

AN ANALYSIS OF THE IMPLICATIONS OF THE FAST TRACK LAND REFORM PROGRAM ON CLIMATE CHANGE AND DISASTER MANAGEMENT IN ZIMBABWE: A CASE OF CHEGUTU DISTRICT

By: Gibson Chitiga and Percyslage Chigora

ABSTRACT

In 1998 land hungry farmers went around and illegally allocated themselves portions of large scale owned farmland forcing a move by the Zimbabwean government to embark on a land distribution policy dubbed the Fast Track Land Reform Program (FTLRP). The policy saw a number of households into prime land, including some areas that were never cleared. The subsequent clearance of land and associated activities on the new areas has had an implication on climate change and disaster management. The purpose of this paper, therefore, is to explore the activities of the newly resettled farmers and analyze their linkage to climate change and disaster management. The paper will delve on the impact of the FTLRP program on climate change and disaster management. In the conclusion, the paper will provide the way forward in support of better natural resource management in order to avoid negative effects of climate change.

Key Words: land reform, climate change, disaster management, environmental degradation, Zimbabwe.

INTRODUCTION

The land question has been a topical issue in Zimbabwe since colonization right through up to post-independence and has been dominating post-independence politics. The resultant Fast Track Land Reform Program (FTLRP) was the movement of a number of people into land that was formally

occupied by commercial farmers. The land being utilized now has increased with new areas being cleared to enable cultivation of crops and other associated activities. These activities certainly have implications of environmental management as well as climate change. Of concern are activities that have a negative impact on climate that will ultimately lead to increased frequencies of droughts, change in rainfall seasons, flooding, and the speedy rate of desertification. It from this background, the paper aims at exploring the newly resettled farmers' activities on the environment and if they will have impact on climate change and disaster management.

BACKGROUND TO FTLRP, CLIMATE CHANGE AND DISASTER MANAGEMENT

Fast Track Land Reform Program was under taken at the backdrop of continued contention over land. The origins were colonialism and the subsequent policies alienated land from the indigenous African populace to minority European colonialists and settlers (Chigora & Guzura, 2008). In post independent Zimbabwe, attempts were made to resettle the indigenous landless but this did do much as there was continued demand for land. The government had attempted to seek alternative ways of improving the livelihoods of the people without really tackling the land issue, to which it failed leaving access to land as the only option available. In the post ESAP era, 1996 and beyond, the government had to rethink the land problem. Moves were made to try and raise the resources to implement land reform. Firstly, they failed to get support from the former colonizer, Britain. Secondly, they failed to raise funds at the 1998 donor conference. Thirdly, they failed to implement a new constitution, which could have empowered the government to acquire the farms legally. Those who wanted the land were left with no option but to invade the farms with the support of the government, since it had failed to find other options for taking the land. This led to the drawing up of the FTLRP, which saw the settling of people on former commercial farms. The new farmers that moved in had wide range of activities which they were undertaking to enable their survival and enhancement of their livelihoods. These activities had varying effects on the environment, which were likely to impact negatively on disaster management which will, in the end affect, the climate.

In simple terms, climate change is any long-term change in weather conditions. In terms of occurrence, climate change may occur in an area, given the changes in weather conditions to extreme case. In recent usage, climate change usually refers to changes in modern climate. In late 2007, the Intergovernmental Panel on Climate Change released their Fourth Assessment Report (AR4), drawing together scientific evidence on climate change. This report states, unequivocally, the manifold evidence that climate change

is occurring. Global average air temperatures are rising, with eleven of the last twelve years (1995-2006) ranking amongst the twelve warmest years in the instrumental record of global surface temperature. Warming is also occurring in Africa, with the Third Assessment Report (TAR) noting an average decadal warming of 0.05°C over the 20th century, with the five warmest years occurring since 1996 (Intergovernmental Panel on Climate Change, 2007). There is more data than ever before to suggest that human activity is responsible for these observed changes in climate. The IPCC AR4 states that there is very high confidence that the net effect of human activities since 1750 has been warming. This degree of warming is projected to be likely larger than the global annual mean warming throughout the continent and in all seasons, with the drier subtropical regions (including much of southern Africa) warming more than the tropics. Southern Africa is particularly a critical area where water availability is a major concern. The region's climate is influenced by a range of climate factors, including the El Niño-Southern Oscillation (ENSO) and large scale atmospheric pressure system interactions that can enhance periods of extended rainfall and dryness (Danish Development Research Network, 2009).

