

The study found that irrigation farming has positive and negative impacts in transforming rural livelihoods. Results from the study show that irrigation farming in the study area has transformed livelihoods in rural communities. The farming has resulted in economic development as witnessed by improved household incomes, creation of employment for both irrigation and non-irrigation farmers, introduction of new crops, new administrative and economic structures and non-farm activities which increase employment. Irrigation farming has also resulted in social development of the community with sustainability implications such as food security, poverty eradication, reduction of migration, improved social services, gender equality, resettlement of people, scheme management, new forms of governance and distinction between irrigation and non-irrigation farmers. In addition to that, irrigation farming has resulted in infrastructural development as witnessed by the tarred road, improvement of houses and their electrification. Irrigation farming also resulted in infrastructural development also witnessed by the conservation of natural resources by irrigation farmers. The farming also resulted in cultural as noticed by many churches which were introduced in the community. However, some challenges were noticed such as water shortage, unfair distribution of water, lack of markets and marketing facilities, small plots resulting in small scale of production,

illiteracy of farmers, lack of agricultural inputs, pests and insects in the irrigation farm, health problems, conflicts and failure to access credit by farmers. Despite these challenges, irrigation farming has remained successful in transforming the livelihoods of irrigation farmers.

ACRONYMS

AGRITEX……Department of Agricultural Technical and Extension Services

ARDA……Agricultural and Rural Development Authority

CCZ…… Cotton Company of Zimbabwe

DERUDE……. Department for Rural Development

DWD……...Department of Water Development

ESAP……Economic Structural Adjustment Programme

FAO……Food and Agriculture Organisation for the United Nations

IMC……. Irrigation Management Committee

LSCF…….Large Scale Commercial Farmers

NFIF……. National Farm Irrigation Fund

O&M……. Operations and Maintenance

SSIP……..Small Scale Irrigation Programme

UNHCR……. United Nations High Commissioner for Refugees

USAID……United States Agency for International Development

ZINWA……Zimbabwe National Water Authority

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INTRODUCTION

The primary focus of the study was to examine the impact of irrigation farming in relation to transforming livelihoods in rural communities particularly in Nyanga District, Ward 12. According to Haji and Aman (2013:15), in the words of Kamara et al (2004), erratic rainfall has created uncertainty for agricultural production and hence emphasized a call for irrigation in Africa. For this, even if low cost traditional system irrigation technologies (such as use of either rope and buckets to lift and distribute water from shallow open wells or watering cans to lift water from streams) were suggested, their low delivery capacity and labour intensive nature make them highly unfavourable to African production function. This indicates the suitability of applying small-scale irrigation scheme for smallholder farming system that characterizes most sub Saharan African countries.

Mutsvangwa et al (2006), gave a definition of irrigation as the ministering of land through the artificial application of water to ensure double cropping as well as steady supply of water in areas where rainfall is unreliable. Irrigation farming is the backbone of rural economic growth in many countries, contributing substantially to food security, employment and poverty reduction. It has driven rural economic growth by increasing agricultural production and productivity and providing employment, especially through intensification and diversification of agriculture (Hasnip et al, 2001). Kidane et al (2014), state that in Africa agriculture forms the backbone of most of the continent's economies, providing about 60% of all employment. Danato et al (2014), Taffesse (2002) and Teshome (2003), also state that irrigation has served as one of the key drivers behind growth in productivity, increasing household income and alleviation of rural poverty, thereby highlighting the various ways that irrigation can impact poverty. Massive investments in irrigation have made it possible to feed Zimbabwe's growing population and protect it from famine and starvation, as well as enabling transformation of national economies.

However, besides its positive impacts irrigation and irrigation dams have negative consequences to the livelihoods of rural farm households (Asayehegn, 2012). Therefore, the research was seeking to examine the impacts of irrigation farming in transforming livelihoods in rural communities particularly in ward 12 of Nyanga District.

BACKGROUND TO THE STUDY

According to Mudima (1998:21), Zimbabwe is a landlocked country in the Southern African region with an area of over 390 000km2. It is bordered by Zambia, Mozambique, South Africa, Botswana and Namibia. It is situated between 15 and 22 degrees south latitude and 26 and 34 degrees east longitude. Climatic conditions are largely sub-tropical with one rainy season, between November and March. Rainfall reliability decreases from north to south and also from east to west. Only 37% of the country receive rainfall considered adequate for agriculture.

Mudima (1998:22) also states AGRITEX (1999) pointed out that Zimbabwe's economy mainstay is agriculture and it is the country's largest foreign currency earner although the sector contributes only about 18 percent of the country's Gross Domestic Product (GDP). Mudima (1998:22) mentions that about 40 percent of Zimbabwe's exports are agricultural origin and about 70 percent of the population are directly dependent on it for formal employment and agriculture provides about 60 percent of raw materials to industry. The economy performs well when agriculture is thriving.

The agricultural sector has a dualistic nature made up of a fairly advanced large-scale commercial sub-sector and a smallholder sub-sector which is poor, less developed and still needs a lot of support. For the purpose of relating climate, soils and topography Zimbabwe is divided into five Agro-ecological zones or Natural Regions (NRs). Agricultural production patterns depend on these NRs. NRs I, II and III are areas of higher agricultural potential and cover about 35 percent of the land area. NRs IV and V comprise the remaining 65 percent of land area, and these are areas of poor agricultural potential. The commercial sub-sector

occupies about 12 million hectares and 56 percent of this is located in NRs I, II and III. The small-scale sub-sector occupies 16.3 million hectares, 75 percent of which lies in low potential Agro-ecological zones IV and V. Therefore, dryland farming in the majority of the smallholder sub-sector is unsuccessful. Experience has shown that farmers in these areas on average obtain a good harvest once every four to five years (Mudima 1998). According to Chazovachii (2012), in Zimbabwe the Agro-ecological zone IV and V are dominated by irrigation schemes.

Mudima (1998:22) states that the new government of Zimbabwe recognised the role of irrigation in the development of agriculture especially in the improvement of the production of smallholder farmers at independence. Because of the recognition, the government increased its efforts to promote irrigation development in this sector, which the colonial government had neglected. In about 1983, steps were taken to develop new smallholder irrigation schemes and rehabilitate all the irrigation schemes, which were damaged during the Liberation War.

Zimbabwe according to Mudima (1998:22) in all has 155,500 ha are under irrigation, and the area under smallholders is about 8.5 percent of the total irrigated area. Due to its informal nature, micro-scale or garden irrigation in "dambos" or wetlands is not normally included in official estimates of the total irrigation command area. It is however estimated that about 30,000 ha is under micro-scale irrigation in the country, mainly in the "dambos" or wetlands.

Smallholder irrigation schemes in Zimbabwe are of two basic categories: supplementary ("part-time" irrigation) schemes and full production ("full-time" irrigation) schemes. The main water sources for smallholder schemes have been water stored in medium-sized and large dams. Other important sources had been river flow, deep motorised boreholes, sand abstraction systems, shallow wells and springs. Irrigation technologies in use in this sub-sector include surface irrigation, which comprises 68 percent of the schemes, and sprinkler irrigation, which makes up 32 percent of the schemes. In terms of area, 89 percent of the area is under surface

irrigation and 11 percent is sprinkler irrigated. Localised irrigation is not yet in use the smallholder irrigation sub-sector (Mudima 1998).

Smallholder irrigation schemes have three broad types of management which are government-managed, farmer-managed and jointly managed whereby the Department of Agricultural Technical and Extension Services (AGRITEX) develop and maintain government-managed schemes, the government develop farmer-managed schemes but they are owned and managed by the farmers' Irrigation Management Committee (IMCs) and government's intervention s are minimised in terms of management and farmers and government share the financial responsibility for operations and maintenance for jointly-managed schemes. For the jointly-managed schemes headworks are usually the responsibility of the government (i.e dam or weir, pumbing station and conveyance system up to field edge) and farmers take responsibility for the infield infrastructure. In Zimbabwe according to Mudima (1998:22) 50 percent of the smallholder schemes are farmer-managed, 32 percent are government-managed and 18 percent are jointly-managed. However, in terms of area, the government is still managing a larger hectarage, as most of the farmer-managed schemes tend to be small.

According to Chazovachii (2012:218), in Zimbabwe, irrigation schemes were established as a precaution against the inherent variability of rainfall as well as to ensure that cultivation is done all year round to boost and increase food production in the country so as to alleviate poverty. More so the government's attention to the development of irrigation schemes was a bid to meet its objectives towards decentralising irrigation schemes mainly in rural areas for empowerment.

Nyamaropa communal area is located about 180km north-east of the eastern border city of Mutare. The area borders on Mozambique at the Gairezi river. The original people of Nyamaropa belong to the Barwe –Tonga ethnic group of the Shona people. They used to practise some form of localised, rather than restricted, shifting cultivation. Two interventions

by the colonial state dramatically changed the life of the original inhabitants. The enactment of the Land Apportionment Act (1930) by the colonial government led to the eviction of whole families from their home areas which were designated for White commercial farming. The second intervention brought irrigation technology to the area. The idea to construct an irrigation scheme in Nyamaropa emerged in the mid-1950s when an African agricultural demonstrator noticed the irrigation potential of the area (Magadlela and Hebinck, 1995:46). Construction of the scheme started in 1956 and it started operating in 1961. Between 1956 and 1960 many changes in Nyamaropa's landscape took place and these are remembered by local people as marking irreversible developments brought in from outside that changed their outlook on life (Magadlela and Hebinck,1995:46).

Nyamaropa irrigation scheme is located in an area with average annual rainfall of 800mm2. Part of the catchment area of the Morozi river that supplies the project with water is on the border with areas that receive annual rainfall of more than 1,000 mm, which makes it slightly different from the rest of the schemes in Manicaland, most schemes are in areas that receive average annual rainfall of less than 500mm and have poor soils. The irrigation scheme's water comes from a concrete weir at the perennial Morozi river, 10 km away. There is no pumping, the system is fully gravity fed. There is a control dam 7 km away with a capacity of 1, 625,000 cubic metres and a night storage dam in the scheme with a capacity of 30,000 cubic metres (AGRITEX records, Nyamaropa). This is according to Manzungu and van der Zaag, ed (1996: 102-103). The irrigation scheme has 720 plot holders (495 males and 225 females) and it is 517 hectares, according to Mr Chimombe, an AGRITEX Officer (2017).

CONCEPTUAL FRAMEWORK

The section seeks to give the concept of key variables of the study in short. The aspects are:

- Livelihoods
- Irrigation farming

- Rural transformation

Livelihoods are defined as ways of obtaining the necessary assets for living (FAO, 2014). For example, based on Chambers and Conway (1992), the Institute of Development Studies defines livelihoods in terms of the capabilities, assets (both material and social resources) and activities required to make a living (Khanal et al, 2014).

The examination of livelihoods can be based on the following indicators:

- Income
- Quality and level of education
- Assets acquired
- Health care
- Food security
- Standards of living
- Accommodation

According to FAO (1997), **irrigation** is "the supply of water to agricultural crops by artificial means, designed to permit farming in arid regions and to offset the effect of drought in semi-arid region." FAO (1997) also pointed out that Van Averbeke et al (2011) states that irrigation water is applied to ensure that soil moisture is sufficient to meet crop water needs and thus reduce water deficit as a limiting factor in plant growth. Irrigation is generally defined as the application of water to the land for the purpose of supplying moisture essential to plant growth. Irrigation is intended to augment the water supply from rainfall.

Rural transformation according to Berdegue et al (2013), is defined as a process of comprehensive societal change whereby rural societies diversify their economies and reduce their reliance on agriculture; become dependent on distant places to trade and to acquire goods,

services and ideas, move from dispersed villages to towns and small and medium cities, and become culturally more similar to large urban agglomerations.

THEORETICAL FRAMEWORK

Ian Scoone's framework of sustainable livelihoods was used for this study. The approach is people-centred, holistic and dynamic in seeking to understand, learn from and build upon change. It starts from an analysis of people's strengths, opportunities and constraints rather than needs, seeking to build on poverty reducing potential and emphasising the issue of sustainability. Further emphases are the linkages between activities at the macro and micro levels and the importance of the policy and institutional environment in influencing chosen livelihood strategies and outcomes. There is also a need to understand the 'vulnerability context': the trends (for example, economic and technological), shocks (for example, climatic or market related) and cultural practices which affect livelihoods. This is according to Hasnip et al (2001).

The sustainable livelihoods framework shows how sustainable livelihoods are achieved through access to various livelihood resources which are economic, natural, human and social capital. The resources are combined to pursue different livelihood strategies.

According to Khanal et al (2014:6), while farming systems analysis focuses on production, the livelihoods framework enables us to understand poverty in the context of lack of opportunities in economic, political and social life. The pathways out of poverty lie in people's capabilities to exploit opportunities using their own assets, while also overcoming their vulnerabilities. These factors form the foundation of livelihoods framework.

According to Khanal et al (2014: 6), the approach recognises the interconnectedness of development and poverty issues, ensures that cross-sectoral linkages are taken into account and

helps to identify key entry points, resulting in more focused interventions. It offers a way to analyse problems holistically, while identifying specific interventions.