Climate change for Zimbabwe will, in fact, affect the new farmers and dash their hopes for transforming their livelihoods through land reform. In terms of climate change, Zimbabwe is vulnerable to climate change principally through shifting rainfall patterns and extreme events. Decreases in rainfall are occurring across all seasons, but especially during the early and late rains. Increased incidences of drought and late heavy downpours have become a common problem (Governance and Social Development Centre, 2009). Other potential changes include increased temperatures (especially in the dry season), localized floods, and decreased/varying river flow. Chegutu is one of the small towns at the central land of the country with relatively flat land suitable for crop production. The district is in Mashonaland West. The main crops grown in the district are maize, ground nuts, cotton, and market gardening in areas around the town. Before the FTLR, the district farming activities were largely dominated by commercial farmers. These were replaced by A1 Model farmers and A2 Model farmers. In the district, the agricultural sector currently represents the largest force driving the district's economic activity. Agricultural production processes, particularly plant growth, are dependent on climatic conditions. This makes agricultural activities extremely vulnerable to climatic changes. In Zimbabwe, a fairly significant amount of agricultural produce comes from the small scale and subsistence farmers. The greatest challenge to government lies in the sensitization of subsistence farmers to the impacts of climate change. These farmers already operate in the most marginal areas and are certainly the most

vulnerable group (Danish Development Research Network, 2009). Managing the environment becomes a tool for avoiding the excesses of climate change.

For Zimbabwe, environmental management may not be fully understood without looking at the concept of environment. In its broadest sense, an environment is a part of the earth's surface that supports life and, in which, life occurs. As early as 1987, Zimbabwe had started addressing the problem of environmental degradation with active participation of the Ministry of Environment and Tourism through "The National Conservation Strategy" (1987), in which a number of policy statements on possible mitigation and response strategies were enunciated (United Nations Environment Programme, 1997). The need to harmonize uncoordinated fragmented pieces of environmental legislation are cited as a major drive that led to the drafting of the first Environmental Management Bill in 1997 and its subsequent amendments until 2002, when it was passed into law. The Act provides a set of institutional set-ups and legal foundation for the sustainable management of natural resources and the protection of the environment, the prevention of pollution and environment degradation, the preparation of a national and other environmental management plans, as well as the establishment of an Environmental Management Agency and an Environment Fund. The Environmental Impact Assessment (EIA) requires all development projects, with significant negative environmental impacts, to be subjected to full EIAs. When the EIA report meets the set requirements, a certificate, valid for a period of two years, is issued. The requirements of the EIA are uniform across the country covering Mashonaland West as well as Chegutu district, in particular.

Failed management of the environment scales disaster, which can be defined as a state of extreme (usually irremediable) ruin and misfortune and management, is being in charge of something and successfully coming to terms with it. The focus of disaster management is to reduce the risk posed by actual and potential hazards. Hazards can be broadly grouped into three areas: natural, technological, and complex emergencies. Given the Zimbabwean situation, environmental management is closely linked to disaster management because climate poses the most dreadful disasters to the country and the region.

THE IMPLICATIONS OF THE FTLR ON CLIMATE CHANGE AND DISASTER MANAGEMENT

As observed earlier, agriculture and climate change are interrelated processes, both of which take place on a global scale cascading down to continents, down to small communities, and the two have a close relationship with disaster management. The FTLRP that took place in Zimbabwe since 1998 was mainly a redistribution of a natural resource that holds the life of each and every living organism on the face of the earth, which is land. Lack of proper administration, poor implementation and unorganized support of the scheme from the law enforcement bodies, as well as the policy makers, yields detrimental effects upon the natural world. This was just the preliminary stage of a looming crisis of abuse misappropriation of the natural resources, land, vegetation, and wildlife. Various activities of the resettled farmers of Chegutu district have different effects of different levels that, in their particular ways, also contribute to climate change.

Upon resettlement on the land, the new farmers began their various agricultural activities, such as land clearing (slash and burn) and building of structures. For about a decade now, the newly resettled farmers have been exploiting the land, as well as all other natural resources available. This has been poorly managed and it significantly contributed to climate change, a phenomenon which commenced centuries ago. These activities are not the root causes of the phenomenon, but they are not doing anything to adapt to the situation that is already at hand. They are, rather, catalyzing further degradation of the state of the environment which pushes the situation further to the drain. This exposes the nation, region, continent, and the whole world to a scourge of disasters that negatively ravage the livelihoods of the population of the world.

The fast track land reform program, as a national policy, took cognizance of the positive and negative effects it could pose on the human and biophysical environment. In response, there were a chain of agreements and legislations signed and agreed upon in order to manage proper constitutional and procedural utilization of the environment. In contrary, signing agreements and enabling legislations is not enough when it comes to environmental management. There is need for dedicated and equipped personnel to implement the legislation. The manner in which the legislation is put to practice with objectivity gives birth to proper environmental management thereby giving responsive and informed response to climate change mitigation, adaptation, and proper disaster management.

The established Lands Office is a fallacy when it comes to issues of the environment. The office was set just to make sure those who were settled the “Jambanja” way, are now recognized by the state because the office should have made an effort to remove and relocate people settled in fragile environments, like water ways and sandy soils. It would be an over expectation to expect effective environmental management from the District Lands Office because they are settling people, but they could not provide information such as the area of the district, number of farms in the district prior to the FTLR, or how many people they have relocated in the district.

The reform process authenticates that African governments are “paper tigers” because, on paper, the reform process is very procedural and consultative, as stated by the land policy statement of 1999, the criteria for identifying land to be acquired for redistribution are that the land is derelict, underutilized, owned by a farmer who has other farms, foreign owned, or contiguous to communal areas (Government of Zimbabwe, 2001). However, under the fast track, most of these criteria were largely abandoned.