Taking it from this framework the ward 12 irrigation farm made use of resources available such as water, land and labour in their irrigation farming. Central to the framework there is the analysis of various organisational and institutional factors that contribute to sustainable livelihoods outcomes. The Zimbabwean government created institutions which support irrigation farming such as AGRITEX. There is also IMC which also supports irrigation farming.

Basing on Chambers and Conway (1992) a livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks maintain or enhance its capabilities while not undermining the natural resource base.

Irrigation farming has the potential to create or kill sustainable rural livelihoods, it all depends with policies and practices within the farming. This approach, therefore links with the research in the sense that in irrigation farming there is need to understand the trends, shocks and cultural practices which affect livelihoods. There is also need for the analysis of the five different types of assets which people draw to build their livelihoods which are natural capital, social capital, human capital, physical capital and financial capital.

STATEMENT OF THE PROBLEM

The research was seeking to examine the importance of irrigation farming in rural livelihoods. In particular, the research sought to assess the impact of irrigation farming in transforming rural livelihoods. Irrigation farming is central to development because it has both positive and negative effects to development. It can affect social, economic, cultural and environmental development negatively or positively. In other words, irrigation farming's central to

development is highlighted by its positive and negative impacts on livelihoods and development. For the positive impact, irrigation farming is improving the levels and security of productivity, employment, incomes for irrigating farms households and farm labour, increased opportunities for rural livelihood diversification and many others. However, irrigation farming has raised some problems in Ward 12 of Nyanga District. Some of the problems are that diseases, especially water-borne diseases are spreading in the area and they are even causing deaths of people, irrigation farming is also raising a lot of conflicts in ward 12 and the grazing land for livestock has been reduced because of the irrigation and the irrigation dam which were constructed.

RESEARCH OBJECTIVES

- To identify the benefits derived from irrigation farming in Zimbabwe
- To assess the contribution of irrigation farming in improving people's livelihoods in ward 12 of Nyanga district
- To identify constraints confronting irrigation farmers in the study area and offer suggestions

RESEARCH QUESTIONS

- What are the benefits derived from irrigation farming in Zimbabwe?
- What are the contributions of irrigation farming in improving people's livelihoods in ward 12 of Nyanga district?
- What are the constraints confronting irrigation farmers in the study area and what recommendations should be given?

SIGNIFICANCE OF THE STUDY/JUSTIFICATION

The desire to unearth the impacts of irrigation farming in transforming rural livelihoods as well as the desire to unpack the fact that there are certain achievements made by irrigation farming

in influencing the livelihood activities and development instigated this research. The research uses Ward 12 of Nyanga District where there is Nyamaropa irrigation scheme as a case study. The main reason for choosing Ward 12 is because irrigation farming started long back in the area so a lot of achievements have been made through farming and the area has been transformed though farmers are facing challenges. This research will give an insight to Agricultural and Rural Development Authority (ARDA), ZINWA, AGRITEX and IMC on the problems being faced by irrigation farmers. The government can also get awareness to the hardships and the possible solutions to those which are currently faced by irrigation farmers. The research will also benefit academia on knowing the impact of irrigation farming in transforming rural livelihoods.

LIMITATIONS OF THE STUDY

The researcher faced financial constraints during the research. Shortage of cash for fares to the study area and to move around the study area was the major constraint faced by the researcher in conducting the research. However, despite these constraints the research was undertaken.

RESEARCH METHODOLOGY

The qualitative method was used to provide the opportunity for in-depth understanding of the different irrigation pathways that promote the livelihoods development of beneficiary rural dwellers. The qualitative method involves the use of participatory qualitative research tools such as focus group discussions, key informant interviews, in-depth interview, and so on for the data collection (Akudugu et al 2016:5). Qualitative research is a form of enquiry that analyses information conveyed through language and behaviour in natural settings. It is used to capture expressive information not conveyed in quantitative data about beliefs, values, feeling, and motivations that underlie behaviours. It is concerned with developing explanations of social phenomena. That is to say, it aims to help us to understand the social world in which

we live and why things are the way they are. It is concerned with the social aspects of our world and seeks to answer questions about why people behave the way they do, how opinions and attitudes are formed, how people are affected by the events that go on around them and how and why cultures and practices have developed in the way they have (Hancock et al 2007:7).

DATA GATHERING INSTRUMENTS

The researcher used two instruments that are interviews and questionnaires to gather data from respondents.

Questionnaires

Questionnaires are important in that written data will not be lost easily. Once data has been written, that information can be kept safely and cannot be easily lost due to human error like forgetting. They are also crucial in that the respondent will take his or her time to complete the questionnaires. The questionnaires can be left in respondent's hands and completed and collected later. This can be so to give the respondents enough time to fill in the questionnaires.

Interviews

In this research, interviews were also used. During interview, the data was written down on interview questionnaires and some were recorded through voice recorder so as to get the full details about the research. More so, some of the respondents had difficulties in reading and understanding English and as a result, interviews were of importance in accommodating them. Some irrigation farmers, non-irrigation farmers and an AGRITEX officer were interviewed.

SAMPLING

Fridah (2002), defines sampling as an act of selecting a part from a whole for the purpose of providing insight on the characteristics of a whole. It is a method of studying from a few selected items, instead of the entire bid number of units. Sampling is very important in this research. The major importance is that because of the large population in the research area, it

is expensive, difficult if not impossible to consult each and every individual. Therefore, sampling allows for to choose specific group of people as respondents. With the large numbers of irrigation and non-irrigation farmers in ward 12 of Nyanga district, it was difficult to interview every irrigator and non-irrigator in the area hence only a sample size was used as a representation of other families and individuals in the area.

TARGET POPULATION

Targeted population of the research were people of ward 12 of Nyanga District which is Nyamaropa under headman Sanyamaropa, under chief Sawunyama. This encompass irrigators and non-irrigators as well as the AGRITEX staff. This research targeted 150 respondents for both interviews and questionnaires. The researcher used 100 irrigators from Nyamaropa Irrigation Scheme. From the 100 irrigators, the researcher used 75 adults, that is, 40 women and 35 men and 25 children, that is, 15 boys and 10 girls. The researcher also used 49 non-irrigators who live in Ward 12 of Nyanga District. From the 49 non-irrigators the researcher used 30 adults, that is, 15 men and 15 women and 19 children, that is, 10 boys and 9 girls. An AGRITEX officer was also interviewed.

SAMPLING METHODS

The researcher used purposive type of sampling. It groups participants according to pre-selected criteria relevant to a particular research question. It is judgemental, selective and subjective. Respondents will be hand-picked on the basis of specific characteristics. It is important in that it ensures balance of group sizes when multiple groups are to be selected. Purposive sampling is therefore most successful when data review and analysis are done in conjunction with data collection. Sample sizes are flexible prior to data collection; depend on the resources and time available, as well as the study's objectives. This method is useful as it

enables the researcher to gather much data against the time available for data collection in the area of study (FHI, 2006).

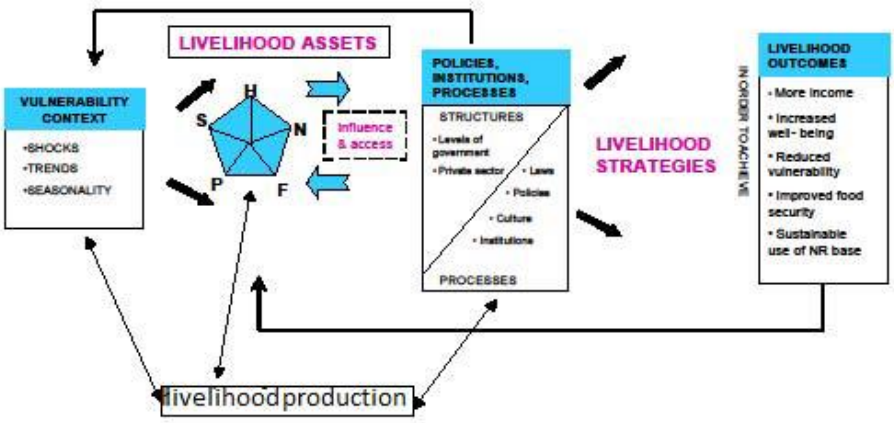
LITERATURE REVIEW

This section reviews the literature on the impact of irrigation farming in transforming livelihoods in rural communities.

Hasnip et al (2001) point out that there are four inter-related mechanisms through which irrigated agriculture can enhance and sustain rural livelihoods. These are: improvement in the levels and security of productivity, employment and incomes for irrigating farm households and farm labours, the linkage and multiplier effects of irrigation development (as part of wider agricultural growth) for the wider economy, increased opportunities for rural livelihood diversification and multiple uses of water supplied by irrigation infrastructure.

According to Hasnip et al (2001:6), Robert Chambers, a pioneer of livelihoods approaches, argued that the generation and support of livelihoods has a higher priority than production *per se* (Chambers 1988). Chambers emphasised that the impact of irrigation on the rural poor depends on who produces the food and who has the ability to obtain it, on who gains and who loses more generally. Overall, he argued that the poor gain from irrigation through increased employment and income, in improved security against impoverishment, from less out-migration and in improved quality of life.

Sustainable Rural Livelihood



Key: F= financial; S= social; H= human; P= physical; N=natural

Source: Sustainable livelihoods framework, available at http://www.ifad.org/sla/background/index.htm in Khanal et al (2014:8)

According to Tesfaye et al (2006:180) a study by Hussain et al (2004) confirms that access to reliable irrigation water can enable farmers to adopt new technologies and intensify cultivation, leading to increased productivity, overall higher production, and greater returns from farming. This in turn opens up new employment opportunities; both on farm and off-farm, and can improve incomes, livelihood, and the quality of life in rural areas. Hasnip et al (2001) also mentioned that Stanbury (1984) stated that in Northern India, it was found that irrigation increased cropping intensity, farm income, and also job opportunities for the landless. As a result of increased cropping intensity, women's participation in agricultural work increased. Cropping became more diversified and of higher value. Increased fodder from weeds and crop residues led an increase in the number of buffaloes kept. Crop residues (cotton sticks) replaced dung cakes for fuel, saving time for women.

Hernandez et al (1974) according to Hasnip et al (2001) stated that in Mexico, a comparison of the situation before and after irrigation, showed improvements in income, diet and nutritional status, but only for the middle and higher socio-economic classes. Increased agricultural production did not necessarily lead to an improvement of the diet or nutritional status of the poorest segment of the population.

The study also examined the change in status of assets between the benchmark survey and the re-survey. There was a positive relationship between landholding size and assets. Since irrigation there has been a great increase in the number of non-farm assets, reflecting the increased prosperity. An increase in non-farm assets was also perceptible for landless households, showing that they had also benefitted from increased employment and incomes. House construction increased substantially in villages after irrigation. (Hasnip et al, 2001)

Irrigation and the need for interaction with urban centres were also believed to have influenced the social outlook and lifestyle of the beneficiary groups. There was also an increase in conflict over water allocation, leading to social tensions and even murder. Although many believed it had heightened income inequalities and some blamed it for increased alcohol consumption, interviewed households were almost unanimous about the positive impacts of irrigation in improving their living standards (Hasnip et al, 2001).

According to Sharma and Sharma (2004), small scale irrigation projects also supplied water for domestic purposes. They further highlighted that small scale irrigation projects brought abundant supplies of water for domestic purposes in India where cities such as Delhi and Jupor depend on canal water for public water supply (Chazovachii 2012:222).

Impact of irrigation farming in Zimbabwe in transforming rural livelihoods

According to Chazovachii (2012:219), irrigation farming contributes significantly at the household in terms of income in rural areas. This is supported by Mudima's (1998:25) evaluation of 5 case studies of Zimbabwean irrigation schemes, that smallholder irrigation can be reliable sources of income. Individual farmers from the irrigations were getting monthly incomes as high as Z$5,833 per farmer per month from plots of just 1 ha, while dryland incomes can be as low as Z$1,000 per month per farmer from an average 6 ha plot size. The incomes were higher than the minimum wage of Z$1,400 per month which is paid for unskilled labour in the Zimbabwean industry and a minimum wage of Z$600 per month is paid for unskilled labour in the agricultural industry of Zimbabwe. From a social point of view, a farmer in an irrigation scheme is much better off than labourers in urban industries who are faced with a lot of demands like rent, water and electricity charges on their income.

According to Chazovachii (2012:220), Makumbe (1996) stated that having most of the rural household unemployed, most families' income levels are relatively low and possibly not enough to acquire basic commodities and services. People in Mutambara confessed that their project enables members to earn an income which enables them to meet some of their basic needs. Cash earned from the sale of food is used to cover household needs like cooking oil, paraffin and others. It also enables members to meet educational needs of their children such as exercise books and tuition fees. Irrigation farming has long term economic contributions to rural livelihoods. Chenje et al (1998) according to Chazovachii (2012:220) asserted that agriculture is the backbone of Zimbabwe's economy and as such irrigation is very important agriculture practice to the country given that the country suffered periodic droughts in 1972, 1982/3, 1991/2 and 2002/4. Irrigation in Zimbabwe offers greater yields than dryland since more than one crop can be grown annually.