In an interview with Chegutu District environmental officer, Munyaradzi Mariswa (2009), highlighted that EMA was supposed to take part in the FTLRP as part of the Land committee providing technical background on environmental management. In a different interview with the Lands Officer, Chegutu District (2009), she alluded that land was resettled on the first come first serve basis. In her words, she said, “there is a form that people have [to] fill in when applying for land but it is not effectively used because some people may submit the form and never follow-up”, thus the reform was done haphazardly. Probably because they do not have the vehicles, the office allocates land to the people from their offices. This usually results in settling on fragile environments and overpopulating the resettlement areas.

The District Lands office denied the existence of any form of environmental degradation in the resettlement areas “No erosion, no deforestation nor siltation of rivers in the district” (Land Officer, 2009). However, she acknowledged that there is a high demand of land from the people that they no longer have the space to allocate. This may contribute to the fact that the resettlement areas may now be overpopulated in terms of what things ought to be. She also complained about bulldozing of political chiefs to get what they want, regardless of whatever the responsible authorities have to say (Land Officer, 2009).

As a result, there is no open land that is reserved for forests and preservation of some special species of vegetation. Its either the land belongs to a farmer who can clear it at will or it is a grazing land. Even though most of the land cleared will be used for crop production, crops cannot be effective in absorbing carbon sinks in comparison to natural forests. This kind of poor planning means there was no environmental consideration when the resettlement process was being done. Most of the poorly managed resettlement process consequences may not be felt nor seen at early stages, but they go along with the activities of the resettled people. Because of scarcity, they will make sure they consume as much as they can before the next man does, thereby causing unbearable pressure on the environment.

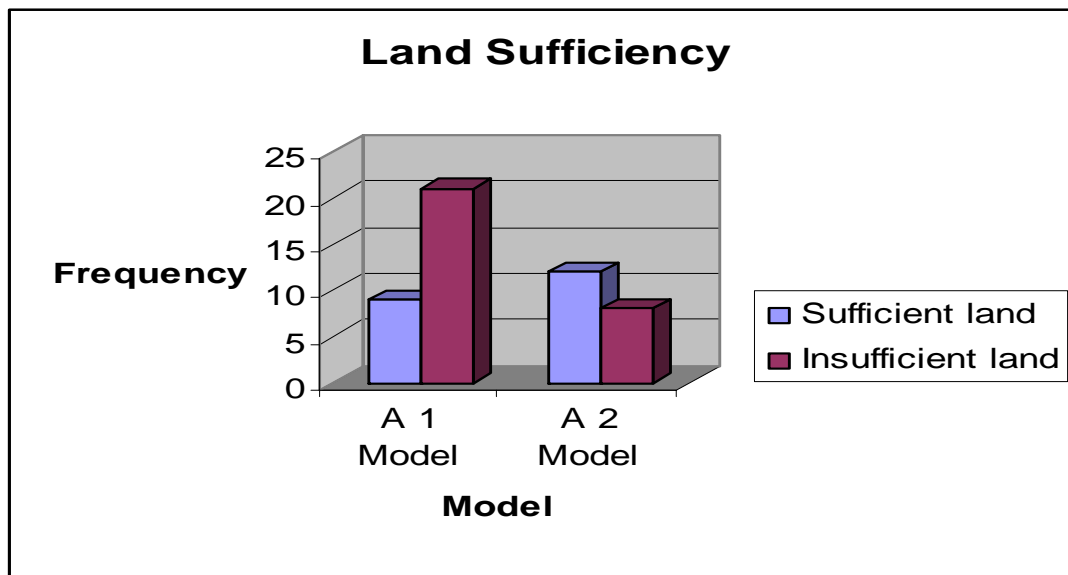
The demographic look of the people residing in the resettlement areas shows that there are economically active. Though the age of respondents ranges from 20 years to 60 years, 48 of the respondents were between the age of 20 and 49 years. Out of this figure, more than 40 of them were males, which are mainly the heads of the households of the study population. Economically, this is healthy and promising, but to the environment, this is the worst. This composition implies that there are more energetic people who are willing to work and, in the resettlement areas, they will only work either on the vegetation or on the land. The more they work on vegetation, the more deforestation occurs and the more they till the land, the bigger enemies of the earth they become. Erosions are rife where the soil is loosened.

Among the family sizes of the population studied, 40 of the families range between 7 and 12 members per each family. The economies of these people are solely dependent on agricultural production, therefore the bigger the family the greater the demand from the fields. On the other hand, the only form of labor available is the family members, thus the bigger the family the more available labor is. This creates more pressure on the environment and any degradation on the environment makes a mark on climate change because climate is managed by the status of the environment. Climate change exposes the world to a wide range of disasters, such as droughts and floods. This is in support of Chenje's observation that, "the country is facing escalating and unsustainable pressure from fast growing populations" (Chenje, 2000). A direct overutilization of the vegetation also leads to desertification of which the country is already under threat of desertification.

Given the family sizes of the people in the resettlement areas of Chegutu district and the amount of land allocated to them and the animal population that they own, it came out of the research that the land they

own is not enough for them and their livestock. Amongst the A1 Model farmers, most of the farmers did not get the amount of land that they had applied for and it is not sufficient according to them, as 21 of the 30 A1 Model farmers investigated responded that the land is not sufficient. Figure A shows the levels of insufficiency to interviewed farmers. This insufficiency simply means that more pressure is exerted on the available natural resources for survival.

Figure A



Source: Research findings

This insufficient land has to sustain the lives of the people as well as their domestic animals and the wildlife in the resettlement areas. One of the AGRITEX officers alluded that each farmer should have 14 ha of grazing land enough for 5 heads of cattle. This restricts their stocking to an average of 5 heads if they all have an average of 20 ha per farmer. With the insufficiency at hand, most of the A1 farmers have between 4 to 9 beasts per family. These numbers are multiplying with time as the animals are reproducing. If one beast is added every year in each family, after 5 years, each head will be ranging from 9 to 14 beats per family and grazing on the same grazing land. This means there is a lot of unbearable pressure on vegetation, exposing the nation to overgrazing which leads to desertification, which is an unbearable disaster. There are also other domestic animals reared by these farmers, like donkeys, goats, sheep, and pigs, which would also want to feed on the available vegetation. Domestic animals' pressure on the environment is limited in the A2 model farmers because their fields are relatively bigger than the A1 model farmers.

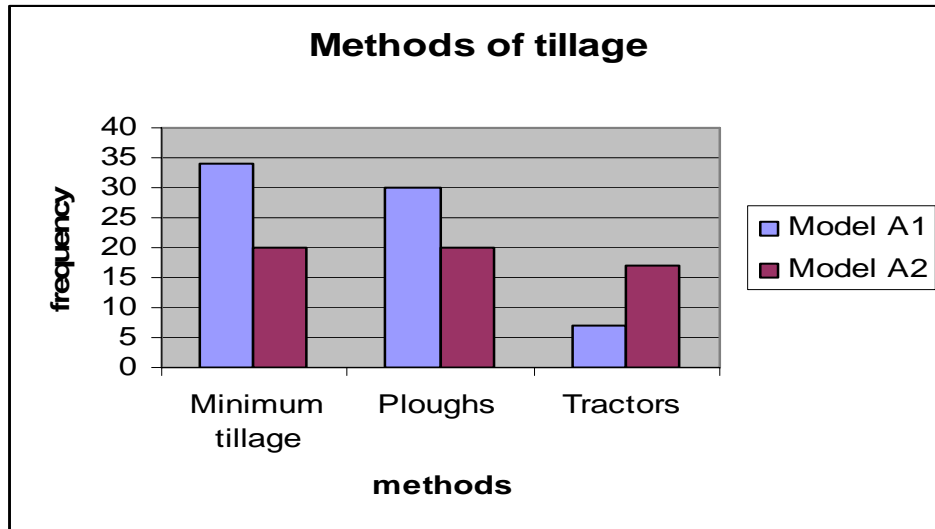
These demographic pressures on the environment demand that there be more bare land for agriculture and overgrazing leads to desertification. A bare land allows the fast blowing of the wind and, in conjunction with overgrazing, results in erosion. With desertification, there is an increase in temperatures, low humidity, and, consequently, low rainfall, hence climate change and that exposure may lead to natural disasters. This leads to a point that poor environmental management is literally poor disaster management.

The activities of the resettled farmers are the major perpetrators of environmental degradation, which constitutes poor environmental management leading to climate change. Growing of crops as a form of farming is not a threat to the environment, but there are pertinent issues at stake, such as the sustainability of the methods employed.

Farmers had to first burn the thickets before cutting and stumping the land for their agriculture. With the density of the thickets, there was no room for fire guards, meaning that the fire was not controlled at all. Thus, there was a massive release of carbon into the atmosphere. There was also digging of the ground during the stumping process. Besides the act of clearing the land, there are cases of reckless burning of bushes in the district during winter time when the grass is dry. The US Global Change research Office notes that “Land use changes, e.g., clearing land for logging, ranching, and agriculture, also lead to carbon dioxide emissions. Vegetation contains carbon, which is released as carbon dioxide when the vegetation decays or burns” (US Global Change Research Office, 1997). This does not only increase the amount of carbon in the atmosphere, but also leaves the ground exposed, as well as reducing the agents of transpiration.

Something that these farmers may not avoid is tilling the land because their farming is mainly crop growing. These farmers employ different methods of farming as shown by **figure B**.