According to Mudima (1998:27) the evaluation of the 5 schemes showed that their participants acquired various assets. This was clearly illustrated by Chitora irrigation scheme. The participants who used to live with their parents before the scheme now have brick walled houses of their own. They are all married and own various household assets, electrical goods and farm implements. The farmers confirmed that their standard of living had indeed improved.

Mudima (1998:27) also stated that irrigation is one way of generating employment in rural areas. All the 5 Zimbabwean schemes he studied were found to hire labour additional to that provided by the irrigating households to assist in land preparation, planting, weeding and harvesting. Mudima (1998) gave an example that a typical viable small-holder irrigation scheme 1 ha of irrigated tomatoes will require 120 labour days for planting, weeding, harvesting and marketing over a period of three months. He added that the availability of employment in irrigation scheme is also important in terms of reduction of rural to urban migration. Chazovachii (2012:221) stated that Donahue et al (1993) cited that in Zimbabwe about three quarters of the population is employed in agricultural industries. However, Moyo (1991) in Manzungu (2004) argued that small scale irrigation schemes normally depend on self-employment because farming is not highly mechanised hence much of the labour is normal.

Mudima (1998:27) highlighted that the 5 irrigation schemes of Zimbabwe he studied have afforded the farmers an opportunity to operate on a commercial basis. Most of the schemes have had their participants acquiring entrepreneurial skills. This is evidenced by the ability of the farmers to do their own budgeting, keep record books and manage their own affairs. These skills are most evident in farmer-managed schemes. Farmers have to search for marketing information, organise cropping programmes which fit the markets and organise transport to

such markets. They are also capable of negotiating contracts, although they still need assistance in this aspect.

ETHICAL CONSIDERATIONS

During the research process, the researcher adhered to ethical considerations which govern all research processes conducted by human beings. The researcher applied voluntary participation and informed consent as ethical considerations to the information to be provided by respondents. The researcher sought permission from the responsible authorities before conducting the research and the information researched was only be used specifically for the purpose of this study.

Voluntary Participation

Participation should be voluntary in research, and there should be no coercion or deception. For the most part, the researcher should not be in a position to force respondents to participate, but there are some situations in which could potentially occur. The researcher should remember that participants are assisting him or her, and they should be invited to participate, with a clear understanding that they are under no obligation to do so and that there will be no negative consequences for them if they do not assist the researcher in his or her research.

Informed Consent

Another important issue in student research involving human intervention is to ensure that potential participants fully understand what they are being asked to do and that they are informed if there are any potential negative consequences of such participation. The most effective way to address the informed consent issue is through the use of an information sheet, which is provided to all those who are invited to participate. If possible, this should be on official university letterhead, as this not only has been shown to increase the response rate but also informs respondents that this is an official university activity. In situations in which there

is potential for participant harm to occur, participants should be given the invitation sufficiently in advance to enable them to carefully consider whether they will participate.

Permission from Location

One ethical issue that researchers frequently overlook relates to getting permission from the location in which the research is being undertaken or where the data is being collected. When getting the permission, it is also important that the person the researcher talks with has the ability to give that permission and that the researcher's activities are organised well in advance

Chapter 1

THE RISE OF IRRIGATION FARMING IN ZIMBABWE AND ITS EFFECTS ON LIVELIHOODS

Chapter Overview

This chapter will look at the rise of irrigation farming and its effects on transforming rural livelihoods in Zimbabwe. The emerging of irrigation farming and its positive and negative effects on rural livelihood transformation will be discussed in the contemporary Zimbabwe.

1.The rise of irrigation farming in Zimbabwe

According to Zawe et al (2015:8), in Zimbabwe, both pre-independence (pre-1980) and post-independence governments have been the key drivers of smallholder irrigation development, at strategic, planning, financing, implementation and management levels. The extent of government involvement was dictated by strategic objectives that differed, in particular before and after independence. Though none of the governments managed to produce a comprehensive irrigation policy document, strategic considerations that varied from time to time and from one government to the next had a profound impact on irrigation development, especially in terms of how projects were initiated, financed, the technologies selected, and implementation processes undertaken. The motivations driving smallholder irrigation development placed smallholder farmers at the epicentre of the strategies, allowing farmers to participate to the extent that was consistent with the strategic development objectives. For long, Zimbabwe has not had an irrigation policy to specifically guide irrigation development, but it has had development policies and legal instruments, most from other sectors of the economy, that have shaped the perception, implementation and management of irrigation in the country.

1.1 Pre-independence Scenario

The large framework of colonial agricultural development policy was predicted on creating a dual agricultural system that significantly favoured large-scale commercial (mostly European) farmers against smallholder African farmers. According to Zawe et al (2015:8) the policy of

separate development of Black and White people adopted by pre-independence governments gave birth to two major groups of irrigators: (1) Large Scale Commercial Farmers (LSCFs) (private individuals or institutions) who had title to land and, on the strength of the National Water Law (1912), had a basis on which to obtain water rights; and (2) smallholders who had no title to land and, therefore lacked a basis on which to apply for water rights. According to Magadlela (2000) from 1912 onwards smallholder developed their own irrigation schemes, encouraged by missionaries, to fight famine. The Manicaland province schemes were the first ones to be developed. However, from 1928 onwards the colonial government started to assist them and soon took over the schemes' management, imposing crops and forbidding rain-fed farming. During the development of the first few irrigation schemes in Manicaland Province between 1912 and 1927, smallholder farmers became main actors when, of their own initiative and without government assistance, but with technical assistance from missionaries, they developed, operated and maintained schemes, that became the first formal farmer-managed schemes. According to Rukuni and Makadho (1994:128), Roder (1965) contends that from 1912 to 1927 smallholder farmers constructed and operated their own irrigation projects. The first schemes were in the Eastern District along the Sabi Valley and its tributaries where rainfall is erratic and the growth of summer crop is therefore not normally possible without irrigation. In the Sabi Valley is where government subsidized schemes were started as early as 1928 and have kept pace with development in the commercial farming area. Beach's historical studies indicate that irrigation practices were present in the lives of pre-19th century groups of Shona-speaking ethnic groups in areas around Nyanga in Eastern Zimbabwe. No precise details exist on this, except evidence of stone constructions and earthen canals which Beach calls channels (Rukuni and Makadho, 1994:128). There are traces of an ancient terraced system in Nyanga, Eastern Zimbabwe, with furrows, reservoirs and aqueducts pointing to pre-colonial irrigation techniques, as well as the Limpopo river catchment, the Lowveld and the Drakensberg

escarpment (Tempelhoff, 2009). The thousands of stone terraced mountain slopes were used to lead water from mountain streams to the terraces. In the 19th century, *dambo,*or vlei, *mbugas,* and *fadama* cultivation (lowlands and valley bottoms) was widespread and intensive, despite the fact that it was banned by the colonial authority in early 1900s, and cultivation those lowlands and inland valley bottoms continue still today (Mabeza et al, 2012). Zawe et al (2015:8) pointed out that by 1945 government had increased regulation and control of plot-holders thereby taking over the management of communal irrigation schemes. Farmers viewed the imposition of water rates and requirements of double cropping, as attempts by the government to control their fate. There was a steady but unspectacular growth of irrigation development throughout Zimbabwe during 1920 to 1950.

By 1950 according to Watermeyer (1981) cited in Gwanzura (1987) the area under irrigation had reached 7000 hectares. Most of these schemes relied on river flow diversion works to supply their needs but from 1950 onwards it became clear to both government and irrigators that rivers were becoming fully righted and that it was necessary to venture into storage works. In the 1950s government placed high priority on water development, in particular dam construction and the provision of concessionary loans for irrigation development in the LSCF sector. This initiative made the LSCF key beneficiary stakeholders of this policy. The amendment of the Land Apportionment Act of 1930 to the Land Apportionment Act of 1950 to remove Blacks from White areas and move them to Native Reserves, stimulated compensatory construction of new dams and smallholder irrigation schemes by the government to accommodate those displaced (Zawe et al, 2015). According to Gwanzura (1987) irrigation development in colonial Zimbabwe proceeded on the lines of small self-contained schemes on individual farms. As from 1936 the colonial government adopted a more active policy of water conservation and two large dams for irrigation purposes were constructed on the Umgusa river

near Bulawayo and Mushandike river near Masvingo (formerly Fort Victoria). Both of the schemes were entirely government owned.

After the Second World War, new irrigation schemes were developed to settle black farmers displaced from areas designated for white commercial farmers. Due to lack of involvement in management and rising costs to be paid to the government, the smallholders deserted these schemes, which became uneconomic. As a result; from 1960 to 1980 there has been almost no irrigation development for smallholder farmers, but the government invested heavily in dam construction and irrigation infrastructure for the large commercial farmers. In 1961, the construction of Kyle Dam was completed and it was to serve 26 500 hectares in the South Eastern lowveld for sugar production by Triangle and Hippo Valley estates (Zawe et al, 2015).

In the 1960s government became a major player in the small-holder irrigation sector as it financed and developed government-managed small-holder irrigation schemes based on the policy of stemming urban migration by rural communities. These schemes were exclusively surface irrigation schemes since Blacks were not expected to cope with the more sophisticated sprinkler irrigation. Although the target beneficiaries of this policy were rural communities, the nature of the policy militated against any meaningful farmer participation as it excluded farmers from both the choice of irrigation technology and the processes of project implementation. The result was that farmers viewed the schemes as government enterprises in which they were mere labourers and, therefore, passive stakeholders, forced to engage in irrigation so as to grow crops as prescribed by government agents (Zawe et al, 2015:8).

Zawe et al (2015:8) also mentioned that around 1975, at the height of liberation war, government constructed irrigation schemes to provide for ‘protected villages’ for rural communities to deny liberation war fighters access to communities. These schemes were negatively viewed by the beneficiaries. Government enacted the Water Act (1976) and its

amendments in 1987, consolidating permanent private ownership of water through private property ownership and priority dating of water rights. Priority rights militated against the entry of new irrigators (most of whom were communal farmers) into irrigation sector. The top-down approach to smallholder irrigation development can be attributed to the governments of the time. Donors were not involved owing to sanctions against the country. Many schemes constructed during this period are still operational, and are expected to continue to function in a sustainable manner.

According to Rukuni and Makadho (1994:128) recorded history shows that some of the first irrigation schemes were Mutema and Mutambara, constructed after 1900 but before the 1930s by some local villagers. With the appointment of Alvord in 1926 to improve African farming, government started its active involvement in smallholder irrigation, but there was still much involvement from among plot holders who identified with the projects and regarded them as theirs.

1.2 Post-independence Scenario

According to Zawe et al (2015:9), Mfote (1994) and Bolding et al (2004) mentioned that smallholder irrigation development in Zimbabwe post-independence happened in an ad hoc way. This ad hoc approach, it is argued, was a symptom of the absence of an appropriate policy to guide the process. Many other commentators (Mupawose 1984; Magadzire 1994; Chabayanzara 1994 and Chitsiko 1995) echo these sentiments (Zawe et al, 2015). Makadho (1994) in Zawe et al (2015) made it more explicit when he stated that "irrigation policy is not in black and white: it is only understood." As a result, some of the objectives of smallholder irrigation development in Zimbabwe have not differed in any meaningful way from the colonial era. The objectives have hovered around increasing production per unit of land, introduction of new irrigation technology, decongestion of communal areas (Manzungu, 1999 in Zawe et al, 2015:9) and bringing the marginalized communal farmers into the market economy (Mfote

personal communication 2004 quoted by Zawe et al, 2015). Some attempts were made by central government departments responsible for irrigation, aided by international and bilateral donor agencies, to come up with some policies. However, the attempts were not coordinated, and each attempt emphasised different or new agendas. This section shows how this scenario has led to the current status of smallholder irrigation schemes in Zimbabwe.

1.2.1 Rehabilitation, attempts at user participation and cost recovery (1981-1984)

According to Zawe et al (2015:9), the government introduced "Scientific Socialism" leading to the attempts to establish state-assisted irrigation-based agricultural co-operatives. During the period there was very little development of new irrigation schemes. Efforts were centred on the rehabilitation of the irrigation schemes destroyed during the fifteen years of liberation struggle. The United Nations High Commissioner for Refugees (UNHCR) and the USAID funded the rehabilitation and reconstruction program. The main policy initiative during this period was the Department of Rural Development (DERUDE) policy paper on smallholder irrigation schemes of April 1983. It advocated for: (i) increased smallholder farmer participation in financing the establishment, O&M (operations and maintenance) of smallholder irrigation schemes, (ii) introduction of Irrigation Management Committees (IMCs) with the hope of achieving user management (Bolding 2004:196 in Zawe et al, 2015:9), and (iii) enhancement of cost recovery so as to reduce government spending on smallholder irrigation schemes. Successive government irrigation agencies have subsequently depended heavily on the DERUDE document described by Meinzen-Dick (1993:35) as 'the most definitive smallholder irrigation policy statement in Zimbabwe.' This document was, however, never formally adopted by the government as policy.