Figure B: methods of tillage



Source: Research findings

The diagram show that more of the A1 model farmers employ minimum tillage in their farming practices. This is friendly to the environment, even though it is coincidence that they do not have the resources to till the land. TIEE says “cultivation of undisturbed soils results in the loss of soil carbon ... much of the carbon stored in soil is lost to the atmosphere due to enhanced decomposition during cultivation” (Teaching Issues and Experiments in Ecology, 2009), and most of the land cultivated by these new farmers were virgin lands prior to 1998. Although the A2 farmers also employ minimum tillage, they constitute a bigger fraction that uses tractors as a way of tilling the land. Tilling the land loosens the soil, exposing it to erosion, since some of the farmers practice their faming on sloping lands, for example in Johanadale and Nyamashesha Resettlement areas.

Moldboard ox drawn ploughs are the most appropriate with the soils of the environment, but they need to be helped with other good farming practices, like attending to eroded areas as well as making contour ridges even before erosion occurs. The situation is even worse to those settled in the waterways, like most of the A1 Model farmers in Nyamashesha area south of Chegutu urban. Combined with the use of chemical substances, which are becoming detrimental to the environment as agued by Chenje, “land degradation is a threat to the survival of the environment and physical features of the country. Key issues include escalating erosion, declining fertility, increasing salinity, soil compaction, agrochemical pollution, and deforestation” (Chenje, 2000) Some of the farmers burn the grass as a way of hunting

small creatures, like mice and rabbits as well as warthogs and bocks. They burn down the grass to expose the animals so that they can easily trap them. Besides destroying the vegetation that facilitates transpiration, they also expose the soil to erosion, which leads to siltation of rivers thereby reducing evaporation and ultimately low rainfall, which is a major component of climate change. Shortage of rainfall is drought, a dreadful disaster for human livelihoods, which cascades to hunger and famine.

There is an alarming rate of deforestation in the resettlement areas of Chegutu district. Wood is the most common and available building material and a form of energy, as compared to other building materials.

It is used for building various structures, as shown by Table R.

Table A

	Houses	Roofing	Dara	Granary	Kraals	Fencing
Bricks	42	0	0	8	0	0
Wood	50	50	50	39	50	50
Grass	0	50	0	0	0	0
Asbestos	0	4	0	0	0	0
Iron sheets	0	1	1	0	0	0
Wire	0	0	14	0	0	2

Source: Research findings

This may be because of availability and affordability, but also the lack of security of permanent residence of the farmers. One AGRITEX officer (2009) noted, “Since the people were told not to build permanent structures, the common building material is wood. Firewood is only accessible source of energy. Thus, there is a rampant slashing of trees both for energy and as a building material.” All the farmers interviewed use wood for their structures, except for a few who do not use them for building granaries not because they have alternatives, but because they do not have the granaries at all.

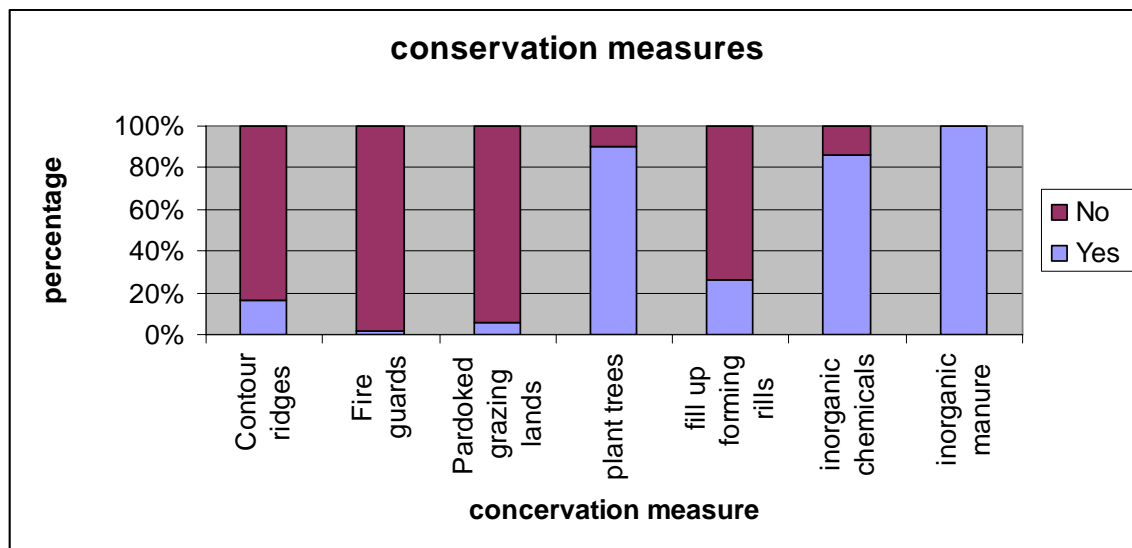
Wood is also the most common source of energy used for cooking and warmth, except for a few A2 model farmers who were fortunate enough to be settled on former farmhouses that used electricity. As a

way of getting rid of their crop residue, most of the farmers burn the residue while others recycle it into organic manure. Even though in smaller quantities, firewood produces carbon into the atmosphere. With the limited land in the resettlement areas, farmers continuously harvest vegetation for fire hood. The situation has been worse between the years 2007 to 2009 where there were excessive power cuts in towns, farmers had to supplement their incomes buy selling fire hood to the urban dwellers. Even though some of the farmers said that they plant trees annually, the number of trees they plant is excessively outnumbered by the number of trees they cut per year. Farmers know that it is their right to cut trees within their jurisdiction, but they are aware that harvesting timber from the communal land is prohibited. Some, especially the A2 model farmers, acknowledged the role of EMA and forestry commission in managing the environment as well as enforcement of law pertaining to the environment.