1.2.2 Increased emphasis on user finance (1985-1990)

Makwarimba et al (2004) quoted by Zawe et al (2015) state that government policy during this period emphasised the reduction of government subsidies and increased farmer participation in the design, financing and management of smallholder irrigation schemes. The mandate to

design, construct, and operate smallholder irrigation was wholly put under one department, AGRITEX. However, the development of the water source and subsequent delivery of the water to the irrigation schemes remained the responsibility of the Department of Water Development (DWD). According to Rukuni and Makadho (1994) quoted by Zawe et al (2015), it is during this period that government introduced the National Farm Irrigation Fund (NFIF), which was set up in 1985. The NFIF was a loan facility through which a group of smallholder farmers could borrow money for the purchase of irrigation in-field equipment at low interest rates. Government retained the responsibility for financing the main system to field edge. Overall the policy was ineffective because smallholders hardly made use of the loan facility. Bolding (2004) and Zawe (2006) in Zawe et al (2015) point out that electoral promises by various politicians to provide each district with a dam and smallholder irrigation scheme free of charge, as well as the availability of donor support to smallholder irrigation development at no cost to the ultimate users, severely undermined the policy.

1.2.3 Irrigation management turn-over by experiment and default (1990-1999)

As a consequence of the Economic Structural Adjustment Program (ESAP) adopted by the government in 1990, the economy of the country was opened to market forces. The government's capacity to provide finance for O&M for the smallholder irrigation schemes was eroded as it struggled with economic reforms. The Irrigation Division of AGRITEX began to experiment with irrigation management turnover policies. In some cases, farmers were forced to contribute resources for O&M as government and farmers experimented in some kind of joint irrigation management while in others irrigation schemes were turned over to the farmers by default when government failed to provide O&M funds (Bolding et al 2004 quoted by Zawe et al 2015). The following experiments were initiated to test policy models for future use by AGRITEX: (i) Farmesa initiative (1996); (ii) the Musikavanhu Small Scale Irrigation Programme (SSIP,1995); (iii) SSIP, 1999; (iv) the Negomo Irrigation Scheme; (v) AGRITEX's

participatory irrigation design and construction of wholly farmer managed smallholder schemes; and (vi) AGRITEX's commercialization of irrigation services through the Agricultural Research Fund. AGRITEX's participatory design and construction of irrigation survived up to 2000. The Farmesa approach and AGRITEX's commercialization proposals are still to be implemented. The SSIP and Negomo attempts were never completed having been abandoned at the commencement of the agrarian reform (locally known as 'Third Chimurenga') in 2000.

At independence in 1980 the new government of Zimbabwe recognised the role of irrigation in agricultural development, especially in improving the production of the smallholder farmers. The government increased its efforts to promote irrigation development in this sector, which had been neglected by the previous colonial government. In about 1983, steps were taken to develop new smallholder irrigation schemes and rehabilitate all the irrigation schemes, which were damaged during the Liberation War.

Zimbabwe has made tremendous strides in smallholder irrigation since 1980. From about 57 malfunctioning schemes covering 2,500 ha in 1980, over 180 formal1 irrigation schemes have been developed over the years in communal, resettlement and small-scale purchase areas, bringing the total area under smallholder irrigation today to about 12,000 ha. In all, 155,500 hectares are under irrigation, and therefore the area under smallholders is about 8.5 percent of the total irrigated area. Due to its informal nature micro-scale or garden irrigation in "dambos" or wetlands is not normally included in official estimates of the total irrigation command area. However, it is estimated that about 30,000 ha is under micro-scale irrigation in the country, mainly in the "dambos" or wetlands.

ZIMBABWE: EVOLUTION OF SMALLHOLDER IRRIGATION POLICY

PERIOD	POLICY OBJECTIVES
1912-1927	Missionaries encourage irrigation development among small farmers

1928-1934	Government provides services and helps farmers develop irrigation schemes but farmers retain control
1935-1945	Government takes over management of communal irrigation schemes
1946-1956	Land Apportionment Act of 1930 is amended and Blacks are moved to Native Reserves. New irrigation schemes are created to resettle Black farmers
1957-1965	Government curtail development of new schemes because they are not cost effective
1966-1980	Government policy of separate development for Blacks and Whites and introduction strategy of rural growth points, mostly based on irrigation
1981-1990	Government policy emphasises reduction of irrigation subsidies and greater farmer participation in the design, financing and management of scheme.

Source: Adapted from Roder (1965), Rukuni (1984), and Rukuni and Makadho (1934:130) cited in Magadlela ((1999:36)

Irrigation development in African areas is viewed by the Gwanzura (1987:3-5) as;

a) The implementation of the Land Apportionment Act of 1930. This act legalised the unfair distribution of land between the white settlers and African peasants which had started in 1890 in a de facto manner. The African peasants got a small quantity of land of poor quality whose carrying capacity was very low. Therefore, irrigation development was meant to enable the land to carry greater populations evicted from the designated white areas, (Yet in white areas irrigation development was meant to enable the population using the land to make more profitable use of it.)

b) It was also meant to deal with the ecological crisis that had resulted in these African areas due to overcrowding and unsuitability of the environment to the use it was put to. The 1951 Land Husbandry Act failed to produce any tangible results. The State reasoned that the Act failed to yield good results due to the state's limited control of the peasant farmer. It felt on an irrigation scheme the control of the farmers would be much easier than on dry land plots, and therefore the passing on of new and better techniques of production would be much easier and faster. In fact, the state's control of irrigators reduced them to state labourers.

c) Irrigation development was thought to produce a large and prosperous rural black elite whose influence in conjunction with African Purchase farmers would produce a stabilizing influence on the country's politics and extend the tax base into the rural areas. It was also thought that the prosperity of these irrigators would have a stabilizing influence on the large farm economy by lessening the demand for land in scheduled white areas.

d) After U.D.I the tempo in agricultural development is diversification of agricultural production in an effort to beat the United Nations sanctions of 1966, and irrigation development was seen as a way of bringing more land into production and incorporating the peasant into cash crop production. This was achieved through the crops the peasant was made to choose from.

e) Irrigation development was also viewed as a rural development tool. It was thought that irrigation development would provide employment opportunities within the Communal Lands for a large and growing population. The neo-classical theory of economic development was applied. It was hoped that it would create real wealth on the irrigation schemes, which would overflow into the surrounding areas. This however, remained in essence a real "trickle" down of wealth. It has actually led into the process of rural differentiation.

f) After 1975, the tempo shifted from "development" to security consideration. Irrigation schemes became part and parcel of Protected Villages, especially in the Masvingo Province. The security forces found it better in terms of supervision of peasants working on irrigation schemes which were fenced than peasants working on scattered dry-land plots.

g) 1980 onwards irrigation development is again viewed as a cutting edge of development in rural areas. It is seen as a way of bringing about a transformation of peasant production. It is also seen as a way of resettling peasant farmers (Mushandike Irrigation Scheme) and as a "band Reform" tool.

Effects of irrigation farming on livelihoods in Zimbabwe

In Zimbabwe irrigation farming is a reliable source of income. According to Mudima (1998:24) from a social point of view a farmer in an irrigation scheme is certainly better off than labourers in urban industries who are faced with a lot of other demands like rent, water and electricity charges on their incomes.

Irrigation farming is generating employment in rural areas of Zimbabwe. Mudima (1998:26) states that irrigation schemes are found to hire labour additional to that provided by the irrigation households to assist in land preparation, planting, weeding and harvesting. The availability of employment in the irrigation schemes is important in terms of reduction of rural to urban migration. It is important to appreciate that a reduction in migration is in fact a saving for the urban municipalities in terms of an avoided cost of providing services like housing, water, sewerage, education and health to potential migrants.

According to the findings of FAO (1997) Zimbabwe's food situation is characterised by food security at national level but food insecurity at micro level. The major concern is the availability

of food at household level. Irrigation schemes are found to act as sources of food security for the participants and surrounding communities through increased productivity, stable productivity and increase incomes. Some irrigation schemes are located in harsh climatic regions where people cannot grow enough to feed themselves because of unfavourable weather conditions. The farmers participating in irrigation schemes never run out of food, unlike their dryland counterparts. The payment of hired labour in kind by most schemes also ensures food security and better nutrition (Mudima, 1998).

Irrigation development in Zimbabwe contribute towards drought savings. According to Mudima (1998:27) the Government of Zimbabwe (GOZ) has spent large amounts of money since 1980 on drought relief. Irrigation farming is important as a development strategy since it results in government savings and ensures access to food by farmers. Farmers enjoy the human dignity of producing their own food instead of continuous food hand-outs by the government.

Irrigation farming in Zimbabwe enables farmers to acquire various assets. For example, according to Mudima (1998:27), at Chitora irrigation scheme in Mutoko, the participants who used to live with their parents before the scheme now have their brick walled houses of their own. They are all married and own various household assets, electrical goods and farm implements. The farmers in an interview confirmed that their standard of living had indeed improved. At Hama Mavhaire irrigation scheme in Mvuma about 29 percent of the plot holders were reported to have bought between one and four head of cattle from the proceeds of the scheme. The conclusion that can be drawn is that well performing smallholder irrigation schemes can permit accumulation of wealth by participants.

Farmers are offered an opportunity to operate on commercial basis by irrigation schemes. Participants in most irrigation schemes can acquire entrepreneurial skills. The evidence is that farmers have the ability to do their own budgeting, keep record books and manage their own

affairs. Farmers are also able to search for marketing information, organise cropping programmes which fit the markets and organise transport to such markets and they are capable of negotiating contracts.

According to Mudima (1998:28), the fact that irrigation schemes result in the increase in incomes for the farmers means that the schemes are promoting economic development of the nation, which is measured by the well-being of the people. The changes which occur to the people, such as improved houses for farmers, better nutrition, self-reliance, improved assets, to mention a few are part of economic development.

In Zimbabwe under irrigation farming high cropping intensities are practised. Crops unknown to communal farmers can be grown under irrigation. The cropping pattern is normally dominated by high value crops so that the farmers can generate enough income to operate and maintain the irrigation schemes. If the irrigation schemes produce high-value crops for both local and export markets it means the schemes are now participating in the mainstream economy. A compromise between subsistence requirements, availability of sound agronomic rotations, road infrastructure, proximity to markets and marketing demand in most cases is the cropping pattern.

Irrigation farming in Zimbabwe is also promoting high yields of crops. As compared to dry-land farmers, irrigation farmers get higher yields. Irrigation farmers are also able to grow high value crops both for local and export markets, thus effectively participating in the mainstream economy.

With irrigation farming, farmers in Zimbabwe are developing a commercial mentality which is being indicated by the use of high level of inputs by irrigators as compared to dry-land farmers. For instance, irrigation farmers can use 500kg/ha top dressing fertilizer for maize whereas dry-land farmers can use on average 100kg/ha. The difference shows that irrigators

are operating on commercial lines while needing labour intensive and labour hiring is characterised by people who are business minded. Irrigation farmers can open bank accounts for depositing all their proceeds from crop marketing; hence developing their way of life.

Irrigation farming in Zimbabwe is also supporting business activities for local dealers who supply the schemes with inputs. High levels of fertilizers and chemicals are required for the high value crops grown in different irrigation schemes so the fertilizers and chemicals are mainly purchased from the local dealers, thus supporting others business activities. Transporters hired by the farmers to carry produce to the market can also benefit.

However, irrigation farming in Zimbabwe has also negative effects on livelihoods. Irrigation affects health. Irrigation dam is a source of water for different purposes such as washing and drinking. However, dams give rise to swamp areas in different parts of drainages. Different pests and insects mainly mosquitoes can be introduced with the foundations of swamps. Due to this malaria becomes the major problem of the area. Canal construction without cement is another health problem for both humans and livestock. Canals without cement percolate water and the percolated water goes to homes of humans and livestock which causes unconditional humidity in living homes. It can lead to viral, fungal and bacterial diseases. Irrigation households are forced for other additional expenses to cement the basement of their homes. In addition, the percolated water accumulated in the form of swamps also causes water borne diseases.

Irrigations in Zimbabwe are also leading to the displacement and resettlement of people. Irrigation schemes displace households from their homes especially those who are settlers in the dam sites, upper and down streams.

Conclusion

The rise of irrigation farming in Zimbabwe has evolved as a way to fight famine and poverty and to resettle people who have been displaced by the Land Apportionment Act of 1930.

Irrigation farming brought positive effects on rural livelihoods which include employment, incomes, infrastructural development, food security, health and wealth. However, irrigation farming also affected people in Zimbabwe negatively bringing diseases through swamp areas and it also displaced people from their areas. However, it is difficult to know the statistics of people affected in Zimbabwe in general because the topic has not been researched on.

Chapter 2

THE IMPACT OF IRRIGATION FARMING ON LIVELIHOODS IN NYANGA DISTRICT, WARD 12

Chapter Overview

This chapter seeks to explore the livelihoods of rural people before and after the introduction of irrigation farming. The chapter explores the nature of rural livelihoods in Nyanga District particularly in ward 12 before and after irrigation introduction, thus this chapter highlights the way livelihoods in ward 12 were structured before and after the coming in of irrigation farming. The chapter also explores challenges surrounding irrigation farming.

2.1 Livelihoods of people in ward 12 before the coming in of irrigation farming

The research respondents acknowledged that before irrigation farming came in ward 12 of Nyanga District, people under headman Sanyamaropa lived in small huts which were made of mud and poles and the area consisted of thick bush before the arrival of white men and Agricultural Demonstrators. They said that people lived in small villages which were scattered mainly at the edges of the bushy area whose swampy sections the people cleared for cultivation, in the plain, pan-like area, and on the foot of the hills surrounding Nyamaropa irrigation scheme. They also acknowledged that while some people had their huts scattered on the foot of the hills, some stayed along the Gairezi river which borders Mozambique and Zimbabwe. '*As I heard, our elders used to live in very small huts which they did not use cement and bricks to build but they used poles which they took from surrounding bushes and mud. For roofing they used grass. They lived in small villages which were all around in an area which was plain and was like a sauce pan in the sense that it is a depression within a range of hills around it.'* One respondent responded as the researcher interviewed.

Another respondent said, "*Some of our elders' villages were across the Gairezi River which borders Zimbabwe and Mozambique and the elders could cross the river at will especially*

before the height of the liberation war in the 1970s. This was because security along the border was relaxed." The respondent highlighted that to the Barwe people the border was of no importance except that it imposed an unnecessary divide between people who regarded themselves as under the same leadership of Headman Sanyamaropa and belonging to one ethnic group.

Other respondents also said that most of the Barwe people had dual citizenship (Mozambican and Zimbabwean. "*The Barwe people before the introduction of irrigation farming carried around both Zimbabwean and Mozambican identity documents since they had dual citizenship. That is what my grandmother used to tell me.*" One of the respondents responded during an interview. So when the irrigation scheme began most of the Barwe people did not know what was taking place. Most of them thought it was a government strategy for them to work on European farms for cash and because of these thoughts some of them fled from their places either into Mozambique or to the surrounding hills. One respondent during an interview said, "*Our elders did not know what was happening when the scheme was introduced and most of them fled to Mozambique to stay with their relatives and some built their own homes there and others went to start their homes at the surrounding hills. This was all because they did not want to work on European farms as they thought that Europeans wanted to disturb their lives like what they did during the Land Apportionment Act of 1930."*

Some respondents highlighted that, one of the first irrigators called Chibonda was given a plot which was used by the authorities as a field to demonstrate to the reluctant locals the beauty of irrigation. The AGRITEX officer said, "*From our records, Chibonda's plot was meant to show the Barwe people that the government did not just want to remove them from their land per se but it also wanted to boost their chances for survival under drought situations*." It was also from the AGRITEX officer that the government had probably made one of the worst mistakes

to use an immigrant for a demonstration plot because the ward 12 villagers attached everything about it to its foreign characteristics in every sense, so the government had to find ways to appeal to people so that they would accept the project.

2.1.1 Shifting cultivation by the Barwe people

Most respondents in the area acknowledged that shifting cultivation was done but not very much. One of the irrigators said, "*As many old people always say, the original inhabitants of this place who were of the Barwe ethnic group used to practise shifting cultivation on a limited scale for grain. They relied on gathering fruits and tubers for the supplementation of their diets and they also relied on fishing and hunting for protein. Both cultivation and hunting were the major sources of food although cultivation was on a limited scale*." The respondents also highlighted that before the introduction of irrigation farming in ward 12 the Barwe people highly valued their land which was under the Headman's custody and they respected and honoured it because they had the belief that it was through the land that their ancestors gave them food and water.

Of the interviewed respondents some highlighted that cultivation was done on a limited scale on small plots in the wet land towards what is the South Eastern side of the scheme today. They said, "*Crops which were grown are maize, sorghum, millet, yams and other local varieties of crops and most of the yams were grown along the banks of the Gairezi River where there are fertile soils and the crops were grown on small plots which people used to peg by tying bunches of grass together to show others that the plot has an owner*." The respondents said that the local population was small but women and children had to use family pieces of land to cultivate. This is because elders had claimed most cultivable land by pegging but they did not cultivate all the claimed pieces of land.

One responded said that before the introduction of irrigation farming in ward 12 there was an interesting link between hunting and the acquisition of land or pegging for cultivation among

the Barwe people. The respondent said, "*The Barwe people had ways of trapping or snaring wild animals for food which was not strongly prohibited as it is today. So what happened in relation to land was that, when an animal was caught in someone's trap and it fell, the spot on which it fell was to be owned by the hunter for cultivation even if the animal ran a few metres from the initial location of the trap. If someone was found cultivating on the land s/he would be reminded of the big catch, and s/he would leave the piece of land*."

Some respondents found shifting cultivation being of an advantage as they highlighted that as a farming method it had the advantage of restoring the fertility of the soil during the often extended fallow periods. The respondents said that some outsiders felt that the Barwe people had major food production or supply problems, and the outsiders suggested for intensified cropping on a large scale on the basis that it could assist in avoiding starvation in years of drought. The Barwe people saw irrigation development and immigrant irrigators as a threat to their very heritage as they keep in their minds oral history recollections. The respondents added that although the Barwe's group cultural identity was affected by the project of irrigation farming, they still had certain aspects of their cultural belongingness that made them one group such as observing *chisi* and attending rain-making ceremonies. One respondent said, "*Our elders did not want irrigation farming because they said it was of negative effect to their culture. The elders used to say because of irrigation farming people were going to fail to respect our cultural values. They also believed that shifting cultivation restores soil fertility."*

Before the construction of Nyamaropa irrigation scheme, the local people had many ways of entertaining themselves and whiling away time. For example, they would dance to drums and hoe-blade tinkling music.

2.1.2 The disappearing school in Nyamaropa

Some respondents were of the view that there was a small school in the area called Sanyamaropa but they did not clearly remember when it began. Some old irrigation farmers

said that they only recall finding it there. Some irrigation farmers said, "*The Barwe villagers used to say that a very few people attended lessons at that school which was set up by Missionaries who were passing through the area in the early 1940s*." Some of the respondents who were the earliest immigrants in Nyamaropa said that they found the school operating in 1954 but today there is not even a single indication that the school ever existed where local people point out its former location, save for a heap of old broken and useless bricks.

Some irrigators said that instead, at the place where the school was there is now a big farmers' shed where community meetings and irrigation issues are held. Some of the villagers say they hardly remember the school but most of them know about it. A 67 years old man was quoted saying, "*I know about the school yes, but the place where the school was, is that place where we put our shed for our meetings. The school was set up long back that some of our friends could hardly remember about it."*

Drawing from the information from ward 12 villagers about the school, although the information is thin, the suggestions are that, the villagers had been reached by external influences. One of the respondents said that the Nyamaropa villagers may not have been fully receptive to the educational drive by whoever set up the school but mere existence of the school is evidence of the fact that intervention of externals started much earlier than the introduction of field conservation contours that preceded the development of irrigation. Moreover, some young men in the study area had been either to places like Harare, Bulawayo or South Africa to find jobs and although their numbers may be limited the fact remains that there was external influence among local Barwe people. Respondents pointed out that the Barwe people did not contact much with the outside world.

Some of the irrigation farmers under interview pointed out that some Barwe people were not receptive to outsiders for many reasons, such as security reasons because of the fact that some villagers knew of villages which were burnt down during the war due to the reason that they

gave food to the Nationalist guerrillas. The respondents also said, "*Some Barwe villagers were not very eager to see cars around their villages, some of them could become curious of course and come forward to meet strangers and there are cases were some of the local Barwe people would be arrested for dealing in illegal drugs such as marijuana (dagga) across the Mozambican border*."

2.2 The evolution of irrigation farming in ward 12, Nyanga District

The respondents highlighted many issues concerning the evolution of irrigation farming in ward 12. It was from the respondents that two interventions by the colonial state in the Nyamaropa area changed the life of the original inhabitants. One of the intervention was that of the enactment of the Land Apportionment Act (1930) by the colonial government which led to the eviction of whole families from their home areas which were designated for White commercial farming. Nyamaropa communal area was not gazetted for White commercial farming but the communal area attracted many people from the area around Nyanga town which is about 60 kilometres away and from other places in Zimbabwe. One irrigation farmer said, "*Some people came from as far as Harare, Chipinge, Rusape, Buhera and Mutasa for white commercial farming. The people settled in Nyamaropa or close by and they started farming. These people visited the headman and kraalheads in the area to pay mutete which is a gift to show respect, a form of homage to the traditional custodians of the land*." The colonial state intervention in other areas of Zimbabwe brought different groups of people together in Nyamaropa whose origins are recognized by everyone as they are easily identifiable by their names and totems and those who came from other places are named by the original inhabitants of the Nyamaropa area as aliens *(wawuyi* in Shona*)* and the original inhabitants and their descendants are called as locals *(wemuno* in Shona*).*

The AGRITEX officer mentioned that the second intervention by the colonial state brought irrigation technology to the Nyamaropa area. He said, "*It was in the mid-1950s when the idea to construct an irrigation scheme in this area of Nyamaropa came out after an African*

agricultural demonstrator noticed the potential of irrigation of the area because the valley of Nyamaropa seemed to have very fertile soils and a dam to hold the water to supply the valley was easy to build nearby." The AGRITEX officer added that Nyamaropa irrigation scheme's construction started in 1956 where the district commissioners of Nyanga mobilised both forced and voluntary labour from local villagers and people displaced from their home areas to construct canals.

The AGRITEX officer also pointed out that the Nyamaropa irrigation scheme's operation started in 1961 but some irrigators were saying the first crop was in 1960. The AGRITEX officer said, "*From the records we have, just from the beginning of the scheme, cultivation was done by newcomers and by the locals but the majority of the local people did not want the idea of irrigation farming and only a few joined because irrigation farming did not fit their life styles since they did not imagine themselves as the full-time farmers required by irrigation farming*." He added that the locals also resented paying irrigation fees for land because they considered it theirs and they accused newcomers of taking over their land and of being puppets to the colonial authorities who were confining people to poor and arid areas.

The locals were to choose between joining the scheme as irrigators and moving from the irrigation land onto the surrounding hills so many of the locals took off to Mozambique and some settled on the slopes of the hills. Those who settled on the slopes of the hills now provide much of the labour on the scheme, as the AGRITEX officer said.

The respondents said that many dry-land farmers today are getting involved in part-time irrigation farming especially in winter but they still do not regard themselves as irrigators and they refer to most of the full-time irrigators as aliens. A woman who is a non-irrigator was quoted saying, "*I do not want to be an irrigation farmer, I just want to earn from working for these irrigation farmers. These irrigation farmers are newcomers so I cannot leave my land*

(dry-land) to do irrigation farming to compete with these newcomers." As pointed out by one non-irrigator, newcomers and locals for more than 30 years have been in conflict.

Some respondents indicated that no-one anticipated problems that would rise in re-allocation of plots and the introduction of the block system when the irrigation scheme was being constructed and the plots being allocated. Each type of crop is grown in a separate block and irrigators have plots in each of several such blocks. Farmers were randomly given four-acre plots as they came into the irrigation scheme and they cleared their four-acre plots (farmers were to clear their own plots for cultivation so that they would identify with the project and regard the plots and the whole scheme as their own and in this objective, the project seems to have succeeded) and they were given extra two acres as a reward if the irrigation officer deemed their performance excellent but the reward was not an extension of the plot the farmers were already working on but it was on the different side of the scheme, one of the irrigation farmers indicated. They said that farmers had to move between plots which were kilometres apart in the scheme and the pattern and variable sizes of land-holdings precluded a block system of irrigation.

The AGRITEX officer said that those who introduced irrigation farming during the period which Nyamaropa irrigation scheme was constructed had an assumption that the commoditisation of small-scale communal production would be speed up by intensified production and they had a hope that this would stimulate development for the benefit of both the producers and their prospective markets in the adjacent dry-land area, the urban centres and the national economy at large.

2.3 Livelihoods of the community in ward 12 after the introduction of irrigation farming

The respondents highlighted both positive and negative effects on livelihoods in ward 12 after the introduction of irrigation farming. Most of the respondents pointed out that irrigation farming has affected livelihoods of ward 12 positively and a few negatively.

DISTINCTION BETWEEN FARMERS

The irrigation farmers highlighted that the irrigation intervention brought about a distinction in Ward 12 and the distinction is between those who irrigate *(warimudambo),* the majority of whom are newcomers and a minority are locals, and those engaged in dry-land farming.

The AGRITEX officer was quoted by the researcher saying, "*Dry-land farmers primarily depend on rains meaning their farming is rain-dependent or rain-fed and it is a way of farming different from irrigation farming in which the supply of water is reliable, constant and secure*."

The AGRITEX officer added that, two separate sections for irrigated and dry-land farming were created by the government department of AGRITEX and later on the distinction in the course of development acquired a different meaning since dry-land farming became associated with traditional and irrigation farming with modern. In addition to that, farmers and AGRITEX associate irrigation farming with relief from drought since Zimbabwe experiences severe periods of drought.