The situation on the environment is further exacerbated by illegal gold panning in some parts of the district where gold is found. The land has greatly changed its shape in the Pickstone area as well as the Gadzema area, where some gullies are now developing. Gold panning does not only disturb the land causing massive erosion, but it also involves the cutting of trees and burning of grass to clear the working area.

In a bid to manage the environment, farmers do the least as compared to what they are supposed to do in protecting and managing the environment as illustrated by **Figure C**.

Figure c



Source: Research findings

From the diagram, less than 20% of the farmers have contour ridges in their fields and less than 5% have fireguard around their fields. Even though there is a bigger number of planted trees, most of the trees planted are fruit trees and the numbers are far much lower than the number of trees they cut annually. Also the use of inorganic manure is very common, but it is not friendly to the environment as it emits some gases into the atmosphere.

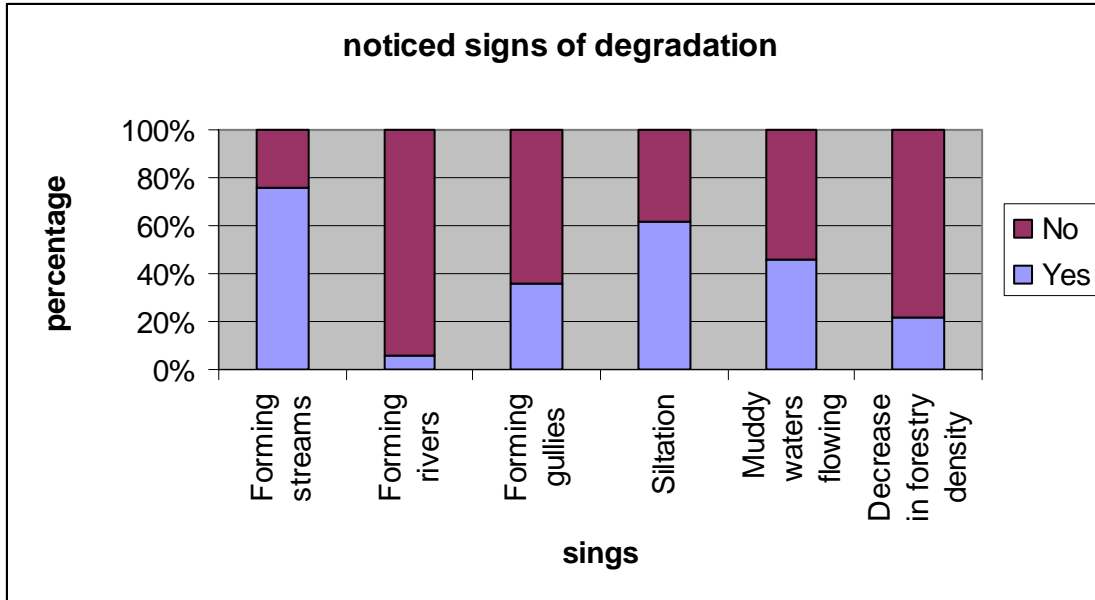
Agricultural activities, including all those by the newly resettled farmers, contribute to greenhouse gas increases through land use in four main ways: carbon dioxide releases linked to deforestation, methane releases from rice and wheat cultivation, methane releases from enteric fermentation in cattle, and nitrous oxide releases from fertilizer application. Deforestation also affects regional carbon sequestration, which can result in increased concentrations of carbon dioxide, the dominant greenhouse gas. Land-clearing methods, such as slash and burn, are effected by burning biomass, which directly releases greenhouse gases and particulate matter, such as soot, into the air.

Environmental degradation in the district affects a bigger portion of the Zambezi River Basin. This is captured by the UNEP that the Mupfure River that cuts through the district is part of the Zambezi catchment. Thus erosion, poor water quality, and siltation in the district do not affect only the local people, but the whole region as well as the globe at large.

The researchers discovered that most of the farmers know the components of climate and what it ought to be, though they could not relate it to the current phenomenon of climate change and environmental management. The responsible authorities know the concepts in their literal sense. They even know what is required of them in terms of environmental management, but they are highly incapacitated and the government is not taking up its responsibility in environmental management as a top priority issue.

The farmers agreed that there was a shift in the general patterns of weather from what they used to know, but they did not have the explanation as to what was causing the change. Some of them even knew that there is something called climate change but they did not know what it is. Further investigation of the farmers brought out that not so many of the farmers could even notice the environmental degradation taking place in their localities. This is authenticated by Figure D.