ADMINISTRATIVE AND ECONOMIC STRUCTURES

As highlighted by the AGRITEX officer new administrative and economic structures and agencies to the area of ward 12 were brought alongside irrigation by the colonial intervention in Nyamaropa communal area. He also said there was a substantial increment in the involvement of the Department of Native Agriculture in agricultural production of smallholders. The AGRITEX officer said, "*After independence in 1981, it became the responsibility of the newly formed AGRITEX to disseminate information to both irrigation and non-irrigation farmers about crop recommendations, crop rotation schemes and new technologies."*

INTRODUCTION OF NEW CROPS

The irrigation farmers said that after the introduction of irrigation farming in ward 12, new crops arrived in the area, such as tobacco, cotton, wheat and hybrid maize, most of which were to be produced for market. They added that the introduction of cash crops brought also other new agencies of change, such as buyers of cotton, tobacco and maize. One irrigation farmer

said, "*Instead of growing yams, millet and other crops which were grown before the introduction of the irrigation scheme, we are now growing cotton, wheat, tomatoes, tobacco and many other cash crops and we are living a better life than before."*

NEW FORMS OF GOVERNANCE

The AGRITEX officer highlighted that the AGRITEX records show that the introduction of irrigation farming in ward 12 brought about new forms of governance which were introduced in the form of local government structures operating alongside the long-established tribal authorities comprising chiefs, headmen of neighbourhoods and kraal-heads. Some of these were African leaders appointed by the colonial authorities to help administer reserves, especially in tax collection and land allocation.

SCHEME MANAGEMENT

It was from the respondents that colonial intervention and the introduction of irrigation farming in ward 12 created another structure which is the Irrigation Management Committee (IMC) elected by irrigation community and AGRITEX for the daily management of the irrigation scheme. They said that IMC is headed by a chairman, assisted by a vice-chairman, treasurer, secretary and eight other members. The IMC together with AGRITEX makes decision on water distribution but maintenance fees are set by the government.

The respondents also added that there is a set of by-laws which lay down the rules of conduct of the irrigation scheme which were formulated and accepted by a general meeting of the irrigation community and the by-laws show among other things that farmers who do not pay maintenance fees on time will be evicted that is, if the IMC and AGRITEX make such a decision. The respondents highlighted the other duties of lMC as enforcing by-laws, collecting fines from farmers who violate them, conveying meetings involving irrigators and acting as some kind of broker for the marketing of irrigation produce. "*We have a management committee which makes decision on water distribution with the help of AGRITEX. The*

committee also collect fines from irrigation farmers who break rules and also it helps in the marketing of irrigation produce." This was said by one of the farmers

OUTCOMES AND INCOMES

Irrigation farmers in ward 12 highlighted that irrigation farming has increased output level in three ways. They highlighted the first way as irrigation augmenting water supply and helping reduce crop losses through erratic rainfall and in addition, permitting multiple and continuous cropping in a year and hence increasing total farm output per parcel of land in a year and finally, in ward 12 where land was available but the water supply was minimal or seasonal, irrigation farming allowed for intensive crop cultivation. They pointed out that because of complimentary inputs such as fertilisers, high yielding crop varieties and modernised technology, irrigation farming brought about increases in output levels and the increases in outputs led to increased incomes, which is a key livelihood outcome as highlighted by one of the irrigation farmers who is benefiting from irrigation farming. He said, "*We are now getting a lot of outcomes because of irrigation and there is now a big difference between the outcomes we used to get before irrigation farming and what we are now getting. On top of that we now have better incomes."* Irrigation farmers of ward 12 also mentioned that irrigation farming has greatly impacted their livelihoods through improved output levels. They mentioned that ward 12 irrigation scheme is a source of income and food supply for many dry-land farmers and Mozambicans who get into the irrigation scheme for different reasons.

EMPLOYMENT

The irrigation farmers of ward 12 also pointed out that irrigation farming has reduced poverty through employment by creating farm labour for them, wage labour for others and labour for maintenance of irrigation facility. The farmers also highlighted that higher value crops, higher yields and the more intensive cultivation techniques led to higher, less risky and more continuous levels of employment in ward 12 and income for both irrigators and non-irrigators. They said that non-irrigators with small landholding but also dependant on on-farm

employment as a source of income, benefit from increased and more evenly spread irrigation farm labour opportunities, improved wage rates, reduced out-migration and increased return migration and improved security against impoverishment. "*The irrigation scheme is our source of employment and our source of income."* This was said by a non-irrigator.

CONSUMPTION AND FOOD SECURITY

As highlighted by some irrigation farmers, the introduction of irrigation farming in ward 12 has led to the increase in production and this has led to increase in the quantity of food available which has led to the reduction in food prices and improvement in food security. They highlighted that irrigation farming has reduced poverty among net food purchasers in irrigated and non-irrigated areas of ward 12 and the irrigation farmers find it wise for them to first secure their food reserves before they get into cash crop production and they also give some amounts of crops to relatives and friends whose harvests may not have been good for that particular season. One irrigation farmer was quoted by the researcher saying, "*At my home, I have many children. They are 11 and on top of that I stay with 5 relatives, so all in all we are 18, that is, including me and my wife but to tell you the truth there is not even a single day when this whole family spent without food because of poverty or lack of food. I have a lot of food I grow in the scheme and the prices of food are low at the shops."*

NON-FARM ACTIVITIES

As said by some ward 12 villagers irrigation farming in ward 12 has promoted non-farm income generating activities. For instance, when there are increases in output and incomes for that matter with declines in food prices, enriched farmers and workers are able to increase their expenditure on non-food products and this leads to demand for non-food goods and services leading to the establishment of business that provide goods and services. They said that this has resulted in the increased employment opportunities in non-farm income generating activities such as transportation, petty trading, construction, to mention a few. A non-irrigator

was quoted saying, "*I am a driver and I transport some of the irrigation produces for Cairns company."*

HEALTH

The ward 12 irrigation and non-irrigation farmers pointed out that the introduction of irrigation farming in their area has affected their livelihoods in a socio-economic context in many different ways. They pointed out that irrigation farming brought about positive impacts on nutritional outcomes, through the availability and increased food supplies and in addition, the ward 12 irrigators are affording to purchase wider variety of foods because of increased income levels thereby increasing dietary diversity and ensuring balanced diets with adequate intake of balanced diets. Respondents also shared that they afford to take their children and themselves to the hospital for medical attention in case of any medical complication. But they said that after the introduction of irrigation farming in their area health risks arose from water borne diseases because the irrigation involves canals which encourage water related diseases and pests whose growth and development in enhanced by anthropic environments associated with irrigated agriculture. The irrigation farmers and even the non-irrigation farmers in the study area said that they have more problems with diarrhoea diseases and parasitic infections like malaria as highlighted by one non-irrigator who said, "*The crops which are grown in the irrigation farm are nutritious and it is good for health but the problem is that mosquitoes from the scheme are causing malaria."*

RESETTLEMENT

Nyamaropa irrigation scheme, according to Reynold (1969:14) can be regarded partly as a settlement scheme for displaced people. The AGRITEX officer mentioned that many of the people who had been displaced from their home areas as a result of the Land Apportionment Act (1930) were resettled after the construction of the scheme and these people had access to new and irrigated land. The AGRITEX officer added that farmers in ward 12 due to irrigation

farming were enabled to produce valuable crops such as cotton, tobacco, maize, wheat, beans, to mention a few, which satisfy both their subsistence and cash needs.

The AGRITEX officer also mentioned that irrigation farming is providing the resettled people with the necessary produce to pay, in cash or in kind or both, for agricultural inputs which are seeds, fertiliser, pesticides and insecticides and the labour they need, and to take part in community life, spiritually, culturally as well as socially.

He mentioned that through irrigation farming the resettled farmers became successful farmers and they are now living a decent life whereby they own brick houses, eat well and they are able to send their children to school. One of the irrigators characterised schooling by referring to '*learning from money from the land.'*

CONSERVATION OF NATURAL RESOURCES

The respondents said that ward 12 irrigation scheme is seen to contribute in a way with the conservation of natural resources because while the dry-land farmers at Nyamukondeza, an area adjacent to the irrigation scheme are engaged in gold panning, the irrigators are not. Irrigation farming is offering full-time employment to the irrigation farmers such that the farmers are distracted from engaging in environmentally destructive activities like gold panning as one quoted saying, "*We spend most of our time in the scheme doing farming and we do not have time to do gold panning like the Nyamukondeza people."*

ASSETS

The respondents highlighted that through irrigation farming irrigators and non-irrigators are managing to acquire assets using incomes from the scheme. For instance, some farmers bought scotch carts, harrows, cultivators, bicycles, cars, tractors, improved their houses and acquired new houses. Irrigators and non-irrigators of the study area highlighted that they have made improvements to their houses. The quality of housing has increased significantly since the introduction of irrigation. Improvements made include tin roofs and walls, additional rooms, partial brick/concrete construction and in some cases new brick/concrete house construction.

As highlighted by some respondents some very successful farmers in the irrigation scheme have set up shops with earnings from their irrigated plots and electrification of some irrigation houses, shops, schools, clinic and hospital came after the introduction of irrigation farming.

The respondents mentioned that following the introduction of irrigation in their area, livestock numbers are reported to have decreased and the main reason for this is shortage of grazing land. Some farmers highlighted that grazing land had been converted to crop land and the construction of the dam reduced grazing land. Some respondents cited quarrels over grazing land as a reason for the reduction in livestock numbers. One of the irrigation farmers said, "*Through irrigation farming I have acquired a brand new lorry, I have also renovated my house, it now has 8 rooms and it is now painted. There is also electricity at my home. But the problem is that I do not have livestock not because I do not want to have it but because there is now shortage of grazing land since the irrigation was introduced. Some of my colleagues sold their livestock due to the shortage of grazing land."*

INFRASTUCTURAL DEVELOPMENT

It was from the respondents that the road from the small town of Nyanga to ward 12 was tarred to ease transport problems for the produce of farmers from both the irrigation and surrounding dry-land. One of the farmers said, "*In 1983 that is when the road from Nyanga to this area was completely tarred so that it can be easy for us to transport our farm produces."*

DECISION MAKING BY MEN AND WOMEN

The respondents highlighted that the inclusion of women in committees at Nyamaropa irrigation scheme represents a recognition of the importance of gender in decision making. They mentioned that the IMC and its sub committees gives an insight into the decision making responsibilities from a gender point of view and the IMC consists of 5 women and 7 men. One of the female IMC member said, "*Long ago decision making was for men only but I am happy that the introduction of irrigation farming here in ward 12 also enabled us women to make decisions."*

EDUCATION

The respondents pointed out that the availability of income enabled irrigators and non-irrigators to educate their children and also themselves. Most of the respondents afforded to take their children to boarding schools (both primary and secondary). A few sent their children to local schools so as to minimise costs. Some of them were orphaned non-irrigator boys and girls who would work for irrigators so as to earn money for their fees. An orphaned girl was quoted by the researcher saying, "*I work in the irrigation scheme to earn money for my fees and I go to a local school. Some of our friends who still have parents go to boarding schools and some go to local schools as their parents want to minimise costs."*

MULTIPLE USES OF WATER

Irrigation in ward 12 has provided water for washing, bathing and drinking. The irrigation farmers said that water used in the irrigation is vital in that it maintains the viability of their livelihoods. Some of the irrigators highlighted that water for washing clothes and dishes is not a problem because they take it from the irrigation scheme and that is where they also take water for bathing and drinking though it is not very safe for drinking. The irrigators mentioned that the irrigation is their nearest source of water that is why they take water for drinking there.

COMPETITION BETWEEN DRY-LAND FARMERS AND IRRIGATION FARMERS

The respondents highlighted that irrigation farming in ward 12 brought about competition between dry-land farmers and irrigation farmers whereby many dry-land farmers are best producers of maize, cotton and tobacco in the communal area competing with the irrigators. Even though irrigators benefit from the advantage of secure water resources and three cropping seasons, dry-land farmers have one cropping season and depend on erratic rainfall patterns but they have large farms. Also there is an irrigation scheme which is in ward 10 which is Nyakomba irrigation scheme. They also said there is also competition between Nyakomba irrigation scheme and Nyamaropa irrigation scheme and the competitions they are under lead to high crop production. An irrigation farmer during an interview said, "*Dry-land farmers in this area are now best producers of the crops we grow in the irrigation scheme because they*

are competing with. There is also Nyakomba irrigation scheme which is about 8 km from this area which some of the crops they produce are just the same as the crops we produce here. The competition is good because it results in increased crop production despite the fact that marketing of the produce will be a problem."

BELIEF SYSTEM

The respondents in ward 12 highlighted that the arrival of people from other areas of Zimbabwe who came to join the irrigation scheme in ward 12 caused the introduction of Christianity in the area. They said that most of the ward 12 local people believe in ancestral spirits and most of the new comers (those who came from other areas to join irrigation farming) believe in Christianity. The respondents regard Christianity as modern and ancestral spirits as traditional. Since the introduction of irrigation farming there are 19 churches in the area of which before the establishment of the irrigation scheme there was not even a single church as highlighted by another irrigation farmer who is a full member of the United Methodist Church. Today people in ward 12 join churches of their choice.

MIGRATION

The respondents highlighted that the introduction of irrigation farming in ward 12 reduced the number of out migrants but it increased the number of immigrants. One respondent said, "*Before the introduction of the irrigation scheme I heard that people used to go to Mozambique but because of this irrigation scheme people are coming here from different places including Mozambique to do different businesses."*

2.4 Challenges surrounding irrigation farming in Nyanga district, Ward 12

Ward 12 shared a quite number of challenges they have faced in irrigation farming since they started operating.

WATER SHORTAGE

One of the challenges faced by Nyamaropa irrigation scheme is the shortage of water. AGRITEX staff and irrigation farmers saw the problem as arising from excessive illegal water

usage upstream by non-irrigators. The ward 12 irrigators stated that their status as irrigators had changed since upstream irrigators started taking more water to expand their gardens. They said that they are more like dryland farmers who grow one crop per season. They do not blame water shortage in the scheme on changes in rainfall patterns, but on upstream people's use of their (irrigators) water. A respondent from the irrigation farm said, "*Water shortage is our main challenge and the shortage is caused by non-irrigators who are using water upstream."*

Whilst irrigators believe that water shortage problem is mainly caused by incompetent management on the part of some irrigators, their IMC and AGRITEX, the headman and his followers, mostly dry-land farmers, believe that shortage of water is a result of misunderstandings between the people and their spiritual realm. One dry-land farmer said, *"Water shortage in the irrigation is not because it is being used upstream by non-irrigators but it is because people do not follow what our ancestors want so the ancestors get angry and they cause water shortage in the area."*

WATER DISTRIBUTION

Challenges with irrigation water distribution in ward 12 is causing conflicts between upstream and downstream irrigating households. Because the programs to irrigate each cultivated crops are not standardised, irrigation water use depends only on spatial location of the farm plot and it does not consider the amount of water required for the type of cultivated crop and time interval of water application. The other issue is that some irrigators hold on to water for too long even when their plots are saturated. One downstream farmer said, "*The upstream farmers are using water for too long forgetting that we downstream farmers also need to use that water."*

Also on water distribution AGRITEX staff have blamed irrigation farmers for cropping the whole irrigation scheme on the point that it takes longer to get round a full cycle of water allocations to the plants, resulting in wilting of farmers' crops while the dam is full.

PLOTS SIZE AND SCALE OF PRODUCTION

It was complained by some farmers that the plots they were allocated from the beginning are too small for them to produce on a scale large enough to fully commercialise. The farmers would like to be fully incorporated into the market but cannot cope because they have problems marketing crops which are not enough for some buyers' quota. One irrigation farmer said, "*At one moment we clashed with the Cotton Company of Zimbabwe (CCZ), local and provincial politicians, on the issue of the relocation of the cotton grader from our irrigation scheme to another region because we were not producing enough bales to warrant having the grader based at our local cotton depot."*

LACK OF MARKETS AND MARKETING FACILITY

Some of the crops and vegetables cultivated at Nyamaropa irrigation scheme are highly perishable and bulky so there is no efficient marketing channel and the ward 12 marketing system does not always facilitate outcomes desired by farmers. One reason for this is the similarity of products and marketing patterns. Tomatoes are the dominant crops, often harvested by farmers at the same time, which leads to high availability and low prices during the main marketing period. Because there is no efficient storage system in ward 12, products quality deteriorates rapidly, which means that farmers must sell within a very short time and at low prices. This was highlighted by one of the farmers who said, "*It is hurtful that we will be expecting a lot of cash from our crops but due to the similarity of our produce and the fact that some of them are perishable we are earning peanuts. From what I have discovered our marketing channel is inefficient."*

The other challenge on marketing is that since some buyers of the irrigation produce drive to the irrigation scheme to buy the crops, they charge the prices for the crops. For example, a buyer can say s/he is buying maize at $210 per tonne. Farmers are selling their crops to buyers at very low prices.

EDUCATIONAL LEVELS OF FARMERS

The level of illiteracy in ward 12 is high with some farmers having not attained any level of education. A few of the respondents were educated beyond Ordinary level. The AGRITEX officer confirmed that due to low levels of literacy farmers are not highly concerned with participating in training programmes that are aimed at improving production level of crops. The AGRITEX officer also pointed out that the ward 12 farmers are bad investors and not all of them always listen to AGRITEX's technical advice which they consider inappropriate. The farmers do their own things mixing new and old ways as stated by the AGRITEX officer. The production of high value crops in irrigation schemes is usually knowledge intensive and the level of education of the farmer can be an important variable in the choice of crop and level of production.

ASSET OWNERSHIP

Livestock ownership in ward 12 is low. Cattle and goats in rural areas are viewed as a symbol of wealth as they can be sold when the need for cash arises or slaughtered for meat to supplement the farmers' meat requirements and cattle are also used for draft power. Since a lot of farmers do not have cattle they hire out tillage and they pay in cash or in kind. Cattle are important as a form of saving. The farmers said, "*We do not have livestock. If we had livestock it was going to be an advantage to us because it would raise cash for us and we were also going to use cattle for draft power."*

The farmers in ward 12 use tractors or carts to transport both inputs and outputs to and from the scheme and those without scotch carts and tractors are at a disadvantage as they hire out. Lack of productive assets by farmers leads to high production costs as farmers are forced to higher these at a cost.

AGRICULTURAL INPUTS

Limited access to agricultural inputs is a major challenge threatening the sustainability of Nyamaropa irrigation scheme. In some instance the inputs are not available on the market, for example, wheat and pesticides while for other inputs the prices are too high. The farmers

highlighted that fertilizers are sometimes not available from the local shops making the accessibility difficult as they have to buy them from the nearest small town of Nyanga and by acquiring inputs from Nyanga, the prices increase due to transport costs.

Farmers are prevented from growing some high value crop types like potatoes due to their high costs. They have fear of failure after expending much on them. Some farmers are not using any insecticides/ pesticides due to their unavailability on the local market and the prohibitive high costs. Most of the farmers are not using the recommended ideal high yielding seed varieties. For instance, for the maize crop some farmers use Seed Co 513 while some use Pioneer 5 series varieties, which are medium yielding varieties and are mainly grown in rain-fed agriculture. The farmers said that they do not use the recommended seeds because of the unavailability of the appropriate seed type on the market and the AGRITEX officer highlighted that most of these farmers lack knowledge since they do not want to attend meetings where they will be taught about farming.

Some farmers highlighted that the unavailability of the appropriate seed type can be linked with shortage of better quality seeds. The quality and quantity of the products produced by the farmers is determined by the availability of better quality and sufficient supply when required by farmers. Improved productivity is drove by seed multiplication and the distribution of improved genetics. In ward 12 there is a problem of supply of better quality seeds at the right time.

PESTS AND INSECTS

Pests and insects including large bird infestations is the other challenge faced by ward 12 irrigation farmers. Some irrigators highlighted that the soil which is not drying up properly throughout the year for double cropping season is causing worms. However, other pests like birds have been introduced in the scheme due to the presence of water bodies which the birds use for swimming and living and affect production due to easy mobility. This becomes a problem to irrigators producing tomatoes which are easily consumed by bird predators.

Also the most common crops produced by the irrigation farmers are beans, tomatoes, cotton and tobacco. Consideration of diseases and pest control has seen the irrigation committees enforcing the production of a single crop on all irrigation plots per season, either beans or tobacco. This uniformity although desirable for some crops, for some it has led to problems at marketing level. Since some of the markets are local and very small, production of a single crop for instance, tomatoes, has led depressed prices so much that irrigation farmers have not been able to sell all their produce.

HEALTH

Even though the irrigation and non-irrigation farmers are affording to take their children and themselves to hospital for medical attention in case of any medical complication, malaria which is the most common disease in the area is adding expenses of medication and it is reducing labour force for irrigation. The AGRITEX officers stressed out that some of the child and adult deaths in ward 12 are caused by malaria and this forces the reduction of labour availability for production.

Water from the irrigation is the water for drinking for the irrigation farmers. The water is not safe since it is from an unprotected source. Diarrhoea is another common disease in ward 12 and it is affecting children mostly. An irrigation farmer who goes to an apostolic church where going to clinics or hospitals is not recommended stressed out that 2 of his children died of diarrhoea and he was suspecting that the disease was caused by the water for drinking they take from the irrigation.

CONFLICTS

Conflicts in ward 12 are another challenge faced. They emerge and they continue to arise. The IMC and the AGRITEX conflict about present and future management of the irrigation scheme, especially with regards to water distribution and seasonal cropping patterns. The expansion of the irrigation scheme so that dry-land farmers can have access to irrigated plots and the block

system introduction in the irrigation divide the irrigation community into two conflicting camps led by two different types of local leadership.

Another conflict is between various belief systems. Irrigators do not always accept the local perception held by headman Sanyamaropa and his people of the role of ancestors. An example is the observance of *chisi*, a day sacred to the spirits of the land, and on which farming should not be done or soil should not be tilled. Irrigation farmers who came from other areas suggest that *chisi* no longer fits their perception of modern farming because irrigation for them means hardwork. One of the respondents said, "*We came here for business. Farming is our business. We did not come here to respect and wait for the headman's holiday. Why is it that teachers and nurses in this area are going to work on Fridays and those who own shops do not shut them down on Fridays to observe chisi?"* The headman and his followers accuse irrigators and churches of having tainted traditional sacred places, by worshipping in or near them. The headman also accuses irrigators for eroding traditional values and beliefs. Irrigators view local traditions as stifling development and progress. Most irrigators in Nyamaropa irrigation scheme became members of many churches in and around the scheme.

Conflicts in ward 12 are also there among the irrigation farmers about why some farmers harvest more crops than others but they have same number of plots. Farmers who harvest less than others say that those who harvest more use *mishonga* to have good harvests and they use those *mishonga* to collect crops and fertilizer from others plots. This was highlighted by one respondent who said, "*Muno mudambo mishonga ndoinotoshandiswa nevamwe vanhu kuti vatore zvirimwa zvevamwe. Tinotoziva rimwe zinyoka reblack rekuti ukangongoriwana mumunda mako wotoziva kuti hapana chauchakohwa plus ukawana mune kadungwe kemasvosve eblack uchingobva kuisa fertiliser wotoziva kuti fertilizer yave kuenda mumunda memuridzi wemasvosve."* So there are conflicts between farmers who always harvest a lot of crops and those who harvest a few.

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Access to credit through formal institutions does not exist in Nyamaropa irrigation scheme. Only a few of farmers are currently accessing loans from individuals. Not having access to loans is resulting in irrigators not having the credit needed to finance inputs and improving land. The lack of access to credit also affects the choice of crops to be grown. This was highlighted by one of the farmers who said, "*We do not have access to credit from formal institutions. Those who can access loans can access it from individuals. Failure to have access to credit through formal institutions is a problem to us because we are failing to finance inputs."*

THIEVES AND ANIMALS

Another challenge faced by irrigation farmers of ward 12 is that crops grown in the irrigation scheme are targeted by thieves who raid the place for crops and animals which destroy the crops. The irrigation farmers highlighted that thieves take their crops for selling and this tend to draw back irrigation farming. The other challenge the farmers highlighted is that the irrigation is surrounded by hills where baboons and monkeys are found. The baboons and monkeys go down hills to the scheme to destroy crops like tomatoes and maize.

Conclusion

Irrigation farming which is believed to have started in ward 12 of Nyanga District in 1960 up to recent years has changed life for the people in ward 12. Both negative and positive effects have been associated with irrigation farming.

Most people in ward 12 are benefitting from irrigation farming. They are accessing the basic needs as well as enjoying life that is being enjoyed by those who are employed in urban areas. However, irrigation farming is negatively affecting some people in ward 12 by bringing conflicts and diseases in the area. Most respondents however pointed to the positive impacts of irrigation farming.

Chapter 3

ENHANCING IRRIGATION FARMING IN NYANGA DISTRICT, WARD 12

Chapter Overview

This chapter seeks to suggest possible measures to improve irrigation farming so that it can help in transforming rural livelihoods. Irrigation schemes have a profound effect on household livelihood especially in the rural areas and these schemes need to be encouraged. The following recommendations which can be applied in other rural areas and irrigation farms were drawn after exploring the challenges that are being faced by ward 12 in transforming their livelihoods through irrigation farming.

Enhancing irrigation farming

The ward 12 irrigation farmers highlighted that there is need for the improvement of market access for farm inputs such as seeds, fertiliser, chemicals and also to improve market access condition and marketing infrastructure as a form of incentive for irrigation farmers to increase effectiveness of irrigation schemes. One of the farmers said, "*Market access for the inputs we use should be improved so that it will not be expensive for us."*

Local and central and non-governmental organisations should work together to improve the irrigation farmers' marketing system by educating farmers about marketing and developing market facilities such as storage. A non-irrigator who is a teacher at the nearest primary school viewed such a recommendation saying, "*From my point of view, for these farmers' marketing system to improve, I recommend the working together of local and central organisations and the non-governmental organisations which have to do with agriculture, to educate these farmers about marketing of agricultural produce and they should also develop market facilities for the farmers such as storage and other services since some of the farmers' produce are perishable."* It is also recommended that farmers should be linked with markets and marketing systems meaning that farmers should have reliable information about markets before they plant

they crops so that they can adjust to their temporary crop mix to accord with market demand and price signals so that they can sell their crops more easily.