Figure D



Source: Research findings

Most of the farmers could notice forming water streams but they could not acknowledge that these were gradually developing into small rivers. Even though some of the AGRITEX officers said that they were embarking in stoning of waterways, the researcher could not identify any stoned waterway.

During the field visits, the researcher discovered that gullies are not a common feature in Chegutu district, but they are there at the Gadzema area on what is known as Hopely Farm. It is further shown that these gullies are still developing and expanding with each raining season. This information shows the state of the environment in the resettlement areas.

Commenting of the Environmental Impact Assessment (EIA), Munyaradzi Mariswa (2009) said it is a tool to predict and identify likely impacts of any proposed developmental project. It provides proposed remedial measures and the EMA office is empowered to evict anyone who defy orders of the act. “Under the minerals act, the government acknowledges that if you discover the precious metal on your land, you can shun agriculture and venture into mining, but one should have the council license, mines permit as well as the EIA certificate.” (Munyaradzi Mariswa, 2009). The officer said that even though the office is ill-equipped with no office and no vehicles, they hold awareness campaigns at the resettlement areas and hold environmental management clubs at Pfupajena Secondary School (Chegutu town) and Tivatou Primary school (ward 25) and at Chibero College (Norton town). He also said that it

is a great hindrance towards environmental management that the district office is understaffed. Even though the office has enough stationery, there is no office space to work from and the province of 6 districts have only 2 vehicles. Due to these reasons, the EMA office cannot execute its duties effectively, posing a negative impact on the environment. In as much as this is essential and contributes to environmental management, it is not adequate because these are urban schools and do not cover the resettlement areas where the information does not reach.

The best the ARITEX officers said they can do is to hold campaign meetings with farmers to encourage and educate them on good farming practices, though they do not dwell much on environmental management. In ward 16 and 17, the officer said she, at times, would hold community stone pitching and planting star grass. AGRITEX Officer (2009) remarked "I also hold monthly meetings with the farmers, even though the meetings are mainly aimed at improving the farmers yields, a few things are said about environmental conservation. It is difficult to hold such meetings, in most cases, because at times the situation forces us to use our own money to buy stationery and transport." With their jobs marginally done and emphasis paid on productivity, the officers make their recipe for disaster because it takes short period to destroy the environment but it takes decades to build it up. The AGRITEX officers said that they face many challenges, such as transportation to the operational areas and they also cannot find accommodation in the same areas though transportation came out to be a major challenge. One of the officers said that she hikes private transportation for about 10-20 kms using her personal money from her meager salary and walk for about 5-10 kms to go to her area of operation. One officer remarked that cell phone farmers are also a challenge because they do not attend meetings and yet they are the ones who give instructions to the people who do the work. She said that those who attend the meetings are not the ones who make the decisions that relate to the environment.

Government of Zimbabwe's Water Act (1998) is a law that promotes Integrated Water Resources Management, which has since been adopted as a basis for water resources management in Zimbabwe. The act calls for equitable distribution of water among competing users (agriculture, mining, industry, and the environment). The country has been subdivided into seven catchments. Each catchment is managed by a catchment council. The catchment council consists of elected representatives from the different water users. The act would be a good management tool if enforced properly, but the mechanisms are not in place. As for Chegutu district, a former commercial farmer was elected the chair

of the catchment council has been a victim of the resettlement process and he fled from the district, thus he can no longer execute his duties. The ZINWA office have recognized some changes in rainfall variability, a change in water quality, as well as quantity of runoff alluding these to increased loss of vegetation and change in land use. They also acknowledged the siltation of rivers authenticated by presence of sand dunes and turbid discharge in rivers. This is a result of increased runoff caused by reduced vegetation and poor land use as well as gold panning which are common practices in the Gadzema and Pikstone areas done along water ways and in rivers.

Lack of resources, expertise, capital, machinery, and the initiative to protect and care for the environment are the major weaknesses of water management in the district as well as the nation at large. This is coupled with the failure to enforce the existing policies because of prioritisation.

FUTURE POLICY ISSUES

In terms of policy, the Zimbabwean natural environment is highly protected with a wide range of policies, legislations, and acts. Amongst these are the EMA (Act), the Forestry Act, and the Water Act. These go hand in glove with the implementers which are EMA (Agency), The Forestry Commission, and ZINWA, respectively. These receive substantial support from the local traditional leaders, the police, as well as the Neighborhood Watch. The AGRITEX also plays a pivotal role in educating the communities on effective and sustainable environmental management.

In as much as the country is richly blessed with policies and legislations that protect the environment, there is a lot to be desired in terms of implementation of the policies. The EMA Office in the district reported that they have only one officer for the whole district. He is also heavily incapacitated in terms of transportation and equipment. Given that the officer is equipped and has enough manpower executing their duties in the pretext of the act, there shall be a huge positive change in how resettled farmers interact with the environment. In contrary, if the office continues with the way it is operating with all office duties piled on one man, the current abuse of the environmental shall continue and even increase with population increase as the prisoner's dilemma theory will come into play as farmers will be competing to consume as much as he can before the next farmer does it before him.

Land Reform is one area that will not be reversed in any way and, given the economic conditions of the country; the rate at which the forests are being cleared will increase because farmers will continue using

wood as a building material and source of energy, both in the resettlement areas and in towns. Given that there will be an improvement of the country's economic base with less power cuts and electrification of the resettlement areas, the rate of land clearing may not totally come to an end but will be significantly reduce.

The problems of the parastatals are more or less the same; the Forestry Commission is also ill-equipped that they find it difficult to execute their duties effectively. The Commission is highly relevant in protecting and rebuilding vegetation, but it is not operating to its capacity. If transport and equipment is made available and office operates up to its capacity, much can be done to rebuild the forests and educating the people in proper forestry management and environmental protection.

Failure to effectively implement the Forestry Act poses the most dreadful disaster of desertification. The rate of deforestation, vis a vis the rate of reforestation, projects a hazardous disaster ahead. Signs of desertification are already showing in Suri Suri area where there are vast areas of deforested lands which are not being cultivated and to make the condition worse, the areas are burnt out recklessly. It can also be observed along the country highways that all resettlement areas along the roads are ravaged by veld fires showing the extensiveness of the situation.

The AGRITEX officers are fully staffed, but poorly equipped resulting in poor implementation of their duties. Most of the resettlement areas are not yet developed thus there are poor transportation links or even accommodation for the officers to reside in their areas of operations. With no vehicles and transport allowances, the officers can hardly get to their working points and, as a result, the communities are not educated and the environmental dangers taking place are not noticed by the authorities. If the state does not take up its responsibility, the communities will remain under the cloud of ignorance and the consequences do not bring any good to the environment further exposing the nation and region to climate related disaster, like floods, drought and desertification.

ZINWA, despite that the operations office is situated more than 200 kms away from the district, is in minimum contact of the communities and the officers simply because the resettlement areas are regarded as less important to mines and industrial areas because of income related to working with such institutions. Thus, there should be an effort from the ZINWA office to try and manage the water

resources in the resettlement areas. Given that ZINWA shows its concern over the rivers, dams, pools, and underground water in the resettlement areas, even though it is not directly involved with the activities that affect the water quality and quantity, it can act as a pressure group or an implementing partner in protecting fragile environments, as well as taking measures to reduce erosion.

These statistics (level of education) show that the people residing in the resettlement areas are literate and not resistant to knowledge. What they need is to be fed with the information pertaining to climate change and disaster management and they can easily grasp the basic concepts. Thus, given that the relevant authorities like AGRITEX, EMA, and the Forestry Commission execute their duties to educate the farmers on how they can responsibly take good care of the environment, there shall be an improvement in environmental management in Zimbabwe.

The state should consider a better form of lease that gives farmers a sense of security and ownership to their designated plots. The 99 year lease that they were given and that they were advised not to build permanent structures gives them insecurity that any time they may be removed thus the prisoner's dilemma. Giving these farmers a permanent lease and teaching them that the environment belongs to them thus they have to exploit it sustainably.

The government should have the political goodwill in terms of funding and allocation of resources. There should also be collective participation of all stakeholders. All parties that governs the environment should consult each other when formulating policies as well as giving feedback to each other on the improvements, achievements, and shortfall which must then be constructively used for a better environmental management, which is the backbone of managing climate related disasters.

Unless there is a radical change in the way state actors execute their duties and the farmers continue with their current activities, the nation is heading for massive environmental related disasters. These are interrelated and intertwined. Deforestation and cultivation loosens the soil, leading to erosion, which damages the shape of the earth, leading to siltation of rivers, leading to reduced evapo-transpiration hence drought, and, consequently, hunger and famine. Burning of crop residue and bushes reduces carbon sinks hence emitting more carbon into the atmosphere causing global warming. Thus is the

current trends of environmental exploitation and mismanagement continues. With these trends, the nation is heading for a wide range of climatic disasters.

CONCLUSION

In serving the intended goals of the study, the research managed to bring out various agricultural activities undertaken by the newly resettled farmers. These include deforestation, farming on waterways and general disturbance of the soil through cultivation since convectional farming is their main economic activity. Even though some of them plant some trees, they plant fruit trees and are way fewer than they cut thus it makes no effect. Wood is the main building material and major source of energy. In some cases, gold panning is done and it loosens the soil and deforms the shape of the earth. These activities affect climate in that deforestation and burning of grass and crop residues reduces carbon sinks thereby increasing the amount of carbon in the atmosphere leading to global warming. Reduced evapotranspiration leads to low precipitation and droughts, which leads to hunger and famine, and, at times, irregular excessive rains which courses floods and famine as well. Most of these activities that are detrimental to the environment are a result of sheer ignorance on the part of the farmers. Even though the government's legislations are richly designed with consciousness and specificity, there is poor enforcement and the environmental issues are underfunded thus the nation remains a paper tiger with no implementation. If the situation remains the same, there shall be further over utilization of the resources leading to siltation of rivers, low precipitation, and/or floods both leading to famine all because the nation is not adapting to and mitigating the effects of climate change.

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