It is also recommended to provide infrastructural services before implementing irrigation schemes so as to reduce the less profitability and the perish ability of the irrigation sector.

From the irrigation farmers' perspective, seasonal uniformity and similarity of production in mass reduces profitability from the irrigation sector. So the farmers recommended for diversification of their product temporally and spatially for better profitability in addition to implementation of processing industries in cooperation.

It was from one irrigation farmer that irrigation and irrigation dams have negative impact in animal production through reduction of grazing land throughout the year and they also cause lack of free communal land for movement. He highlighted that crop production is also reduced by irrigation dams as a result of pest infestation, lack of aeration, water logging and percolation which leads to swamps and in addition, it affects public health through infestation of malaria and other water borne diseases. The farmer recommended that the positive and negative impacts of irrigation should be considered while planning of irrigation scheme and there is need for the cementing of canals for the prevention of water logging, percolation and changing the irrigation land to swamps.

The organisations that are involved in treating water should take into consideration the treatment of irrigation farmers' water for drinking for the prevention of water borne diseases and health facilities should implement malaria treatment mechanisms. This was highlighted by one farmer who said, "*We need our water for drinking to be treated because it is not very safe since some of our colleagues are dying of diarrhoea and it is the water which is causing the disease. Also there should be implementation of malaria treatment mechanisms by health workers because malaria is the most common disease in this area."*

It is also necessary to train irrigation farmers in water management, production of irrigated crop and the marketing of the crops and also general management and operation and maintenance of irrigation. There should be efficient and effective training of farmers for the performance of irrigation farming in the area. This was highlighted by a newcomer irrigation farmer who is eager for trainings who said, "*Even some of our colleagues do not want trainings, I think it is wise for the AGRITEX to train those who want in the management of water, the production of irrigation crops and how to market them. We should also be trained about the general management of the irrigation and its operation and maintenance. From the trainings that is where our success comes from."*

When conflicts arise, the resolution should be passed wisely to avoid continuous conflicts so that the scheme can run smoothly. The recommendation was highlighted by a non-irrigator who said, "*Conflicts in the irrigation farm are arising from different groups of people and the conflicts can hinder the development of the irrigation scheme so I recommend wise passing of resolutions to the conflicts so as to avoid other conflicts which may come again and again so that there can be a smooth running of the irrigation scheme."*

For fair distribution of water in the irrigation scheme, the downstream irrigation farmers recommended proper water management by the IMC and AGRITEX. One of the downstream irrigation farmers pointed out that since it is the IMC and the AGRITEX which decide on water distribution they should ensure that there is fair distribution of water in the scheme because it is not fair for upstream farmers to hold water for long whilst downstream farmers do not have.

Farmers with small plots in the irrigation scheme need to have large plots so that they can produce their crops on large scales for them to fully commercialise. One of the farmers who own small plots said, "*Since we are facing challenges in commercialising our produce because the quantity needed, I recommend all the farmers with small plots to be given also large plots so that they can fully commercialise."*

There should be an improvement in access to credit so as to enhance the farmers' participation in the irrigation scheme. The farmers pointed out that if there are no credit for inputs it is important for them to be assisted with inputs during the first season so that they can create cash flow base. The farmers also recommended that there should be formal institutions which can offer them loans to finance their inputs and to improve their lands. One of the farmers said, "*Because we are facing challenges in finance for inputs (the challenge is mainly faced by those who have just joined irrigation farming now) like pesticides, fertilizers and many others my recommendation is for us to have formal institutions in which can offer us loans for inputs and for the improvement of our land. Informal institutions just offer a few people."*

Conclusion

Due to irrigation farming in Zimbabwe rural livelihoods have improved and standards of living among families participating in irrigation farming have been raised. As found in the study, irrigation farming has increased employment, access to better health services, food security, better housing, education, among other things on people living in areas with irrigation farms. These improvements have contributed to the wellbeing of many people.

Basing on the indicators of sustainable livelihood the people of ward 12, Nyanga District because of irrigation farming have been able to improve their incomes, food security, standards of living, health care, accommodation, quality and level of education and acquiring assets.

However, irrigation farming has caused sufferings among other people as the study shows. Conflicts in ward 12 are increasing in the irrigation scheme. Deaths are caused in the area because of diseases arising from the scheme.

Though irrigation farming has some negative effects, it has more positive effects that negative. In this case, the people involved in irrigation farming are gaining a lot from the farming. It is shown by the research that irrigation farming has brought a positive living to many rural livelihoods.

Reference

Primary Source

Interviews with irrigation farmers, non-irrigation farmers and AGRITEX officer

Secondary Source

Akudugu, M.A., Nyamadi, B.V. and Dittoh,S. (2016). *Transforming smallholder agriculture in Africa through irrigation: An assessment of irrigation impact pathways in Ghana,* Addis Ababa, Invited Paper presented at the 5th International Conference of the African Association of Agricultural Economists, September 23-26, 2016

Asayehegn, K. (2012). *Negative impact of small-scale irrigation schemes: A Case Study of Central Tigray Regional State,* Ethopia: School of Environment, Gender and Development Studies Hawassa University

Berdegue, J.A., Rosada, T. and Bebbington, A.J. (2013). *The Rural Transformation,* pdf

Chazovachii, B. (2012). *The Impact of Small-scale Irrigation Schemes On Rural Livelihoods: The Case of Panganai Irrigation Scheme Bikita District Zimbabwe,* Masvingo: Great Zimbabwe University

Dananto, M.U. and Alemu, E. (2014). *Irrigation water management in small scale irrigation schemes: The Case of Ethopian rift valley lake basin,* Environment. Res. Eng. Management

FAOSTAT, (1999). Available online: http://apps.fao.org/agi-bin/nph.db.pl

FHI, (2006). *Qualitative Research Methods:A Data Collector's Field Guide.*s.1..:Family health international

Fridah, M. (2002). *Sampling.* s.1.:https://profiles.uonbi.ac.ke/fridah_mugo/files/mugo02sampling.pdf

Haji, J. and Aman, M. (2013). *Impact analysis of Mede Telila small scale irrigation scheme on house poverty alleviation: Case of Gorogutu District in Eastern Haratghe Oromia National Regional State,* Ethopia

Hancock, B., Ockleford, E. and Windridge, K. (2007). *An Introduction to Qualitative Research,* The NIHR RDS EM/YH, 2007

Khanal, P.R., Santini, G. and Merrey, D.J. (2014). *Water and the Rural Poor, Interventions for improving livelihoods in Asia,* Bangkok: Food and Agriculture Organisation of the United Nations Regional Office for Asia and the Pacific

Kidane, D., Mekonmen, A. and Teketay,D., (2014). *Contributions of Tendaho Irrigation Project to the improvement of livelihood of Agro pastrolists in the Lower Awash Basin,* Northeastern Ethopia: Ethiop.J. Res Innov Foresight 2014,6, 1-19

Magadlela, D. (2000). *Irrigating Lives: Development intervention and dynamics of social relationships in an irrigation project,* Wagenigen University

Magadlela, D. and Henbinck, P. (1995). *"Dry fields and spirits in trees- A social analysis of development in Nyamaropa Communal Area, Zimbabwe,"* in ZAMBEZ/A Volume 22, No. 1, 1995

Manzungu, E. and van der Zaag, P. (ed). (1996). *The Practice of Smallholder Irrigation: Case Studies from Zimbabwe,* Harare: Mazongororo Paper Converters (Pvt) Ltd

Manzungu, E. (2004), *Farmers Elected Bodies and Smallholder Irrigation In Zimbabwe,* Harare: Weaver Press

Mudima, K. (1998). *Socio-economic impact of smallholder irrigation development in Zimbabwe: A case study of five successful irrigation schemes,* Private irrigation in Sub Saharan Africa, Colombo, Sri Lanka: International Water Management Institute

Mutsvangwa, T. and Doranalli, K. (2006). *Agriculture and Sustainable Development,* Netherlands: The Hague University Press

Taffesse, N. (2002). *The role of Irrigation Development in Enhancing Household Food Security. A Case Study of Three Small-scale Irrigation Schemes in Southern Nations, Nationalities and People's Region.* Masters Thesis, Addis Ababa, Ethopia: Addis Ababa University

Tesfaye, A., Bogale, A. and Namara, R.E., (2006). *The Impact of Small Scale Irrigation on Household Food Security: The Case of Filtino and Godino Irrigation Schemes in Ada Liben District,* Ethopia: East Shoa

Teshome, W. (2003). *Irrigation Practices, State Intervention and Farmers Life-World in Drought Prone Tigray,* PhD Thesis, Addis Ababa, Ethopia

Ziba, D. (2015). *The Impact of Irrigation Schemes on Farmers' Income and Livelihoods in the Upper East Region of Ghana,* Ghana: Kwame Nkrumah University of Science and Technology

Appendices

My name is Rachel Nyakatawa (R137541P) doing Bachelor of Arts Honours Degree in Development Studies at Midlands State University. I am conducting a research on the impact of irrigation farming in transforming rural livelihoods in ward 12 of Nyanga District. It is the requirement of the Bachelor of Arts Honours Degree in Development Studies that every student conduct a research on any area of interest. This questionnaire was designed to come up with data that will be used for that purpose. The information provided in this research will remain private and confidential. The material will be used for nothing other than academic purposes by the researcher only. Your participation will be greatly appreciated.

You are free to answer or not to answer.

Appendix 1 (Questionnaire)

A. Questionnaire for irrigators and non-irrigators

Area of influence…….	Contact infor……..
District……..	Date…….
Irrigation Name……..	

Please put a tick/answer where appropriate. Provide evidence where possible

1. Sex (a) Male ( ) (b) Female ( )

2. Age ……..

3. What is your level of education? (a) Primary ( ) (b) Secondary ( ) (c) Higher ( ) (d) None( )

4. Religion (a) Christian ( ) (b) Traditional ( ) (c) Others (Specify)……

5. Marital Status (a) Single ( ) (b) Married ( ) (c) Divorced ( ) (d) Widow ( )

6. Which farming do you undertake? (a) irrigation farming ( ) (b) rainy season farming ( )

7. Are you engaged in other income generating activities apart from irrigation/ rainy season farming? Yes ( ) No ( )

8. How long have you practised irrigation/ rainy season farming? ……

9. What are your main objectives for doing irrigation farming? ……

10. What assets have you acquired since you started/ since you were employed in irrigation farming?.....

11a. During the last five years were any repairs, improvements or additions made to your home at cost? Yes ( ) No ( )

b. If yes, what repairs, improvements or additions did you make to your home? ……

12. During the last 12 months has your household diet improved or worsened?.....

a. (if worsened) How has it worsened? ……..

b. (if improved) How has it improved? ……

13a. In the last 12 months have you been able to access the following? Education.. Yes ( ) No ( ), Health insurance … Yes ( ) No ( ), Assets… Yes ( ) No ( ), Employed farm labour.. Yes ( ) No ( )

b. Were you able because of your involvement in the irrigation farming? Yes ( ) No ( )

c. Is there any change in your livelihood outcomes because of irrigation? If yes, which way?

14. How do you select type of crops for your irrigation farming? (a) Better price ( ) (b) Good production ( ) (c) High disease tolerance ( ) (d) Easy to cultivate ( ) (e) Seed availability( )

(f) Others (Specify)…….

15. How would you describe the yields of your crops? (Good, Average, Bad)……

16a. Before you joined irrigation farming/ you were employed in the irrigation, what was the monthly estimated income of your household?.....

b. What is the estimated monthly income of your household now?.....

c. Can you say you are better off with your farming/ employment in the irrigation scheme than ever before?.....

17a. Which constraints do you face in irrigation farming?.....

b. How does each constraint affect your participation in irrigation farming? Give possible solution to the constraints you are facing……

18a. In what way do you market your farm produce? Any problems? Yes ( ) No ( ). If yes, what are the problems?.....

b. What challenge do you face in marketing your produce?

c. Do you get market information about prices and demand conditions of agricultural inputs and output? Yes ( ) No ( ). If yes, indicate the source of information……..

d. How far is the local market?.....

Appendix 2 (Interviews)

A. Interview questions for irrigation farmers

1) Do you have any information about how people used to live before the introduction of irrigation farming?
2) What level of education did you attain?
3) How did you venture into irrigation farming?
4) What have you managed to acquire since you started irrigation farming?
5) Are there any challenges you are facing in irrigation farming?

6) How are you dealing with those challenges?
7) Any other comment?

B. Interview questions for non-irrigators

1) Do you know anything about how people used to live before the establishment of the irrigation scheme?
2) Are you benefitting from the scheme and how are you benefitting?
3) What challenges are you facing from the irrigation scheme?
4) How are you coping with the challenges?
5) Do you have any other comment?

C. Interview questions for AGRITEX officer

1) Do you have any information about the area of ward 12 prior to the introduction of irrigation farming?
2) What changes do you know which came after the introduction of the scheme?
3) How does the community view your social responsibility programme?
4) Are there any challenges you are facing from the irrigation, the irrigation farmers and the community as a whole?
5) How are you dealing with the challenges?
6) Any other comment